

SECTION 15400 GENERAL PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 NOTE

- A. The requirements of Section 15010 apply to work performed under this Section.

1.2 SCOPE

- A. The work under this Section of the Specification shall include the furnishing of labor, materials and equipment for the installation of complete plumbing systems, including interior sanitary soil, waste and vent piping; interior domestic hot and cold water piping, plumbing fixtures and appliances to provide continuous and satisfactory service.

1.3 CONNECTIONS TO EQUIPMENT

- A. Provide labor and materials to connect equipment furnished under this Section of the Specification.
- B. Provide labor and materials to connect equipment furnished under other Sections of the Specification and requiring plumbing connections as if the equipment was furnished under this Section of the Specification. Provide traps, water stop valves, etc., for sinks requiring such connections.

PART 2 - PRODUCTS

2.1 DRAINS

- A. Provide roof, floor and area drains shown on Drawings and/or described below. Drains shall be Zurn, J. R. Smith, Josam or Ancon.
- B. Floor drains shall have deep seal "P" traps. Provide flapper type backwater valves on drains connected directly to the storm sewer where the line serving the floor drains does not have a backwater valve.
- C. Floor drains shall be of the following type:
 - 1. FD-A – cast iron adjustable nickel bronze 8 x 8 inch strainer.
 - a. Zurn - Z-415S
 - 2. FD-B – similar to FD-A with secondary strainer.
 - a. Zurn – ZN-525-S
 - 3. FS - cast iron, 8 inch deep porcelain enamelled receptor with dome strainer and nickel bronze half grate.
 - a. Zurn – Z-1801

2.2 CLEANOUTS

- A. Cleanouts shall be provided at ends of runs, at changes of direction and near the base of

each vertical soil, waste, or drain pipe. Cleanouts shall be placed every 50 feet minimum, unless the conditions require them at closer intervals or as indicated on the drawings. Cleanouts at the base of vertical pipes shall be placed in a fitting just above the floor. Cleanouts shall consist of Y branches or 1/4 bends the full size of the line for piping 4 inches and smaller, and 4 inches for larger pipes. Cleanouts in horizontal lines shall be extended to floor level or grade as necessary. Cleanouts shall be series as listed below:

1. Below concrete floors with no finish or ceramic tile finish.
 - a. Zurn - ZN-1400-3
 - b. J. R. Smith - 4041
 - c. Josam - 56020-15
 - d. Ancon - CO-200-S
 2. Below carpeted floors.
 - a. Zurn - ZN-1400-15
 - b. J. R. Smith - 4020-Y
 - c. Josam - 56020-2-14-15
 - d. Ancon - CO-200-RC
 3. Below resilient tile floors.
 - a. Zurn - ZN-1400-7
 - b. J. R. Smith - 4160
 - c. Josam - 56020-12-15
 - d. Ancon - CO-200-TS
 4. Exposed horizontal piping.
 - a. Zurn - Z-1440A
 - b. J. R. Smith - 4400
 - c. Josam - 58500-20
 - d. Ancon - CO-200
 5. Concealed in finished wall-prime coat.
 - a. Zurn - Z-1440-1
 - b. J. R. Smith - 4510
 - c. Josam - 58710-15
 - d. Ancon - CO-450-RD
 6. Base of exposed vertical pipes.
 - a. Zurn - Z-1445
 - b. J. R. Smith - 4510
 - c. Josam - 58510
 - d. Ancon - CO-460
 7. Base of concealed vertical pipes.
 - a. Zurn - Z-1445-1
 - b. J. R. Smith - 4530
 - c. Josam - 58790-15
- B. Cleanouts shall consist of cast iron ferrules. Access covers shall be polished nickel bronze in finished areas, brass below carpeting. Access covers will be secured by non-ferrous tamperproof screws.

2.3 GREASE INTERCEPTOR (INSIDE TYPE)

- A. Provide a steel grease interceptor with interior and exterior acid resisting enamel finish. Capacity shall be as noted on the Drawings.

