

CELLAR DOOR TENANT FIT-UP

SECTION 22 00 00 - PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The drawings and the specifications including Section 23 05 00 "Common Work Results for HVAC" are hereby made a part of the work of this section.

1.2 DESCRIPTION

- A. The work covered by this Section of the specifications includes the furnishing of labor, materials, equipment, transportation, permits, inspections, and incidentals and the performing of operations required to provide a complete and functional plumbing system.
- B. Work shall be in accordance with the current edition of the Maine Internal Plumbing Rules and applicable local ordinances.

1.3 SUBMITTALS

- A. Substitutions: Your attention is directed to Section 23 05 00-"Substitutions", relative to competition and the (ONLY) notation. Familiarity with this section shall be achieved before reading the PRODUCTS section of this specification.
- B. The items for which the submittals paragraph in Section 23 05 00 "Common Work Results for HVAC", apply are as follows:
 - 1. Piping materials.
 - 2. Valves.
 - 3. Pipe hangers.
 - 4. Fixtures and trim.
 - 5. Miscellaneous equipment.
 - 6. Water heating equipment.
 - 7. Piping, valves and equipment identification.
 - 8. Piping insulation and vapor barrier coating.
 - 9. Firestopping materials and methods.
 - 10. Insulation kits for ADA-compliant sinks.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Soil and Waste (Sanitary), Condensate Drains and Vent Piping: Schedule 40 PVC or service weight cast iron with push-on joints below grade. Above grade, vent piping may be Schedule 40 PVC or service weight cast iron "no Hub" above grade. Above grade sanitary and waste and roof drain piping shall be service weight cast-iron, "No-Hub". "Vents thru roof" shall be service weight cast iron.
- B. Domestic Water Piping and Condensate Drain Piping: Type L hard copper tubing and cast bronze or wrought copper solder fittings, lead-free solder.
- C. Exposed Water and Waste Piping at Fixtures: I.P.S. copper with cast brass fittings chrome plated finish, with deep one piece escutcheon plates at traverse points.

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- D. Solder: Lead-free (ONLY), Englehard Silvabrite 100, 440°F melting point, ASTM B32.
- E. Piping located in masonry (CMU) construction: Piping shall be protected from contact with concrete (masonry) by use of pipe sleeves or other methods approved by the local plumbing inspector.

2.2 GAS PIPING SYSTEM

- A. Gas Piping: Schedule 40 carbon steel pipe conforming to ASTM 120 or A53, with threaded joints and malleable iron fittings (Above grade). Exterior piping shall be painted.
- B. Ball Valves for Gas Service: Copper alloy with chromium plated floating ball per Federal Specification WW-V-35B, Type II, Class 3. Blowout-proof stem, reinforced teflon seats, threaded ends, quarter turn on-off, 600 WOG rating, 250 psi rating for natural-gas, UL-listed as a natural-gas shutoff valve, Apollo Model 80-100 series.

2.3 NO HUB COUPLINGS

- A. For above grade DWV piping, couplings shall be Clamp-All HI-TORQ125, shall maintain 15 PSI hydrostatic seal, constructed with a 304SS housing and ASTM C-564 neoprene gasket. Couplings shall meet FM 1680, IBC and local codes and requirements.

2.4 VALVES AND ACCESSORIES

- A. General Service Ball Valves: Apollo Model 77-100 (threaded) or 77-200 (solder), Victaulic PL-300 (push-to-connect), bronze full port, or Nibco, copper alloy with stationary seat ring and chromium plated or stainless steel floating ball per Federal Specification WW-V-35B. Blowout proof stem, reinforced PTFE seal. Sizes 2" and larger shall have threaded ends. Provide lever or tee handle with stem extension as required to allow operation without interfering with pipe insulation.
- B. Butterfly Valves: Victaulic Series 608 with copper-tube dimensioned grooved ends, cast bronze body per ASTM B584, with elastomer coated ductile iron disc with integrally cast stem. Valve rated to 300 psig CWP, with disc coating UL classified in accordance with ANSI/NSF-61 for potable water service.
- C. Check Valves: Horizontal Swing, MSS SP-80, Type 3, Class 125.
- D. Drain Valves: Provide ball valves with 3/4" hose connection and brass cap and chain.
- E. Fixture Service Stop Valves: Angle Loose Key Stop, ASME A112.18M.
 - 1. Each plumbing fixture and item of equipment shall have individual stop valves in the hot and cold supplies.
 - 2. Service stop valves exposed in finished areas shall be chrome-plated brass; in non-finished areas, ball valves shall be used in lieu of chromed supplies.

