

## 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:

1. Faucets
2. Flushometers.
3. Toilet seats.
4. Protective shielding guards.
5. Fixture supports.
6. Water closets.
7. Urinals.
8. Lavatories.
9. Showers.
10. Kitchen sinks.
11. Service sinks.
12. Wash Fountains

- B. Related Sections include the following:

1. Division 22 Section "Emergency Plumbing Fixtures."
2. Division 22 Section "Drinking Fountains and Water Coolers."

#### 1.3 DEFINITIONS

- A. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- B. 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.
- C. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. LEED Submittals:
  - 1. Product Data for WE Prerequisite 1, WE Credit 2 and WE Credit 3: Documentation indicating flow and water consumption requirements.

Retain first paragraph below if fixtures include electrical components and wiring.

- C. Shop Drawings: Diagram power, signal, and control wiring.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For flushometer valves and electronic sensors to include in emergency, operation, and maintenance manuals.

#### 1.6 QUALITY ASSURANCE

- A. 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.
- B. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- C. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- D. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
- E. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
  - 1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
  - 2. Vitreous-China Fixtures: ASME A112.19.2M.
  - 3. Water-Closet, Flushometer Tank Trim: ASSE 1037.
- F. Comply with the following applicable standards and other requirements specified for lavatory and 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.
- G. Comply with the following applicable standards and other requirements specified for bathtub bathtub/shower and shower faucets:
1. Backflow Protection Devices for Hand-Held Showers: ASME A112.18.3M.
  2. Combination, Pressure-Equalizing and Thermostatic-Control Antiscald Faucets: ASSE 1016.
  3. Faucets: ASME A112.18.1.
  4. Hand-Held Showers: ASSE 1014.
  5. High-Temperature-Limit Controls for Thermal-Shock-Preventing Devices: ASTM F 445.
  6. Hose-Coupling Threads: ASME B1.20.7.
  7. Manual-Control Antiscald Faucets: ASTM F 444.
  8. Pipe Threads: ASME B1.20.1.
  9. Pressure-Equalizing-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
  10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
  11. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
- H. 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. Manual-Operation Flushometers: ASSE 1037.
  4. Brass Waste Fittings: ASME A112.18.2.
  5. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
- I. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Flexible Water Connectors: ASME A112.18.6.
  2. Hose-Coupling Threads: ASME B1.20.7.
  3. Off-Floor Fixture Supports: ASME A112.6.1M.
  4. Pipe Threads: ASME B1.20.1.
  5. Plastic Toilet Seats: ANSI Z124.5.
  6. Supply and Drain Protective Shielding Guards: ICC A117.1.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. The earthenware of all fixtures must be unmarked, true and level. Vitreous ware shall be warranted not to craze, discolor or scale.
- B. All faucets and exposed traps, fittings, trim, connections, etc., for fixtures, shall be of polished chromium plated brass unless specified otherwise.

### 2.2 LAVATORY FAUCETS

#### A. Lavatory Faucets:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Chicago Faucets.
  - b. T & S Brass and Bronze Works, Inc; Model B-0871-CR-LF05.
- 2. Description: ADA Compliance. Two-handle 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: Chrome plate.
  - c. Maximum Flow Rate: 0.5 gpm.
  - d. Centers: 4 inches.
  - e. Mounting: Deck, exposed.
  - f. Valve Handle(s): Lever, 4 inches.
  - g. Inlet(s): NPS 1/2 male shank.
  - h. Spout: Rigid type.
  - i. Spout Outlet: Aerator.
  - j. Operation: Non-compression, manual.
  - k. Drain: Grid.
  - l. Tempering Device: Thermostatic if required.

