

SECTION 15400

PLUMBING

PART 1 GENERAL

1.1 SUMMARY

A. Scope

1. Refer to Division 15 Section "General Mechanical Requirements".
2. Provide all plumbing as shown or specified, including components, accessories and trim for a complete installation.

B. Description Of Systems And Equipment

1. PLUMBING FIXTURES AND TRIM
 - a. Carriers, supports, fixtures, trim, supplies and drains with connection to rough-in work for supplies and drainage.
2. DRAINAGE SPECIALTIES
 - a. Roof drains, floor drains, cleanouts and P-traps.
3. PLUMBING EQUIPMENT
 - a. Water coolers, water heaters, hose bibbs, wall hydrants and backflow preventers with hangers or supports and connections to rough-in work for supplies, drainage and vent as required for equipment use.

C. Related Work Specified Under Other Sections

1. Division 15 Section "General Mechanical Requirements."
2. Division 15 Section "Underground Piping Systems."
3. Division 15 Section "Aboveground Piping Systems."
4. Division 15 Section "Valves."
5. Division 15 Section "Piping Specialties."
6. Division 15 Section "Pumping Equipment."
7. Division 15 Section "Thermal Insulation."

1.2 QUALITY ASSURANCE

A. Requirements Of Regulatory Agencies

1. Provide plumbing work per (International Plumbing Code)(BOCA Basic Plumbing Code)(Verify code used for each project), except where superseded by State or Local authorities.

1.3 SUBMITTALS

- A. Furnish submittals for items that are identified in this SECTION by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Division 01 Section "Shop Drawings, Product Data and Samples," and Division 15 Section "General Mechanical Requirements" for definition of codes for types of submittals and the administrative requirements governing submittal

procedure. Additional submittal requirements pertaining to this SECTION are specified herein under this Article.

- B. Certificate: Submit Manufacturer's Data Form U-1 for water cooler storage tank.

PART 2 PRODUCTS

2.1 PLUMBING FIXTURES AND TRIM

A. General

1. Provide fixtures with trim necessary for a complete assembly and functioning installation, including supplies, risers, stops, drains, escutcheons, couplings, gaskets, nuts, fasteners, seats and fittings.
2. Provide fixtures basically selected from a single manufacturing source and of like quality and material.
3. Provide rough-in per manufacturers published instructions.
4. For exposed to view trim, including surface penetration escutcheons, support escutcheons and fasteners, furnish chromium-plated or nickel-plated brass with polished, bright surfaces, normally referred to as "chrome-plated".
5. All plumbing fixtures in barrier free environment shall be in compliance with ADA. Where lavatories are indicated with the symbol (HCP), furnish unit complete with thermostatic tempering valve in faucet supply piping, and cover hot water and drain piping with a molded closed cell vinyl insulation from lavatory to wall.
6. Vitreous china fixtures shall be color as selected by the ARCHITECT from the manufacturer's standard color schedule, except where otherwise specifically noted.

B. Fixture Supports

1. Ferrous metal carriers: Support wall hung fixtures; furnish and select for the particular installation conditions. Securely bolt carriers to the supporting surface.
2. Enameled iron support: For fixtures specified with support surfaces not concealed by support escutcheons.
3. Concealed adjustable arm carriers: With steel pipe uprights and buttress foot block bases; to support lavatories. Conceal lavatory fixture support arms by means of secure, deep drawn, chrome plated escutcheons.
4. Carriers: With adjustable fittings, drain connections and buttress foot block bases; to support water closets.
5. Carriers: With mounting plates, steel pipe uprights and buttress foot block bases; to support urinals.
6. High extension type carriers: Furnish for water closets and urinals, for the handicapped.
7. Chair carriers: To support medical sinks except as otherwise specified.
 - a. Josam.
 - b. J. R. Smith.
 - c. Wade.
 - d. Zurn.