- B. Interceptor shall be provided with perforated removable sediment chamber with lift handle. Top of interceptor shall be flush with floor and constructed to be gas and water tight.
- C. Provide flow control fitting to adjust flow rate to capacity of interceptor. Provide nickel brass non slip access overflow control valve.

Grease interceptor shall be Zurn Z1170E with extension to floor or similar of Josam or Smith

PART 3 - EXECUTION

3.1 SANITARY PIPING

- A. Sanitary piping shall be extended from fixtures, appliances, etc., to the sanitary sewer. Verify location, size and elevation of the sewer before performing work and notify the Architect if discrepancies are noted.
- B. Sanitary piping below the lowest finished floor to their connections to existing utilities shall be service weight cast iron pipe, CS-188-66, modified and made up with neoprene double seal gaskets of the same manufacturer as the pipe. Pipe and fittings shall bear the mark of the Cast Iron Soil Pipe Institute.
- C. Sanitary piping within the building, above ground shall be schedule 40 polyvinyl chloride sewer pipe.
- D. Threaded joints shall have American National taper screw thread with pipe joint compound applied to the male thread.
- E. The minimum size of underground lines is to be 3 inches.
- F. Install traps of the same size and material as the pipe on which they occur. They shall be provided with clean-outs and traps connected to the sanitary system shall be vented as required.
- G. Clean-outs shall be provided at the end of drainage lines, at the base of soil, waste and conductor stacks, at every 50 feet in the sanitary drainage lines buried under the floor, and at other points necessary to make the entire drainage system accessible for cleaning as far as practicable. Clean-outs shall be full size of the pipe where used, except that for piping 4 inches and over, clean-outs shall be 4 inches maximum. Clean-outs below the first floor shall be extended to the finished floor and fitted with adjustable threaded nickel bronze clean-out covers. Where stacks enter drains near walls, piers, or foundations causing difficult access to end clean-outs, there shall be a horizontal clean-out on the stack just above the floor with a long sweep 1/4 bend at the foot of the stack. Where such construction occurs in walls or partitions, the clean-out shall be accessible through a 12" x 12" access panel.
- H. Vent piping shall be pitched toward the drain it serves to free itself quickly of any waste and condensation. Vent piping passing through the roof shall not be less than 3 inches in diameter and shall extend above the roof. The connection between screwed vent piping and cast iron soil pipe shall be by means of a Manoff hub or similar fitting. Each vent as

it passes through the roof shall be provided with a copper vent connection.

- I. Drain piping from air conditioning unit and refrigeration unit condensate pans above the ground shall be type "M" copper made up with 50/50 tin-lead solder or Schedule 40 PVC made up with solvent as per the manufacturer's recommendations. Provide a P-trap at the connection to each piece of equipment as required by the manufacturer's installation instructions. Provide a clean-out at each change of direction and maintain pitch of 1/4" per 10 feet on all horizontal drain lines.
- J. Where lines pass under or through footings, encase them in concrete to uniform thickness as directed.
- K. In connection with underground piping, connections and turns, unless otherwise specified, shall be made with Y fittings and 3/4 bends. Runs of soil, waste and drain lines shall be made in direct lines as indicated on the Drawings. Pipes shall be graded as sharp as possible with a minimum slope as indicated on the drawings. Changes in direction from vertical to horizontal may be made with long radius 1/4 bends. Clean-outs shall be installed as specified hereinbefore.

