

SECTION 15400

PLUMBING

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Contractor shall inform Contracting Officer of testing date a minimum of seven (7) consecutive calendar days prior to testing system and backfilling trenches.
- B. Provide all necessary labor, materials, operations, tools and techniques required to furnish and install complete the plumbing systems as and within the limits indicated.
- C. Submit written request for interruption of the existing plumbing system not less than seven (7) consecutive calendar days prior to the time for which the interruption is requested.
- D. Existing conditions, materials, sizes and dimensions shown on these drawings represent the best available information obtained from existing drawings and field investigations. Prospective bidders shall visit the premises and familiarize themselves with all work details and conditions before submitting a bid. Reasonable modifications to indicated arrangements to suit actual conditions shall not constitute a basis for requesting additional funds from the State.
- E. Prior to ordering materials and equipment, the Contractor shall verify all existing conditions, materials, sizes and dimensions that affect their work, and shall coordinate their work with all trades involved.
- F. Obtain all permits and pay the costs thereof. Arrange for inspections when required, in sufficient time to avoid delay to the project. Provide copies of inspection reports and disinfection certificates.

1.2 SCOPE OF WORK

- A. Exterior column shower piping and trim.
- B. Installation and connection of State-furnished equipment and other items as indicated.
- C. Related Work Specified Elsewhere
 - 1. SECTION 05500 - METAL FABRICATIONS
 - 2. SECTION 15011 - GENERAL MECHANICAL PROVISIONS

1.3 LAWS, RULES, REGULATIONS, REFERENCES

- A. The entire installation shall comply with the latest applicable rules and regulations of the County, the State of Hawaii, and any other applicable laws, codes, rules and regulations whether or not specifically mentioned hereinafter.

- B. Codes
 - 1. Plumbing Code, County of Hawaii
 - 2. Building Code, County of Hawaii
 - 3. Hawaii County Code, Chapter 5 – Building
 - 4. Hawaii Administrative Rules, Title 11, Chapter 11, Sanitation
 - 5. Water System Standards, 2002
 - 6. Americans With Disabilities Act Accessibility Guidelines (ADAAG), 36 CFR Part 1191

- C. References
 - 1. American Society for Testing and Materials (ASTM) Publications
 - a. B32-08 Standard Specification for Solder Metal
 - b. B62-09 Standard Specification for Composition Bronze or Ounce Metal Castings
 - c. B88-03 Standard Specification for Seamless Copper Water Tube
 - d. CGSB-41-GP-25M Standard for Pipe, Polyethylene, for the transport of liquids
 - e. CSA B137.1 Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services.
 - f. D-1248 Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
 - g. D-3035 Standard Specifications for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on Controlled Outside Diameter
 - h. D-3350 Standard Specifications for Polyethylene Plastics Pipe and Fittings

- i. F-714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on outside diameter.
- 2. American Society of Mechanical Engineers (ASME) Publications
 - a. B16.18-01 Cast Copper Alloy Solder Joint Pressure Fittings
 - b. B16.22-01 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
- 3. American Water Works Association (AWWA) Publications
 - a. C550-05 Protective Epoxy Interior Coatings for Valves and Hydrants
- 4. Manufacturers Standardization Society (MSS) Publications
 - a. SP 110-96 Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends
- 5. NSF International (NSF) Publications
 - a. 61-09 Drinking Water System Components – Health Effects

1.04 SUBMITTALS

- A. General: The Contractor shall submit submittals in accordance with the SECTION 15011 - GENERAL MECHANICAL PROVISIONS.
- B. Shop Drawings: The Contractor shall submit shop drawings showing the entire work with inverts, sleeves and dimensions. Contractor shall check project [and reference] drawings to avoid interferences with structural features and with work of other trades. No plumbing or piping work shall commence until such plans have been approved and accepted by the Contracting Officer. Any deviations from the shop drawings shall require approval by the Contracting Officer.
- C. Submit the following:
 - 1. Manufacturer's product data
 - 2. Shop drawings
 - 3. MSDS sheets
 - 4. As-built drawings
 - 5. Certificates
 - 6. One-Year Guarantee

PART 2 – PRODUCTS

2.01 WATER PIPING, BURIED

- A. Copper Tubing: ASTM B88, NSF 61, Type K, annealed with ASME B16.18 or ASME B16.22 solder joint copper fittings. Provide lead free solder.