### 2.3 LABORATORY FAUCETS

- A. Laboratory cold and hot water faucets shall be deck mounted, chromium plated brass mixing faucets. Faucets shall have a rigid gooseneck spout with integral, non-removable vacuum breaker, and serrated nozzle. Handles shall have colored plastic inserts:
  - 1. Cold Water: Dark Green
  - 2. Hot Water: Red

- B. Laboratory pure water faucets shall be deck mounted, chromium plated brass, with tin lining and self-closing valves. Faucets shall have a rigid gooseneck spout and serrated nozzle. Handles shall have colored plastic inserts labeled "pure water."
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Chicago Faucets Model No. 930 (hot & cold water) or Model 969 (pure water),
  - 2. Barnstead.
  - 3. Wolverine Brass.
  - 4. T & S Brass.

## 2.4 SHOWER FAUCETS

### A. Individual Shower Faucets,:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Leonard Valve Company.
  - b. Powers; a Watts Industries Co.
  - c. Symmons Industries, Inc.; Model 1-901S
  - d. Zurn Industries, LLC; AquaSpec Commercial Faucet Products.
- 2. Description: ADA Compliance. Single-handle pressure-balance valve. Include hot- and cold-water indicators; check stops; and shower head, arm, and flange. Coordinate faucet inlets with supplies and outlet with diverter valve.
  - a. Body Material: Solid brass.
  - b. Finish: Polished chrome plate.
  - c. Maximum Flow Rate: 2.5 gpm, unless otherwise indicated.
  - d. Diverter Valve: Integral with mixing valve.
  - e. Mounting: Exposed.
  - f. Backflow Protection Device for Hand-Held Shower: Not required.
  - g. Operation: Noncompression, 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.
  - j. Supply Connections: NPS 1/2.
  - k. Shower Head Type: Ball joint.
  - l. Shower Head Material: Metallic with chrome-plated finish.
  - m. Spray Pattern: Adjustable.
  - n. Integral Volume Control: Required.
  - o. Shower-Arm Flow-Control Fitting: Not required.
  - p. Temperature Indicator: Not required.
  - q. Accessories: Soap dish, sloped metal top cap and stainless steel covering.

### B. Group Shower Faucets:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Bradley; Type CA.
2. Description: Six foot high stainless steel column shower with shower heads containing separate volume controller set at 3 gpm, supplies and drain from below. Provide necessary soap trays, cover for column top, and stop valves.
  - a. Valves: Slide-by washer-less type with colored indicating buttons red for hot and blue for cold. Hot water valve to be on the bottom.

## 2.5 SINK FAUCETS

### A. Service/Custodian Closet Sink Faucets:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Chicago Faucets; Fitting No. 445-897SRCXKCP.
  - b. T & S Brass and Bronze Works, Inc.; Model No. B-0665-BSTP Modified With Ceramic Cartridges.
2. Description: Service sink faucet with stops in shanks, vacuum breaker, hose-thread outlet, integral check valves and pail hook. 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: 2.5 gpm, unless otherwise indicated.
  - d. Mixing Valve: Two-lever handle.
  - e. Backflow Protection Device for Hose Outlet: Required.
  - f. Centers: 8 inches.
  - g. Mounting: Back/wall.
  - h. Handle(s): Lever.
  - i. Inlet(s): NPS 1/2 female shank.
  - j. Spout Type: Rigid, solid brass with wall brace.
  - k. Spout Outlet: Hose thread.
  - l. Vacuum Breaker: Required.
  - m. Operation: Noncompression, manual.
  - n. Drain: Not required.

### B. Single Compartment Kitchen Sink Faucets:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Chicago Faucets; Fitting No. 1888-XKCP

- b. T & S Brass and Bronze Works, Inc.
2. Description: NSF 61 Compliant. Kitchen faucet without spray. 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, unless otherwise indicated.
  - d. Mixing Valve: Two-lever handle.
  - e. Backflow Protection Device for Hose Outlet: Required.
  - f. Centers: 8 inches.
  - g. Mounting: Deck, exposed.
  - h. Handle(s): Lever.
  - i. Inlet(s): NPS 1/2 male shank.
  - j. Spout Type: Swing, solid brass.
  - k. Spout Outlet: Aerator.
  - l. Vacuum Breaker: Required.
  - m. Operation: Noncompression, manual.
  - n. Drain: Not required.

