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GENERAL PROVISIONS

2401-13-01 Authority

These Regulations are promulgated by the Republic of Palau Environmental Quality Protection Board pursuant to the authority vested in the Board by the Palau Environmental Quality Protection Act and under Section 5 of Palau Public Law 1-58 (24 Palau National Code Section 121 et. seq.) and Section 5 of Palau Public Law 1-73 (34 Palau National Code Section 1201 et seq.), the Sewer Use Act of 1984. These Regulations and technical provisions and specifications shall have the force and effect of law and shall be binding on all persons and other legal entities whether public or private subject to the jurisdiction of the Republic of Palau.

(Effective October 19, 2019)

2401-13-02 Purpose

Whereas Palau residences, businesses, commercial establishments, hotels, recreational facilities, and government offices and facilities will continue to rely on a range of options and technical solutions for wastewater treatment and disposal; and whereas proper design, construction, and operation of wastewater management systems provide personal and public benefit through protection of groundwater and surface water; and whereas public health can be significantly impacted by use of substandard or inadequate wastewater treatment and disposal systems; and whereas waste from confined animal facilities and aquaculture facilities can impact the quality of ground water and surface water and public health, the purpose of these Regulations are:

- (A) To protect the health of the wastewater disposal system user and operator and his/her neighbors;
- (B) To establish minimum standards for planning, designing, construction and effectiveness that will ensure that waste treatment systems and the discharge of wastewater;
 - (1) Will not contaminate or degrade the groundwater of Palau;
 - (2) Will not contaminate or degrade the waters of any swimming beach or coral reef, shellfish breeding ground, or stream used for public or domestic water supply purposes or for recreational purposes;
 - (3) Will not be accessible to insects, rodents, or other possible carriers of disease which may come into contact with food or drinking water;
 - (4) Will not pose a health hazard by being accessible to children;

- (5) Will not create a public nuisance due to odor or unsightly appearance;
 - (6) Will not violate any other local or national laws, rules, or regulations governing water pollution or sewage disposal.
- (C) To provide for a reasonable service life for each wastewater treatment and disposal system;
 - (D) To provide for registration and requirements for cleaning of wastewater systems and hauling and disposal of sanitary wastes;
 - (E) To establish minimum standards for the treatment of confined animal facilities wastes;
 - (F) To establish minimum standards for the treatment of aquaculture facilities wastes;
 - (G) As with all of the Palau Environmental Quality Protection Board (EQPB) Regulations, the design standards and details described in these Regulations and in the permitting processes are intended as minimum standards. The ultimate responsibility for success or failure of all constructed wastewater treatment systems lies with the applicant. Although the Palau EQPB sets these minimum standards that applicants must follow, EQPB takes no responsibility for possible failures of systems that are permitted under these Regulations. Each system must be designed for the specific location and specific use of the system, in accordance with these Regulations and established engineering standards of practice for wastewater collection, conveyance, treatment and disposal.

(Effective October 19, 2019)

2401-13-03 Definitions

As used herein, unless the context otherwise requires, the terms:

- (A) “Act” means the Palau Environmental Quality Protection Act, (EQPA), 1983, Public Law 1-58, as amended.
- (B) “Approved” means approval for an item or action by the EQPB or the Chairman.
- (C) “Animal waste” means animal excreta and associated feed losses, bedding, spillage or overflow from watering systems, wash and flushing waters, sprinkling waters from livestock cooling, precipitation polluted by falling on or flowing into a confined animal facility (“runoff”), and other materials polluted by livestock or their direct products.
- (D) “Aquaculture” means the breeding, raising, maintaining, and/or selling of marine or freshwater species of aquatic organisms in land-based tanks, ponds, or stream or ocean impoundment, or in submerged tanks or pens in marine or freshwaters.
- (E) “Aquaculture waste” or “Aquaculture wastewater” means excreta and associated feed losses, discharges from batch or flow-through systems, spillage or overflow from land-based tanks, ponds, or other impoundments that are used to breed or raise marine or freshwater organisms, or precipitation falling on or flowing from an aquaculture facility (“runoff”), and other materials polluted by aquaculture organisms or their direct products.
- (F) “Available sewer” means a public sewer which has been constructed in a road-way, street or easement abutting the property on which the subject building is located:
 - (1) Within 200 horizontal feet of the public sewer or within 200 horizontal feet of any lot or premises which abuts and is served by such public sewer; and

