

DIVISION 15 - MECHANICAL

SECTION 15011 - GENERAL MECHANICAL PROVISIONS

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. Work Included: Applies to all work of DIVISION 15 - MECHANICAL.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Section 01300 - SUBMITTALS.
- B. Section 09911 - PAINTING.

1.03 PLANS

- A. The plans and specifications direct attention to certain required features of the materials and equipment but do not purport to cover all details entering into its design and construction. Nevertheless, the Contractor shall furnish and install the mechanical systems complete in all details and ready for operation. The mechanical systems shall be installed substantially as shown on the plans and as specified herein and shall be designed for installation in the area designated with proper space allowed for clearance and maintenance access.
- B. Attention is directed to the fact that the plans are based upon certain equipment configurations and that equipment components of other approved equal manufacturers may differ from the arrangement indicated on the plans. If other approved equipment is accepted which require an arrangement different from that indicated on the plans or specified, the Contractor shall prepare and submit for approval, detailed civil, architectural, structural and mechanical drawings, layouts, calculations, and equipment lists showing all necessary changes and embodying all special features of the equipment which the Contractor proposes to furnish. The cost of such changes shall be borne by the Contractor at no increase in contract price or extension of contract time for the project.

1.04 SUBMITTALS

A. Submit in accordance with Section 01300 - SUBMITTALS.

B. General Requirements:

1. Data Required with the Submittal: The Contractor shall submit all data sufficient to demonstrate conformance to the requirements of DIVISION 15 - MECHANICAL. The submittal shall include, but not be limited to, manufacturer's name, catalog number or designation, and the physical characteristics of the equipment. The submittal shall be in the form of printed data sheets, catalog cuts and shop drawings. Reference to manufacturer's literature without enclosing a copy of the referenced document will be considered insufficient.

Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal. Incomplete packages will be returned without a review.

2. Approval Requirements: Approval of material and equipment will be based on manufacturer's published data.
3. Identification: All submittals covering equipment shall be identified with the equipment numbers shown on the contract drawings and the system served.
4. Substitutions:
 - a. Substitutions shall be subject to the requirements of the GENERAL PROVISIONS, paragraphs 2.7 and 6.13, as amended by the Special Provisions, and Section 01300 - SUBMITTALS. Supporting data shall be furnished for all substitutions. Redesign of civil, architectural, structural, environmental, mechanical or any other feature made necessary by the use of substitutions shall be the responsibility of and at the expense of the Contractor, and subject to approval by DOT-A.
 - b. Where such approved deviation requires a different quantity and arrangement of piping, equipment or hazardous material abatement from that specified or indicated on the drawings, the Contractor shall furnish and install any such piping, structural supports, and any other additional equipment required by the system, or hazardous material abatement at no additional cost to the State.

- C. List of Material and Equipment: The Contractor shall submit to DOT-A for approval six (6) sets of a complete list of proposed material or equipment. This list shall include manufacturer's name and material or equipment identification such as styles, types, or catalog numbers, to permit ready and complete identification. Catalog numbers specified herein are given for reference only. The Contractor shall furnish the latest model manufactured.
- D. Shop Drawings: The Contractor shall submit to DOT-A for approval six (6) sets of prints of shop drawings in accordance with the requirements of Section 01300 - SUBMITTALS. Shop drawings shall be submitted for equipment not completely identifiable by information contained in the list of materials and equipment.
 - 1. The Contractor shall submit detailed shop drawings of all equipment and all materials required to complete the project. No material or equipment may be ordered, delivered to the job site or installed until the Contractor has in his possession the approved shop drawings for the particular material or equipment. The shop drawings shall be complete as described herein.
 - 2. Approval rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the contract drawings and specifications.
 - 3. Failure of the Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time, and no claim for extension by reason of such default will be allowed.
 - 4. Shop drawings shall be submitted for, but not limited to, the following:
 - a. Plumbing System.
 - b. All items described in specifications and on drawings.
 - c. Other items as DOT-A may direct.
 - 5. Shop drawings shall include as applicable:
 - a. Identification of each fixture.
 - b. Dimensioned layouts and arrangement of plumbing system.