2.5 PIPE HANGERS

- A. Adjustable Swivel Hangers:

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1. Pipe sizes 2" and less: Carpenter and Paterson Fig. 800, oversize for insulated piping systems.
 2. Pipe sizes larger than 2": Carpenter and Paterson Fig. 100, oversize for insulated piping systems.
- B. Riser Clamp: Carpenter and Paterson Fig. 126 CT copper plated for copper piping, Fig. 126 for iron and PVC piping.
- C. Insulation Shields: 18 ga. galvanized steel, 180° wrap, Carpenter and Paterson Fig. 265P, Type H.

2.6 FIXTURES AND TRIM

- A. (P-1) Water Closet: Floor-mounted, flush valve, Toto CT705EN, elongated bowl, white vitreous china, low consumption (1.28 gpf).
1. Seat: Church Model 295C, commercial weight solid plastic, open front, self-sustaining check hinge, for elongated bowl, white color.
 2. Flush Valve: Sloan Royal 111-1.28, 1.28gpf, ADA compliant. Furnish with bumper stop, vacuum breaker and stop valve.
- B. (P-1A) HC Water Closet: Floor-mounted, flush valve, Toto CT705ELN, elongated bowl, white vitreous china, low consumption (1.28 gpf).
1. Seat: Church Model 295C, commercial weight solid plastic, open front, self-sustaining check hinge, for elongated bowl, white color.
 2. Flush Valve: Sloan Royal 111-1.28, 1.28gpf, ADA compliant. Furnish with bumper stop, vacuum breaker and stop valve.
 3. Total installed height of front edge of seat shall be 17" to 19" above finished floor. Final installation shall meet ADA guidelines and ANSI A117.1.
- C. (P-2) ADA Urinal: Wall-hung, flush-valve type, Toto UT447E, white vitreous china, low consumption (0.5 gpf), urinal lip shall extend a minimum of 14" from finished wall.
1. Flush Valve: Sloan Royal 186-0.5Toto 'EcoPower' 0.5gpf, ADA compliant. Furnish with bumper stop, vacuum breaker and stop valve.
 2. Carrier: Zurn or Jay R. Smith ANSI A112.6.1M concealed chair carriers.
 3. Urinal shall be installed with front rim a maximum of 17" above finished floor and flush valve handle a maximum of 44" above finished floor. Final installation shall meet ADA guidelines and ANSI A117.1.
- D. (P-3) ADA Lavatory, Undermount: Kohler "Ladena" K-2215 (ONLY), 21"x14", white vitreous china with overflow, faucet holes on 4" centers.
1. Faucet: Kohler "Fairfax" K12181 (ONLY), single handle, 1.5 GPM flow aerator, polished chrome finish, ceramic control cartridge.

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2. Drain: perforated grid strainer with bright metal finish.
 3. Trap: Chrome-plated, cast copper alloy, 1-1/4" P-trap with cleanout plug. Adjustable with connected elbow and nipple to wall.
 4. Lavatory shall be installed at 34" above finished floor. Final installation of lavatory and accessories shall meet ADA guidelines and ANSI A117.1.
- D. (P-4) Utility / Mop Sink: Mustee 19F (ONLY), 34"x20"x24", one piece molded structural thermoplastic construction with integrally molded drain assembly, heavy gauge steel legs with built-in levelers
1. Faucet: Mustee model 93.600, chrome finish, 4" centerset brass faucet with 7" swing spout, lever handles, replaceable seats and stems and aerator.
- E. (P-5) Kitchen Sink, Double Bowl: Elkay ELUHAQD32179 (ONLY) undermount sink, 18 ga stainless steel with lustrous highlighted satin finish, 32-1/61"x18-1/2"x9" deep overall size (12-3/16"x16-1/2"x9" & 16-1/2"x16-1/2"x9" bowl dimensions), fully sound deadened. Provide with undermount brackets.
1. Faucet: Kohler "Vinnata" K-690 (ONLY), single handle with 9-1/2" gooseneck spout and integral pull out spray head (w/ touch control for spray to stream water flow), ceramic control cartridge, temperature memory, high limit safety, integral vacuum breaker, 1.8 gpm flow rate. Brushed nickel finish.
 2. Strainer: Elkay Removable basket and neoprene stopper.
- F. (P-5A) Kitchen Sink, Single Bowl: Elkay ELUH1616 (ONLY) undermount sink, 18 ga stainless steel with lustrous highlighted satin finish, 18-1/2"x18-1/2"x7-7/8" deep overall size, rear center drain placement, fully sound deadened. Provide with undermount brackets.
1. Faucet: Kohler "Vinnata" K-690 (ONLY), single handle with 9-1/2" gooseneck spout and integral pull out spray head (w/ touch control for spray to stream water flow), ceramic control cartridge, temperature memory, high limit safety, integral vacuum breaker, 1.8 gpm flow rate.
 2. Strainer: Elkay Removable basket and neoprene stopper.
- G. (P-5B) Kitchen Sink, Single Bowl: Elkay ELUH241610PD (ONLY) undermount sink, 18 ga stainless steel with lustrous highlighted satin finish, 26-1/2"x18-1/2"x10" deep overall size, rear center drain placement (Elkay Perfect Drain), fully sound deadened. Provide with undermount brackets.
2. Faucet: Kohler "Vinnata" K-690 (ONLY), single handle with 9-1/2" gooseneck spout and integral pull out spray head (w/ touch control for spray to stream water flow), ceramic control cartridge, temperature memory, high limit safety, integral vacuum breaker, 1.8 gpm flow rate.
 2. Strainer: Elkay Removable basket and neoprene stopper.
- H. Acceptable fixture / trim / brass manufacturers are as follows: Zurn, Sloan, Toto, American-Standard, Eljer, Just, Elkay, Kohler, and Moen (Commercial).