C. Lavatories

1. TYPE L-1:

- a. Wall hung vitreous china lavatory, wheelchair, nominal 20 x 27 inches with drilled holes on 4 inch centers for gooseneck supply faucet, front overflow, concealed arm support, and integral perforated strainer drain fitting .(ADA Compliant)
 - 1) American Standard, "Wheelchair" 9141.011.
 - 2) Crane "Wheelchair" 1H360.
 - 3) Kohler "Morningside" K-12636.
- b. Faucet:
- c. Supply trim:
- d. Drain trim:
- e. Trap:

2. TYPE L-2 (HCP)(Countertop):

- a. Countertop vitreous china lavatory, self-rimming oval lavatory, complete with faucet holes on 8 inch centers, fitting ledge, front overflow, nominal 20 x 17 and integral perforated strainer drain fitting. (ADA Compliant)
 - 1) American Standard, "Aqualyn" 0475.020.
 - 2) Crane "Sonnet" 1-283-S.
 - 3) Eljer "Donna" 051-3328.
 - 4) Kohler "Pennington" K-2196-8.
- b. Faucet:
- c. Supply trim:
- d. Drain trim:
- e. Trap:

D. Lavatory Faucets

1. TYPE LF-1: Widespread Faucet with drain, grid strainer tailpiece, 8"centers, lever handles, polished chrome.
 - a. American Standard4802.00 with #342 handles.
 - b. Chicago Faucet 404A-E12 with No. 950 handles and No. 327A drain.
 - c. Kohler K-7443-4A with K-7715 drain and K-16012-2 Handles..
2. TYPE LF-9 [C]: Sensor operated 4 inch center-set electronic hand washing faucet, with long grid drain, vandal-proof, 0.5gpm aerated spray head, sensor range adjustment screw, 120 VAC/24 VAC transformer, polished chrome.(ADA Compliant). Where sensor operated faucets are used for (HCP) lavatories, furnish complete with a thermostatic tempering valve option.
 - a. Delta "Inovations" Series.
 - b. Delany "Sensor-Faucet" Series.
 - c. Sloan "Optima" Series.

E. Lavatory Supply Trim

1. TYPE TTV: Where (HCP) lavatories are indicated, furnish complete with a thermostatic tempering valve having heavy cast bronze body, corrosion resistant internal components, and brass stem with screwdriver adjustment, designed to compensate for temperature fluctuations induced by water temperature and pressure changes in the supply line.
 - a. Powers Process Controls, "Hydroguard".

- b. Conbraco.
 - c. Lawler Manufacturing Co.
 - d. Leonard Valve Co.
2. TYPE ST-1: Supply with loose key stops.
 - a. American Standard 2303.105.
 - b. Chicago Faucet 1016MM.
 - c. Elkay LK-2680.
 - d. Kohler K-7607 Mod.
- F. Lavatory Drain Trim
1. TYPE DT-1: Polished chrome drain with perforated strainer and 1-1/4 inch tailpiece.
 - a. American Standard 2411.015.
 - b. Chicago Faucet 327A.
 - c. Kohler K-7715.
 - d. Elkay LK-9
 2. TYPE DT-2: Polished chrome offset drain with perforated strainer and 1-1/4 inch tailpiece.
 - a. American Standard 7723.018.
 - b. Eljer 803-0530.
 - c. Kohler K-13885.
- G. Lavatory Traps
1. TYPE LT-1: 1-1/4 inch cast brass P-trap with cleanout and waste to wall.
 - a. American Standard 4401.014.
 - b. Crane 8-5260.
 - c. Kohler K-9000.
- H. Water Closets
1. TYPE WC-1(HCP): Floor mounted syphon jet elongated type with 1-1/2 inch top spud for exposed flush valve, 1.6 gpf.. Furnish china bolt caps.
 - a. American Standard "Madera" 2305.100.
 - b. Crane "Whirlton" 3-325.
 - c. Kohler "Anglesey" K-4386.
 - d. Eljer "Sanus" 111-1115.
- I. Seats
1. TYPE WCS-1: White, solid plastic, with extended back, without cover for elongated bowl, with open front and self sustaining hinges.
 - a. Kohler, K-4670 SC.
 - b. Church 9400KN SSC Series.
 - c. Olsonite 10-CC/SS.
 - d. Sperzel 50-E.

