

**SECTION 22 4000
PLUMBING FIXTURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water closets.
- B. Urinals.
- C. Lavatories.
- D. All-in-one lavatory system.
- E. Sinks.
- F. Service sinks.
- G. Under-lavatory pipe supply covers.
- H. Electric water coolers.
- I. Drinking fountains.
- J. Showers.
- K. Eye wash fountains.
- L. Emergency showers.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Owner-furnished fixtures.
- B. Section 06 4100 - Architectural Wood Casework: Preparation of counters for sinks and lavatories.
- C. Section 07 9200 - Joint Sealants: Sealing joints between fixtures and walls and floors.
- D. Section 11 4000 - Foodservice Equipment: Food service sinks.
- E. Section 11 5300 - Laboratory Equipment: Laboratory sinks.
- F. Section 12 3600 - Countertops: Preparation of counters for sinks and lavatories.
- G. Section 22 1005 - Plumbing Piping.
- H. Section 22 1006 - Plumbing Piping Specialties.
- I. Section 22 3000 - Plumbing Equipment.
- J. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures 2011.
- C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2013.
- D. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus 2010.
- E. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping 2015.
- F. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015.
- G. IAPMO Z124 - Plastic Plumbing Fixtures 2012.
- H. ANSI Z358.1 - American National Standard for Emergency Eyewash and Shower Equipment 2009.

- I. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration. 2008.
- J. ASME A112.6.1M - Supports for Off-the-Floor Plumbing Fixtures for Public Use 1997 (Reaffirmed 2002).
- K. ASME A112.18.1 - Plumbing Supply Fittings 2012.
- L. ASME A112.19.1 - Enamelled Cast Iron and Enamelled Steel Plumbing Fixtures 2013.
- M. ASME A112.19.2 - Ceramic Plumbing Fixtures 2013.
- N. ASME A112.19.3 - Stainless Steel Plumbing Fixtures (Designed for Residential Use) 2008 (R2013).
- O. ASME A112.19.4M - Porcelain Enameled Formed Steel Plumbing Fixtures 1994 (R2004).
- P. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks 2011.
- Q. ASME A112.19.14 - Six Liter Water Closets Equipped with Dual Flushing Device 2013.
- R. ASME A112.19.15 - Bathtub/Whirlpool Bathtubs with Pressure Sealed Doors 2012.
- S. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices 2004.
- T. ASTM D570 - Standard Test Method for Water Absorption of Plastics 1998 (Reapproved 2010).
- U. ASTM D638 - Standard Test Method for Tensile Properties of Plastics 2014.
- V. ASTM D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between - 30 C and 30 C with a Vitreous Silica Dilatometer 2008.
- W. ASTM D785 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials 2008.
- X. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.
- Y. IAPMO Z124 - Plastic Plumbing Fixtures 2012.
- Z. ICC A117.1 - Accessible and Usable Buildings and Facilities 2009.
- AA. ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.
- BB. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- CC. NSF 61 - Drinking Water System Components - Health Effects 2014 (Errata 2015).
- DD. NSF 372 - Drinking Water System Components - Lead Content 2011.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Manufacturer's Instructions: Indicate installation methods and procedures.
- D. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for electric water cooler.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 FLUSH VALVE WATER CLOSETS

