

SECTION 224000  
PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following conventional plumbing fixtures and related components:
  - 1. Showers.
  - 2. Faucets for showers.
  - 3. Dishwasher Air Gap.
  - 4. Faucets for lavatories.
  - 5. Faucets for sinks.
  - 6. Flushometers.
  - 7. Toilet seats.
  - 8. Protective shielding guards.
  - 9. Fixture supports.
  - 10. Interceptors.
  - 11. Water closets.
  - 12. Lavatories.
  - 13. Owner-furnished fixtures.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- C. Cast Polymer: Cast-filled-polymer-plastic material. This material includes cultured-marble and solid-surface materials.
- D. Cultured Marble: Cast-filled-polymer-plastic material with surface coating.
- E. Fitting: Device that controls the flow of water into or out of the plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts,

shower heads and tub spouts, drains and tailpieces, and traps and waste pipes. Piping and general-duty valves are included where indicated.

- F. FRP: Fiberglass-reinforced plastic.
- G. PMMA: Polymethyl methacrylate (acrylic) plastic.
- H. PVC: Polyvinyl chloride plastic.
- I. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of plumbing fixture indicated. Include selected fixture and trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.
- B. Operation and Maintenance Data: For plumbing fixtures to include in emergency, operation, and maintenance manuals.
- C. Warranty: Special warranty specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.
  - 1. Exception: If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.
- D. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- E. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

- F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
  
- G. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
  - 1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
  - 2. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
  - 3. Slip-Resistant Bathing Surfaces: ASTM F 462.
  - 4. Solid-Surface-Material Lavatories and Sinks: ANSI/ICPA SS-1.
  - 5. Stainless-Steel Commercial, Handwash Sinks: NSF 2 construction.
  - 6. Vitreous-China Fixtures: ASME A112.19.2M.
  - 7. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
  - 8. Water-Closet, Flushometer Tank Trim: ASSE 1037.
  
- H. Comply with the following applicable standards and other requirements specified for lavatory sink faucets:
  - 1. Faucets: ASME A112.18.1.
  - 2. Hose-Connection Vacuum Breakers: ASSE 1011.
  - 3. Hose-Coupling Threads: ASME B1.20.7.
  - 4. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
  - 5. NSF Potable-Water Materials: NSF 61.
  - 6. Pipe Threads: ASME B1.20.1.
  - 7. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
  - 8. Supply Fittings: ASME A112.18.1.
  - 9. Brass Waste Fittings: ASME A112.18.2.
  
- I. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
  - 1. Atmospheric Vacuum Breakers: ASSE 1001.
  - 2. Brass and Copper Supplies: ASME A112.18.1.
  - 3. Dishwasher Air-Gap Fittings: ASSE 1021.
  - 4. Manual-Operation Flushometers: ASSE 1037.
  - 5. Plastic Tubular Fittings: ASTM F 409.
  - 6. Brass Waste Fittings: ASME A112.18.2.
  - 7. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
  
- J. Comply with the following applicable standards and other requirements specified for miscellaneous components:
  - 1. Flexible Water Connectors: ASME A112.18.6.
  - 2. Floor Drains: ASME A112.6.3.
  - 3. Grab Bars: ASTM F 446.
  - 4. Hose-Coupling Threads: ASME B1.20.7.
  - 5. Off-Floor Fixture Supports: ASME A112.6.1M.
  - 6. Pipe Threads: ASME B1.20.1.

7. Plastic Toilet Seats: ANSI Z124.5.
8. Supply and Drain Protective Shielding Guards: ICC A117.1.

#### 1.6 WARRANTY

- A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace components of whirlpools that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Structural failures of unit shell.
    - b. Faulty operation of controls, blowers, pumps, heaters, and timers.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal use.
  2. Warranty Period for Commercial Applications: Three year(s) from date of Substantial Completion.

#### 1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed.
  2. Faucet Cartridges and O-Rings: Equal to 5 percent of amount of each type and size installed.
  3. Flushometer Valve, Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than 2 of each type.
  4. Toilet Seats: Equal to 5 percent of amount of each type installed, but no fewer than 2 of each type.

### PART 2 - PRODUCTS

#### 2.1 SHOWERS

- a. Showers Standard PMMA with base, grab bar and faucet.
  - 1) PMMA (Acrylic) Showers:
    - a) Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following but are not limited to:

- 1) Acryline USA, Inc.
  - 2) Aqua Bath Company, Inc.
  - 3) Aqua Glass Corporation.
  - 4) Aquatic Industries, Inc.
  - 5) Clarion Bathware.
  - 6) Crane Plumbing, L.L.C.
  - 7) Jacuzzi, Inc.
  - 8) Kohler Co.
  - 9) LASCO Bathware.
  - 10) MAAX.
  - 11) Praxis Industries, LLC.
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- 2) Standard: ANSI Z124.1.2.
  - 3) Nominal Size: 30 by 60 inches with a rollover curb ADA accessible.
  - 4) Surround: One piece.
  - 5) Bathing Surface: Slip resistant according to ASTM F 462.
  - 6) Color: White.
  - 7) Drain Location: Center.