J. Flush Valves

1. TYPE WV-1: Diaphragm type, top spud, exposed, chrome plated, hand operated, with vacuum breaker, screw driver stop and with wall and spud flanges, 1.6 gallon per flush low consumption, ADA compliant.
 - a. Delany "Flushboy" 402-1.
 - b. Sloan "Royal" 111.
2. TYPE WV-3: Diaphragm type, top spud, exposed, chrome plated, sensor operated, with vacuum breaker, screw driver stop and with wall and spud flanges, 1.6 gallon per flush low consumption, ADA compliant. Furnish unit complete with 110 to 24 VAC transformer for hard wire installation.
 - a. Delta "Teck" 81T201HW.
 - b. Delany "Sensor-Flush."
 - c. Sloan "Optima."

2.2 DRAINAGE SPECIALTIES

A. Floor Drains (FD)

1. Floor drains shall conform to applicable portions of ANSI/ASME A112.6.3. Provide floor drains with: Traps, except where otherwise indicated; running traps below ground floor shall have extension cleanouts on house side; inside caulk outlets on ground floor; threaded or caulk outlets to match piping for suspended slabs; bottom outlets except where otherwise indicated or required; seepage pans and weepholes and clamping collars for slabs with membrane or metal pan waterproofing. BITUMINOUS COATING, factory or field applied to all surfaces before rusting occurs except grate. Provide hopper drains with grates.
2. Provide following types, where indicated. Series numbers given represent basic style only and do not necessarily include required modifications or sizes.
3. TYPE FD-1: Cast iron body, with double drainage flange, weepholes, adjustable 5 inch polished nickel-bronze round strainer, removable sediment bucket, trap seal primer connector.
 - a. Josam 30000-5C.
 - b. Smith 2000 Series.
 - c. Wade W-1100-STD.
 - d. Zurn Z-415-5" B.
4. TYPE FD-2: Cast iron body, adjustable top, 8-1/2 inch minimum diameter, heavy deep set grate, removable sediment bucket.
 - a. Josam 31600.
 - b. Smith 2320.
 - c. Wade W-1340-TD.
 - d. Zurn Z-520.
5. TYPE FD-3: Cast iron body, removable sediment bucket, minimum 12 inch diameter heavy duty loose set grate.
 - a. Josam 36210.
 - b. Smith 2140.
 - c. Wade W-1200-TD.
 - d. Zurn Z-509.

- B. Trap Seal Primer Connectors
 - 1. Fitting for inserting trap primer connection in outlet of conventional floor drain. ½ inch NPT primer inlet tapping; threaded, spigot or No-Hub inlet and outlet.
 - a. Smith 2695, 2696 or 2697.
 - b. MIFAB MI-600.
 - c. Josam Series 88350.
 - d. Zurn Z-1023.

2.3 CLEANOUTS (CO)

- A. Raised head cleanout plugs: Provide cast brass, except as indicated.
- B. Gasketed gas and liquid tight cleanouts: Provide where under pressure or required for space function.
- C. Cleanouts and access: Provide in finished spaces as approved by the ARCHITECT-ENGINEER.
- D. Seepage flange and weephole: Provide in cleanouts in slabs not on ground floor.
- E. Inside caulk outlets: Provide on the ground floor.
- F. Seepage flanges, weep holes and flashing clamp: Provide in cleanouts in floors with membrane or metal water proofing.
- G. TYPE CO-1: Scoriated bronze alloy cover with cast iron body, threaded bronze plug; secure to plug with countersunk screw.
 - 1. Josam 56010.
 - 2. Smith 4023.
 - 3. Wade 6000.
 - 4. Zurn Z-1400.
- H. TYPE CO-2: Heavy duty scoriated bronze alloy cover with cast iron body, threaded bronze plug; secure to plug with countersunk screw.
 - 1. Josam 56060.
 - 2. Smith 4103.
 - 3. Wade 8000Z.
 - 4. Zurn Z-1400-HD.
- I. TYPE CO-3: Round, coated cast iron access frame with anchor flanges, galvanized cast iron parts, and heavy duty scoriated secured cover with “SAN” wording cast in cover.
 - 1. Josam 58680.
 - 2. Wade 8300-MF.
 - 3. Smith 4250.
 - 4. Zurn Z-1474.

