

WASTEWATER TREATMENT SYSTEM

SECTION 13131

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

1.2 GENERAL CONDITIONS

This section covers the design, construction and installation of a wastewater treatment system and absorption bed disposal system, in place complete.

- A. The contractor shall provide drawings, details and calculations necessary to demonstrate compliance with the requirements of this specification. All drawings shall be checked and stamped by a State of Hawaii, licensed Civil Engineer hired by the contractor.
- B. The contractor shall submit drawings, details and calculations as necessary to the State of Hawai'i, Department of Health, Wastewater Branch (DOH-WWB) for review and approval. The submittal to DOH-WWB shall include, but not be limited to, a Basis of Design Report including a site evaluation with percolation test results and design calculations; Construction Drawings showing all required details of the sewage treatment unit, distribution box, and absorption bed; and Operation & Maintenance Manuals. The contractor, through their licensed Civil Engineer, shall obtain approval from DOH-WWB for construction as well as use of the wastewater treatment system and wastewater effluent disposal absorption beds.
- C. The wastewater treatment shall generally consist of the following components. These components do NOT represent all of the components required for proper construction and operation of the wastewater system. The contractor or their suppliers are responsible to ensure all components required for proper construction and operation of the system are provided and installed.
  1. Preloader Tank: Provide a minimum 1,000-gallon capacity, dual compartment, polypropylene septic tank, Infiltrator Model IM-1060 or approved equal. Excavation for the preloader tank shall extend a minimum of 12" from the walls of the tank. The tank shall be laid upon 6" of 1-1/2" clean drain rock and backfill around the tank shall be pea gravel. The top of the tank shall be a minimum of 12" below finish grade. A 12" wide x 12" deep non-reinforced concrete buoyancy counterweight collar shall be poured around the tank. Follow manufacturer's recommendations and details for construction of the concrete collar.
  2. Aerobic Treatment Unit: Provide an aerobic treatment unit with minimum capacity of 1,000 gallons per day (GPD), ECOPOD E100N with Infiltrator Model IM-1530 1,500-gallon polypropylene tank and aeration blower unit by Infiltrator Water Sewage Treatment Unit

Technologies, or approved equal.

3. Duplex sewage pump station: Provide a duplex sewage lift station in HDPE pump basin with float tree, splice boxes, wiring, piping, CBT Model 1000G with Pumps by International Wastewater Technologies, Inc., or approved equal. A 12" wide x 12" deep non-reinforced buoyancy counterweight collar shall be poured around the sewage lift station pump basin. Follow manufacturer's or supplier's recommendations and details for construction of the concrete collar.
4. Absorption Bed: Provide eight (8) rows of H-20 traffic rated absorption bed chambers by Infiltrator or approved equal. Contractor shall over-excavate as necessary to extend geogrid a minimum of five (5) feet beyond the perimeter of the absorption bed. Contractor shall follow the manufacturer's detail for H-20 traffic rated chambers.
5. Connection to the prefabricated bathroom complex plumbing and electrical systems.
6. See Site Plan for requirement for the wastewater effluent disposal absorption beds.

D. Applicable Code Requirements:

2. The design and construction of the wastewater treatment system and absorption bed disposal system shall conform to the latest edition of the following:
  - a. 2003 International Building Code;
  - b. 2003 Uniform Plumbing Code;
  - c. 2008 National Electrical Code;
  - d. State Occupational Safety and Health Law;
  - e. 2006 IECC;
  - f. All other applicable codes, laws, ordinances, rules and regulations of place of building. The strictest of the aforementioned shall govern the design and construction of this project.

E. Design Criteria:

The design and construction of the sewage treatment unit shall conform to, but not be limited to, the following design criteria:

- a. Hawaii Administrative Rules, Chapter 11-62 Wastewater Systems

F. Coordination with others:

1. See 1.2 General Conditions, Paragraph B above for requirement to obtain services of a licensed civil engineer to obtain approval from DOH-WWB.
2. Objectives: In preparing the Design Documents (plans and specifications), the contractor shall take proper care to assure the following:

