

B. Flexible connectors: Anaconda, Aeroquip or approved equal.

## 2.2 DESCRIPTION

### A. Copper Pipe - Plumbing:

1. Pipe: Hard drawn copper type "L" above grade and hard drawn copper type "K" below grade, ASTM B88.
2. Fittings: Wrought copper solder type.
3. Solder
  - a. Above ground: 2" and smaller - Lead free, 95-5, tin silver and flux.
  - b. Below ground: 2 1/2" and larger - Lead free, brazing alloy and flux.

## PART 3 EXECUTION

### 3.1 PREPARATION - MEASUREMENTS, LINES AND LEVELS

- A. Check dimensions at the building site and establish lines and levels for the work specified in this Division.

### 3.2 PIPING INSTALLATION

- A. Install unions in all non-flanged piping connections to apparatus and adjacent to all screwed control valves, traps, and appurtenances requiring removal for servicing, so located that piping may be disconnected without disturbing the general system.
- B. Install all piping as to vent and drain.
- C. Support all piping independently at apparatus so that the equipment shall not carry its weight.
- D. Dielectric Fittings: Provide dielectric couplings, unions or flanges between dissimilar metals. Additionally, provide dielectric couplings as required to isolate cathodically protected piping and equipment. Fittings shall be suitable for the pressure and temperature to be encountered.
- E. Domestic water piping joints
  1. Above ground:
    - a. 2" and smaller - soldered.
    - b. 2-1/2" and larger - brazed.
  2. Below ground: Brazed.
- F. Screwed Joints: Ream pipe ends. Apply dope or tape to male threads only. Brass joints shall be made with Teflon tape only. Make up fitting with not over two threads showing beyond the fitting end. Make junctions of galvanized pipe to cast iron with tapped spigots or half couplings screwed to the end of galvanized pipe to form a spigot end.
- G. Solder Type Joints:
  1. Clean the copper tubing and fittings thoroughly with steel wool before applying the flux. The copper tubing shall have all burrs removed, be reamed to full bore, and be true and round for all joints.
  2. Apply heat uniformly to secure penetration of the filler material. Leave full bead around the entire circumference of the joint to show proper penetration and sealing.
  3. Flux shall not be used for copper-to-copper joints. Flux shall be used for joining copper to brass or bronze. In those cases where flux is used, particular care shall be exercised in applying the flux to avoid leaving any excess inside the completed joints.
- H. Plastic Pipe: Provide piping and connections installed in conformance with the piping manufacturer's recommendations.
- I. Provide flexible connectors at all piping connections to mechanical equipment.
- J. Provide seismic bracing and support per SMACNA "Seismic Restraint Manual Guidelines for Mechanical Systems", Seismic Hazard Level (SHL) B.

### 3.3 SPECIALTIES INSTALLATION

- A. Install all piping specialties where shown on the drawings and in accordance with manufacturer's recommendations.

## SECTION 22 11 19

### DOMESTIC WATER PIPING SPECIALTIES

## PART 1 GENERAL

### 1.1 DESCRIPTION

- A. This section prescribes the requirements for materials and methods of installation of piping specialties for piping systems where indicated required by code or as good practice dictates.

### 1.2 SUBMITTALS

- A. Catalog or technical data on automatic flow control valves for proposed manufacturer.
- B. Operating and maintenance data.

## PART 2 PRODUCTS

### 2.1 UNIONS

- A. Type: 150 malleable iron, brass to iron seat, ground joint, black or galvanized to match pipe. 200-psi wog bronze, ground joint, solder type for copper tubing. Where dissimilar metals join, dielectric unions, couplings or flanges shall be installed.

## PART 3 EXECUTION

### 3.1 INSTALLATION - GENERAL

- A. Provide unions at all mechanical equipment connections as required allowing equipment removal from piping without destruction or cutting of piping or pipe joints.

## SECTION 22 13 00

### FACILITY SANITARY SEWERS

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Work included: Providing of all required sanitary waste and vent system's piping, and utility connections for all services specified or shown on the drawings or required by demolition.

### 1.2 QUALITY ASSURANCE

- A. Piping material and installation to meet requirements of the local plumbing, mechanical, building codes and serving utility requirements.

