SECTION 224000 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. All work to be furnished and installed under this section shall comply with all the requirements of General Conditions, Supplemental Conditions, Division 01 - General Requirements, and Section 220500 - Basic Plumbing Materials and Methods, and other Sections in Division 22 specified herein.

1.2 SCOPE

A. All work to be furnished and installed under this section shall include, but not necessarily be limited to, the installation of plumbing fixtures and trim.

1.3 RELATED WORK IN OTHER SECTIONS

A. Section 220500: Basic Plumbing Materials and Methods

1.4 SUBMITTALS

A. Prior to construction submit for approval all materials and equipment in accordance with Division 01. Submit manufacturer's data, colors, installation instructions, and maintenance and operating instructions for all components of this section including, but not limited to, the following:

1. Plumbing fixtures.
2. Piping specialties.
3. Toilets.
4. Lavatories.
5. Sinks.
6. Drinking fountains.

B. Shop Drawings: Submit rough-in drawings. Detail dimensions, rough-in requirements, required clearances, and methods of assembly of components and anchorages. Coordinate requirements with Architectural Woodwork shop drawings specified in Division 06 for fixtures installed in countertops and cabinets. Furnish templates for use in woodwork shop.

C. Samples: Submit samples of any piece of equipment requested by Architect for review and approval.

D. Wiring Diagrams: Submit manufacturer's electrical requirements and wiring diagrams for power supply to units. Clearly differentiate between portions of wiring that are factory installed and field installed portions.

1.5 CODES AND STANDARDS

A. Applicable Plumbing Code with State Amendments.

B. All fixtures and accessories must be approved for use by the State and local jurisdictions.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

C. All fixtures and faucets must meet all requirements of Americans with Disabilities Act (ADA).

D. State Energy Code

E. ARI Standard 1010: “Drinking Fountains and Self-Contained Mechanically Refrigerated Drinking Water Coolers.”

F. NSF/ANSI 61: This Standard is intended to cover specific materials or products that come into contact with drinking water, drinking water treatment chemicals, or both. The focus of the Standard is evaluation of contaminants or impurities imparted indirectly to drinking water. The products and materials covered include, but are not limited to, process media, protective materials, joining and sealing materials (cements, solders, gaskets), pipes and related products, mechanical devices and plumbing devices such as fixtures and valves.

G. NSF 372: Materials containing not more than 0.2 percent lead when used with respect to solder and flux and not more than a weighted average of 0.25 percent when used with respect to the wetted surfaces of pipes and pipe fittings, plumbing fittings, and fixtures, providing a specified definition and formula for determining “weighted average”.

H. American National Standards Institute (ANSI): Comply with ANSI Z358.1 (latest version) “Emergency Eyewash and Shower Equipment”. The standard includes, but is not limited to, the following guidelines:

1. All emergency flushing equipment must be located with 10 seconds of the hazardous material.
2. Safety showers and/or eye/face wash stations must be located on the same level as the hazard and the path of travel shall be free from obstructions.
3. Equipment must be served with tepid water (60-100°F).
4. The operational control valve shall remain open without the use of the operator’s hand until intentionally closed.
5. If shut-off valves are installed in the supply line(s) serving the flushing equipment for maintenance purposes, provisions must be in place to prevent unauthorized shut-off. Removal of valve handles or lock-out devices are acceptable methods to secure valves.
6. Eye/face wash equipment for splashes or spills where the eyes and face are affected requires flushing of 3 gpm at 30 psi (0.207 megapascals) for 15 minutes. The spray nozzle(s) should be at least 6 inches from any obstruction and mounted between 33 and 45 inches above the floor.
7. Eyewash nozzles shall be protected from airborne contaminants. The protective cover shall automatically be removed and not require a separate motion by the operator when activating the unit.
8. Plumbed emergency showers and eye/face wash equipment shall be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available.
9. Plumbed emergency showers and eye/face wash equipment shall be activated annually weekly for a period long enough to verify operation and ensure that flushing fluid is available.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

1.6 QUALITY ASSURANCE

A. Battery Operation: For those plumbing fixtures provided with battery operated valves (toilets, urinals, and sink faucets) powered by lithium or alkaline batteries shall be selected with a minimum operational service life of six (6) years based on 4000 operations per month. Any failure of batteries during the first six years of service, from the date of Certificate of Occupancy, shall be replaced by the installing contractor at no additional charge to the Owner.

B. High Efficiency Toilet (HET) Performance: High efficiency (HET) toilets (water closets) shall have a Maximum Performance (MaP) score rating of 800 grams, or greater, as listed by the Alliance for Water Efficiency (http://www.allianceforwaterefficiency.org). Sanitary sewer pipes serving HET fixtures shall be sloped at a minimum of 2% for pipe sizes up to 4” diameter.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver units to the site in containers with manufacturer's stamp or label affixed.