## 2.2 SHOWER FAUCETS

- a. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.
- b. Shower Faucets Single handle, thermostatic, mixing valve.
  - 1) Single-Handle, Thermostatic Faucets:
    - a) Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following but are not limited to:
      - 1) American Standard America.
      - 2) Lawler Manufacturing Co., Inc.
      - 3) Leonard Valve Company.
      - 4) Powers.
  - 2) Fixture:
    - a) Standard: ASME A112.18.1/CSA B125.1.
    - b) General: Include hot- and cold-water indicators; check stops; and fixed shower head, arm, and flange. Coordinate faucet inlets with supplies.
    - c) Body Material: Solid brass with nonmetallic trim.
    - d) Finish: Polished chrome plate.
    - e) Maximum Flow Rate: 2.5 gpm unless otherwise indicated.

- f) Mounting: Exposed.
  - g) Operation: Compression, manual.
  - h) Antiscald Device: Integral with mixing valve.
  - i) Check Stops: Check-valve type, integral with or attached to body; on hot- and cold-water supply connections.
- 3) Supply Connections: NPS 1/2.
  - 4) Shower Head:
    - a) Type: Ball joint and head integral with mounting flange.
    - b) Shower Head Material: Combined, metallic and nonmetallic with chrome-plated finish.
    - c) Spray Pattern: Adjustable.
    - d) Integral Volume Control: Not required.
    - e) Shower-Arm, Flow-Control Fitting: 2.0 gpm.

## 2.3 DISHWASHER AIR-GAP FITTINGS

### a. Dishwasher Air-Gap Fittings:

- 1) Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following but are not limited to:
  - a) B & K Industries, Inc.
  - b) Brass Craft Manufacturing; a subsidiary of Masco Corporation.
  - c) BrassTech Inc.
  - d) Dearborn Brass.
  - e) Geberit US.
  - f) Sioux Chief Manufacturing Company, Inc.
  - g) Watts Brass & Tubular; a division of Watts Water Technologies, Inc.
- 2) Standard: ASSE 1021.
- 3) Description: Device designed to prevent backflow of contaminated liquid into domestic dishwashers.
- 4) Material: Plastic body[ with chrome-plated-brass cover].
- 5) Hose Connections: 5/8-inch- ID inlet and 7/8-inch- ID outlet.
- 6) Capacity: At least 5 gpm; at inlet pressure of at least 5 psig and at temperature of at least 140 deg F.
- 7) Mounting: Deck.
- 8) Hoses: Rubber and suitable for temperature of at least 140 deg F.
  - a) Inlet Hose: 5/8 inch ID and 48 inches long.
  - b) Outlet Hose: 7/8 inch ID and 48 inches long.

## 2.4 LAVATORY FAUCETS

A. Lavatory Faucets:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following but are not limited to:
  - a. American Standard Companies, Inc.
  - b. Bradley Corporation.
  - c. Chicago Faucets.
  - d. Delta Faucet Company.
  - e. Eljer.
  - f. Elkay Manufacturing Co.
  - g. Fisher Manufacturing Co.
  - h. Grohe America, Inc.
  - i. Just Manufacturing Company.
  - j. Kohler Co.
  - k. Moen, Inc.
  - l. Royal Brass Mfg. Co.
  - m. Sayco; a Briggs Plumbing Products, Inc. Company.
  - n. Speakman Company.
  - o. T & S Brass and Bronze Works, Inc.
  - p. Zurn Plumbing Products Group; Commercial Brass Operation.
  
2. Description: Single-control mixing valve. Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
  - a. Body Material: Commercial, solid brass
  - b. Finish: Polished chrome plate.
  - c. Maximum Flow Rate: 2.2 gpm.
  - d. Centers: 4 inches.
  - e. Mounting: Deck, exposed.
  - f. Valve Handle(s): Wrist blade, 4 inches.
  - g. Inlet(s): NPS 3/8 tubing, with NPS 1/2 male adaptor.
  - h. Spout: Rigid type.
  - i. Spout Outlet: Aerator.
  - j. Operation: Compression, manual.
  - k. Drain: Pop up.
  - l. Tempering Device: Mechanical.