## 2.6 FLUSHOMETERS

Revise as required for project or for LEED points. MSU is testing several hands free options so contact project mechanical rep to confirm model to use.

- A. Water Closet Flushometers (hands free applications)
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Sloan Valve Company; Model Royal 111-ESS
  - 2. Description: Exposed water-closet flushometer for wall hung top spud bowls. Infrared convergence-type proximity sensor with smart technology. Include brass body with corrosion-resistant internal components, non-hold-open feature, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
    - a. Internal Design: Diaphragm operation.
    - b. Style: Exposed.
    - c. Inlet Size: NPS 1.
    - d. Trip Mechanism: Oscillating, lever-handle actuator. ADA Compliance.
    - e. Consumption: 1.6 gal./flush.
    - f. Tailpiece Size: NPS 1-1/2 and standard length to top of bowl.
    - g. Power: Hardwired power converter.
- B. Water Closet Flushometers

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Sloan Valve Company; Model Royal 111
2. Description: Exposed water-closet flushometer for wall hung top spud bowls. Infrared convergence-type proximity sensor with smart technology. Include brass body with corrosion-resistant internal components, non-hold-open feature, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
  - a. Internal Design: Diaphragm operation.
  - b. Style: Exposed.
  - c. Inlet Size: NPS 1.
  - d. Trip Mechanism: Oscillating, lever-handle actuator. ADA Compliance.
  - e. Consumption: 1.6 gal./flush.
  - f. Tailpiece Size: NPS 1-1/2 and standard length to top of bowl.

C. Urinal Flushometers (hands free applications)

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Sloan Valve Company; Model Royal 186-0.5 ESS
2. Description: Exposed water-closet flushometer for wall hung top spud bowls. Infrared convergence-type proximity sensor with smart technology. Include brass body with corrosion-resistant internal components, non-hold-open feature, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.
  - a. Internal Design: Diaphragm operation.
  - b. Style: Exposed.
  - c. Inlet Size: NPS 3/4.
  - d. Trip Mechanism: Oscillating, lever-handle actuator. ADA Compliance.
  - e. Consumption: 0.5 gal./flush.
  - f. Tailpiece Size: NPS 3/4 and standard length to top of bowl.
  - g. Power: Hardwired power converter.

D. Urinal Flushometers

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Sloan Valve Company; Model Royal 186-0.5
2. Description: Exposed water-closet flushometer for wall hung top spud bowls. Include brass body with corrosion-resistant internal components, non-hold-open feature, control

stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.

- a. Internal Design: Diaphragm operation.
- b. Style: Exposed.
- c. Inlet Size: NPS 3/4.
- d. Trip Mechanism: Oscillating, lever-handle actuator. ADA Compliance.
- e. Consumption: 0.5 gal./flush.
- f. Tailpiece Size: NPS 3/4 and standard length to top of bowl.

E.

## 2.7 TOILET SEATS

### A. Toilet Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Bemis/Church Seats; Model 2155SSC.
  - b. ProFlo; Model PFTSCOFA2000WH.
  - c. Zurn Industries, LLC; Commercial Brass and Fixtures.
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: Heavy-duty commercial.
  - f. Color: White.

## 2.8 PROTECTIVE SHIELDING GUARDS

### A. Protective Shielding Pipe Covers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Plumberex Specialty Products Inc.
  - b. TRUEBRO, Inc.
  - c. 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.

## 2.9 FIXTURE SUPPORTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Josam Company.
  2. Smith, Jay R. Mfg. Co.
  3. Tyler Pipe; Wade Div.
  4. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
  5. Zurn Plumbing Products Group; Specification Drainage Operation.
- B. Water-Closet Supports:
1. Description: Combination carrier designed for adjustable mounting height of wall-mounting, water-closet-type fixture. Include single or double, horizontal, 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.
  2. Basis-of-Design Product: Wade Model W-310 and W-320.
- C. Urinal Supports:
1. Description: Designed for wall-mounting. Include rectangular steel uprights with feet.
  2. Basis-of-Design Product: Wade Model W-400.
- D. Lavatory Supports:
1. Description: Concealed arms with non-slip locking devices for wall-mounting. Include rectangular steel uprights with feet.
  2. Basis-of-Design Product: Wade Model W-520.
- E. Drinking Fountain/Water Cooler Supports:
1. Description: Designed for wall-mounting. Include rectangular steel uprights with feet.
  2. Basis-of-Design Product: Wade Model W-400.

