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SECTION 224200 - COMMERCIAL PLUMBING FIXTURES

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Commercial showers.

Commercial sinks.

Commercial urinals.

Commercial water closets.

Commercial wash fountains.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Retain first subparagraph below for projects that include Section 114000 "Foodservice Equipment," and revise "Kitchen/Utility Sinks" and "Handwash Sinks" paragraphs in this Section accordingly.

Section 114000 "Foodservice Equipment" for NSF-compliant foodservice and handwash sinks.

Section 224100 "Residential Plumbing Fixtures" for residential plumbing fixtures.

Section 224300 "Healthcare Plumbing Fixtures" for healthcare plumbing fixtures.

Section 224500 "Emergency Plumbing Fixtures" for emergency plumbing fixtures.

Section 224600 "Security Plumbing Fixtures" for security plumbing fixtures.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project. Include only essential definitions or acronyms not well understood by the affected industry or trade.

* + - * 1. FRP: Fiberglass-reinforced plastic.
				2. High-Efficiency Flush Volume: 1.28 gal. or less per flush.
				3. PMMA: Polymethyl methacrylate; also known as "acrylic."
				4. Standard-Efficiency Flush Volume: 1.6 gal. per flush.
				5. WaterSense Fixture: Water closet and/or flushometer valve/tank certified by the EPA to meet the WaterSense performance criteria.
			1. ACTION SUBMITTALS

Action submittals are submittals requiring responsive action and return of reviewed documents to Contractor.

* + - * 1. Product Data:

Include construction details, material descriptions and thicknesses, dimensions of individual components and profiles, and finishes for plumbing fixtures.

Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

Retain "Shop Drawings" Paragraph below if required for Project.

* + - * 1. Shop Drawings:

Plans, elevations, sections, and [**mounting**] [**attachment**] details.

Details of equipment assemblies, including accessories. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, location and size of each field connection, location and size of each cutout, and anchorage provisions and attachment methods. Indicate coordination requirements for adjacent and interfacing Work.

Diagrams for power, signal, and control wiring.

* + - 1. INFORMATIONAL SUBMITTALS

Informational submittals are submittals that require review by Architect, but they do not require Architect's responsive action and return of reviewed documents to Contractor, provided submittals comply with requirements. If rejected, submittals with responsive action must be returned to Contractor.

Retain "Coordination Drawings" Paragraph below where coordination is required for installation of products and materials by separate installers. Preparation of coordination drawings requires participation of each trade involved; coordinate with other Sections specifying products and materials to be included. See Section 013100 "Project Management and Coordination."

* + - * 1. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories and/or counter-mounted sinks.
			1. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data:

For lavatories and faucets.

Retain first subparagraph below if automatic, electronic-sensor faucets are required for Project.

In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

Servicing and adjustments of automatic faucets.

For shower valves to include in maintenance manuals.

For sinks and faucets to include in operation and maintenance manuals.

Retain first subparagraph below if automatic, electronic-sensor faucets are required for Project.

In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

Servicing and adjustments of automatic faucets.

For flushometer valves[ **and electronic sensors**] to include in operation and maintenance manuals.

For wash fountains and components to include in operation and maintenance manuals.

* + - 1. MAINTENANCE MATERIAL SUBMITTALS

See Section 017700 "Closeout Procedures" for submission of maintenance material items.

* + - * 1. Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Faucet Washers and O-Rings: Equal to [**10**] <**Insert number**> percent of amount of each type and size installed.

Faucet Cartridges and O-Rings: Equal to [**5**] <**Insert number**> percent of amount of each type and size installed.

Shower Valve Washers and O-Rings: Equal to [**10**] <**Insert number**> percent of amount of each type and size installed.

Shower Valve Cartridges and O-Rings: Equal to [**5**] <**Insert number**> percent of amount of each type and size installed.

Waterless Urinal Trap-Seal Cartridges: Equal to [**200**] <**Insert number**> percent of amount of each type installed, but no fewer than [**12**] <**Insert number**> of each type.

Waterless Urinal Trap-Seal Liquid: Equal to [**1 gal.**] <**Insert volume**> for each urinal installed.

Flushometer-Valve Repair Kits: Equal to [**10**] <**Insert number**> percent of amount of each type installed, but no fewer than [**one**] [**six**] <**Insert number**> of each type.

1. PRODUCTS

Do not use same plumbing fixture designation as is used for another plumbing fixture in Section 224100 "Residential Plumbing Fixtures," Section 224300 "Healthcare Plumbing Fixtures," Section 224500 "Emergency Plumbing Fixtures," and Section 224600 "Security Plumbing Fixtures."