2.5 SINK FAUCETS

A. Sink Faucets:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following but are not limited to:

- a. American Standard Companies, Inc.
  - b. Bradley Corporation.
  - c. Broadway Collection.
  - d. Chicago Faucets.
  - e. Delta Faucet Company.
  - f. Dormont Manufacturing Company.
  - g. Eljer.
  - h. Elkay Manufacturing Co.
  - i. Fisher Manufacturing Co.
  - j. Grohe America, Inc.
  - k. Just Manufacturing Company.
  - l. Kohler Co.
  - m. Moen, Inc.
  - n. Royal Brass Mfg. Co.
  - o. Sayco; a Briggs Plumbing Products, Inc. Company.
  - p. Speakman Company.
  - q. T & S Brass and Bronze Works, Inc.
  - r. Zurn Plumbing Products Group; Commercial Brass Operation.
2. Description: Kitchen faucet with spray, three-hole fixture. Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
- a. Body Material: Commercial, solid brass.
  - b. Finish: Satin Finish Nickel.
  - c. Maximum Flow Rate: 2.5 gpm, unless otherwise indicated.
  - d. Mixing Valve: Two-lever handle.
  - e. Centers: 6 inches.
  - f. Mounting: Deck.
  - g. Handle(s): Wrist blade, 4 inches.
  - h. Inlet(s): NPS 3/8 tubing with NPS 1/2 male adapter.
  - i. Spout Type: Swivel gooseneck].
  - j. Spout Outlet: Aerator.
  - k. Drain: Not required.

## 2.6 FLUSHOMETERS

### A. Flushometers,:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following but are not limited to:
  - a. Coyne & Delany Co.
  - b. Delta Faucet Company.
  - c. Hydrotek International, Inc.
  - d. Sloan Valve Company.
  - e. TOTO USA, Inc.
  - f. Zurn Plumbing Products Group; Commercial Brass Operation.

2. Description: Flushometer for water-closet-type fixture. Include brass body with corrosion-resistant internal components, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
  - a. Internal Design: Diaphragm or piston operation.
  - b. Style: Exposed.
  - c. Inlet Size: NPS 3/4.
  - d. Trip Mechanism: Mechanical, push-button actuator with stainless-steel access plate.
  - e. Consumption: 1.6 gal./flush.
  - f. Tailpiece Size: NPS 1-1/4 and standard length to top of bowl.

## 2.7 TOILET SEATS

### A. Toilet Seats:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following but are not limited to:
  - a. American Standard Companies, Inc.
  - b. Bemis Manufacturing Company.
  - c. Centoco Manufacturing Corp.
  - d. Church Seats.
  - e. Eljer.
  - f. Kohler Co.
  - g. Olsonite Corp.
  - h. Sanderson Plumbing Products, Inc.; Beneke Div.
  - i. Sperzel.
2. Description: Toilet seat for water-closet-type fixture.
  - a. Material: Molded, solid plastic with antimicrobial agent.
  - b. Configuration: Open front without cover.
  - c. Size: Elongated.
  - d. Hinge Type: SS, self-sustaining.
  - e. Class: Standard commercial.
  - f. Color: White.

## 2.8 PROTECTIVE SHIELDING GUARDS

### A. Protective Shielding Pipe Covers:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Engineered Brass Co.
  - b. Insul-Tect Products Co.; a Subsidiary of MVG Molded Products.
  - c. McGuire Manufacturing Co., Inc.
  - d. Plumberex Specialty Products Inc.
  - e. TCI Products.
  - f. TRUEBRO, Inc.
  - g. Zurn Plumbing Products Group; Tubular Brass Plumbing Products Operation.
2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
- B. Protective Shielding Piping Enclosures:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. TRUEBRO, Inc.
  2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

## 2.9 FIXTURE SUPPORTS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Josam Company.
  2. MIFAB Manufacturing Inc.
  3. Smith, Jay R. Mfg. Co.
  4. Tyler Pipe; Wade Div.
  5. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
  6. Zurn Plumbing Products Group; Specification Drainage Operation.
- B. Water-Closet Supports:
1. Description: Combination carrier designed for accessible mounting height of wall-mounting, water-closet-type fixture. Include single or double, vertical or horizontal, hub-and-spigot or hubless waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.
- C. Lavatory Supports,:

1. Description: Type III, lavatory carrier with hanger plate and tie rod for wall-mounting, lavatory-type fixture. Include steel uprights with feet.
2. Accessible-Fixture Support: Include rectangular steel uprights.

## 2.10 INTERCEPTORS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Josam Company.
2. MIFAB Manufacturing Inc.
3. Smith, Jay R. Mfg. Co.
4. Tyler Pipe; Wade Div.
5. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
6. Zurn Plumbing Products Group; Specification Drainage Operation.