- A. Water Closets: Vitreous china, ASME A112.19.2, floor mounted, siphon jet flush action, china bolt caps.
 - 1. Flush Valve: Exposed (top spud).
 - 2. Flush Operation: Sensor operated.
 - 3. Handle Height: 44 inches or less.
 - 4. Supply Size: 1-1/2 inches.
 - 5. Outlet Size: 2 inches.
 - 6. Color: White.
 - 7. Manufacturers:
 - a. American Standard, Inc; [_____]: www.americanstandard-us.com/#sle.
 - b. Gerber Plumbing Fixtures LLC; [_____]: www.gerberonline.com/#sle.
 - c. Kohler Company; [_____]: www.kohler.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Flush Valves: ASME A112.18.1, diaphragm type, complete with vacuum breaker stops and accessories.
 - 1. Sensor-Operated Type: Solenoid or motor-driven operator, low voltage hard-wired, infrared sensor with mechanical over-ride or over-ride push button.
 - 2. Exposed Type: Chrome plated, escutcheon, integral screwdriver stop.
 - 3. Manufacturers:
 - a. Sloan Valve Company; [_____]: www.sloanvalve.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Seats:
 - 1. Manufacturers:
 - a. American Standard, Inc; [_____]: www.americanstandard-us.com/#sle.
 - b. Bemis Manufacturing Company; [_____]: www.bemismfg.com/#sle.
 - c. Olsonite; [_____]: www.olsonite.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Solid white plastic, open front, extended back, self-sustaining hinge, brass bolts, with cover.
- D. Water Closet Carriers:
 - 1. Manufacturers:
 - a. JOSAM Company; [_____]: www.josam.com/#sle.
 - b. Zurn Industries, Inc; [_____]: www.zurn.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

2.03 WALL HUNG URINALS

- A. Wall Hung Urinal Manufacturers:
 - 1. American Standard, Inc; [_____]: www.americanstandard-us.com/#sle.
 - 2. Kohler Company; [_____]: www.kohler.com/#sle.
 - 3. Zurn Industries, Inc; EcoVantage Z5798 High-Efficiency Urinal System: www.zurn.com/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Urinals: Vitreous china, ASME A112.19.2, wall hung with side shields and concealed carrier.

1. Flush Volume: 1.0 gallons, maximum.
 2. Flush Valve: Exposed (top spud).
 3. Flush Operation: Sensor operated.
 4. Trap: Integral.
 5. Supply Size: 3/4 inch.
 6. Outlet Size: 2 inches.
- C. Flush Valves: ASME A112.18.1, diaphragm type, complete with vacuum breaker stops and accessories.
1. Sensor-Operated Type: Solenoid operator, battery powered, infrared sensor and override push button.
 2. Exposed Type: Chrome plated, escutcheon, integral screwdriver stop.
 3. Manufacturers:
 - a. Sloan Valve Company; [_____]: www.sloanvalve.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Carriers:
1. Manufacturers:
 - a. JOSAM Company; [_____]: www.josam.com/#sle.
 - b. Zurn Industries, Inc; [_____]: www.zurn.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
 2. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

2.04 LAVATORIES

- A. Lavatory Manufacturers:
1. American Standard, Inc; [_____]: www.americanstandard-us.com/#sle.
 2. Kohler Company; [_____]: www.kohler.com/#sle.
 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Vitreous China Wall Hung Basin: ASME A112.19.2; vitreous china wall hung lavatory, [_____] by [_____] inch minimum, with 4 inch high back, rectangular basin with splash lip, front overflow, and soap depression.
1. Drilling Centers: 8 inch.
- C. Vitreous China Counter Top Basin: ASME A112.19.2; vitreous china self-rimming counter top lavatory, [_____] with drillings on 8 inch centers, front overflow, soap depression, seal of putty, caulking, or concealed vinyl gasket.
- D. Supply Faucet Manufacturers:
1. Chicago Faucet; [_____].
- E. Supply Faucet: ASME A112.18.1; chrome plated combination supply fitting with open grid strainer, no aerator with maximum flow of 2.2 gallons per minute, indexed handles. 8" gooseneck spout. Chicago Faucet model 786-E29XKABCP.
- F. Thermostatic Mixing Valve: Thermostatic mixing valve, ASSE 1070 listed, with combination stop, strainer, and check valves, and flexible stainless steel connectors.
1. Manufacturers:
 - a. Watts Company; www.watts.com
- G. Accessories:
1. Chrome plated 17 gage, 0.0538 inch brass P-trap with clean-out plug and arm with escutcheon.
 2. Offset waste with perforated open strainer.
 3. Tamper proof with removable key stops.
 4. Flexible supplies.
 5. Carrier:
 - a. Manufacturers:
 - 1) JOSAM Company; [_____]: www.josam.com/#sle.
 - 2) Zurn Industries, Inc; [_____]: www.zurn.com/#sle.

