

SECTION 15400 - PLUMBING

PART 1 - GENERAL

1.01 SUMMARY

- A. The General Provisions of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section.
- B. This Section covers the following items:
 - 1. Furnishing, installing and testing of plumbing systems within the building.
 - 2. Storm drain piping.
 - 3. Plumbing fixtures.

1.02 GENERAL REQUIREMENTS

- A. 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.
- B. Provide all necessary labor, delegated design, materials, operations, equipment, tools and techniques required to furnish and install complete the plumbing work as and within the limits indicated.
- C. Prior to ordering materials and equipment, the Contractor shall field verify all existing conditions, materials, sizes and dimensions that affect their work, and shall coordinate their work with all trades involved.
- D. Submit written request for interruption of the existing plumbing system not less than thirty (30) days prior to the time for which the interruption is requested.
- E. Obtain all permits and pay the costs thereof. Arrange for inspections in sufficient time to avoid delay to the project. Provide copies of inspection reports and disinfection certificates.
- F. Inform DOT-A of testing date a minimum of seven (7) days prior to testing system and closing in walls.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Section 01300 - SUBMITTALS.
- B. Section 09911 - PAINTING.
- C. Section 15011 - GENERAL MECHANICAL PROVISIONS.

1.04 LAWS, RULES, REGULATIONS AND REFERENCES

- A. The entire installation shall comply with the latest applicable laws, codes, rules and regulations of the State of Hawaii, the City and County of Honolulu, and any other applicable laws, codes, rules and regulations whether or not specifically mentioned hereinafter.
- B. Codes:
 - 1. Building Code, State of Hawaii and City and County of Honolulu.
 - 2. Plumbing Code, State of Hawaii and City and County of Honolulu.
 - 3. Fire Code, State of Hawaii and City and County of Honolulu.
- C. References:
 - 1. American Society for Testing and Materials (ASTM) Publications:
 - a. A74-20 Standard Specification for Cast Iron Soil Pipe and Fittings
 - b. A888-21a Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications
 - c. C564-20a Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
 - d. C1540-20 Standard Specification for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings
 - e. D2665-20 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

- f. F891-16 Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe With a Cellular Core
- 2. Cast-Iron Soil Pipe Institute (CISPI) Publications:
 - a. 301-18 Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications
- 3. Factory Mutual (FM) Publications:
 - a. 1680-89 Approval Standard for Couplings Used in Hubless Cast Iron Systems for Drain, Waste or Vent Sewer, Rainwater or Storm Drain System Above and Below Ground, Industrial / Commercial and Residential
- 4. Manufacturers Standardization Society (MSS) Publications:
 - a. SP 58-18 Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation

1.05 SUBMITTALS

- A. General: The Contractor shall submit submittals in accordance with Section 01300 - SUBMITTALS and Section 15011 - GENERAL MECHANICAL PROVISIONS.
- B. Shop Drawings: The Contractor shall submit shop drawings showing the entire work with inverts and dimensions. Contractor shall field verify and 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 DOT-A. Any deviations from the shop drawings shall require approval by DOT-A.
- C. Submit the following:
 - 1. Manufacturer's product data.
 - 2. Shop drawings.

3. MSDS.
4. Test reports.
5. As-built drawings.
6. Certificates.
7. Two-Year Guarantee.

PART 2 - PRODUCTS

2.01 DRAIN PIPING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A74, service weight, with ASTM C564 neoprene gaskets or lead and oakum joints.
 1. Pipe Lining and Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and an electrically deposited, high performance anodic epoxy top coat.
 2. Fitting Lining and Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and an epoxy acrylic powder top coat.
- B. Cast Iron Pipe: ASTM A888 and CISPI 301, hubless, service weight, with ASTM C564 neoprene gaskets, ASTM C1540 and FM 1680 Class 1, IAPMO listed, Type 316 stainless steel corrugated shield (with a minimum thickness of 0.015 inches), Type 316 stainless steel clamps, and Type 316 stainless steel screws.
 1. Pipe Lining and Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and an electrically deposited, high performance anodic epoxy top coat.
 2. Fitting Lining and Coating: Chemically deposited zinc-phosphate pretreatment layer followed by an electrically deposited, high-performance cathodic epoxy coating, and an epoxy acrylic powder top coat.
- C. PVC Pipe: ASTM D2665 or F891 with solvent weld joints.

2.02 PLUMBING FIXTURES

- A. Furnish all items as required for installation and connection of fixtures 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. Fixtures List:

- 1. Roadway Drain (RD-1) shall be 3-inch cast iron body with a no-hub outlet, adjustable top, flashing collar, ductile iron grate and cast iron sediment bucket.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
roadway drain	Jay R. Smith	2488Y

- 2. Roadway Drain (RD-1) shall be 4-inch cast iron body with a no-hub outlet, adjustable top, flashing collar, ductile iron grate and cast iron sediment bucket.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
roadway drain	Jay R. Smith	2488Y

2.03 CLEANOUTS

- A. Cleanouts shall be cast iron ferrule with threaded countersunk cleanout plug.