2.7 MISCELLANEOUS EQUIPMENT

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- A. Water Hammer Arrestors (Shock Absorbers): Plumbing and Drainage Institute listed, Zurn or Josam.

Schedule:

"A" - Size #100 PDI - 0-11 Fixture Units

"B" - Size #200 PDI - 12-32 Fixture Units

"C" - Size #300 PDI - 33-60 Fixture Units

- B. Vacuum Breaker: Watts Model N36, 3/4" size, 20 CFM capacity.
- C. Strainer: Watts Series 777, MIL-S-16293, epoxy-coated or bronze body wye-type, 200 WOG rating, screwed end connections, 20 mesh stainless steel, monel, or bronze screen.
- D. Thermometers: Weiss Instruments Model DVU35, solar-operated, Tel-Tru, Terrice or Ashcroft, adjustable angle, plastic or Type 304 stainless steel case. The digital display shall include 3/8" high (minimum) LCD digits. The thermometer display shall be in °F. Accuracy shall be +/- 1% of the displayed value or 1⁰, whichever is greater. Furnish with brass thermowells and provide with heat transfer fluid to fill the sealed interstitial space between bulb and well. Evidence of the transfer fluid leaking shall be cause for refilling and sealing the well.
1. Thermowell: Provide with brass thermometer wells projecting a minimum of 2" into the pipe with extension to face of insulation. Provide with heat transfer fluid to fill interstitial space between bulb and well.
 2. Range: 30°F to 240°F for domestic hot water systems.
- E. Pressure Gauges: Tel-Tru or Ashcroft Type 1005, Grade B, 3-1/2" dial, ANSI B40.1, drawn steel case, white background dial with black figures, clear glass window, brass movement, beryllium copper bourdon tube, 0 to 100 PSI range, accuracy shall be within 2% over middle half of scale and 3% over the remainder. Provide with shut off petcock and restrictor.
- F. Trap Primer: Zurn Z-1022 Automatic Trap Primer, all bronze body with integral vacuum breaker, non-liming internal operating assembly with gasketed bronze cover, flow-thru design operates on a 2-5psi pressure drop.
- E. Backflow Preventor (BFP): Conforming to AWWA C506, FCCHR-USC Manual Section 10, and UL listed. Types, sizes and capacities scheduled.
1. Double Check (DC): Double check backflow assembly with test ports, bronze body with stainless steel springs, corrosion resistant internals, stop and waste ball valves.
 2. Atmospheric Double Check (DCA): Double check continuous pressure type with atmospheric port for low hazard applications, 250°F maximum water temperature, bronze body, stainless steel internals with rubber seals and integral strainer.
1. Reduced Pressure Zone (RPZ): Reduced pressure principle type; bronze body with stainless steel internals. Provide bronze body ball valves, test cocks, and air gap fittings.

