

SECTION 15400-PLUMBINGPART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract documents, including General and Supplementary Conditions and Division 1, General Requirements, are hereby made a part of the work of this Section 1, the more stringent requirements shall govern.
- B. All work shall comply with all federal, state, and local codes and any other authorities having jurisdiction.

1.02 SUMMARY

- A. Perform work and provide materials and equipment as required for a complete and operational Plumbing system as shown on the Drawings and as specified in this Section. Completely coordinate with work of other trades and provide for complete and fully functional installation. When the word “provide” is used in this specification, it shall mean to furnish and install.
- B. The work shall include, but is not limited to, the following major items of work:
 - 1. Complete Plumbing system for all renovated sections of the building utilizing the existing infrastructure. Design and installation shall be in accordance with the Massachusetts State Building Code. Systems shall be capable of providing 110 deg. F. hot water, provide trap primers for all floor drains. A complete system of sanitary drain, condensate drains, and waste system shall be provided. Provide condensate drain piping for all HVAC equipment.
 - 2. Design drawing stamped by a registered professional engineer in the State of Massachusetts.
 - 3. All sanitary, drain, waste and vent systems and piping inside the building and connection to site sanitary sewer and storm drain systems inside of building, or as specifically called out on the drawings.
 - 4. All hot and cold water distribution and hot water re-circulation systems. Furnish all piping, fittings, insulation, supports, valves, and pumps. Lav guards
 - 5. Demolition of all existing plumbing fixtures, piping, and equipment made obsolete by new construction.
 - 6. Plumbing fixtures, trim and supports.
 - 7. Connections to fixtures and equipment furnished and installed by others requiring water, gas, drains, and waste.

8. Furnish access panels.
 9. Arrange for inspections and perform cleaning and testing.
 10. Equipment bases and supports.
 11. All rigging and hoisting of equipment as required.
 12. Disconnect and legally remove all existing plumbing systems made obsolete by new construction.
- C. Related Work Specified Under Other Divisions
1. Division 16000 – Power Circuiting
 2. Division 15600 – HVAC
- D. This contractor is responsible for sleeving all holes required of his work prior to pouring of the concrete slabs. All holes less than or equal to 4” shall be the responsibility of this contractor to core. Sizes larger shall be cored the G.C. However, if coring is required due to failure of this contractor to set a sleeve prior to pouring than this contractor shall be responsible for bearing the cost of any of this additional work required of the G.C.
- E. Contractor is responsible for coring and fire-stopping all rated penetrations of the structure.

1.03 SUBMITTALS

- A. Product data: within 15 calendar days after the Contractor has received the Owner’s Notice to proceed, submit the following. Refer to Division 1 requirements for copy quantity of submittals or if not specified submit seven (7) copies.
1. It is expected that the contractor shall provide the Architectural design team, with a set of contract drawings stamped by a Professional Engineer registered within the Commonwealth of Massachusetts for permit and construction. For estimating purposes, the contractor shall use the guidelines described herein for sizing and selecting the system components.
 2. Coordinated shop drawings, showing proposed layout of equipment and piping and other components of the system. Coordination drawings shall be done at 1/4” = 1’-0”. Submit cut sheets on fixtures, piping, etc...
 3. Manufacturer catalogs, samples, and other items needed to fully demonstrate the quality of the proposed materials and equipment. In addition to the submittals formerly mention herein equipment specification sheets and dimensional data on the following:
 - a. Plumbing fixtures and supports..

- b. Valves and fittings.
- c. Piping insulation.
- d. Piping and accessories.

B. Record Drawings

- 1. Include a copy of the record drawings (as-builts) in each copy of the operation and maintenance manual described below.

C. Testing and Balancing Reports

- 1. Submit four (4) copies of a certified testing and water piping sterilization report to the Architect for review and approval.

D. Operating Instructions

- 1. Prior to the completion of all work and the final inspection of the installation by the Owner, three (3) copies of a complete Instruction Manual, bound in booklet form and suitably indexed, shall be submitted to the Architect for review and approval. All written material contained in the manual shall be typewritten or printed.