- 3) Substitutions: See Section 01 6000 - Product Requirements.
- b. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded studs for fixture hanger, bearing plate and studs.

2.05 SINKS

- A. Sink Manufacturers:
 1. American Standard, Inc; [____]: www.americanstandard-us.com/#sle.
 2. Kohler Company; [____]: www.kohler.com/#sle.
 3. Elkay[____]: www.elkay.com
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Single Compartment Bowl: ASME A112.19.3; [____] by [____] by [____] inch outside dimensions 20 gage, 0.0359 inch thick, Type 302 stainless steel, self rimming and undercoated, with ledge back drilled for trim.
 1. Drain: 1-1/2 inch chromed brass drain.
- C. Double Compartment Bowl: ASME A112.19.3; [____] by [____] by [____] inch outside dimensions 20 gage, 0.0359 inch thick, Type 302 stainless steel, self rimming and undercoated, with ledge back drilled for trim.
 1. Drain: 1-1/2 inch chromed brass drain.

2.06 UNDER-LAVATORY PIPE SUPPLY COVERS

- A. Manufacturers:
 1. Plumberex Specialty Products, Inc; [____]: www.plumberex.com/#sle.
 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Basis of Design: Plumberex Specialty Products, Inc; www.plumberex.com/#sle.
 1. Under-Lavatory Covers with Snap-Lock Fasteners (Molded): Plumberex Pro-Extreme.
- C. General:
 1. Insulate exposed drainage piping including hot, cold and tempered water supplies under lavatories or sinks per ADA Standards.
 2. Exterior Surfaces: Smooth nonabsorbent with no finger recessed indentations for easy cleaning.
 3. Construction: 1/8 inch PVC with antimicrobial, antifungal and UV resistant properties.
 - a. Comply with ASTM C1822 Type III for covers on accessible lavatory piping.
 - b. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
 - c. Comply with ICC A117.1.
 - d. Thermal Resistance: R value of 0.504 or lower when tested by ASTM C177.
 - e. Thermal Conductivity: K value of 0.358 or density of 21.61 pcf per ASTM C518.
 - f. Microbial and Fungal Resistance for Interior and Exterior: Comply with ASTM G21.
 4. Color: High gloss white.
 5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces. No cable ties allowed.

2.07 ELECTRIC WATER COOLERS

- A. Electric Water Cooler Manufacturers:
 1. Elkay Manufacturing Company; [____]: www.elkay.com/#sle.
 2. Haws Corporation; [____]: www.hawsco.com/#sle.
 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Water Cooler: Electric, mechanically refrigerated; surface mounted, ADA compliant; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
 1. Capacity: 8 gallons per hour of 50 degrees F water with inlet at 80 degrees F and room temperature of 90 degrees F, when tested in accordance with ASHRAE Std 18.
 2. Electrical: 115 V, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.

2.08 SERVICE SINKS

- A. Service Sink Manufacturers:
 - 1. American Standard, Inc; [_____]: www.americanstandard-us.com/#sle.
 - 2. Elkay Manufacturing Company; [_____]: www.elkay.com/#sle.
 - 3. Just Manufacturing Company; [_____]: www.justmfg.com/#sle.
 - 4. Zurn Industries, Inc; [_____]: www.zurn.com/#sle.
- B. Bowl: ASME A112.19.1; 22 by 18 by 12 inch deep, porcelain enamelled (inside only) cast iron roll-rim sink, with 12 inch high back, concealed hanger, chrome plated strainer, stainless steel rim guard, cast iron P-trap with adjustable floor flange.
- C. Trim: ASME A112.18.1 exposed wall type supply with cross handles, spout wall brace, vacuum breaker, hose end spout, strainers, eccentric adjustable inlets, integral screwdriver stops with covering caps and adjustable threaded wall flanges.
- D. Accessories:
 - 1. 5 feet of 1/2 inch diameter plain end reinforced plastic hose.
 - 2. Hose clamp hanger.
 - 3. Mop hanger.