## 2.11 WATER CLOSETS

- A. Water Closets:

1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following, but are not limited to:
  - a. American Standard Companies, Inc.
  - b. Briggs Plumbing Products, Inc.
  - c. Capizzi.
  - d. Crane Plumbing, L.L.C./Fiat Products.
  - e. Eljer.
  - f. Kohler Co.
  - g. St. Thomas Creations.
  - h. TOTO USA, Inc.
2. Description Accessible, wall-mounting, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - a. Style: One piece.
    - 1) Bowl Type: Elongated with siphon-jet design.
    - 2) Design Consumption: 1.6 gal./flush.
    - 3) Trip Mechanism: Push-button actuator.
    - 4) Color: White.
  - b. Supply: NPS 1/2 chrome-plated brass or copper with wheel-handle stop.
  - c. Style: Flushometer valve.
    - 1) Bowl Type: Elongated with blowout design.

- 2) Design Consumption: 1.6 gal./flush.
- 3) Color: White..
- d. Fixture Support: Water-closet support combination carrier.

## 2.12 LAVATORIES

- a. Lavatories solid surface round, PMMA.
  - 1) Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following, but are not limited to:
    - 1) American Standard America.
    - 2) Bradley Corporation.
    - 3) DuPont.
    - 4) Formica Corporation.
    - 5) Franke Consumer Products, Inc.
    - 6) InPro Corporation (IPC).
    - 7) Rynone Manufacturing Corp.
    - 8) Swan Corporation (The).
  - 2) Fixture:
    - a) Standard: ASME A112.19.2/CSA B45.1 for vitreous-china lavatories.
    - b) Type: Self-rimming.
    - c) Round Nominal Size: 15 inches in diameter.
    - d) Faucet-Hole Punching: Three holes, 2-inch centers mounted on vanity.
    - e) Color: White.

### B. Lavatories: wall hung

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following, but are not limited to:
  - a. American Standard Companies, Inc.
  - b. Barclay Products, Ltd.
  - c. Briggs Plumbing Products, Inc.
  - d. Crane Plumbing, L.L.C./Fiat Products.
  - e. Eljer.
  - f. Gerber Plumbing Fixtures LLC.
  - g. Kohler Co.
  - h. Mansfield Plumbing Products, Inc.
  - i. Peerless Pottery, Inc.
  - j. Sterling Plumbing Group, Inc.
  - k. St. Thomas Creations.
  - l. TOTO USA, Inc.

2. Description: Wall-mounting, vitreous-china fixture.
  - a. Type: Slab.
  - b. Size: 20x27 inches rectangular.
  - c. Faucet Hole Punching: Three holes, 4-inch centers.
  - d. Faucet Hole Location: Top.
  - e. Pedestal: Not required.
  - f. Color: White.
  - g. Faucet: Lavatory with pop-up waste.
  - h. Supplies: NPS 3/8 chrome-plated copper with stops.
  - i. Drain: See faucet.
    - 1) Location: Near back of bowl.
  - j. Drain Piping: Schedule 40 ABS or PVC, NPS 1-1/4 by NPS 1-1/2 P-trap; NPS 1-1/2, tubular waste to wall; and wall escutcheon.
  - k. Hair Interceptor: Not required
  - l. Protective Shielding Guard(s): ADA
  - m. Fixture Support: Lavatory .

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.
- B. Examine cabinets, counters, floors, and walls for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
  1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
  2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
  3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.

- D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall-mounting fixtures with tubular waste piping attached to supports.
- F. Install floor-mounting, back-outlet water closets attached to building floor substrate and wall bracket and onto waste fitting seals.
- G. Install counter-mounting fixtures in and attached to casework.
- H. Install fixtures level and plumb according to roughing-in drawings.
- I. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
  - 1. Exception: Use ball, gate, or globe valves if supply stops are not specified with fixture. Valves are specified in Division 22 Section "General-Duty Valves for Plumbing Piping."
- J. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- K. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- L. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- M. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
- N. Install toilet seats on water closets.
- O. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.
- P. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- Q. Install traps on fixture outlets.
  - 1. Exception: Omit trap on fixtures with integral traps.
  - 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- R. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to

conceal protruding fittings. Escutcheons are specified in Division 22 Section "Common Work Results for Plumbing."

- S. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."

### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

### 3.4 FIELD QUALITY CONTROL

- A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.
- E. Install fresh batteries in sensor-operated mechanisms.

### 3.5 ADJUSTING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Adjust water pressure at faucets and flushometer valves to produce proper flow and stream.
- C. Replace washers and seals of leaking and dripping faucets and stops.
- D. Install fresh batteries in sensor-operated mechanisms.

3.6 CLEANING

- A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:
  - 1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
  - 2. Remove sediment and debris from drains.
- B. After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.7 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224000