2.02 WATER PIPING, ABOVE GRADE

- A. Copper Tubing, ASTM B88, NSF 61, Type L, hard drawn, with ASME B16.18 or ASME B16.22 solder joint copper fittings. Solder joints shall be lead free.

2.03 POLYETHYLENE ENCASEMENT

- A. Polyethylene Encasement shall be AWWA C105 polyethylene tube or sheet.

2.04 UNIONS AND COUPLINGS

- A. Pipe Size 2-Inches and Under: Malleable iron unions for threaded ferrous piping; bronze unions for soldered copper pipe joints.

2.05 BALL VALVES

- A. Up to 2-Inches: Two piece bronze body, 150 psi steam working pressure, 600 psi nonshock cold working pressure, full port, chrome plated brass ball, Teflon seats and stuffing box ring, blowout-proof stems, stainless steel lever handle, threaded ends. Valves shall comply with MSS SP-110.

2.06 PLUMBING FIXTURES

- A. All exposed piping at fixtures shall be chrome plated.
- B. Furnish all items as required for installation and connection of fixtures and equipment furnished under this or other sections. Coordinate with other trades and disciplines as required.
- B. For each item specified, products of one manufacturer are identified to establish a standard of comparison. Products of other manufacturers will be considered if submitted for approval.
- C. Installation of accessible fixtures and equipment shall conform to ADAAG.
- D. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Maximum allowable force shall be 5-pounds per ADAAG 309.4.
- E. Fixtures List:
 - 1. Water Closet (WC-1, Non-Accessible) shall be vitreous china, elongated, floor mounted, 12-inch rough-in, top spud type, siphon jet fixture, with white solid plastic open front seat less cover and self-sustaining hinge with check. Provide

exposed flush valve with vacuum breaker, bolt caps, and no-seep wax ring gasket. Exposed metal parts shall be chrome-plated brass. Fixture shall discharge not more than 1.6 gallons per flush.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
Water Closet	Kohler	K-4350
Flush Valve	Sloan	111
Seat	Kohler	K-4670-SA

- Water Closet (WC-2, Accessible) shall be vitreous china, elongated, floor mounted, 12-inch rough-in, top spud type, siphon jet fixture, bowl rim height above finished floor shall be 16-1/2 inches, with white solid plastic open front seat less cover, with self-sustaining hinge with check. Provide exposed flush valve with vacuum breaker, bolt caps, and no-seep wax ring gasket. Exposed metal parts shall be chrome-plated brass. Fixture shall discharge not more than 1.6 gallons per flush. Water closet installation shall comply with ADAAG 604. Flush Controls shall be on open-side per ADAAG 604.6.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
Water Closet	Kohler	K-4302
Flush Valve	Sloan	111
Seat	Kohler	K-4670-SA

- Urinal (UR-1, Accessible) shall be wall hung, vitreous china, washout type, with 3/4-inch top spud. Provide with strainer and wall hangers. Provide exposed flush valve with vacuum breaker. Fixture shall discharge not more than 0.125 gallons per flush. Urinal installation shall comply with ADAAG 605.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
Urinal	Kohler	K-4991-ET
Flush Valve	Sloan	186-0.125

- Exterior Hose Bib shall be rough solid brass, with 1/2-inch MPT inlet, 3/4-inch hose thread outlet, equipped with factory installed non-removable vandal resistant vacuum breaker and loose key handle.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
Hose Bib	Arrowhead	251-BFP

2.07 PIPING IDENTIFICATION AND WARNING

- A. Buried Piping: Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility line. Provide tape in rolls, 6-inches minimum width, color coded as stated below for the intended utility with warning and identification imprinted in bold black letters continuously and repeatedly over the entire tape length. Warning and identification to read, "CAUTION BURIED (intended service) LINE BELOW" or similar wording. Color and printing is to be permanent, unaffected by moisture or soil.

Warning Tape Color Code

Blue: Potable water.

2.08 MISCELLANEOUS METALS

- A. Other metal components not specified elsewhere shall be in accordance with SECTION 05500 - METAL FABRICATIONS.

PART 3 – EXECUTION

3.01 WORKMANSHIP

- A. Comply with applicable codes of the County of Hawaii and with regulations of the State of Hawaii.
- B. Defective work or materials shall be removed by the Contractor and corrected without extra compensation.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside piping before assembly.
- C. Verify adjacent construction is ready to receive rough-in work of this Section.
- D. Locate existing water lines and sewer lines and proposed points of connection thereto, and verify that the new lines can be connected to the existing piping.