### 1.3 OPERATION AND MAINTENANCE DATA

- A. Submit certificates of inspections and tests to owner.

### 1.4 QUALITY ASSURANCE

- A. Piping material and installation to meet requirements of the local plumbing, fire and building codes and serving utility requirements.
- B. Pipe Cleaning: Should any pipe be plugged, the piping shall be disconnected, cleaned and reconnected without additional cost to Owner.
- C. Damage to the building or systems resulting from failure to properly clean the system shall be corrected without additional expense to the Owner.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Pipe and fittings: Standard product of manufacturer.
- B. Flexible connectors: Anaconda, Aeroquip or approved equal.

### 2.2 PIPE AND PIPE FITTINGS

#### A. DESCRIPTION

1. Sanitary Waste Systems: Cast iron pipe above grade. ABS or Cast Iron below grade to five feet beyond building lines and below grade where depth of bury is less than 24 inches.
2. Vent Systems: Cast iron, ABS or galvanized steel pipe.
3. Miscellaneous Condensate and Indirect Drains: Type "L" hard drawn copper tubing for plumbing service.

## 2.3 MATERIAL DESCRIPTION:

### A. Galvanized Steel Pipe:

1. Pipe: Schedule 40 galvanized steel pipe conforming to A120-82.
2. Fittings: Galvanized screwed cast iron.

### B. Cast Iron Pipe:

1. Pipe: Hubless cast iron soil pipe, CISPI 301 / ASTM A888, stamped with the collective Cast Iron Soil Pipe Institute trademark.
2. Fittings:
  - a. Hubless cast iron fittings - CISPI 30-901 or cast iron hub and spigot fittings ASTM A74.
  - b. Underground couplings - Clamp-all Corporation, Husky SD4000 or approved equal.
  - c. Aboveground couplings - couplings meeting CISPI designation 301-85 except rain drain couplings in systems greater than 25 feet of water column (use Husky SD4000.)
  - d. Couplings to steel or plastic pipe - Fernco "lowflex" or approved equal.

### C. Acrylonitrile-Butadiene-Styrene-ABS-DWV Pipe and Fittings:

1. Pipe and Fittings: Schedule 40 Acrylonitrile-Butadiene-Styrene (ABS) DWV plastic drain, waste and vent having a cellular core conforming to ASTM D3965 and with the National Sanitation Foundation standard 14. Pipe shall be iron pipe size and conforming to ASTM F 628. Fittings shall conform to ASTM D 2662. Glued fittings only.
2. Provide tracer wire 1 foot above all underground waste and sewer lines outside building.
3. All pipe, manifolds and fittings to be of same manufacturer and install in accordance with manufacturer's recommendations.
4. Solvent cements shall conform to ASTM D 2535.

### D. Copper Pipe - Plumbing:

1. Pipe: Hard drawn copper type "L" above grade and hard drawn copper type "K" below grade, ASTM B88.
2. Fittings: Wrought copper solder type.
3. Solder
  - a. Above ground: 2" and smaller - Lead free, 95-5, tin silver and flux.
  - b. Below ground: 2 1/2" and larger - Lead free, brazing alloy and flux.

## PART 3 EXECUTION

### 3.1 PREPARATION - MEASUREMENTS, LINES AND LEVELS

- A. Check dimensions at the building site and establish lines and levels for the work specified in this Division.

### 3.2 PIPING INSTALLATION

- A. Install unions in all non-flanged piping connections to apparatus and adjacent to all screwed control valves, traps, and appurtenances requiring removal for servicing, so located that piping may be disconnected without disturbing the general system.
- B. Install all piping as to vent and drain.
- C. Support all piping independently at apparatus so that the equipment shall not carry its weight.
- D. Dielectric Fittings: Provide dielectric couplings, unions or flanges between dissimilar metals. Additionally, provide dielectric couplings as required to isolate cathodically protected piping and equipment. Fittings shall be suitable for the pressure and temperature to be encountered.
- E. Screwed Joints: Ream pipe ends. Apply dope or tape to male threads only. Brass joints shall be made with Teflon tape only. Make up fitting with not over two threads showing beyond the fitting end. Make junctions of galvanized pipe to cast iron with tapped spigots or half couplings screwed to the end of galvanized pipe to form a spigot end.
- F. Solder Type Joints:
  1. Clean the copper tubing and fittings thoroughly with steel wool before applying the flux. The copper tubing shall have all burrs removed, be reamed to full bore, and be true and round for all joints.
  2. Apply heat uniformly to secure penetration of the filler material. Leave full bead around the entire circumference of the joint to show proper penetration and sealing.
- G. Flux shall be used for copper-to-copper joints. Flux shall be used for joining copper to brass or bronze. In those cases where flux is used, particular care shall be exercised in applying the flux to avoid leaving any excess inside the completed joints.
- H. Provide flexible connectors at all piping connections to mechanical equipment.

### I. Waste and Vent Systems

1. Install waste, storm, overflow storm and vent piping system sized in conformance with the drawings.
  2. Grade horizontal waste runs 1/4 inch per foot where possible. Piping 3" and greater may be run at 1/8 inch per foot minimum when approved by the Administrative Authority.
  3. Make all changes in direction with appropriate fittings.
  4. Collect vents together in ceiling space and extend through roof for minimum penetrations.
  5. Flash and counterflash all vents through the roof.
  6. Verify exact location of all fixtures from architectural drawings.
  7. Test piping system per Section 22 05 93.
- J. Miscellaneous Condensate and Drain Systems:
1. Install condensate system sized in conformance with the drawings.
  2. Slope lines in direction of flow.
  3. Install indirect waste fittings as shown on the Drawings, providing access as required by code.
  4. Indirect drains in kitchen area are to spill to floor sinks above the flood level of the floor sink and in location that allows removal of grate and does not create splashing during discharge.
  5. Test piping system per Section 22 05 93.

### 3.3 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

- A. Contractors shall provide proper sizing when providing sleeves or core-drilled holes to accommodate their through penetrating items. All voids between sleeve or core-drilled hole and pipe passing through, shall be firestopped to meet the requirements of ASTM E-814, in accordance with Section 21 00 00 - Firestopping.

## SECTION 22 42 00

### COMMERCIAL PLUMBING FIXTURES

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Work included: Providing of all plumbing fixtures, fixture trim, cleanouts and appurtenances as shown or required.
- B. Product Certification: Provide only products certified for use in the State of Oregon.

### 1.2 SUBMITTALS

- A. Provide submittals in accordance with Section 22 00 00.
- B. Submittals shall include manufacturer's catalog literature for all products used.

### 1.3 OPERATION AND MAINTENANCE DATA

- A. Provide O&M data in accordance with Section 22 00 00.

### B. O&M data shall include:

1. Manufacturer's literature.
2. Maintenance instructions.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Vitreous China Plumbing Fixtures: American Standard, Toto, Eljer, Mansfield, Crane, Kohler or approved equal.
- B. Stainless Steel Plumbing Fixtures: Elkay, Just or Kohler.
- C. Fixture Trim: Delta, Chicago, T & S Brass, Symmons or approved equal.
- D. Hose Bibbs: Jay R. Smith, Acorn, Woodford or approved equal.
- E. Toilet Seats: Olsonite, Bemis, Church or Bencke.
- F. Flush Valve: Sloan or Zurn.
- G. Shower Enclosures: FiberFab, Lasco or approved equal.
- H. Supplies and Stops: Speedway, McQuire, Zurn or Eastman.
- I. Floor Drains and Floor Sinks: Jay R. Smith, Watts Ancon, Wade or Zurn.
- J. Roof Drains, Overflow Roof Drains and Overflow Nozzles: Jay R. Smith, Watts Ancon, Wade or Zurn.
- K. Cleanouts: Jay R. Smith, Wade, Watts Ancon or Zurn.
- L. Carriers: Jay R. Smith, Zurn or approved equal.
- M. Priming Valves: Precision Plumbing Products only.
- N. Water Hammer Arrestors: Smith or Precision Plumbing Products.
- O. Emergency Eye Washes: Haws, Bradley, Chicago or Speakman.
- P. Tempering Valves: Haws, Leonard, Lawler or approved equal.
- Q. Expansion Tanks: Amtrol, Watts or approved equal.
- R. Drinking Fountains: Haws, Oasis, Sunroc, Elkay, Halsey Taylor.
- S. Reduced Pressure Backflow Preventers: Watts, Conbraco, Febo or approved equal.
- T. Domestic Hot Water Circulating Pumps: Bell & Gossett, Grundfos, Taco or approved equal.
- U. Sump Pumps: Myers, Gould, Zoeller or approved equal.

## 2.2 DESCRIPTION

### A. Water Closet (WC-1):

1. American Standard "Afwall" Model2257.101, white vitreous china, 16-1/2" high rim, wall mounted, elongated bowl, siphon jet action 1.6 gpf.
2. Sloan Royal 111-1.6, diaphragm type, 1.6 gpf flush valve, dual filtered by-pass, vandal resistant cap, ADA compliant handle, sweat solder adapter, cast set screw wall flange
3. Olsonite No. 10SSC, Heavy duty elongated, solid, white plastic open front seat less cover with stainless steel hinge post and self-sustaining hinge.

### B. Water Closet, ADA (WC-2):

1. American Standard "Afwall" Model2257.101, white vitreous china, 16-1/2" high rim, wall mounted, elongated bowl, siphon jet action 1.6 gpf.
2. Sloan Royal 111-1.6, diaphragm type, 1.6 gpf flush valve, dual filtered by-pass, vandal resistant cap, ADA compliant handle, sweat solder adapter, cast set screw wall flange
3. Olsonite No. 10SSC, Heavy duty elongated, solid, white plastic open front seat less cover with stainless steel hinge post and self-sustaining hinge.

### B. Lavatory, ADA (L-1):1

1. American Standard, "Lucerne" Model 0356.015, wall mounted, concealed armed support, white vitreous china.
2. Delta 591T258 Sensor operated faucet, 0.5 gpm, vandal resistant aerator, thermostatic mixing valve in recessed mounting box. battery operated.
3. Pre-formed manufactured insulation kit for trap, waste and water supplies.
4. Chrome Plated brass grid drain.
5. Provide point of use thermostatic hot water tempering valve on hot water supply.

### D. Sink, ADA (S-1):

1. Just, Model OLF-ADA-1619, Overall dimensions 16" x 19", top-set, drop-in, self rimming, counter mouted, type 304 stainless steel lavatory with front overflow, faucet ledge drilled for 4" centers.
2. American Standard "Monterrey" model 5500.170, deck mounted chrome plated one-piece brass faucet, lever paddle handles, 1.5 gpm.
3. Pre-formed manufactured insulation kit for trap, waste and water supplies.
4. Chrome Plated brass grid drain.
5. Provide point of use thermostatic hot water tempering valve on hot water supply.

- E. Floor Drain (FD-1): J.R. Smith, Fig. 2005-02-A-NB-U-P050, Duco cast iron body, nickel bronze adjustable strainer head, 2" outlet, vandal proof screws, clamping ring for waterproof flooring and trap primer connection.

- F. Supplies and Stops: Flexible supplies with loose key angle stops to wall with canopy flanges and all exposed surfaces chrome plated.

### H. Traps:

1. Exposed Traps: 17-gauge chrome plated tubing adjustable P\_trap with slip bushing.
2. Concealed or Below Grade: Coated cast iron P\_trap, recessed screw joint or to match cast iron pipe.
3. Support Rims: Stainless steel rims, if sink not furnished with integral rim.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Provide plumbing fixture trim where applicable on fixture.

### B. Plumbing Fixtures:

1. Plumbing Fixtures Mounting Heights: All fixtures standard rough in catalogued heights unless specified or shown otherwise on the architectural drawings.
2. Floor Drain: Set top flush with finished floor unless otherwise noted on architectural drawings.

### C. Priming Valves:

1. Floor drain and Floor Sink traps primed with priming valves with 3/8" copper pipe.
2. Six traps maximum primed from one priming valve.
3. Where priming valves are installed in finished rooms, conceal in wall and provide access door.
4. Install shutoff valve ahead of priming valve.

- D. Water Hammer Arrestors (WHA): Provide where shown and where recommended by Plumbing Drainage Institute (PDI). Furnish access panel to allow repair or replacement.

- E. Drawings are diagrammatic and may not show all required cleanouts and fittings. Provide additional required items at no additional cost.



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Plumbing

Specifications

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