B. Store and protect products against dirt, water, chemical, and mechanical damage. Do not install damaged products. Remove damaged products from project site.

1.8 MAINTENANCE

A. Extra Stock:

1. Furnish special wrenches and other devices necessary for servicing plumbing fixtures, flush valves, and trim to Owner’s Representative with receipt in a quantity of one device for each 10 fixtures.
2. Furnish faucet repair kits complete with all necessary washers, springs, pins, retainers, packings, o-rings, sleeves, and seats in a quantity of one kit for each 10 faucets.

1.9 WARRANTY

A. Provide minimum one-year warranty from date of Substantial Completion, including all parts, material, labor and travel.

B. Refer to Section 220500 for additional warranty and Substantial Completion requirements.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide fixtures as specified. Fixtures in any secure or public areas shall be vandal proofed.

B. Architect/Engineer shall review and approve any substitution requested by Contractor prior to bid submittal.

C. Provide fixture as specified, acceptable manufacturers:

1. Vitreous China or Cast Iron Fixtures: American Standard, Eljer, Zurn, or Kohler.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

2. Stainless Steel Sinks: Elkay, or Just.
    a. All stainless steel is minimum 18-gauge, type 304 unless otherwise specified.
3. Drinking Fountains: Elkay, or Haws.
4. Terrazzo Service Sinks: Florestone, or Stern Williams.
5. Showers enclosures: Lasco, Fiber Fab, Aquaglass, or Aqua Bath.

D. Provide faucet as specified. Acceptable manufacturers: Chicago Faucets, Zurn, Symmons, T and S, or Delany.

E. Non-Aerating, Low Flow Laminar Device:

1. Provide laminar flow control device on faucets for healthcare facilities. Refer to plumbing fixture schedule on Drawings for flow rates.
2. Pressure compensation flow control device shall be capable of delivering specified flow rate over the supply pressure range of 40-80 psi. Each device shall incorporate a self-cleaning feature. Accuracy shall be +/- 10% of the flow rate specified. Flow shall be non-aerated, non-splash and clear. Noise shall not exceed 20 dBA at 50 psi.
3. Housing shall be constructed of brass and nickel-chrome plated. Perforated plates shall be brass or stainless steel. Screens shall be series 300 stainless steel or Acetal. Entire assembly shall be lead free. Provide vandal resistant feature.
4. Manufacturer: Omni (Chronomite) #A Series, or Neoperl.

F. Distributed Stream, Pressure Compensating, Low Flow Faucet Device:

1. Provide pressure compensating flow control or laminar flow control devices on public access faucets for office buildings, hotels, motels, schools, restaurants and other public facilities. Refer to plumbing fixture schedule on Drawings for flow rates.
2. Pressure compensation flow control device shall be capable of delivering specified flow rate over the supply pressure range of 40-80 psi. Each device shall incorporate a self-cleaning feature. Accuracy shall be +/- 10% of the flow rate specified.
3. Housing shall be constructed of brass and nickel-chrome plated. Perforated plates shall be brass, stainless steel or acetal. Screens shall be series 300 stainless steel or acetal. Entire assembly shall be lead free. Provide vandal resistant feature.
4. Manufacturer: Neoperl #PCA Mikado Tre Spray 0.35 gpm, or Omni (Chronomite) #A Series.

G. Provide thermostatic mixing valves and fixtures conforming to ASSE 1070 to limit the maximum water temperature to 110°F for all public lavatories and 120°F for all other public fixtures served with hot water. Handle position stops and temperature mixing valves shall be used as required to limit maximum temperature to prevent scalding. Water heater thermostats shall not be considered a suitable control.

H. Provide flush valve as specified. Manufacturers: Sloan, Hydrotek, Zurn, or Delany.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

I. Provide commercial grade toilet seat as specified. Manufacturers: Bemis, Church (Bemis), or Beneke.

J. Provide heavy-duty cast iron commercial grade carrier as specified. Provide compact carriers where space is limited. Comply with ASME A112.6.1M for Floor-Affixed Supports for Off-The-Floor Plumbing Fixtures for Public Use. Provide cast iron nipples and couplings with neoprene gaskets, or better. Plastic nipples and couplings are not allowed. Manufacturers: Jay R. Smith, Watts, Josam, Wade, Zurn, or Mifab.