## 2.10 WATER CLOSETS

- A. Water Closets:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Standard Companies, Inc.; Model "Afwall" 2257.103.
    - b. Kohler Co.; Model "Kingston" K-4325.
    - c. Zurn Industries, LLC; Commercial Brass and Fixtures.
  2. Description: ADA compliance, wall-mounting, vitreous-china fixture designed for flushometer valve operation.

3. Style: Flushometer valve.
  - a. Bowl Type: Elongated with siphon-jet design with 1 ½" top spud. Include chromium plated mounting nuts and washers, and vandal-proof trim.
  - b. Height: Standard or accessible as shown.
  - c. Design Consumption: 1.6 gal./flush.
  - d. Color: White.
4. Flushometer: As specified
5. Toiler Seat: As specified
6. Fixture Support: As specified.
7. Gasket: Sexauer No. 060855, 5" x 1". Wax rings not allowed on wall-hung water closets.

## 2.11 URINALS

### A. Low Consumption Urinals:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Sloan Valve Company. Model SU-7006
  - b. Zurn Industries, LLC; Commercial Brass and Fixtures; Model Z5798 or Z5758.
  - c. American Standard, Model 6590.001
  - d. Kohler, Model K-4991-ET-0
2. Description: ADA compliance, accessible, wall-mounting, back-outlet, vitreous-china fixture designed for flushometer valve operation.
  - a. Type: High efficiency washout flushing action.
  - b. Strainer or Trapway: Strainer assembly with integral trap.
  - c. Design Consumption: 0.5 gal./flush
  - d. Color: White.
  - e. Supply: NPS ¾ top spud.
  - f. Outlet: NPS 2.
  - g. Fixture Support: As specified.

## 2.12 LAVATORIES

### A. Lavatories:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Standard Companies, Inc.; Model "Lucerne" 0355.012.
  - b. Kohler Co.; "Greenwich" K-2032.
  - c. Sloan Valve Company.
  - d. Zurn Commercial Plumbing Fixtures.

2. Description: ADA Compliance, wall-mounting, vitreous-china fixture.
  - a. Type: With back.
  - b. Size: 20 by 18 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: As specified.
  - h. Supplies: NPS 3/8 chrome-plated copper with stops.
  - i. Drain: Grid.
  - j. Drain Piping: NPS 1-1/4 chrome-plated, P-trap; NPS 1-1/4, 17 gauge thick tubular brass waste to wall; and wall escutcheon.
  - k. Hair Interceptor: Not required
  - l. Protective Shielding Guard(s): Supplies as required.
  - m. Fixture Support: As specified.

## 2.13 KITCHEN SINKS

### A. Single Compartment Kitchen Sinks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Elkay Manufacturing Co.
  - b. Just Manufacturing Company; Model SL-2119-A-GR.
2. Description: One-bowl; counter-mounting, type 304, 18-8 stainless-steel kitchen sink.
  - a. Overall Dimensions: 21" D x 19" W
  - b. Bowl:
    - 1) Dimensions: 16" D x 16" W
    - 2) Drain: 3-1/2-inch grid, centered in bowl.
  - c. Sink Faucet: As specified
  - d. Supplies: NPS 1/2 chrome-plated copper with stops.
  - e. Drain Piping: NPS 1-1/2 chrome-plated, cast-brass P-trap; 17 gauge thick tubular brass waste to wall; continuous waste; and wall escutcheon(s).
  - f. Disposer: Supplies as required.
  - g. Dishwasher Air-Gap Fitting: Not required.
  - h. Hot-Water Dispenser: Not required