3.2 WATER PIPING

- A. Install water piping to prevent undue stresses due to expansion, contraction, or imposed loads. Provide expansion loops and offsets as necessary to prevent damage.
- B. Lines of water piping shall be protected from water hammer by shock absorbers. Where shock absorbers are necessary, they shall conform to the Plumbing and Drainage Institute's published requirements and be installed in accordance with the manufacturer's instructions.
- C. Water piping shall pitch in such a manner that all parts of the complete system can be drained through drain cocks provided in low points in the system. Hot water piping shall grade up in the direction of flow 1/8 inch in 10 feet. Eccentric coupling shall be used where necessary to avoid pockets.
- D. Install flanges and unions as necessary to facilitate easy removal of piping and equipment.
- E. Hot and cold water branches to group fixtures shall be valved. Valves and stops shall also be installed in the piping at all points where their presence facilitates isolating parts of the system for maintenance. Each fixture shall be provided with stops so arranged that the fixtures can be cut off without interfering with the water supply to other fixtures.
- F. Water piping is to be insulated and oversized hangers are required to accommodate the inserts of rigid insulation.
- G. Soldered joints for copper tubing in cold and hot water lines shall be made with lead free wire solder; joints shall be made in accordance with instructions published by the manufacturer.
- H. Water piping shall be of type "L" hard drawn copper water tube, ASTM B88 with solder

type wrought copper fittings, ANSI A40.3. Brass solder joint valves shall be used with copper tubing. Solder shall be 95-5 tin antimony type; protect piping from materials, which may cause corrosion of copper.

- I. Exposed piping at fixtures shall be IPS red brass, chromium plated.
- J. The mains, branches and connections of the hot and cold water distribution piping systems shall be provided with a valve; these valves shall be placed at the points shown on Drawings or directed by the Architect for proper control of the system. Equipment or appliances shall be separately valved so that service can be shut off and the piece of equipment or appliance removed without disturbing the piping system. Valves shall be located so as to be accessible to the operator. The separate valves for equipment and appliances are in addition to faucets supplied herein or in other Sections.
- K. Provide for expansion of piping subject to temperature changes. This shall be accomplished by swings, bends or loops.
- L. A pressure gauge shall be installed on the system side of the water meter. It shall be as manufactured by March, American, Ashcroft or Terrice with a standard die cast case, threaded brass body, 3-1/2" diameter dial with black features, 3/8" connections, heavy industrial type casing and front glass. The range shall be selected so normal operating pressures read approximately 1/2 scale. The unit shall be installed with a stop clock.

3.3 GAS PIPING - NATURAL GAS

- A. Gas piping shall be extended from the existing gas lines to the new and relocated appliances requiring connections.
- B. Natural gas pipe above ground:
 - 1. Pipe shall be Schedule 40 black steel, ASTM A-53 or A-120.
 - 2. Fittings 2" and smaller shall be threaded in accordance with ANSI B16.3 and shall be 150 PSI malleable iron in accordance with ASTM A-197 and shall be UL listed. Manufacturer shall be Stockham or approved equal.
 - 3. Fittings over 2" shall be butt welded schedule 40 black steel.
 - 4. Valves 2" and smaller shall be Conbraco Industries Figure No. 70-100-07 screwed ball valve with tee handle, or approved equal.
 - 5. Valves over 2" shall be Wallworth Figure 1700F flanged lubricated plug cock with No. 2 handle, 200 psi, or approved equal.
 - 6. Flanges shall be carbon steel welding neck or threaded Class 150, ASTM A105, manufactured by Vogt, or approved equal.
 - 7. Unions shall be 300 psi malleable iron with brass seat Stockham Figure 895 or approved equal.
 - 8. Provide a shut-off valve, union, and 6" drip leg at each gas equipment connection.
 - 9. See manufacturer's instructions for piping installation requirements for particular equipment.
 - 10. Provide a flexible pipe connector at the connection to the emergency generator. The flexible connector shall be as manufactured by Keflex, Model KFOS. Unit shall be rated for use with natural gas and shall be constructed of stainless steel. End fittings shall be male pipe threaded of Schedule 40 steel. Install as per

manufacturer's instructions.