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- a. That all phases of the construction work are fully shown and/or described so that the intent of the work is understood by all concerned.
  - b. The use of sound construction practices utilizing methods, equipment and materials of proper dependability and durability with economy in operation and maintenance.
  - c. The contractor shall obtain approval for construction and use of the wastewater treatment system and wastewater effluent disposal absorption beds from the DOH, Wastewater Branch.
3. CIVIL DRAWINGS: All drawings prepared by the Civil Engineer shall meet the following specifications:
- a. All drawings shall be prepared on 11" x17".
  - b. TITLE SHEET
  - c. Standard Title Block.
  - d. Name of project, tax key.
  - e. Names of Architect and/or Engineers (for the manufacturer or its representative) with space allowance for their respective registration stamps.
  - f. Index to drawings.
  - g. Space for Signatures of Approval.
4. MECHANICAL DRAWINGS: A stamped and signed site plan and details, prepared by a Mechanical Engineer licensed in the State of Hawaii, shall include, but not be limited to, the following:
- a. Water service connection.
  - b. Sewer system connection.
  - c. Plumbing fixtures.
  - d. Ventilation System.
  - e. Sewage treatment system components.
  - f. Pump systems.
5. ELECTRICAL DRAWINGS: A stamped and signed site plan and details, prepared by an Electrical Engineer licensed in the State of Hawaii, shall include, but not be limited to, the following:
- a. Electrical service connection. i.e. Live Load, etc..
  - b. Lighting, switching, and receptacle layout.
  - c. Luminaires schedule.
  - d. Power system, panels and outlets.
  - e. Location of all special outlets.
  - f. Panel board location.
6. Submittal for Design Review

- a. Preliminary Design Submittal: The drawings and calculations shall be sent to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation, Engineering Branch, 4 Sand Island Access Road, Honolulu, Hawaii, 96819, Attention: Mr. Finn McCall. Email PDF files to: [finn.d.mccall@hawaii.gov](mailto:finn.d.mccall@hawaii.gov).

Submit the following:

- a. PDF file of all drawings
  - b. Word and PDF File of specifications
7. Final Design Submittal: The Final Design Submittal shall be made only after all comments on the Design Review have been incorporated in the final tracings and specification originals.

All sheets of the final drawings shall have all required Structural, Mechanical, and Electrical Engineers' approval stamps and signatures.

Submit the following:

- a. PDF file of all drawings
- b. Word and PDF File of specifications

## PART 2 - PRODUCTS

### 2.1 AEROBIC TREATMENT UNIT

- A. Contractor shall provide an aerobic treatment unit with minimum capacity of 1,000 gallons per day (GPD), ECOPOD E100N with Infiltrator Model IM-1530 1,500-gallon polypropylene tank and aeration blower unit by Infiltrator Water Technologies, or approved equal.
- B. Brand names of materials or equipment indicated in this section are specified to indicate a quality, style, appearance or performance; the bidders shall use in their bids one of the specified brand names or approved equal.
- C. Warranty: The aerobic treatment unit shall be warranted, for a one-year period from the date of acceptance, against material defects or workmanship.
- D. Electrical: All electrical work shall conform to the requirements of the latest edition of the NEC adopted by the County of Maui at the time of construction.
  1. Service: As required for wastewater treatment system.
  2. Panel: As required for wastewater treatment system.

3. Equipment: As required for wastewater treatment system.
  4. Materials: As required for wastewater treatment system.
- F. Mechanical: Shall conform to the requirements of the latest edition of the UPC adopted by the presiding County at the time of construction.
1. General
    - a. Water Supply: Copper tubing, Type K below grade and Type L above grade, ATSM B88, sweat fittings, lead free solder.
    - b. Plastic grommets on studs at copper pipes to prevent galvanic interaction.
    - c. Sewer: Rigid PVC Schedule 40, solvent welded joints, NSF and IAPMO certified.
    - d. Supports: Pipe clamps: 'Unistrut' fiberglass rigid pipe clamps
- H. Substitutions: Alternate aerobic treatment unit manufacturer/supplier may be considered provided a substitution request is submitted to the Engineer in writing at least 10 days prior to the bid deadline. The substitution request must be approved by the Engineer in writing prior to the bid deadline to be allowed to base bid off substitute sewage treatment unit. The Engineer's decision shall be final and conclusive.

## 2.1 PRELOADER TANK

The specifications for the preloader tank are based on products provided by International Wastewater Technologies, Inc., 1931-A Kahai Street, Honolulu, HI 96819.

- C. Brand names of materials or equipment indicated in this section are specified to indicate a quality, style, appearance or performance; the bidders shall use in their bids one of the specified brand names or approved equal.
- D. Warranty: The preloader tank shall be warranted, for a one-year period from the date of purchase, against material defects or workmanship.
- E. Tank: 1,500-gallon capacity, dual compartment, polypropylene shell, Infiltrator Model IM-1530 or approval equal. Tank shall be provided with 24" bolted manways for access and pumping including necessary manway risers.
- F. Inlet/Outlet: Inlet and outlets shall be 4" capable of accommodating schedule 40 PVC pipe.
- G. Substitutions: Alternate preloader tank manufacturer/supplier may be considered provided a substitution request is submitted to the Engineer in writing at least 10 days prior to the bid deadline. The substitution request must be approved by the Engineer in writing prior to the bid deadline to be allowed to base bid off substitute tank. The Engineer's decision shall be final and conclusive.