3.03 INSTALLATION

- A. Install all plumbing work as indicated and as specified herein.
- B. Installation of plumbing systems including fixtures, materials and workmanship shall be in accordance with the Plumbing Code, County of Hawaii.
- C. Install items furnished under other sections but specified for installation under this section.

- D. Provide traps, tailpieces, stops, escutcheons and all other items required to complete installation. Install items furnished under other sections but specified for installation under this section.
- E. Completely encase buried copper water piping with polyethylene tube or sheet in accordance with AWWA C105.
- F. Copper pipe shall be insulated from direct contact with ferrous piping connections by approved insulating (dielectric) unions or couplings.
- G. Install piping to conserve building space and not interfere with use of space. Group piping whenever practical at common elevations.
- H. Install piping to allow for expansion and contraction without stressing pipes, joints, or connected equipment.
- I. Provide clearance for access to valves and fittings.
- J. Slope water piping and arrange to drain at low points.
- K. Install specialties in accordance with manufacturer's instructions.
- L. Air chambers shall be provided on each cold water fixture supply extending to a minimum of 12-inches above fixture outlet. Each air chamber shall be located where it will empty and refill with air when the water is drained from piping. Chamber shall be the same size as the piping.
- M. Install each fixture with chrome plated rigid or flexible supplies with screwdriver stops, reducers, and escutcheons.
- N. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
- O. Have piping treated, inspected and approved before it is furred in, buried or otherwise hidden.
- P. Escutcheons: Shall be installed around all exposed pipe passing through a finished floor, wall or ceiling. Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly around the pipe. Secure Escutcheon with set screw (if applicable).
- Q. Excavation, Backfill and Concrete Work: All excavation and backfill in connection with plumbing work shall be accomplished in accordance with the Plumbing Code. Provide proper support along the pipe length and where rocks are encountered, provide a minimum of 3-inches of backfill properly tamped for pipe. Pipes shall be buried a minimum of 12-inches below and 3-feet horizontally from all footings.

3.04 APPLICATION

- A. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.
- B. Provide fire stop material for pipe thru fire rated walls and slabs.

3.05 PLUMBING FIXTURES

- A. Furnish, install and properly connect all plumbing fixtures and fittings and/or trims herein specified.
- B. Setting of all fixtures shall be done in an approved workmanlike manner. Special attention shall be exercised to the fixture heights, especially for urinals. Joints between fixtures and wall shall be neatly pointed up with plaster of paris.
- C. Fastenings: Where trimmings and fixtures are secured to concrete, they shall be fastened with 1/4-inch minimum brass machine screw type expansion bolts sufficiently long to insure that the shield shall be wholly within sound concrete. Where trimmings and fixtures are to be mounted on concrete block, each fixture shall have the proper cast iron fixture bracket set anchored to the masonry wall with 1/4-inch diameter toggle bolts. All exposed bolt heads and nuts shall be chrome plated hexagon brass with round tops. All escutcheons on walls and floors shall be chrome plated cast brass with chrome plated set screws.
- D. No wood grounds shall be used for supports of plumbing fixtures.
- E. Accessible Fixture Installation: Fixture location and pipe installation shall maintain all heights and clearances in accordance ADAAG.

3.06 DOMESTIC WATER LINES

- A. Domestic waterlines shall be disinfected by one of the methods prescribed in the plumbing code. Disinfection may be limited to new work only if existing piping is not contaminated during construction. Contractor shall submit certificate of disinfection completed by a licensed testing laboratory to the State.

3.06 PROTECTION

- A. Damage to materials, equipment or building due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the Contracting Officer by, and at the expense of, the Contractor. Be prepared to immediately repair any damage that does occur during any operations, so as to avoid damage to building or contents or interruption of State's operations.

3.07 INSPECTION

- A. Acceptance of the work will not take place until after discrepancies noted by the Engineer have been corrected to the satisfaction of the Engineer.

3.08 CLEANUP

- A. Upon completion of this work, remove all debris and excess materials, tools, etc., resulting from this work from the job site and leave the location of this work broom-clean in an acceptable manner as per the Engineer. All work including plumbing fixtures shall be thoroughly cleaned and ready for use.

END OF SECTION