1.04 INSTRUCTION OF OWNER'S PERSONNEL

- A. After completion of all work and all tests and at such time as designated by the Owner, provide the necessary skilled personnel to operate the entire installation for a period of sixteen (16) hours.
- B. During the operating period, fully instruct the Owner's representative in the complete operation, adjustment and maintenance of the entire installation.

1.05 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.
- B. The Contractor's superintendent shall conduct all coordination between the Contractor, the Architect, the Engineers, etc., and shall fully represent the Contractor's position in his absence. All decisions by the superintendent shall become the responsibility of the Contractor and binding to the Contract. The Contractor shall be responsible for the drawings, and that which is written or implied in the specifications.
- C. Without additional cost to the Owner, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

- D. Before submitting the final proposal examine the site of the proposed work to determine existing conditions that may effect the work, as this section will be help responsible for any assumption in regard thereto.

1.06 GUARANTEE

- A. The Contractor shall guarantee every component part of each system for a minimum of one-year parts and labor. The contractor shall also provide the Owner with factory warranties for all equipment. For equipment with compressors, provide extended five-year warranty on entire sealed system.

1.07 PERMITS, FEES, AND INSPECTIONS

- A. The Plumbing Subcontractor shall secure all permits and pay all fees required for his work. He shall be required to secure all other permits and pay all other fees and charges incidental to the proper carrying out of the Contract. He is to assume all responsibility regarding the observance of the rules and regulations so far as they relate to his part of the work.
- B. The Plumbing Subcontractor shall arrange and pay for all required inspections of his work.

1.08 TEMPORARY HOOK-UPS

- A. The Plumbing Subcontractor shall provide any temporary hook-ups required for the use of water or sanitary for construction purposes and testing out apparatus.

PART 2 – PRODUCTS

2.01 PIPING MATERIALS

- A. All soil, waste and vent lines in accessible areas 2" and larger shall be cast iron "no-hub," ASA group 022 pipe and fittings joined with cast iron clamps as manufactured by "MG" coupling or "Clamp-All". All buried soil, waste, and vent lines shall be service weight cast iron pipe with all fittings carefully fitted and caulked together with oakum and lead, sealed gas and water tight. Minimum size of piping below ground shall be 2". Where it is impractical to install cast iron pipe, as in tight partition work or where the sizes of lines are smaller than 2", Type "L" copper tubing shall be used conforming to ASTM Specification with sweat type fitting using lead free solder and non-corrosive flux, "Non-Korrode", or approved equal conforming to ASTM Specification B 32 alloy 50A. In lieu of oakum and lead joints, "push-on type" resilient gasket fittings may be used on buried pipe only. Provide extra heavy cast iron for urinal connections
- B. All vent lines 2" and smaller shall be Type "L" copper, or DWV, except minimum size below ground shall be 2". Minimum vent terminal through roof shall be 4" except otherwise noted. Vent flashing at the roof shall be by the General Contractor.
- C. All hot, cold water, and hot water recirculating piping within the building shall be hard copper Type "L" seamless drawn tubing assembled with sweat fittings. All solder used shall be lead free, cadmium free, "Silverbrite - 100" or equal, complying with the latest

issue of ANSI A-5.8 publication. All exposed runs to all toilet fixtures and sinks shall be chrome plated, including all exposed piping in kitchen. All below slab trap primer feed piping shall be Type "K" soft rolled with silver solder joints.