2.04 MISCELLANEOUS METALS

- A. Interior Installation: Preformed slotted channel system components used in supports and brackets shall be Unistrut Corporation P1000 or approved equal with Unistrut Defender coating or approved equal.
- B. Exterior and Open Air Installation: Preformed slotted channel system components used in supports and brackets shall be Type 316 stainless steel, Unistrut Corporation or approved equal.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Comply with the latest applicable laws, codes, rules and regulations of the State of Hawaii and the City and County of Honolulu.
- 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. Bevel plain end ferrous pipe.
- 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 drain lines and proposed points of connection thereto, and verify that the lines can be connected to the existing piping. Connect new piping to existing laterals approximately where indicated.

3.03 INSTALLATION

- A. Install all plumbing work in accordance with the manufacturer's instructions and as indicated and as specified herein. Furnish delegated design services when recommended by manufacturer's instructions. Arrange for access to the site by written request submitted not less than seven (7) days prior to the time at which access is requested. Coordinate installation with other trades so as to eliminate or avoid conflicts and delays to the progress of the work.
- B. Installation of plumbing systems including fixtures, materials and workmanship shall be in accordance with the Plumbing Code.
- C. Review manufacturer's rough-in sketches to verify pipe connection sizes and locations of all fixtures. Make final connection to all equipment furnished and/or installed under other sections.
- D. Install piping to allow for expansion and contraction without stressing pipes, joints, or connected equipment.
- E. Install bell and spigot pipe with bell end upstream.
- F. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

- G. Have piping treated, inspected and approved before it is furred in or otherwise hidden.
- H. Slope drain lines at 1/4-inch per foot unless otherwise indicated. Install hubless cast-iron pipe accordance with CISPI pamphlet 100, stainless steel couplings shall be installed in accordance with manufacturer's written instructions.

3.04 APPLICATION

- A. Provide fire stop material for pipe thru fire rated walls and slabs.
- B. PVC and ABS pipe shall not be used in fire rated plenums.

3.05 PIPE/EQUIPMENT SUPPORTS, HANGERS AND INSERTS

- A. Provide all necessary design, calculations, labor, materials, operations, equipment, tools and techniques required to furnish and install complete the pipe/equipment supports, hangers and inserts work.
- B. Install hangers and supports for all piping to provide for expansion and contraction, prevent vibration and maintain required grading by proper adjustment.
- C. Refer to structural drawings and as-built drawings for and field verify type of construction from which piping and/or equipment is to be suspended/supported.
- D. Pipe hangers and supports shall conform to MSS SP-58.
- E. Support vertical pipes at base of the pipe on every floor and at 10-foot intervals maximum. Pipes shall be supported at all elbows, branches and ends.
- F. Grind and smooth all sharp metal edges including struts and fabricated metal supports.
- G. Horizontal Piping Support Schedule:
 - 1. Support horizontal cast iron hub and spigot soil pipe with lead and oakum joints no more than 5-feet center to center. Supports for pipe 10-feet in length shall be spaced no more than 10-feet center-to-center. Support spacing adjacent to joint shall not exceed 18-inches. Brace pipe at maximum 40-foot intervals to prevent horizontal movement. Support at each horizontal branch connection.

<u>Pipe Size</u> (Inch)	<u>Rod Diameter</u> (Inch)	<u>Maximum Spacing</u> (Feet)
3	1/2	10-0
4 and 5	5/8	10-0

2. Support horizontal cast iron hub and spigot soil pipe with compression gasket joints at every other joint. Pipe exceeding 4-feet in length shall be supported at every joint. Support spacing adjacent to joint shall not exceed 18-inches. Brace pipe at maximum 40-foot intervals to prevent horizontal movement. Support at each horizontal branch connection.

<u>Pipe Size</u> (Inch)	<u>Rod Diameter</u> (Inch)	<u>Maximum Spacing</u> (Feet)
3	1/2	10-0
4 and 5	5/8	10-0

3. Support horizontal cast iron hubless soil pipe with shielded couplings at every joint. Pipe exceeding 4-feet in length shall be supported at every joint. Support spacing adjacent to joint shall not exceed 18-inches. Brace pipe at maximum 40-foot intervals to prevent horizontal movement. Support at each horizontal branch connection. Hangers shall not be placed at the coupling.

<u>Pipe Size</u> (Inch)	<u>Rod Diameter</u> (Inch)	<u>Maximum Spacing</u> (Feet)
3	1/2	10-0
4 and 5	5/8	10-0

4. Support spacing for horizontal PVC and ABS pipe with solvent cemented joints shall be no more than 4-feet center-to-center. Allow for expansion every 30-feet. Pipes shall be supported at all elbows, branches and risers.

3.06 PROTECTION

- A. Provide planking, plastic sheeting, or other protective covering as required to prevent damage during construction to existing building elements and equipment. Damage to materials, equipment or building due to the Contractor's neglect shall be repaired or replaced to the satisfaction of DOT-A 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 DOT-A have been corrected to the satisfaction of DOT-A.

3.08 PAINTING

- A. General: Painting of exposed surfaces shall be in accordance with Section 09911 - PAINTING.

3.09 CLEANUP

- A. All equipment and piping shall be thoroughly cleaned in an approved manner and maintained until the final inspection.
- B. 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 DOT-A. All work including plumbing fixtures shall be thoroughly cleaned and ready for use.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

All work specified under this Section shall not be measured for payment but will be paid for at the contract lump sum price for Section 15400 - PLUMBING. The contract price paid shall be full compensation for all labor, materials, tools, equipment, and all other incidentals necessary to complete the work.

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
15400	Plumbing	Lump Sum

END OF SECTION