Caution: Bariatric water closets are not included in this Section. They are generally constructed of stainless steel and require special mounting and supports depending on whether they are floor or wall mounted.

* + - 1. PERFORMANCE REQUIREMENTS

The U.S. Safe Drinking Water Act (SDWA) has required national compliance with less than or equal to 0.25 percent weighted average lead content at wetted surfaces for pipe, fittings, and devices intended to convey or dispense water for human consumption since January 2014. The IPC and the Uniform Plumbing Code have the same requirements. Items in compliance with NSF 61 and NSF 372 also comply with this requirement. Some manufacturers choose to meet this requirement through independent testing and have "Certified Lead-Free" products, which may or may not have NSF 61 or NSF 372 certification.

* + - * 1. Lavatory faucets, sink faucets, shower valves, and wash fountain spray heads and faucets intended to convey or dispense water for human consumption are to comply with the U.S. Safe Drinking Water Act (SDWA), with requirements of the Authority Having Jurisdiction (AHJ), and with NSF 61 and NSF 372, or be certified in compliance with NSF 61 and NSF 372 by an ANSI-accredited third-party certification body, in that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.
				2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
			1. COMMERCIAL SINKS
				1. Handwash Sinks:

Retain this paragraph only if handwash/hand sinks are not specified in Section 114000 "Foodservice Equipment."

Copy "Handwash Sinks - Stainless Steel" Subparagraph below and re-edit for each type of stainless steel handwash sink required.

Insert drawing designation. Use these designations on Drawings to identify each stainless steel handwash sink.

Handwash Sinks - Stainless Steel :

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

Basis-of-Design Product: Subject to compliance with requirements, provide **Elkay; CHS17162 Elkay Stainless Steel 16-3/4" x 15-1/2" x 13", Single Bowl Wall Hung Handwash Sink** or comparable product by one of the following:

<**Insert manufacturer's name**>

Source Limitations: Obtain sinks from single source from single manufacturer.

Fixture:

Standards:

ASME A112.19.3/CSA B45.4.

NSF 61.

Type: [**Wall-mounted**] [**Pedestal-base**] stainless steel basin with radius corners, back for faucet, and support brackets.

Overall Dimensions: [**17 by 16 by 5 inches**] <**Insert dimensions**>.

Caution: Other gauges may be available from manufacturers. Confirm availability prior to selection.

Material: [**18 gauge**] [**20 gauge**] <**Insert gauge**>, Type 304 stainless steel.

Faucet: <**Insert sink faucet designation from "Sink Faucets, Manually Operated" or "Sink Faucets, Automatically Operated" Paragraph**>.

Supply Fittings: Comply with requirements in "Sink Supply Fittings" Paragraph.

Waste Fittings: Comply with requirements in "Sink Waste Fittings" Paragraph.

Retain "Support" Subparagraph below for wall-mounted sinks and coordinate with "Fixture Carriers - Sink" Paragraph in "Fixture Carriers" Article.

Support: [**Sink carrier, framing affixed**] [**Sink carrier, floor affixed with steel uprights**] <**Insert carrier**>.

Mounting Height: [**Standard**] [**Juvenile**] [**Accessible in accordance with ICC A117.1**].

* + - * 1. Sink Supply Fittings:

NSF Standards: Comply with NSF 61 and NSF 372 for supply-fitting materials that will be in contact with potable water.

Standard: ASME A112.18.1/CSA B125.1.

Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless steel wall flange.

Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.

Retain "Wheel handle" option in "Operation" Subparagraph below for one-quarter-turn, ball-type stops.

Operation: [**Loose key**] [**Wheel handle**] <**Insert type**>.

Risers Sizes: [**NPS 3/8**] [**NPS 1/2**].

Risers Material: [**Chrome-plated, rigid-copper pipe**] [**Chrome-plated, soft-copper flexible tube**] [**ASME A112.18.6/CSA B125.6, braided or corrugated stainless steel flexible hose**].

* + - * 1. Sink Waste Fittings:

Standard: ASME A112.18.2/CSA B125.2.

Drain: Grid type with NPS 1-1/2 offset and straight tailpiece.

Trap:

Size: NPS 1-1/2.

Material: Chrome-plated, [**two-piece, cast-brass trap and swivel elbow with 17-gauge brass tube to wall**] [**two-piece, cast-brass trap and ground-joint swivel elbow with 17-gauge brass tube to wall**] [**one-piece, cast-brass trap with swivel 17-gauge tubular brass wall bend**] <**Insert trap type**>; and chrome-plated brass or steel wall flange.