2.4 P-TRAP

- A. Extra heavy cast iron: For connection to type CISP piping.

2.5 HUB OUTLET (HO)

- A. Hub: End of TYPE CISP pipe.

2.6 ROOF DRAINS (RD)

- A. TYPE RD: Free flow type, heavy pattern cast iron body construction, with clamping surfaces not less than 2 inches wide, dome shaped aluminum strainer approximately 12 inch diameter, deck clamp assembly with weir and gravel stop, and sump receiver. Drain body and bolting shall be corrosion protected with manufacturer's standard enamel and electro-deposited coating.
 - 1. Josam 21500 Series.
 - 2. Smith 1010 Series.
 - 3. Wade W-3000 Series.
 - 4. Zurn Z-100 Series.
- B. TYPE ORD: Overflow type, heavy pattern cast iron body construction, with clamping surfaces not less than 2 inches wide, dome shaped aluminum strainer approximately 12 inch diameter, deck clamp assembly with weir and 2 inch water dam, and sump receiver. Drain body and bolting shall be corrosion protected with manufacturer's standard enamel and electro-deposited coating.
 - 1. Josam 21500 Series.
 - 2. Smith 1080 Series.
 - 3. Wade W-3000-D Series.
 - 4. Zurn Z-100-89 Series.

2.7 PLUMBING EQUIPMENT

- A. Domestic Water Heater (Steam)
 - 1. *Domestic Water Heater (Steam) [D]*: Packaged, self-contained, horizontal, instantaneous type steam fired water heater, low pressure design for use with 15 psig steam pressure. Unit shall consist of integrally piped ductile iron heat exchanger and copper coil mounted on a heavy duty angle iron frame with assembled control package. Heater shall supply 15 gallons per minute of hot water when heated from 40 °F to 120 °F without the use of thermostatic control devices or storage tanks. Heater shall be capable of maintaining the temperature at ± 3 degrees over a flow range of a few percent to 100 percent. The water shall flow in the tubes and steam in the shell. System shall be equipped with a re-circulation system with non adjustable valve to set the re-circulation temperature. The re-circulation system (except for pump) shall be integrally mounted. Unit shall include control valve, steam/water heat exchanger, trap, and thermostatic air vent.
 - a. Leslie, Constantemp, Model E1500L.
 - b. Armstrong, Flo-Rite.
 - c. Other approved.

- B. Emergency Eye Wash
 - 1. *Emergency Eye Wash [D]*: Wall mounted aerated eye wash fountain, stainless steel bowl, wall bracket, chrome plated tail piece, 1/2 inch full-port ball valve with stay-open feature when valve is actuated. Furnish unit with dual spray heads with aerated ABS plastic spray outlets and flip top caps.
 - a. Speakman SE-582.
 - b. Haws.
 - c. Western Emergency Equipment.
 - d. Guardian.

- C. Emergency Fixture Tepid Water Supply (EWH)
 - 1. *Instantaneous Tepid Water Heater (EWH) [D]*: UL Listed point of use, tankless heater with flow switch activation, replaceable cartridge Ni Chrome heating element, 1-1/4 inch NPT fittings, and ABS splash proof enclosure. Thermostatic control shall continuously monitor outlet temperature and adjust output for variation in flow and pressure to accurately maintain outlet temperature to +/- 1 deg. F. Unit shall meet tepid water requirements of ANSI Z 358.1.
 - a. Eemax EX60T EE.
 - b. Chronomite Laboratories Inc.

2.8 PLUMBING SPECIALTIES

- A. Hose Faucets (Hose Bibbs Inside Building)
 - 1. Brass or bronze with 1/2 inch male inlet threads, hexagon shoulder, and 3/4 inch hose connection, per FS WW-P-541b, Type 65. Hose coupling screw threads per ANSI B2.4. Provide with vandalproof atmospheric type vacuum breaker.
 - a. Chicago No. 5T.
 - b. Woodford Model 24.