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- F. Circulator (inline)(CP): Taco model indicated, pumps shall be inline cartridge-type or close coupled pump of capacity and performance indicated with all bronze or stainless steel construction 125 psig rated working pressure, 200°F maximum water temperature, carbon Ni-resist mechanical seal, flexible coupling, resilient-mount drip-proof sleeve bearing motor. The pumps shall be factory tested, cleaned and painted with machinery enamel. A set of installation instructions shall be included with pump. Provide high efficiency motors if available as an option of the manufacturer. If high efficiency motors are not available as an option of the manufacturer, submit a certification stating same.

2.8 WATER HEATING EQUIPMENT (EWH)

- A. Electric Water Heaters (EWH): AO Smith, State, Bradford-White, or approved equal packaged unit of make, model, and performance as specified; UL listed with adjustable range thermostat. Set to provide 140°F water temperature. Hot and cold water connections shall be ¾" (minimum).
 - 1. The rated working pressure shall be 150 psig.
 - 2. The electric heating element shall be dual 4500W., 208V, wired for simultaneous operation. Storage capacity shall be 50 gallons. Warranty shall be five (5) years against tank leakage.
 - 3. Installation shall be in accordance with the manufacturer's recommendations.

2.9 PIPING, VALVE, AND EQUIPMENT IDENTIFICATION

- A. Piping identification: Provide plastic "wrap-around" identification markers indicating flow and fluid flowing for the following:
 - 1. Domestic Hot Water
 - 2. Domestic Cold Water
 - 3. Vent Piping
 - 4. Gas Piping
- B. Markers shall be placed 30-50 ft. apart for piping in accessible areas.
- C. Markers shall be placed outside the pipe insulation and in the most obvious location for viewing.
- D. Valve Tags:
 - 1. Attach to each valve a 1-1/2" round or octagonal brass tag with 1/2" indented numerals filled with a durable black compound. In addition to the valve numbers, each tag shall identify the system it controls. Service stop valves exposed in finished areas need not be tagged.
 - 2. Tags shall be securely attached to stems of valves with copper or brass "S" hooks, or chains.
 - 3. Valve charts shall be provided for each piping system and shall consist of schematic drawings of piping layouts, showing and identifying each valve and describing its function. Upon completion of the work, one (1) copy of each

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chart, sealed to rigid backboard with clear lacquer placed under glass and framed, shall be hung where directed. Two (2) additional unmounted copies shall be delivered to the Architect.

4. Tags and charts shall be coordinated with Section 23 00 00 HVAC and when completed this work shall have been done sequentially.
- E. Equipment Identification: Provide laminated plastic nameplates for equipment, pumps, mixing valves, backflow preventers, and balancing valves. Nameplates shall be laminated 0.125-inch thick melamine plastic conforming to Fed. Spec. L-P-387, black with white center core. Surface shall be a matte finish, corners shall be square. Accurately align lettering and engrave into the white core. Minimum size of nameplates shall be 1.0 inch by 2.5 inches. Lettering shall be minimum of 0.25-inch high normal block lettering.

2.10 THERMOSTATIC MIXING VALVE

- A. Thermostatic Mixing Valve (TMV): Shall be Leonard, Model as scheduled, or Symmons, capacities and performance as scheduled with swivel action check-stops at the hot and cold inlets, thermometer, shut-off on the discharge piping and removable cartridge with strainer. Controller shall consist of a liquid fill thermal motor with bellows mounted out of the water. Finish shall be rough bronze.

2.11 GAS PRESSURE REGULATORS

- A. Shall be Maxitrol Series 325, or equal, with vent limiting device or vented to atmosphere. Regulators shall be suitable for 2 psig entering gas pressure and sized for the connected load per the manufacturers recommendations. Provide a regulator at each gas burner, as required.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
 1. Prior to work of this Section, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.
 2. Verify that plumbing may be installed in strict accordance with pertinent codes and regulations and the reviewed Shop Drawings.

3.2 INSTALLATION OF PIPING

- A. Provide and erect in accordance with the best practice of the trade piping shown on the drawings and as required to complete the intended installation. Make offsets as shown or required to place piping in proper position to avoid other work and to allow the application of insulation and finish painting to the satisfaction of the Architect.
- B. The size and general arrangements, as well as the methods of connecting piping, valves, and equipment, shall be as indicated, or so as to meet the requirements of the Architect.

