This master should be used by designers working on Port of Portland construction projects and by designers working for PDX tenants (“Tenants”). Usage notes highlight a few specific editing choices, however the entire section should be evaluated and edited to fit specific project needs.

SECTION 223000 - PLUMBING EQUIPMENT

1. GENERAL
	* + 1. DESCRIPTION
				1. This section describes water heaters, backflow preventers, domestic water expansion tanks, hose reel cabinets, catch basins, grease duct interceptors, washdown systems, and grease traps.
			2. RELATED WORK SPECIFIED ELSEWHERE
				1. Section 220500, Common Work Results for Plumbing
				2. Section 220523, General Duty Valves for Plumbing Piping
				3. Section 220529, Hangers and Supports for Plumbing Piping and Equipment
				4. Section 220545, Seismic Restraints for Plumbing Piping and Equipment
				5. Section 220553, Identification for Plumbing Piping and Equipment
				6. Section 221100, Plumbing Piping
			3. REFERENCES
				1. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers

ASHRAE Chapter 90: Energy Standard for Buildings Except Low-Rise Residential Buildings

* + - * 1. FDA: Food and Drug Administration
				2. OSPSC: Oregon State Plumbing Specialty Code
			1. SUBMITTALS
				1. For each item specified herein, submit product/material data; shop drawings; operation and maintenance data; as-constructed data; installation, startup, and testing manuals; operation and maintenance manuals; and as-constructed drawings.

Use the following paragraph only if Commissioning Section 019100 is included in the contract.

* + - * 1. For each item specified below, submit commissioning plans and schedules; checkout, startup, operational, functional and final acceptance test plans, procedures, checklists, and reports; systems manuals; and operation and maintenance training plans.

Water heaters.

Backflow preventers.

Domestic water expansion tanks.

Hose reel/cabinets.

Grease duct interceptor washdown system.

Grease traps.

* + - 1. QUALITY ASSURANCE
				1. Regulatory Requirements: Water heaters shall meet state energy code requirements.
1. PRODUCTS
	* + 1. WATER HEATERS
				1. Electric Water Heater:

Acceptable Manufacturers: A.O. Smith or pre-bid approved equal.

Description:

Heavy gauge steel, fluorocarbon polymer, epoxy, or glass lined, 150 psi working pressure (ASME rated for 125 gallon size and above).

Sacrificial magnesium anode unless fluorocarbon polymer lined.

Inconel sheath rod type heating elements.

One external adjusting thermostat for each element.

Emersion thermostats that switch magnetic contactors through a staged sequence control (60 KW and larger).

Foam insulation with a baked enamel steel jacket to comply with ASHRAE 90 standards.

Manual reset high limit thermostat, ASME rated temperature and pressure relief valve and drain valve.

UL listed, prewired, and factory tested.

* + - 1. BACKFLOW PREVENTERS
				1. Acceptable Manufacturers: Febco, Watts, or pre-bid approved equal.
				2. Reduced Pressure Type:

2-Inch Size and Smaller: Screwed ends with bubble-tight ball valves, bronze main valve body and cover, bronze main valve with stainless steel 316 trim and four test cocks. Maximum working pressure of 150 psi unless scheduled.

* + - * 1. DCA Double Check Type:

2-1/2-Inch Through 10-Inch Size: Flanged ends, cast iron check valve body and cover and bronze check valve trim. Complete unit consisting of two independently acting spring-loaded toggle lever check valves, two shutoff valves, and four test cocks.

* + - * 1. Vacuum Breakers:

Atmospheric Type (AVB): 1/2-inch through 2-inch size, all brass body, non-spilling type, 150 psig working pressure with maximum temperature of 140ºF. Rough brass finish.

* + - 1. DOMESTIC WATER EXPANSION TANK
				1. Acceptable Manufacturers: Amtrol, Armstrong, Bell & Gossett, Taco, Wheatley, or pre-bid approved equal.
				2. Expansion Tank: Diaphragm type of welded steel, constructed and stamped in accordance with ASME code for 125 psi working pressure. Heavy-duty butyl diaphragm shall meet FDA requirements for potable water supply. Support with steel legs or bases for vertical installation or steel saddles for horizontal installation. Tank shall be precharged with compressed air to minimum fill pressures as indicated.
			2. HOSE REEL/CABINET (HRC-1)
				1. Acceptable Manufacturers: Semler or pre-bid approved equal.
				2. Semler Model SI-1500 potable water cabinet with 18-inch high black painted steel angle frame, 200 feet of 1-inch hose, 1/2 HP, 120-volt motor, single phase, with electric rewind, quick coupling nozzle, pressure regulator, one pressure gauge, two 750-watt cabinet heaters with thermostatic control, 120-volt 100 watt light, lockable door, duplex receptacle. Provide slow closing valve at end of hose.
				3. Provide a 1-inch reduced pressure backflow preventer (Watts 909, Febco 825Y, or pre-bid approved equal) as part of the unit. Mount the provided backflow preventer within the cabinet in the horizontal position in an accessible location for testing purposes. Install a line size strainer within cabinet prior to backflow device.
			3. CATCH BASIN (CB-1)
				1. Construct manholes, catch basins, and cleanouts as shown on the drawings.
			4. GREASE DUCT INTERCEPTOR WASHDOWN SYSTEM
				1. Acceptable Manufacturers: Gaylord Industries, or pre-bid approved equal.
				2. General: Supply system with 1-inch hot water connection (140ºF) and an adjustable daily 3- to 5-minute wash cycle with an inlet pressure of 40-60 psi.
				3. Washdown Control Panel: Gaylord Industries Model GPC-3000-1.00-RP consisting of, but not limited to, the following items: ball valve, line strainer, solenoid valve, detergent tank (with G-510 soap formula), pressure/temperature gauge, microprocessor command center, detergent pump, detergent check valve, shock absorber, detergent flow switch, check valve, copper tubing, and reduced pressure backflow preventer (120 volt, 1Ø, 20 amp).
				4. Spray Nozzle: Gaylord Industries 1.5 gpm spray nozzle. Each nozzle shall cover a minimum area of 2 square feet.