Retain "Grout" Paragraph below if floor-mounted service sinks are included.

* + - * 1. Grout:

Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

Characteristics: Nonshrink; recommended for interior and exterior applications.

Design Mix: 5000 psi, 28-day compressive strength.

Packaging: Premixed and factory packaged.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine roughing-in of water-supply piping and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.
				2. Examine walls and floors for suitable conditions where plumbing fixtures will be installed.
				3. Examine counters for suitable conditions where lavatories and sinks will be installed.
				4. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. INSTALLATION OF COMMERCIAL PLUMBING FIXTURES

Retain "Lavatory Installation" Paragraph below if lavatories are included in Project.

* + - * 1. Lavatory Installation:

Install lavatories level and plumb in accordance with roughing-in drawings.

Install supports, affixed to building substrate, for wall-mounted lavatories.

Indicate on Drawings those lavatories that are required to be accessible.

Install accessible, wall-mounted lavatories at mounting height in accordance with ICC A117.1.

Install water-supply piping with stop on each supply to each lavatory faucet. Install stops in locations that are accessible for ease of operation.

Install trap and waste piping on each drain outlet of each lavatory to be connected to sanitary drainage system.

Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."

Seal joints between lavatories, counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

Retain "Shower Installation" Paragraph below if showers are included in Project.

* + - * 1. Shower Installation:

Assemble shower components in accordance with manufacturers' written instructions.

Install showers level and plumb in accordance with roughing-in drawings.

Install ball[ **or gate**] valves in water-supply piping to the shower if supply stops are specified with the shower valve. Comply with ball[ **or gate**] valve requirements specified in Section 220523 "General Duty Valves for Plumbing Piping." Install valves in locations that are accessible for ease of operation.

Install shower flow-control fittings with specified maximum flow rates in shower arms.

Set [**shower receptors**] [**and**] [**shower basins**] in leveling bed of cement grout.

Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."

Showers, except Cast-Polymer Showers: Seal joints between showers, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

Cast-Polymer Showers: Adhere panels to drywall using shower manufacturer's recommended adhesive. Seal joints, between panels and between panels and adjacent drywall, using shower manufacturer's recommended caulking specific for each application. Match sealant to fixture color.

Retain "Sink Installation" Paragraph below if sinks are included in Project.

* + - * 1. Sink Installation:

Install sinks level and plumb in accordance with roughing-in drawings.

Install supports, affixed to building substrate, for wall-mounted sinks.

Indicate on Drawings those sinks that are required to be accessible.

Install accessible, wall-mounted sinks at mounting height in accordance with ICC A117.1.

Set floor-mounted sinks in leveling bed of cement grout.

Install water-supply piping with stop on each supply to each sink faucet.

Exception: Use ball or gate valves if supply stops are not specified with sink. Comply with valve requirements specified in Section 220523 "General Duty Valves for Plumbing Piping."

Install stops/valves in locations that are accessible for ease of operation.

Install trap and waste piping on each drain outlet of each sink to be connected to sanitary drainage system.

Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."

Seal joints between sinks, counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

Retain "Urinal Installation" Paragraph below if urinals are included in Project.

* + - * 1. Urinal Installation:

Install urinals level and plumb in accordance with roughing-in drawings.

Install wall-hung, back-outlet urinals onto waste-fitting seals and attached to supports.

Install wall-hung, bottom-outlet urinals with tubular waste piping attached to supports.

Indicate on Drawings those urinals that are required to be accessible.

Install accessible, wall-mounted urinals at mounting height in accordance with ICC A117.1.

Install trap-seal liquid in waterless urinals.

Install supports, affixed to building substrate, for wall-hung urinals.

Use off-floor carriers with waste fitting and seal for back-outlet urinals.

Use carriers without waste fitting for urinals with tubular waste piping.

Use chair-type carrier supports with rectangular steel uprights for accessible urinals.

Measure support height installation from finished floor, not structural floor.

Install flushometer-valve, water-supply fitting on each supply to each urinal.

Attach supply piping to supports or substrate within pipe spaces behind fixtures.

Install lever-handle flushometer valves for accessible urinals with handle mounted on open side of compartment.

Install actuators in locations easily reachable for people with disabilities.

Install new batteries in battery-powered, electronic-sensor mechanisms.

Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Install deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."

Seal joints between urinals, walls, and floors using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to urinal color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

Retain "Water Closet Installation" Paragraph below if water closets are included in Project.

* + - * 1. Water Closet Installation:

Install water closets level and plumb in accordance with roughing-in drawings.