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- C. Piping shall be erected so as to provide for the easy and noiseless passage of fluids under working conditions.
- D. Install unions to facilitate removal of equipment.
 - 1. Unions are not required in installations using grooved mechanical joint couplings. (The couplings shall serve as unions and disconnect points.)
- E. Copper pipe shall be reamed to remove burrs.
- F. Connections between copper and steel piping shall be made with brass fittings.
- G. Solder joints shall be made with lead free solder. Clean surfaces to be soldered and use a paste flux. Wash joints with sodium bicarbonate and water to remove corrosive effects of heated solder paste. Caution: Lead-bearing solder is not permitted.
- H. Push-to-Connect Joints: Install Permalynx joints in accordance with the manufacturer's latest published installation instructions. Prepare and mark tubing ends using a tool supplied by the manufacturer and in accordance with the manufacturer's instructions.
- J. Pipe penetrations through walls, floors and ceilings shall have pipe sleeves and shall be in accordance with Section 23 05 00 "Common Work Results for HVAC". Traverse points of piping shall be escutcheoned with split chrome floor and ceiling plates and spring anchors, where visible to occupancy.
- K. Provide a cleanout in the vertical position at the base of each sanitary and storm (roof) drain riser. Locate "Vent-thru-Roof" terminations a minimum distance of thirty (30) feet from outside air intakes.
- L. Sanitary and vent piping shall be sized and installed at 1/4" per foot slope or as indicated and in no case less than 1/8" per foot.

3.3 PIPE HANGERS

- A. Impact driven studs are prohibited.
- B. Copper Tubing: supported at intervals with rod sizes as follows, double nuts on hangers and on beam clips.

Copper Size	Hanger Intervals	Rod Sizes
1/2"	5'	3/8"
3/4"	6'	3/8"
1"	6'	3/8"

- C. Cast Iron Pipe: Supported at intervals with rod sizes as follows, double nuts on hangers and on beam clips.

Cast Iron Size	Hanger Intervals	Rod Sizes
1-1/2"	5'	3/8"
2"	5'	3/8"
2-1/2"	5'	1/2"
3"	6'	1/2"
4"	7'	5/8"

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- D. PVC Pipe: Supported at 4-foot intervals.
- E. Verticals: Supported by use of clamp hangers at every story height, and at not more than 6 feet intervals for copper piping 1-1/4" and smaller size.

3.4 CLOSING IN UNINSPECTED WORK

- A. General: Cover up or enclose work after it has been properly and completely reviewed.
- B. If any of the work is covered or enclosed prior to required inspections and review, uncover the work as required for the test and review. After review, tests and acceptance, repairs and replacements shall be made by the appropriate trades with such materials as necessary for the acceptance by the Architect and at no additional cost to the Owner.

3.7 CLEANUP AND CORROSION PREVENTION

- A. Upon completion of the work thoroughly clean and flush piping systems to the sewer with water.
- B. Fixtures, piping and equipment shall be thoroughly cleaned. Dirt, dust, and debris shall be removed and the premises left in a clean and neat condition.
- C. Caulk around fixtures at floor and wall.
- D. Before covering is applied to piping systems, clips, rods, clevises and other hanger attachments, and before uncovered piping is permitted to be concealed, corrosion and rust shall be wire brushed and cleaned and in the case of iron products, a coat of approved protective paint applied to these surfaces. When corrosion is from the effects of hot solder paste, the areas shall be cleaned and polished and a wash of bicarbonate of soda and water used to neutralize the acid condition.

3.8 DISINFECTING

- A. After the entire potable water system is completed, cleaned and tested, and just before the building is ready to be occupied, disinfect the system as follows: After flushing the mains, introduce a water and chlorine solution for a period of not less than three hours before final flushing of the system.

3.9 TESTS

- A. Sanitary soil, waste and vent piping: Fill with water to top of vents, and test as required by Code.
- B. Water piping shall be tested to a pressure of 100 lbs. per square inch for at least 30 minutes. Pressure drop in this period shall not exceed two pounds per square inch. Leaks shall be repaired and system retested. Notify Architect 24 hours before test is to be performed.

3.10 INSTRUCTIONS

- A. On completion of the project, provide a competent technician to thoroughly instruct the Owner's representative in the care and operation of the system. The total period of

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instruction shall not exceed four (4) hours. The time of instruction shall be arranged with the Owner.

3.11 FIRESTOPPING

- A. Firestopping shall be performed in accordance with Specification Section 07 84 00 "Firestopping". All penetrations of fire-rated assemblies including walls and floors by mechanical system components (piping, ductwork, conduits, etc.) shall be firestopped as specified.

* END OF SECTION *