2.02 VALVES

- A. Valves shall be manufactured by Fairbanks, Jenkins, Lunkenheimer, Hammond, Crane, Powell, or Stockham. (Federal Specifications: WW-V-54c, Class A, Type 1).
1. Gate: 125 lb. WSP, all bronze, non-rising stem, screwed bonnet, one piece wedge, designed to permit repacking under pressure, Lunkenheimer Cat. No. 2133, or equal.
 2. Check: 125 lb. WSP, all bronze horizontal swing type, screwed caps, bronze disc designed to permit regrinding of seat without removal of body, Lunkenheimer Cat. No. 2145, or equal.
- B. In lieu of gate valves on water lines, the Plumbing shall install ball valves "Apollo" or equal brass or bronze solder end ball valves, with teflon seats and full line size ports, unless specifically noted otherwise.
1. On water lines inside building; ball valves 3" and smaller shall be as manufactured by Conbraco Industries, Inc.'s "Apollo", Series 95-200 stop and drain, with 1-1/4" extended stems for piping 1/2" to 1" size; Series 70-100/200 with 1-1/4" extended stems for piping 1-1/4" to 3" size. Valves shall be provided with stainless steel ball, reinforced Teflon seats and seals, bronze body, 400 psi WOG, positive 100% shutoff.
 2. Drain valves at all low points shall be "Apollo" 78-100 or 78-200 Series, 1/2" or 3/4" solder by 3/4" hose end with attached cap and chain.
 3. Valves on gas lines 2" and smaller shall be UL listed, 250 psi. LP gas rated, "Apollo" 80-100-YRPV series with tee handle, as approved by the Massachusetts Fuel Gas Code.
 4. Ball valves shall be of one manufacturer, Conbraco Industries, Inc., "Apollo," Watts Regulator, NibcoScott, or approved equal.
- C. Balancing Valves or Fittings
1. Where indicated on the drawings, furnish and install circuit setter bronze body, calibrated with differential pressure connection locks.
 2. Balancing valves shall be Bell & Gossett or approved equal.
- D. Check Valves
1. Check valves shall be furnished and installed where indicated on the drawings. Valves up to 3" shall be Class 125, solder ends, bronze body, swing type disc, Stockham Figure B-309.

2. Check valves 4" and larger shall be iron body, bronze mounted with body and cap conforming to ASTM A 126 Class B cast-iron, flanged, swing type disc, Stockham Figure G-931.
3. Check valves shall be as manufactured by Stockham, Jenkins, Lunkenheimer, or equal.

2.03 HANGERS

- A. Hangers shall be as manufactured by Grinnell Company, Carpenter & Paterson, or Fee & Mason.
- B. For cast iron and galvanized steel piping - Grinnell Company's Figure No. 260, one to each length of cast iron pipe, at 12 ft. intervals for threaded piping; for copper tubing - Grinnell Co.'s figure CT-65 at 8 ft. intervals for tubing up to 2"; 10 ft. intervals for tubing 2-1/2" and above.
- C. Gas piping shall be supported by steel clevis pipe hangers, one to each 8'-0" of pipe.
- D. For hot, hot water circulating, and cold water piping - Grinnell Company's figure No. CT-99 heavily copper plated at 6 ft. intervals for copper tubing 1-1/4" or less, 10 ft. intervals for piping 1-1/2" and larger. Provision shall be made to allow for expansion and contraction of all piping.
- E. Hangers or supports shall be placed within 1 ft. of each horizontal elbow. Vertical runs of pipe not over 5 ft. in length shall be supported on hangers placed not over 12" from the elbow on the connecting horizontal run.
- F. All vertical piping shall be supported at each story height, with a support at the base of vertical cast iron pipe.
- G. Perforated strap iron hanger or Milford type copper plated steel hangers are not acceptable.
- H. Where piping is supported from ceiling beams, support parallel pipes from different beams.
- I. Support pipes sufficiently clear of all part of structure to allow for full thickness of insulation.
- J. Hangers to be adequate size to include insulation. Furnish and install galvanized steel insulation protection shields outside of insulation on pipe sizes 2" and larger to prevent crushing or indenting of insulation of hangers.
- K. Gas piping on roof shall be supported by roll hanger clevis, 10'-0" on center.

2.04 TRAPS

- A. Traps at fixtures shall be as listed in the Fixture Schedule. Exposed traps shall be chrome plated.
- B. Traps shall be extra heavy cast iron where buried in floors or serving floor drains. Where traps are not connected directly under the drain they serve in the floor, they shall be fitted with top cleanouts and extensions to the floor with access covers and plates.
- C. Furnish and install traps as required for all items of equipment furnished under other Sections of these Specifications, and/or by the Owner.