Tenant- Replace pre-bid approved equal with “unless approved otherwise by the Port prior to initiating work.”

* + - 1. GREASE TRAPS
				1. Acceptable Manufacturers: Zurn, Endura, or pre-bid approved equal.
				2. Grease Traps: Provide grease traps with acid resistant coating, internal air relief by-pass, bronze cleanout plug, and an aluminum cover. Size in accordance with the manufacturer’s recommendations for the application intended. Zurn Model Z1170 or Z1171.
				3. Service: Provide grease traps for the following items:

Grease duct interceptor washdown systems.

Class 1 grease hoods having hood washdown systems.

Pot sinks which will be used for grease hood filter washing. Pot sinks will be reviewed on an individual basis to determine if they require discharge to a grease trap dependent on use.

Tilting kettles.

Tilting skillets.

Woks.

Three-compartment sinks.

Other fixtures used for flushing grease effluent.

* + - 1. SOLIDS INTERCEPTOR

Use the first paragraph where space and inlet and outlet elevations of plumbing fixtures and equipment permits installation of hard plumbed, in-line solids interceptor, readily accessible for cleaning.

Use the second paragraph where inlet and outlet elevations, space, and/or accessibility for cleaning of sediment basket prohibits installation of in-line solids interceptor.

* + - * 1. On-Floor or Semi-Recessed Installation: Provide acid resistant, coated fabricated steel, or stainless steel, with gasketed removable latched lid and removable sediment basket. Zurn Z1183, Endura, or equal.

Sediment Basket: Provide screens with perforation size suitable for the application intended. Coordinate with manufacturer for best practice recommendations.

Rice Interception: Provide custom screen fabricated from 304 stainless steel with 3/32” perforated sheet metal lining or 14 x 14 mesh lining.

* + - * 1. In-Sink Installation: Provide custom fabricated, 16-gauge, 304 stainless steel basket with 3/32" perforated sheet metal lining and fold down handles.

Design: Submit detailed shop drawings with material specifications to the Port for review prior to proceeding with fabrications.

Fabricator: Artic Sheet Metal or pre-bid approved equal.

* + - 1. FLOW CONTROL
				1. Provide cast iron fitting with sani-coated body, NPT threaded inlet, outlet, and air intake vent, and orifice sized per the best practice recommendations of the manufacturer and the Plumbing Drainage Institute. Zurn Z1108, Endura, or pre-bid approved equal.

Install fitting on the discharge of each fixture connected to a grease inceptor. Install between each plumbing fixture served and grease interceptor. No more than one fixture per flow control device is permitted.

For installations with grease interceptor located below the floor of fixtures, install as noted above. Also install a flow control device at inlet to the grease interceptor. Size all flow control fittings to regulate the flow to 1/2 the flow rate capacity of the grease interceptor.

1. EXECUTION
	* + 1. WATER HEATER INSTALLATION
				1. Install in accordance with the manufacturer’s instructions and in accordance with the OSPSC, Chapter 5.
				2. Provide pressure/temperature relief valve (210ºF and 150 psi) on storage tanks. Provide piping from relief valve to a floor drain utilizing a 1-inch air gap at discharge point.
				3. Provide welded galvanized steel drain pan under each water heater with a drain line to the floor drain. Drain line shall be separate from drain line for pressure and temperature valve. Drain pan sides shall be a minimum 1 1/2 inches tall.
			2. BACKFLOW PREVENTERS
				1. Install at height and location suitable for testing purposes by the local governing authority.
				2. Provide funnel drain below reduced pressure backflow device for collecting periodic discharge and testing purposes. Pipe indirect waste from funnel drain to floor drain or to a location as noted on the drawings. Discharge indirect waste above floor drain utilizing a 1-inch air gap.
			3. HOSE REEL CABINETS
				1. Provide 120-volt heat trace on all exposed cold water supply piping outside of building which serves units.
			4. GREASE DUCT INTERCEPTOR AND WASHDOWN SYSTEM
				1. Install control panel and provide required plumbing and electrical connections as instructed by the manufacturer. Provide funnel drain assembly to grease trap and indirect waste piping from reduced pressure backflow preventer to adjacent floor drain. Provide 1‑inch supply piping from control panel to nozzle manifold within grease duct interceptor.
				2. Install nozzles 10 to 12 inches from interceptor surface or as required to cover top and sides (without exhaust duct connections) of grease duct interceptor for a total coverage of all three surfaces.
			5. GREASE TRAPS, SOLIDS INTERCEPTOR, AND FLOW CONTROL
				1. Install in accordance with the manufacturer’s instructions for the application intended.

Choose one of the following two articles. Use Commissioning if Section 019100 is included in the contract; otherwise use Testing.

* + - 1. COMMISSIONING
				1. Commission the following items:

Water heaters.

Backflow preventers.

Domestic water expansion tanks.

Hose reel/cabinets.

Grease duct interceptor washdown systems.

Grease traps.

Flow control.

* + - 1. TESTING
				1. Check out, start up, and test the following items:

Water heaters.

Backflow preventers.

Domestic water expansion tanks.

Hose reel/cabinets.

Grease duct interceptor washdown systems.

Grease traps.

Flow control.

END OF SECTION 223000