- (2) Within 20 vertical feet (measured from the lowest floor level) for single family residences or duplexes or within 50 vertical feet (measured from the lowest floor level) for any other structure.
- (G) “Beneficial use” shall include the use of water reasonably required for domestic, agriculture, commercial, industrial, recreational, and other purposes, on both public and private lands.
- (H) “Board” or “EQPB” means the Republic of Palau Environmental Quality Protection Board or its duly authorized representative.
- (I) “Building” means a structure having a roof and intended to shelter people, animals, property, or business activity, or any structure used or intended to be used for supporting or sheltering any use or occupancy
- (J) “Building Sewer” means the piping of a plumbing system beginning five (5) feet beyond the inner face of the building (the end of the House Sewer or Building Drain) and extending to the public sewer, an owner/operator wastewater management system, or other place of treatment or disposal.
- (K) “Certified Operator” means an individual who has passed an examination that tests their knowledge, skills, ability, and judgment as a wastewater operator for a particular classification level of wastewater treatment facility or wastewater collection or conveyance system, and has been issued a certificate pursuant to Section 2401-13-26 of these Regulations.
- (L) “Cesspool” means any buried chamber, including, but not limited to, any perforated metal tank, perforated concrete vault, or covered hollow or excavation, which receives discharges of untreated sanitary sewage from a building sewer for the purpose of collecting solids and discharging liquids to the surrounding soil. Cesspools are not an approved method of wastewater disposal under these Regulations, and all existing cesspools are considered to be substandard.
- (M) “Chairman of the Palau Environmental Quality Protection Board” or “Chairman” means the Chairman personally or the Chairman’s duly authorized representative.
- (N) “Confined animal facility” means a lot or facility (including an aquatic animal production facility) where animals (including aquatic animals) have been, are, or will be stabled or confined and fed or maintained. Confined animal facilities include areas or structures used to grow or house animals, areas used for processing and storage of product, manure, runoff storage areas, and silage and other feeds storage areas.
- (O) “Contamination” means the introduction of any physical, chemical, biological, or radiological substance into surface or groundwater which has the potential to pose a threat to human health or lead to environmental degradation, or to impede the intended beneficial use of marine or freshwaters.
- (P) “Duplex” means a building which is designated exclusively for the occupancy of one (1) family in each of two (2) units which are attached to each other and which are detached from any other dwelling or commercial building.