- E. Material Safety Data Sheets (MSDS): The Contractor shall submit to DOT-A for approval six (6) sets of MSDS for materials used in this project. Contractor shall perform all work in accordance with the recommendations of the MSDS, including all tests.
- F. As-Built Drawings: The Contractor shall submit to DOT-A one (1) reproducible set of all Contract Drawings corrected to reflect the "AS-BUILT" conditions of the installation. The drawings shall be kept up to date as the job progresses and shall be available for inspection at all times.
- G. Certificates: The Contractor shall submit to DOT-A for approval six (6) copies of certificates, acceptance and compliance with regulations of agencies having jurisdiction. Work shall not be deemed complete until such certificates have been delivered to DOT-A. Certificates shall include the following:
 - 1. Pressure testing of storm drain piping.
- H. Two-Year Guarantee:
 - 1. Contractor shall submit six (6) copies of a written Guarantee that all work is as specified and shall be bound to replace material and equipment defective due to workmanship or materials. Contractor shall not be responsible, however, for defects proven to DOT-A's satisfaction to be due to misuse, accident, or negligence by other parties.
 - 2. Further, Contractor shall be held responsible for all damages to any part of the premises, building and contents caused by leaks or other defect in pipe, equipment or materials provided under the contract drawings and specifications.
 - 3. Terms of this Guarantee are in addition to other guarantee provisions of the specifications, and do not substitute for other more stringent terms, if any.
 - 4. The Contractor shall submit six (6) copies of the Guarantee on material and workmanship.
 - 5. The Guarantee shall commence immediately after the Project Acceptance Date and extend for a period of two years after the Project Acceptance Date. The Guarantee shall include all labor, materials, equipment and parts.

1.05 MANUFACTURER'S INSTRUCTIONS

- A. General: Furnish manufacturer's instructions and data covering installation of all materials and equipment. Submittals shall be in six (6) bound copies each.
- B. Installation instructions for materials shall include precautions for handling, storage and preparation for field application. Description of other materials and tools required to complete the installation shall be included. The instructions shall include illustrations, diagrams and step-by-step procedures. Instructions should indicate if delegated design services are recommended/required.
- C. Identification: The data shall have complete identification throughout using equipment numbers shown on the drawings and indicating the system to which the data pertains.

PART 2 - PRODUCTS

2.01 ASBESTOS PROHIBITION

- A. The use of asbestos containing materials is prohibited. The Contractor shall ensure that all materials incorporated in the project are asbestos-free.

2.02 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall conform to the requirements of applicable Technical Specifications and publications specified therein and shall be as shown. Materials and equipment shall be new and shall be the products of manufacturers regularly engaged in the manufacturing of such products. All items shall essentially duplicate materials and equipment that have been in satisfactory use at least two (2) years in the State of Hawaii prior to bid opening.

PART 3 - EXECUTION

3.01 QUALITY CONTROL

- A. The work shall be performed by workers skilled in the type of work involved under experienced supervision. Where methods of application or installation are specified by commercial standards in DIVISION 15 - MECHANICAL, no departures will be permitted except as specified or as directed by DOT-A.

3.02 INSPECTION AND TESTS

- A. The Contractor shall give DOT-A written notice a minimum of seven (7) days prior to inspection and tests. Tests shall be performed as required in DIVISION 15 - MECHANICAL. All work rejected by DOT-A shall be repaired or replaced by the Contractor at no additional cost to the State.

3.03 VERIFICATION OF DIMENSIONS

- A. The Contractor shall check all dimensions at the site and shall establish all lines and levels. Equipment shall be located to assure proper grade for piping. The Contractor shall be responsible for correctness of all dimensions and fitting of piping and equipment into the available space. Should field measurements show conditions that require relocation of any work, such conditions shall be reported to DOT-A in advance of installation, and the work shall proceed in accordance with his decision.

3.04 PROTECTION DURING STORAGE

- A. All materials and equipment shall be stored in a safe manner, secured from weather, vandalism and theft. All materials shall be stored above the ground or floor level to avoid damage by moisture.

3.05 PROTECTION OF WORK IN PROGRESS

- A. Pipe openings shall be closed with caps or plugs until connections are made. Equipment shall be securely covered for protection against physical or chemical damage. In areas exposed to weather, materials unused at the end of each day's work shall be stored in weather-protected locations. Damage to materials or equipment 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.