## 2.2 DUPLEX SEWAGE LIFT STATION

The specifications for the duplex sewage lift station are based on products provided by International Wastewater Technologies, Inc., 1931-A Kahai Street, Honolulu, HI 96819.

- C. Brand names of materials or equipment indicated in this section are specified to indicate a quality, style, appearance or performance; the bidders shall use in their bids one of the specified brand names or approved equal.
- D. Warranty: The duplex sewage lift station shall be warranted, for a one-year period from the date of purchase, against material defects or workmanship.
- E. Pumps: Two (2) grinder pumps shall be provided. Each pump shall be rated 1 hp, 110v, 1 ph., 60 Hz. Pump shall be by Zoeller Engineered Products or approved equal.
- F. Pump Basin: Shell shall be HDPE with 4" inlet and 1-1/2" outlet. Basin shall be provided with internal piping, ball valves, check valves, float switches, splice boxes, wiring, and all appurtenant components required for operation.
- G. Control Panel: Panel shall be NEMA 4X rated and mounted to the exterior wall of the bathroom unit with stainless steel unistruts. Power and control wiring between the sewage treatment unit and pump basin shall be installed in 1" schedule 40 PVC (below ground wiring) conduit with minimum 12" cover. All above ground wiring shall be installed in 1" schedule 80 PVC or schedule 40 PVC if painted with UV protective paint.
- H. Duplex Sewage Lift Station System: Specifications above are based on CBT Model 1000G W/ PUMPS provided by International Wastewater Technologies, Inc.
- I. Substitutions: Alternate sewage lift station manufacturer/supplier may be considered provided a substitution request is submitted to the Engineer in writing at least 10 days prior to the bid deadline. The substitution request must be approved by the Engineer in writing prior to the bid deadline to be allowed to base bid off substitute pump system. The Engineer's decision shall be final and conclusive.

## PART 3 – EXECUTION

### 3.1 GENERAL REQUIREMENTS

- A. Workmanship:  
All work shall be done by experienced and skilled workers that are familiar with the type of work required to the best practices of this trade.
- C. Qualifications: Wastewater treatment system components shall be provided by a manufacturer/supplier/subcontractor who has a minimum of five (5) years prior experience in design and construction of wastewater treatment systems and is presently regularly engaged this type of work.

### 3.2 PROJECT PHASING

The project is divided into the following phases, all of which shall be included in the Lump sum item for the sewage treatment unit:

A. Design Phase:

1. The contractor or its representative shall engage the services of professional civil, mechanical, and electrical engineering consultants who are licensed to practice in the State of Hawaii; to prepare complete working drawings and technical specifications showing and describing the construction of the wastewater treatment system. All drawings shall be stamped by the respective consultants preparing the construction drawings. The drawings and specifications shall be submitted for approval to the Engineer. The contractor or its representative shall continue onto the Construction Phase only when the drawings and specifications are approved by the Engineer and DOH-WWB.
2. See 1.2 General Conditions, Paragraph B above for requirement to obtain services of a licensed civil engineer to obtain approval from DOH-WWB for construction and use of the wastewater treatment system and absorption bed disposal system.

B. Construction Phase:

The Contractor shall provide all labor, materials, tools and equipment necessary to install and construct the wastewater treatment system based upon approved final design drawings and technical specifications prepared by their consultants.

### 3.3 TESTING AND START-UP

- A. Installation of all equipment and accessories shall be done in accordance with the manufacturer's recommendations and as shown on the Drawings. All system components and controls shall be tested for proper operation of the system prior to requesting an inspection by the Engineer.
- B. The contractor or wastewater treatment system component manufacturer's representatives shall provide training to the State's contracted wastewater treatment plant operators after the system has been tested and proved proper operation and as approved by the State and Engineer.

### 3.4 CLEAN-UP AND PROTECTION

- A. Protect all installed finish work, millwork, fixtures, wall finishes, floor covering, ceiling panels, etc., from being defaced or marred during the installation. The contractor, the sewage treatment unit manufacturer and/or its representative shall replace or repair any damaged work/item as instructed by the Engineer at no additional cost to the State.
- B. At the completion of the installation, remove from the project site all rubbish, debris, etc.,

accumulated during the progress of this work.

### 3.5 SPARE PARTS

- A. The wastewater treatment system component manufacturers shall provide a list with quantities of recommended spare parts to have on hand for operation of the system.
- B. Spare parts required for one (1) full year of operating the sewage treatment unit shall be provided and the cost shall be incidental to the bid items.

END OF SECTION