1. Wall hung water closet with optional flush valve support where applicable: J.R. Smith Fig #0210 Series, #0240 Series, or #0410 Series.
2. High performance wall hung water closet carrier for HET compliant fixtures: Zurn #Z1201/Z1202.
3. Wall hung urinal: J.R. Smith Fig #0634-M12, or Zurn #Z-1221-58.
4. Wall hung lavatory with concealed arm carrier: J.R. Smith Fig #0700–M31, or Zurn #Z1231-EZR-WL.

K. Provide heavy duty commercial grade 17-gauge P-Trap and supplies with stops as specified. Provide heavy duty commercial grade lavatory supplies. Provide supplies meeting AB1953 no lead requirements. Supplies shall be 1/2"x 3/8" x 12" ground joint flexible riser with loose key (LK) angle stop with chrome plates IPS brass nipple. Sink supplies shall be 1/2" x 12" ground joint flexible riser with loose-key angle stop with chrome plated IPS brass nipple. Provide bell type escutcheons for both P-trap and supplies. Manufacturers: Zurn, Brasscraft, Chicago, J.R.Smith, or McGuire.

1. P-Trap for lavatory: McGuire #C8902-DF, or Zurn #Z-8701.
2. P-Trap for sink: McGuire #C8912-DF, or Zurn #Z-8702.
3. Supply for lavatory: McGuire #LFH2165LK, or Zurn #ZH8822-XL-LK Series.
4. Supply for sink: McGuire #LFH2167LK, Zurn #ZH8822-XL Series.
5. Supply for water closet: McGuire #H2169LK, or Zurn #Z8800CR Series.
6. Escutcheons: McGuire #WE00D Series, wrought brass, bell type.
7. Lavatory grid strainer: McGuire #155A, or Zurn #Z-8743.
8. Barrier-free lavatory offset grid strainer: McGuire #155WC, or Zurn #8746.
9. Sink strainer: Elkay LK-18B.
10. Condensate connection on tailpiece under sink: J.R.Smith #9200, Eastman, Keeney, or Zurn.

L. ADA Undersink Wrap: Provide white molded closed cell vinyl pre-fab insulation on P-Trap and on both hot and cold water supply for barrier free lavatories and sinks. Bag type insulators are not acceptable. Manufacturers: Plumberex, Truebro, or Zurn.

2.2 LISTING

A. Refer to plumbing fixture schedule on drawings for manufacturers, model numbers and selection criteria.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

PART 3 - EXECUTION

3.1 GENERAL

A. Verify all dimensions by field measurements. Verify that all plumbing fixtures may be installed in accordance with pertinent codes and regulations, the original design, and the referenced standards.

B. Examine rough-in for potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures.

C. Examine walls, floors and cabinets for suitable conditions where fixtures are to be installed.

D. Install plumbing fixtures level and plumb, in accordance with fixture manufacturer's written instructions, rough-in drawings, and pertinent codes and regulations, the original design, and the referenced standards.

E. Comply with the installation requirements of ADA with respect to plumbing fixtures for the physically handicapped.

F. Floor mounted carrier support systems for wall mounted water closets, urinals, and lavatories:

1. Shall be attached to 3” or thicker concrete slab floors using four 1/2" diameter concrete wedge anchor expansion bolts with minimum 2” embedment and minimum 1-1/2” spacing between anchors at each support location as provided by manufactured carrier. Each bolt shall be capable of withstanding a tension pull-out force of 2,000 lbs. minimum in cracked concrete. Refer to additional manufacturer installation requirements. Manufacturer: Hilti #Kwik Bolt TZ.
2. Shall be attached thru elevated floors using four 1/2" diameter through bolts at each support location as provided by manufactured carrier. Each bolt shall be capable of withstanding a tension pull-out force of 2,000 lbs. minimum in cracked concrete. Refer to additional manufacturer installation requirements.

G. Fasten plumbing fixtures securely to supports behind wall or building structure. Secure supplies behind or within wall construction to provide rigid installation.

H. Install a stop valve in an accessible location in the water connection to each fixture.

I. Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations and within cabinets and millwork.

J. Seal fixtures to walls and floors using sealants as specified in Division 07. Match sealant color to fixture color.

K. Install P-Trap tight to outlets from lavatories and shower drains to minimize the vertical water drop and related drainage noise. Outlet drops longer than 7” to P-trap water level are not acceptable.

L. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning units, then retest.

M. Inspect each installed unit for damage. Replace damaged fixtures.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

N. During construction cover all installed fixtures, sinks, and water coolers with cardboard boxes and wrap with water proof plastic sheeting.

O. Adjust water pressure at drinking fountains, faucets, shower valves, and flush valves to provide proper flow stream.

P. Replace washers or cartridges of leaking or dripping faucets and stops.

Q. Clean fixtures, trim, and strainers using manufacturer's recommended cleaning methods and materials.

END OF SECTION 224000

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.