3.06 PROGRESS OF WORK AND COORDINATION

- A. The work shall be coordinated with the work of other contractors and other trades to avoid interferences, preserve headroom and operating clearances, and to expedite completion of the project.

3.07 INSTALLATION OF EQUIPMENT

- A. Installation and adjustments shall be in accordance with the equipment supplier's written instructions. All accessories required shall be properly installed and connected. Supports shall be adequately anchored.

3.08 PERMITS, LICENSES AND INSPECTIONS

- A. The Contractor shall obtain all permits and licenses required to perform the work, pay all required fees, and shall cooperate with all inspections required by authorities having jurisdiction. Inspections specified in DIVISION 15 - MECHANICAL shall be permitted without interference. Corrections to work as a result of inspections shall be made promptly.

3.09 PAINTING

- A. The Contractor shall be responsible for complete coverage in painting all exposed surfaces. Painting shall be in accordance with Section 09911 - PAINTING as applicable for exposed surfaces.
- B. The Contractor shall patch and touch-up paint all surfaces damaged and/or disturbed due to Contractor's operations. All patching and touch-up painting shall match existing surrounding surfaces.

3.10 FIELD TESTS

- A. The Contractor shall be responsible for testing of the installed work, shall provide all labor, equipment and instruments, and shall conduct pressure tests and operating tests on the piping systems. Testing shall be as specified hereinafter.

3.11 TESTING

- A. Prior Tests: Leave concealed work uncovered until required tests have been completed, but if construction schedule requires it, arrange for prior tests on parts of system as approved.
- B. Preliminary Tests: As soon as conditions permit, conduct preliminary or "turn-over" tests of certain equipment as directed to ascertain compliance with specified requirements. Make needed changes, adjustments or replacements as preliminary tests may indicate, prior to acceptance tests.
- C. Acceptance Tests: Conduct pressure, performance and operating tests as specified for each system or equipment unit, in the presence of DOT-A, as well as representatives of agencies having jurisdiction.
- D. Costs: Furnish labor, materials, instruments and bear costs in connection with all tests.
- E. Defects: All defects disclosed as a result of the following or other tests or operations shall be promptly repaired by and at the expense of the Contractor and to DOT-A's satisfaction. Contractor shall supply all

instruments, labor and tools required by tests. Any defective material, equipment and/or work shall be repaired, adjusted and replaced by new, like materials and equipment, and retested/reinspected before acceptance. Caulking of screwed joints or holes will not be accepted.

- F. Certificates: Obtain certificates of approval, acceptance and compliance with regulations of agencies having jurisdiction. Work shall not be deemed complete until such certificates have been delivered to DOT-A.
- G. Do not paint, cover or conceal piping, nor connect fixtures before testing and obtaining approval.
- H. Test piping that will be concealed, in sections as approved. Perform tests in a manner that will not leave any pipe or joint untested.
- I. Testing procedures and conditions stated above shall also apply to all of the following tests:
 - 1. Plumbing Systems Test.
 - 2. Operating Test.

3.12 PLUMBING SYSTEMS TEST

- A. Test plumbing work as specified herein and according to local Code Regulations. Latter shall govern if they conflict with former. Provide test pump, gauges, meters, instruments, materials, and labor in connection with tests.
- B. Clean piping, equipment and specialties before testing.
- C. Drainage System Pressure Test: Drainage system piping shall be tested with water. Water test shall be applied to the drainage system in its entirety. All openings in the pipes shall be tightly closed except the highest opening, and the system shall be filled with water to point of over-flow.
- D. Make adjustments, repairs, and alterations, as required to meet specified test results. Correct defects disclosed by tests or inspections. In case of pipe defect, replace with same length as defective piece. Repeat tests after defects have been corrected and parts replaced, as directed until pronounced satisfactory.

3.13 OPERATING TEST

- A. After installation work has been completed, tested and approved, test fixtures under normal operating conditions for periods as directed to check

capacities and other details as required demonstrating that they fulfill requirements of the plans and specifications, and that they operate satisfactorily.

- B. Where evidence of stoppage appears in piping or fixtures, disconnect, clean, repair, and reconnect obstructed parts. Contractor shall bear costs of cutting, patching adjoining work necessitated by such cleaning and repairing.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this section will not be measured nor paid for separately, but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION