

SECTION 15300

PLUMBING PIPING SYSTEMS

PART 1 - GENERAL

1.01 SPECIAL NOTICE

- A. Each contractor shall read all relevant documents, become familiar with the job, the scope of work, type of general construction, architectural, structural, mechanical and electrical drawings and the specifications. Each contractor shall also familiarize himself with the purpose for which these documents have been prepared and shall become cognizant of all the details involved. Each contractor shall coordinate his work with that of others to the end that unnecessary delays be avoided.
- B. The term "contractor" used in this section of the specification shall mean the contractor whose work is covered by this section.
- C. When the term "Engineer" is used in this section of the specification, it shall mean the facility engineer.

1.02 SERVICES

- A. Extension of services in the building shall be fabricated from the same materials as the utility lines or those materials hereinafter specified for the building service. Where dissimilar metals are used, proper dielectric unions as hereinbefore specified shall be installed. Should points of service or connections vary from that shown on the drawings, the subcontractor shall properly allow for this in his installation.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15700 covering and insulation.

PART 2 - PRODUCTS

2.01 SANITARY DRAINS AND SANITARY VENT PIPING

- A. All soil waste and vent piping shall be constructed from service weight cast iron soil pipe, joined with cast iron bell and spigot fittings or no hub fittings of the same weight, or schedule 40 PVC soil pipe joined with drainage pattern fittings as allowed by code. Fittings for use in vent systems shall be inverted. Vent lines 2 inches and smaller and waste lines 1 1/2 inch and smaller may be made using galvanized steel pipe and galvanized screwed pattern, malleable iron fittings, or Type "M" hard drawn copper joined with solder type drainage fittings. Install lead piping for waste connection when required by local code. Weights on lead piping shall be in accordance with local code. See Section 07800 Roof Penetrations.

2.02 DOMESTIC WATER PIPING

- A. All domestic water piping, except as hereinafter specified, shall be fabricated from type "L" copper tubing hard drawn, of the sized shown. Fittings on copper tubing shall be wrought copper, sweat type fittings and adapters shall be used when tubing connects to brass piping system. Nipples for connection from copper pipe to plumbing brass shall be red brass Grade "A" threaded. Join copper piping systems using 95-5 hard solder. Water piping installed below building slab shall be fabricated from type "K" soft copper arranged so that no joints are made below the floor line. Should this distance be greater than lengths of type "K" soft copper that are available, then the joints shall be made using sil-fos solder.

2.03 GAS PIPING

- A. Gas piping throughout the building shall be Schedule 40 black steel with malleable iron 150# beaded pattern screwed fittings on piping systems 2 inches in size and smaller with steel weld fittings on piping 2 1/2 inches in size and larger. Make taps from mains to branches using thread-o-lets or weld-o-lets or tee connections. Install interior piping in exposed locations only. Pipe below building lower floor shall be installed in cast iron sleeves vented at both ends.

PART 3 - EXECUTION

3.01 SANITARY DRAINS

- A. The sewage drains and related piping shall be immediately installed after excavation or cutting for same has been done so as to keep the openings for this pipe open as short a time as possible. However, no piping shall be permanently closed up, furred in or covered before inspection and approval. Street elbows, bushings, close nipples, long screws, bull head tees or crosses shall not be installed in the plumbing lines. Each piece of pipe shall be reamed to make the bore of the pipe at its end the same as the pipe. All exposed polished connections from the fixtures shall be made with special care showing no tool marks or threads. Under no conditions shall any piping be run in the floor except as shown on the plans or written approval has been received. Bushings shall not be used where any changes in pipe size occurs, only reducing fittings (or increasers) shall be used.
- B. Sanitary sewers shall be installed a neat manner, shall be installed to grade 1/4 inch per foot if possible, 1/8 inch per foot minimum. Vent piping shall be graded to free itself quickly of any water and condensations. Drainage piping shall run straight as possible and shall have easy bends with long turns. Offset shall be made at 45 or less.
- C. Install cleanouts as shown on the drawings and at each change in direction of the line, at the end of each run, and at the foot of each riser. Cleanouts shall be installed at not more that 80 foot intervals in horizontal lines, taking care to locate cleanouts where they are easily accessible.

- D. Flash all pipe openings through the roof, using 4# sheet lead. Construct the flashing with a base of 10 inches beyond the pipe openings in all four directions and extend the vertical tube up the pipe and terminate by turning into the pipe cavity at least 2 inches on vent pipes 2 inches in size and larger and terminating in a specially fabricated flashing fitting on pipe sized 1 1/2 inch and smaller. The Plumbing Subcontractor shall fabricate flashing and turn over to the roofer to install at the roof level and after completion of this installation he shall finish the top of the flashing as hereinbefore specified.

3.02 INSTALLATION OF WATER PIPING

- A. Water piping systems shall generally be run level, free of traps, without any unnecessary bends, as high as possible and to suit the necessity of clearances for other mechanical work. Water piping shall be so graded and valved to provide for the complete drainage and control of the system. Piping shall be installed so as to cause no unusual noise from flow of fluid within the building system.
- B. Hot supply and return and cold water piping systems shall be separated by at least 6 inches and every precaution shall be taken to see that the pipes do not come in contact. Where piping is paralleled, space shall be provided for the proper thickness of covering.

3.03 NATURAL GAS

- A. Natural gas service piping systems shall generally be run level, free of traps, and without unnecessary bends. Piping shall be routed as high as possible and arranged to provide necessary clearance with other mechanical work. Piping shall be provided with required drip legs, with drains. No unions shall be used on these lines except at connections to equipment.

3.04 CONNECTIONS TO EQUIPMENT NOT FURNISHED UNDER THIS SECTION OF WORK

- A. Plumbing connections for miscellaneous equipment will be furnished by this contractor. He shall rough-in all soil waste, water and gas piping as required and shall make all final connections. All roughing-in shall be done in accordance with approved shop drawings furnished by the subcontractor furnishing the equipment. All water and gas connections shall be properly valved before connection to the equipment. All supply stops, supply tubes and "P" traps required for connection of this equipment will be furnished under this contract. Supply trim, waste connections and other miscellaneous accessories will be furnished by the equipment supplier, but will be mounted by this contractor unless noted otherwise.

3.05 FINAL CONNECTIONS

- A. This contractor shall make final connections of all water and sanitary drain lines required to serve equipment furnished by him. Contractor shall rough-in and make final connections to all miscellaneous equipment furnished and set in place under other sections of the work. All roughing-in and connections shall be made in

accordance with manufacturer's recommendations. All final connections shall be fabricated from the same materials as piping system to which they are connected.

3.06 CLEANING

- A. Clean systems thoroughly before testing. Fixtures, equipment, pipe, valves and fittings shall be free of grease, metal cuttings, dirt and other foreign matter. Remove protective covers. Fixtures (including lavatories, water closets, and urinals) shall be cleaned and ready for use.
- B. After completion of project, clean the exterior surface of equipment included in the section, including concrete residue.
- C. After the completion of the work, all materials and equipment surfaces shall be cleaned and polished in accordance with the finish of the material.
- D. Water system shall be thoroughly flushed and cleansed of any and all deleterious materials at least once before system is placed in operation. At that time, these systems will be carefully checked for leaking and defects as herein specified. An approved cleaning agent will be used in flushing.
- E. At all times, keep the premises clear of undue accumulation of rubbish.
- F. On completion on the work, remove all rubbish and debris resulting from the contract, and dispose of same.
- G. All equipment shall be thoroughly cleaned and left in a satisfactory condition for proper operation at project completion.
- H. Before placing orders for pre-cleaned pipe, fittings, valves, etc., the contractor shall submit the manufacturer's cleaning specifications to the Engineer for approval.

3.07 DISINFECTION OF DOMESTIC WATER SYSTEM

- A. Water piping systems shall be thoroughly disinfected with a solution containing no less than 50 parts per million of available chlorine. Chlorinating materials shall be either liquid chlorine or sodium hypochlorite solution, shall be introduced into the system and drawn to all points in the system. Disinfection solution shall be allowed to remain in system for 24 hours, during this time, valves and faucets shall be opened and closed several times. After disinfection, solution shall be flushed from the system with clear water until residual chlorine content is no greater than 0.2 parts per million.
- B. Work shall be supervised by Owner and preformed by approved chemical testing laboratory and results sent to the Architect or Architect's representative for verification.

END OF SECTION