## 2.14 SERVICE SINKS

### A. Service Sinks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Standard Companies, Inc.; “Akron” Model 7695.008 with 8379.026 Rim Guard and 7798.030 Trap Standard.
  - b. Kohler Co.; “Bannon” K-6714 with K-6673 Adjustable Trap Standard.
  - c. Zurn Commercial Plumbing Fixtures.
2. Description: Trap-standard- and wall-mounting, acid resisting enameled cast-iron fixture with roll-rim with two faucet holes in back and rim guard on front and sides.
  - a. Size: 24 by 20 inches.
  - b. Color: White.
  - c. Faucet: As specified.
  - d. Drain: Grid with NPS 3 outlet.
  - e. Trap Standard: NPS 3 enameled, cast iron with cleanout and floor flange.
  - f. Fixture Support: As specified.

B. Custodial Closet Sinks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Standard Companies, Inc.; “Florwell” 7741.000 with 7745.811 Removable Vinyl-Coated Rim Guard and 7721.038 Flat Grid Drain.
  - b. Kohler Co.; “Whitby” K-6710 with K-8940 Coated Rim Guard and K-9146 Service Sink Strainer.
  - c. Zurn Commercial Plumbing Fixtures.
2. Description: Trap-standard- and floor-mounting, acid resisting enameled cast-iron fixture with roll-rim with rim guard on front and sides.
  - a. Size: 28” x 28” x 13”.
  - b. Color: White.
  - c. Rim Guard: Vinyl-coated.
  - d. Faucet: As specified.
  - e. Drain: Flat grid with NPS 3 outlet.
  - f. Fixture Support: As specified.

2.15 WASH FOUNTAINS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Bradley.
  2. Acorn.
- B. Description: Equipped with individual foot operated controls or electronic sensor operated faucets, stainless steel top, power soap dispenser, supplies with stops and drain from below.

## 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 wall-mounting fixtures with tubular waste piping attached to supports.
- E. Install counter-mounting fixtures in and attached to casework.
- F. Install fixtures level and plumb according to roughing-in drawings.
- G. 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 valves if supply stops are not specified with fixture. Valves are specified in Division 22 Section "General-Duty Valves for Plumbing Piping."
- H. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- I. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- J. 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.

- K. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
- L. Install toilet seats on water closets.
- M. Install trap-seal liquid in dry urinals.
- N. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- 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 shower flow-control fittings with specified maximum flow rates in shower arms.
- R. Install traps on fixture outlets.
  - 1. Exception: Omit trap on fixtures with integral traps.
  - 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- S. Install escutcheons at piping wall and 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."
- T. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant unless indicated otherwise. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."
- U. Install fixtures complete with all supply, soil, waste and vent piping connections; together with all fittings, fastening devices, cocks, valves and appurtenances required to effect complete and serviceable installations.
- V. Caulk all restroom fixtures wall and floor-mounted with latex caulk. Do not use silicone.
- W. Lavatories: Mount at 34" above the finished floor.
- X. Water Closets: Mount at 15 inches above finished floor, except at 17 inches above the finished floor for accessible fixtures.
- Y. Urinals: Mount with the lip 24" above finished floor, except with the lip 15" above finished floor for accessible fixtures.
- Z. When installing a custodial closet sink or a floor-mounted service sink with a wall-mounted faucet, the surface from both side edges up to the faucet including the faucet mounting shall be covered with a non-permeable splash guard.

### 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.
  - 1. Supply Risers: Formed metal nose-piece with insert or formed nose-piece with insert gasket by Brass Craft or approved equal. Rubber gasket type compression fitting is not acceptable.
  - 2. Supply Stops: Brasscraft KT series ¼ turn ball stop, polished chrome-plated, stuffing box or loose-key, straight or angle style with compression or FIP inlet and compression outlet by Brass Craft or approved equal.

### 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.

### 3.6 Install fresh batteries in sensor-operated mechanisms.

### 3.7 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.

### 3.8 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