- (Q) “EPA” or “USEPA” means the United States Environmental Protection Agency.
- (R) “Groundwater” is that part of the subsurface water which is in the zone of saturation
- (S) “House Sewer” or “Building Drain” means that part of the lowest piping of a plumbing system which receives the discharge from soil, waste, and other drainage pipes inside the walls of any building, public or private, and ending five (5) feet beyond the inner face of the building where it conveys to the building sewer.
- (T) “Individual Wastewater Disposal System” (“IWDS”) means a system designed and installed to treat and dispose of sewage from a single structure or group of structures using a sealed septic tank, together with a subsurface wastewater infiltration system (SWIS).
- (U) “Leaching field” and “leaching bed” and “leaching chamber” means a system of buried horizontal perforated pipes or chambers bedded in washed crushed rock (free of fines) or other approved medium, through which septic tank effluent or primary or secondary treated wastewater effluent may seep or leach into the surrounding porous soil.
- (V) “Livestock” means animals raised for human consumption and other uses.
- (W) “Operator” means a person available (must be on site or able to be contacted as needed to initiate an appropriate response action in a timely manner), qualified (having the experience/education necessary to operate/maintain the wastewater treatment and disposal system based on system size, complexity, and wastewater quality), and engaged in the operation of a wastewater collection, conveyance, treatment, and disposal system. “Operator” does not ordinarily mean an official, such as the utility engineer or public works superintendent, exercising only general administrative supervision. Operator duties are varied and include but are not limited to: operating wastewater process equipment, valves, pumps, engines, and generators; cleaning of various process equipment for necessary unit process functions; taking wastewater samples; operating electrical controls; monitoring gauges, meters, and control panels; recognition of process upsets and critical conditions in unit processes; determining and adjusting treatment process conditions using data, meter, and gauge readings; mixing of any chemicals required in treatment; and inspecting the facility for overall process conditions.
- (X) “Owner/Operator Wastewater Management Systems” means any wastewater collection, conveyance, treatment and disposal system that is not connected to and is operated separately from the public sewer system, or which is connected to the public sewer system solely for the discharge of treated wastewater effluent.
- (Y) “Permit” as used in these Regulations shall mean any permit issued by EQPB for the operation of a wastewater management system.
- (Z) “Person” means the Republic of Palau, a state, a political subdivision, a public or private institution, corporation, partnership, joint venture, association, firm or company organized or existing under the laws of the Republic or of any state or country, a lessee or other occupant or property, or an individual, acting singly or as a group.

- (AA) “Primary treated effluent” for the purpose of these Regulations means wastewater effluent from a sealed septic tank of the size and configuration as required by these Regulations, or wastewater effluent from a primary clarifier or primary treatment impoundment.
- (BB) “Point Source Discharge” means the discharge of wastes or wastewater from any building, residential, commercial or industrial building, confined animal facility, aquaculture facility waste, or waste treatment facility, that is discharged through a gravity or pressure pipe into a receiving water.
- (CC) “Public Sewer” means a common sewage collection, conveyance, treatment, and disposal system serving more than one lot, directly controlled by public or government authority.
- (DD) “Restrictive horizon” means a layer of soil or rock material that significantly impedes movement of water vertically through the subsurface. Layers that differ from overlying soil material enough to be considered restrictive horizons include but are not limited to, volcanic bedrock, compacted soil, saprolite, shale and certain clayey soils.
- (EE) “Runoff” means that part of precipitation or irrigation water that runs off the land into ponds, streams, lagoons, bays, or other surface water.
- (FF) “Secondary treated effluent” for the purpose of these Regulations means treated effluent from a wastewater treatment system which has undergone physical, chemical, and/or biological treatment in order to effect physical phase separation to remove settleable solids and biological processes to remove nitrogen, phosphorous, and dissolved and suspended organic and inorganic compounds.
- (GG) “Seepage Pit” means a covered pit with open-jointed lining through which treated wastewater effluent may seep or leach into the surrounding porous soil.
- (HH) “Septage” means the domestic liquid and solid residue pumped from septic tanks, cesspools, holding tanks, vault toilets, chemical toilets or other similar domestic sewage treatment components or systems, and other sewage residues not derived from electrical / mechanical / chemical wastewater treatment facilities.
- (II) “Septic Tank” means a water tight (“sealed”) receptacle which receives the discharge of sanitary sewage and is designed and constructed so as to retain solids, digest organic matter through a period of detention, and allow the clarified liquids to discharge to additional treatment system components or directly into surrounding subsoil through a subsurface wastewater infiltration system.
- (JJ) “Sewage” or “Wastewater” means untreated or insufficiently treated liquid medium that contains human excreta; food wastes disposed of through sewers; wash water; liquid wastes from residences, commercial buildings, agricultural, or animal husbandry/slaughter operations; aquaculture facilities, industrial establishments, or other places of assembly; and such diluting water (e.g., storm water inflow) as may have entered the waste water collection and conveyance system.
- (KK) “Significant treatment and disposal system modification” means any change, replacement, or reconstruction of any wastewater treatment system because of:
- (1) System failure;