Install floor-mounted water closets on bowl-to-drain connecting fitting attachments to piping or building substrate.

Indicate on Drawings those water closets that are required to be accessible.

Install accessible, wall-mounted water closets at mounting height in accordance with ICC A117.1.

Install supports, affixed to building substrate, for floor-mounted, back-outlet water closets.

Use carrier supports with waste-fitting assembly and seal.

Install floor-mounted, back-outlet water closets, attached to building floor substrate, onto waste-fitting seals; and attach to support.

Install wall-mounted, back-outlet water-closet supports with waste-fitting assembly and waste-fitting seals, and affix to building substrate.

Measure support height installation from finished floor, not structural floor.

Install flushometer-valve, water-supply fitting on each supply to each water closet.

Attach supply piping to supports or substrate within pipe spaces behind fixtures.

Install lever-handle flushometer valves for accessible water closets with handle mounted on open side of water closet.

Install actuators in locations easily reachable for people with disabilities.

Install new batteries in battery-powered, electronic-sensor mechanisms.

Install toilet seats on water closets.

Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Install deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."

Seal joints between water closets, walls, and floors using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to water-closet color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

Retain "Wash Fountain Installation" Paragraph below if wash fountains are included in Project.

* + - * 1. Wash Fountain Installation:

Install wash fountains level and plumb in accordance with roughing-in drawings.

Set freestanding wash fountains on floor.

Install off-floor carrier supports, affixed to building substrate, for wall-mounted wash fountains.

Indicate on Drawings those wash fountains that are required to be accessible.

Install accessible, wall-mounted wash fountains at mounting height in accordance with ICC A117.1.

Install water-supply piping with shutoff valve on each supply to each wash fountain faucet. Use ball or gate valves if supply stops are not specified with wash fountain. Comply with valve requirements specified in Section 220523 "General Duty Valves for Plumbing Piping." Install stops/valves in locations that are accessible for ease of operation.

Install trap and waste piping on each drain outlet of each wash fountain to be connected to sanitary drainage system.

Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."

Seal joints between wash fountains, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."

Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

* + - 1. INSTALLATION OF PIPING CONNECTIONS

Coordinate piping installations and specialty arrangements with Drawings and with requirements specified in piping systems. If Drawings are explicit enough, these requirements may be reduced or omitted.

* + - * 1. Connect plumbing fixtures with water supplies and soil, waste, and vent piping. Use size fittings required to match plumbing fixtures.
				2. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
				3. Comply with soil, waste, and vent piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."
				4. Install protective-shielding pipe covers and enclosures on exposed supplies and waste piping of accessible plumbing fixtures. Comply with requirements in Section 220719 "Plumbing Piping Insulation."
				5. Where installing piping adjacent to water closets and urinals, allow space for service and maintenance.
			1. INSTALLATION OF ELECTRICAL CONNECTIONS
				1. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
				2. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
				3. Install electrical devices furnished by manufacturer, but not factory mounted in accordance with NFPA 70 and NECA 1.
				4. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.

Retain one of two subparagraphs below. First subparagraph cross-references Section 260553 "Identification for Electrical Systems" and should be retained for consistent electrical identification. Second subparagraph is an abbreviated version of the product specified in Section 260553 "Identification for Electrical Systems."

Nameplate to be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."

Nameplate to be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least [**1/2 inch**] <**Insert dimensions**> high.

* + - 1. INSTALLATION OF CONTROL CONNECTIONS
				1. Install control and electrical power wiring to field-mounted control devices.
				2. Connect control wiring in accordance with Section 260523 "Control-Voltage Electrical Power Cables."
			2. ADJUSTING
				1. Operate and adjust plumbing fixtures and controls. Replace damaged and malfunctioning plumbing fixtures, fittings, and controls.
				2. Adjust water pressure at faucets to produce proper flow.
				3. Adjust water pressure at shower valves to produce proper flow.
				4. Adjust water pressure at flushometer valves to produce proper flow.
				5. Install new batteries in battery-powered, electronic-sensor mechanisms.
			3. CLEANING AND PROTECTION
				1. After completing installation of plumbing fixtures, inspect and repair damage to finishes. Replace any fixtures unable to be repaired to the satisfaction of the [**Architect**] [**Owner**].
				2. Clean plumbing fixtures and associated faucets, valves, flushometer valves, and fittings with manufacturers' recommended cleaning methods and materials.
				3. Provide protective covering for installed plumbing fixtures and associated faucets, valves, flushometer valves, and fittings.
				4. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224200