- B. Water Hammer Arrestors
 - 1. Water hammer arrestors: Commercially manufactured products with resilient members arranged to absorb the energy of pressure waves generated by valve closure in a line in which liquid is flowing. Rate and certify arrestors with inlets sized 1 inch and smaller per the Plumbing and Drainage Institute Standard PDI-WH201. Arrestors for larger system requirements shall be engineered for the service by the manufacturer.
 - a. Josam 75000 Series.
 - b. Smith 5005.
 - c. Wade W-5.
 - d. Zurn Z-1700 series.

- C. Trap Primer
 - 2. Provide ASSE Standard 1018 automatic trap seal primer suitable for use with up to four floor drains, bronze or brass body, with anti-siphon ports, 1/2 inch NPT female.
 - a. Josam Series 88300.
 - b. MIFAB MI-500 with MI-DU.

2.9 STALL SHOWERS

- A. Shower Head
 - 1. TYPE SH- (HCP): Hand held shower with 1/2 inch inlet, integral automatic flow control of 2.5 GPM, adjustable spray pattern, plated metal hose with rubber liner, and 24 inch slide bar.
 - a. Kohler K-9674.
 - b. Powers P413-8-W.
 - c. Speakman VS1000-123.
 - 2. TYPE SCV-1: The valve shall sense and correct for pressure changes in the water supply system and shall include anti-scald and anti-chill safety stops. It shall be chrome plated, with screw driver check stops, manual shut-off, 1/2" inlets and outlets for concealed piping and with a temperature range of 65degF to 115degF. Valve shall conform to requirements of ASSE 1016.
 - a. Bradley, Equa-Flow 478 ACK.
 - b. Delta, Scald Guard 1603-HDF.
 - c. Powers, Hydroguard P-413-D
 - d. Speakman, SM-1420-SS-VR-M.
 - e. Symmons, Safetymix 4-500-X

2.10 MISCELLANEOUS MATERIALS

- A. Escutcheons: Manufactured from nonferrous metals and chrome plated, except when AISI 300 Series stainless steel is provided.
- B. Flashing: Lead for floor drains shall be fabricated from 4 pound, 36 inch square sheet lead.
- C. Bituminous Coating:
 - 1. Koppers "Bitumastic 50".
 - 2. Porter Coatings Div. of Porter Paint Co. "Tarmastic 101".
- D. Calking: Silicone, white, Type RTV.
 - 1. Dow.
 - 2. General Electric.

2.11 EXTENSION OF PIPING SYSTEM

- A. Piping fittings and valves: Chrome plated, polished surface red brass or bronze.
- B. Piping: Schedule 40 red brass per ASTM B 43.
- C. Pipe fittings: Threaded brass or bronze per ANSI B16.15.
- D. Stop valves and check valves: Straight or angle, cast or bar stock body and trim brass, bronze or stainless steel, rated for system service conditions. Compression type service rated valves are acceptable for water service through 1/2 inch IPS. Other valves per SECTION 15110 except

that body and trim finish may be “brushed” in lieu of “polished”. Valve wheels shall be “four lever” type for compression type valves and round or “four lever” type for other valves.

PART 3 EXECUTION

3.1 DRAINAGE SPECIALTIES INSTALLATION

A. Cleanouts

1. Provide cleanouts where indicated and as required by the applicable codes. Aesthetically locate cleanouts with respect to tile patterns, masonry bond and alignment. Coordinate installation with concrete and masonry work.
2. Connect underground system cleanouts by means of long sweep 1/4 bends or two 1/8 bends. Cleanouts in connection with threaded pipe, where indicated and accessible, shall be cast iron drainage, T-pattern, 90-degrees branch fittings with extra-heavy brass screw plugs of the same size as the pipe up to and including 4 inches.
3. Where cleanout plugs extend beyond the wall finish, furnish machine finished brass plates of sufficient depth to fit against the wall and cover the plug. Paint cleanout cover plates to match adjacent wall finish in lieu of being plated or polished.
4. Remove each threaded cleanout plug from the assembly and make free turning. Reassemble plugs with tetrafluorethylene tape applied to threads or lubricated with waterproof grease. Cleanout surfaces, which remain accessible after installation, shall be protected by plastic films during concrete placing operations.
5. Prior to acceptance of the system, demonstrate that cleanout plugs are easily removable and that cleanouts can be easily rodded with standard rodding tools in the space or clearance provided.