11. Provide shut off valves at branches. Provide for thermal expansion of pipes.

3.4 VALVES

- A. Provide valves as indicated on Drawings, as specified below and as required. Valves, where possible, shall be of one manufacturer, Apollo or approved equal.
- B. Ball Valves:
 1. Threaded end ball valves 3 inches or smaller shall be No. 70-100 series.
Soldered end ball valves 3 inches and smaller shall be No. 70-200 series.
- C. Drain Valves:
 1. Threaded end drain valves shall be No. 78-103-01 or 78-104-01.
 2. Soldered end drain valves shall be No. 78-203-01 or 78-204-01.
- D. Vacuum relief valves shall be Watts Regulator Co., #36A or approved equal.

3.5 WALL HYDRANTS AND HOSE BIBBS

- A. Provide wall hydrants and hose bibbs as herein specified and indicated on the Drawings.
- B. The exterior wall hydrants shall be frostproof hydrants Zurn 1310 with integral backflow preventor, J. R. Smith or Josam. The hydrant face shall be polished nickel bronze. The unit shall have bronze working parts and neoprene washers. Provide a loose key for each hydrant that will operate any hydrant.
- C. Hose bibbs shall be Chicago No. 293, American Standard or Crane. The hose bibbs shall be chromium plated, loose key handle compression faucets with hose end and male IPS shoulder inlet fitted with Watts 8C backflow preventor.

3.6 SHOCK ABSORBERS

- A. Provide shock absorbers in the water piping, in horizontal runs to quick closing valves where shown on drawing and elsewhere as required to prevent noise or injury to the piping system resulting from water hammer.
- B. The shock absorbers shall be J. R. Smith Hydrotrol or Zurn Z-1700 Shocktrol. The unit shall consist of a stainless steel casing and air charged bellows. Shock absorbers shall be sized as recommended in the Plumbing Drainage Institute Standard WH-201.

3.7 INSULATION

- A. After the systems have been installed and tested, insulation as specified below shall be applied. Materials shall be UL, Inc., approved and shall be applied as recommended by the manufacturer's written instructions. Insulation shall conform to fuel contribution, flame spread, and smoke developed limits set forth in the NFPA 90A, 90B and NFPA Bulletin 904. Insulation, jacket material, fillers, and adhesives shall be compatible for use under the particular insulation class specified and shall have the same fire rating. Materials used shall be the products of Owens Corning, PPG, Manville, Knauff Corporation, Certainteed, Armstrong, Eagle Picher, Insul Coustic or Benjamin Foster and

shall be equal to those products that meet the Specifications below.

- B. Insulate cold-water piping, hot water piping, except chrome plated piping exposed at plumbing fixtures. Insulate condensate drain lines and storm drain lines from the roof drain body including drain body to the floor. Piping shall be insulated with 1" wall fiberglass insulation with an all service jacket as manufactured by Owens-Corning, Certainteed, Gustin Bacon or Johns-Manville. Fittings shall be insulated with two (2) layers of loose 1" fiberglass. PVC covers as manufactured by Zeston shall be applied over the joint and finished in accordance with the manufacturer's instructions. End cross-cuts shall be finished with a cement/paint to seal the fiberglass. Cement/paint shall be approved by the insulating manufacturer. Minimum thermal conductivity (K) at 75 F shall be .27.
- C. At the Contractor's option, cold water, hot water and horizontal piping from roof drains may be insulated with flexible foam pipe insulation such as Armstrong Self-Seal Armaflex 2000. Thickness shall be 1/2 inch.
- D. On exposed insulated piping in finished areas within seven feet of the floors, provide .010 inch thick galvanized steel insulation jackets. This does not include piping exposed in unfinished areas such as storage rooms, etc.
- E. At pipe hangers, for piping carrying fluids with temperatures below 70 degrees, provide a rigid core of insulation to support the pipe. Rigid insulation shall be the same thickness as the adjacent insulation and have the same flame spread and smoke developed ratings.

END OF SECTION