2.09 EMERGENCY EYE WASH

- A. Emergency Wash Manufacturers:
 - 1. Speakman Corporation[_____]: speakman.com
 - 2. Bradley Corporation; bradleycorp.com
- B. Emergency Wash: Deck mounted combination faucet and independently operated eyewash with eyewash tempering valve. Chrome plated, cast brass fixture. Eyewash complies with ANSI Z358.1, 2.6 GPM @ 30 psi includes pull handle with graphics, two aerated yellow ABS plastic spray outlets with flip-top dust caps. Faucet complies with ASME A112.18.1 CSA B 125-98. Includes 1/4 turn ceramic cartridges, adjustable center of 6" to 12", vandal resistant 4" wrist blade handles with color coded indexes. Provide Speakman SEF-1800-CA with Speakman SE-370 thermostatic mixing valve.
- C. Emergency Wash: In retrofits where the standard eye wash cannot be used due to space constraints the following is allowed; Faucet mounted eyewash equal to Bradley S19-200B.

2.10 EMERGENCY SHOWERS

- A. Emergency Shower Manufacturers:
 - 1. Haws Corporation; [_____]: www.hawso.com/#sle.
 - 2. Therm-Omega-Tech, Inc; [_____]: www.thermomegatech.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Emergency Shower: ANSI Z358.1; wall-mounted, self-cleaning, non-clogging 8 inch diameter stainless steel deluge shower head with elbow, one inch full flow valve with pull chain and 8 inch diameter ring, one inch interconnecting fittings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.02 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.

- B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.

3.04 INTERFACE WITH WORK OF OTHER SECTIONS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.06 CLEANING

- A. Clean plumbing fixtures and equipment.
- B. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

3.07 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

3.08 SCHEDULES

- A. Fixture Heights: Install fixtures to heights above finished floor as indicated.
 - 1. Water Closet:
 - a. Standard: 15 inches to top of bowl rim.
 - b. Accessible: 18 inches to top of seat.
 - 2. Water Closet Flush Valves:
 - a. Standard: 11 inches min. above bowl rim.
 - b. Recessed: 10 inches min. above bowl rim.
 - 3. Urinal:
 - a. Standard: 22 inches to top of bowl rim.
 - b. Accessible: 17 inches to top of bowl rim.
 - 4. Lavatory:
 - a. Standard: 31 inches to top of basin rim.
 - b. Accessible: 34 inches to top of basin rim.
 - 5. Drinking Fountain:
 - a. Child: 30 inches to top of basin rim.
 - b. Standard Adult: 40 inches to top of basin rim.
 - c. Accessible: 36 inches to top of spout.
 - 6. Emergency Eye and Face Wash:
 - a. Standard: 38 inches to receptor rim.
- B. Fixture Rough-In
 - 1. Water Closet (Flush Valve Type):
 - a. Cold Water: 1 Inch.
 - b. Waste: 4 Inch.
 - c. Vent: 2 Inch.
 - 2. Urinal (Flush Valve Type):
 - a. Cold Water: 3/4 Inch.
 - b. Waste: 2 Inch.
 - c. Vent: 1-1/2 Inch.
 - 3. Lavatory:
 - a. Hot Water: 1/2 Inch.

- b. Cold Water: 1/2 Inch.
 - c. Waste: 1-1/2 Inch.
 - d. Vent: 1-1/4 Inch.
4. Sink:
- a. Hot Water: 1/2 Inch.
 - b. Cold Water: 1/2 Inch.
 - c. Waste: 1-1/2 Inch.
 - d. Vent: 1-1/4 Inch.
5. Service Sink:
- a. Hot Water: 1/2 Inch.
 - b. Cold Water: 1/2 Inch.
 - c. Waste: 2 Inch.
 - d. Vent: 1-1/2 Inch.
6. Drinking Fountain:
- a. Cold Water: 1/2 Inch.
 - b. Waste: 1-1/4 Inch.
 - c. Vent: 1-1/4 Inch.

END OF SECTION