B. Floor Drains

1. Coordinate installation of floor drains with the work of placing concrete to assure proper drain elevation and floor slope.
2. Cast floor drains into the concrete at the time the floors are placed and make watertight.
3. Check drainage of surfaces by flooding with hose.
4. Where indicated, or required by code, furnish floor drains complete with trapseal primer and fitting.

C. Hub Outlet

1. At soil pipe stacks, vent stacks and roof conductors install hub end of TYPE CISP pipe flush with finished floor.
2. Where indicated, terminate hub outlet 2 inches above finished floor.

D. Roof Drains

1. Coordinate installation of roof drains with the work of installing built-up roofing to assure proper drain elevation.
2. Lubricate roof drain associated expansion joint slip surfaces with graphite and oil prior to installation, unless otherwise required by the manufacturer. Adjust packing.

- E. Vertical Roof Conductor Expansion Joints
 1. Install at all roof drains with bottom outlet, except otherwise indicated on the DRAWINGS.

- F. Flashing
 1. Flash floor drains in aboveground slabs with separate finish with 16 oz. copper, 24 inch square sheet. However, floors on ground, provided with membrane or metal pan waterproofing do not require lead flashing but shall have two additional layers of the waterproofing specified at the floor drains. Flashing shall not obstruct the weepholes.
 2. Flash and clamp cleanouts in floors provided with membrane or metal pan waterproofing as specified for floor drains.
 3. Roof sumps used with metal deck construction shall have deck clamps and shall be flashed with 4 pound lead, 36 inch square sheet.
 4. Roof sumps set in concrete construction shall have anchoring flanges and shall be flashed with 16 oz. copper, 36 inch square sheet.

3.2 PLUMBING SYSTEMS INSTALLATION

- A. Plumbing Fixtures Equipment And Specialties
 1. Connect exposed to view supply and drainage trim for fixtures and equipment to the rough piping systems at the wall, unless otherwise specified under the item or indicated.
 2. Wall sleeves are not required at plumbing fixture supply and drainage piping in above grade building surface penetrations, unless otherwise indicated.
 3. Each lavatory shall be set 2 inches from the wall.
 4. Install fixtures per manufacturer's published instructions and as indicated. Calk plumbing fixtures adjacent to walls or floors to which they are attached to preclude dirt and vermin entry. In dietary areas, in lieu of escutcheon plates, calk piping penetrating building surfaces at point of surface penetration to prevent entry of dirt and vermin.
 5. Fixture Supports: Conceal lavatory fixture support arms with secure deep drawn chrome plated escutcheons. Securely bolt and anchor supports to the supporting surfaces.
 6. Supporting elements surface finish shall match that of supported piping systems as specified in SECTION 15100.
 7. Chrome plated piping fittings and valves shall be fabricated and installed with strap wrenches and padded tools to preclude injury to chrome plated surfaces.
 8. Testing and disinfection shall be performed as specified in SECTION 15100.
 9. Handicapped water closets shall be mounted so that the seat height is between 16 and 17 inches above the floor. For unusually low roughing problems, provide a 2 inch lift seat.
 10. Handicapped water closet flush valves shall be installed with operator on the stall wide side and not more than 44 inches above finished floor.
 11. Handicapped urinals shall be mounted so that the lip is 15 inches above the floor.
 12. Domestic water heaters for non-circulating systems shall be installed with a heat trap piping configuration located at the inlet and outlet of the water heater per requirements of ASHRAE 90.1, 2001, Article 7.2 b.

END OF SECTION

Revision History	
Date	Rev. No.
A	0
B	0
C	0
D	0
E	0
F	0
02-19-09	0

LMS/djo

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