2.05 INSULATION

- A. All water piping shall be insulated with heavy density fiberglass pipe insulation with self-sealing lap, 1" thick for hot water and return hot water up to 1-1/2" and 1-1/2" thick insulation on piping 2" and larger, 1/2 " thick for cold water. Insulation shall be one piece snap-on type, Certainteed "500° Snap-On" or equal by Knauf, Manville, or Owens-Corning.
- B. Fittings shall be insulated with PVC jackets applied over fiberglass blanket with joints taped. Cold water piping shall also have mastic applied to all overlapping surfaces to form a vapor barrier. Jackets shall be Certainteed "Snap-On" or equal.
- C. Insulation and fitting jackets shall be installed according to the manufacturer's recommendations. Any gaps or fishmouths shall be remade.
- D. Install an 18" length of rigid (load bearing) insulation at each hanger; insulation shall run continuous through the hanger. To be calcium silicate, or equal.
- E. All exposed drain and water piping at handicapped lavatories shall be insulated with Truebro "Handi Lav-Guard" insulation system, Model 102 w/105 offset, or equal.
- B. Ranges shall be manufacturer's standard closest to the following:
 - 1. Hot water: 25°F - 240°F.
 - 2. Cold water: 0°F - 100°F

2.06 PLUMBING FIXTURES

- A. General Requirements: References made herein are to establish type and quality of materials. Exposed traps and supply pipes for all fixtures shall be chrome plated and connected to the rough piping systems at the wall. Wall escutcheons shall be chromium plated on nickel plated brass with polished, bright surfaces. Vitreous china and acid-resisting enameled cast iron fixtures shall be American Standard or Kohler; toilet seats to be Church, or Olsonite; stainless steel sinks shall be Just or Elkay or an approved equal. Floor drains and carriers shall be Zurn, Wade, or Josen. All new fixtures shall be ADA compliant.

- B. Water closets to be floor mounted tank type with open front seats, lavatories to be wall mounted with electronic faucets. Daycare sink to be single bowl stainless steel with wrist blade faucet and goose neck spout. Break room sink to be single bowl with goose neck spout, hand spray, and garbage disposal.

2.07 ACCESS PANELS

- A. Furnish access panels for all locations where cleanouts, valves, shock absorbers, or other items requiring operation or maintenance are located in finish walls. Access panels will be furnished by this Subcontractor and installed by the General Contractor. This Subcontractor shall co-ordinate location.
- B. Access panels shall be Boico Style C, or equal, size 12" x 12" or larger.

2.08 EQUIPMENT CONNECTIONS

- A. Make final hot water, cold water, waste, and gas connections to all equipment.

2.09 TRAP PRIMER

- A. Furnish and install all brass automatic trap primers on ALL floors drains and where required by Code. Primer shall include automatic pressure activated brass valve with vacuum breaker, and copper duplex manifold distribution reservoir as indicated on the drawings. Valve shall conform with A.S.S.E. Standard 1018.
- B. Valve shall be Precision Plumbing Products, Inc., or equal.

2.10 VACUUM BREAKERS

- A. Furnish and install vacuum breakers as manufactured by Watts or approved equal.
- B. Type "A" - pressure type Watts Model 800 QT with test cocks and ball valves.
- C. Type "B" - atmospheric type, Model 288A chrome plated, when supply is not under constant pressure.

2.11 ELECTRICAL WORK

- A. The Plumbing contractor shall hire a licensed electrical to perform all control wiring as required by code. Minimum gauge of all control wiring is 18AWG. All control wiring shall be plenum rated.
- B. The Electrical Contractor shall install and do all power for all motor starters and un-mounted motors, furnished to him at the job site by other trades..
- C. For all low voltage motors, temperature control wiring, including wiring for interlocking, shall be provided by the Section providing motors, including the installation of all control devices.

- D. Furnish all starters and all motor control devices for motor driven equipment required for the work. The Electrical Contractor shall provide all code required disconnect switches for all motors, except where otherwise noted. The setting of all motors required for mechanical equipment shall be included as part of the mechanical work.
- E. Equipment which includes a number of correlated electrical control devices mounted in a single enclosure or on a common base with equipment, shall be supplied for installation completely wired as a unit with terminal boxes and ample leads ready for external wiring.
- F. All electrical items called for, as part of the mechanical work shall conform to NEMA Standards, to the requirements of the National Fire Protection Association and to the requirements of any local electrical code authority having jurisdiction. Any field modifications required to ensure such conformance shall be included as part of the mechanical work.

END OF SECTION 15400