- (2) Increase in influent sewage flow rate above the design capacity of the existing system;
- (3) Obsolescence.
- (LL) “Single Family Residence” means a building designed exclusively for occupancy of one (1) family, which is detached from any other dwelling or commercial unit, and containing only one (1) dwelling unit.
- (MM) “Sludge” or “Biosolid” means the residual, semi-solid sewage material that is produced as a by-product during treatment of domestic, municipal, or industrial wastewater.
- (NN) “Subsurface Wastewater Infiltration System” or “SWIS” means a system that disperses treated wastewater effluent to the subsurface porous soil layer by means of constructed piping, chambers, lined pits, and associated appurtenances.
- (OO) “Type 1” means a toilet which is flushed with water and is connect to a public sewer system or other wastewater management system other than an IWDS.
- (PP) “Type 2” means a toilet flushed with water and connected to a sealed septic tank and subsurface wastewater infiltration system.
- (QQ) “Type 3” means a structure and excavation for the disposal of human excreta by non-water carriage methods and includes the terms privy, pit-toilet, trench latrine, bored hole latrine, outdoor benjo, and waterless composting toilets.
- (RR) “Type 4” or “Temporary Toilet Facility” means a toilet which is a mobile self-contained structure for the disposal of human excreta in which waste is stored in a leak-proof chamber until removed by proper means for disposal in the public sewer or other approved wastewater management system.
- (SS) “Vessel” shall mean a craft for traveling on water including, but not limited to, a ship or boat.
- (TT) “Wastewater collection system” or “collection system” means pipelines or conduits, pumping stations and force mains, and all other related constructions, devices, appliances and appurtenances, used to collect and convey wastewater to a wastewater treatment system or facility.
- (UU) “Wastewater treatment facility” means any facility or operational unit used to treat, neutralize, stabilize, or dispose of wastewater and residuals.
- (VV) “Wastewater treatment system” means devices, mechanical, electrical, chemical, or a combination of devices, structures, and equipment used to treat, neutralize, stabilize, or dispose of wastewater and residuals.
- (WW) “Wastewater management system” means the system of pipes, structures, and equipment used to collect, convey, treat, neutralize, stabilize, and dispose of wastewater and residuals.
- (XX) “Waters of the Republic of Palau” means all waters in the Republic of Palau, including near shore waters, off-shore waters, and those brackish, fresh, and salt waters that are subject to ebb and flow of the tide including salt water marshes, salt water swamps, fresh water marshes, fresh water swamps, cultivated wetlands, lakes, rivers, springs, streams,

mudflats, and all waters otherwise classified under the Republic of Palau Marine and Fresh Water Quality Regulations (Chapter 2401-11).

(YY) “Water supply” means the water withdrawn from a water source, or that might feasibly be withdrawn from an undeveloped or partially developed water source.

(Effective October 19, 2019)

WASTEWATER MANAGEMENT SYSTEMS –GENERAL

2401-13-04 Facilities and System Requirements

All public, government, and commercial buildings and structures, and all private and commercial residences, and all other buildings or structures where toilets or other plumbing features are required and installed, and all confined animal facilities and aquaculture facilities, shall have wastewater management systems as described in these Regulations.

(Effective October 19, 2019)

2401-13-05 Public Sewer System

Where access to the public sewer system is available, all wastewater plumbing outlets from any and all buildings, structures, and facilities, public or private, shall be connected to the public sewer system and all toilet facilities shall be of Type 1.

(Effective October 19, 2019)

2401-13-06 Public Sewer Not Available

- (A) Where no public sewer, intended to serve any lot or premises, is available in any thoroughfare or right of way abutting such lot or premises, wastewater piping from any building or facility, public or private, shall be connected to an approved owner/operator wastewater disposal system (IWDS or other wastewater management system) and all toilet facilities shall be of Type 1 or Type 2, unless the Board gives prior written consent for construction of a Type 3 facility upon a showing of special mitigating circumstances.
- (B) The public sewer may be considered as not being available when such public sewer is located more than two-hundred feet (200’) from any proposed building or facility or exterior drainage facility on any lot or premises which abuts and is served by such public sewer.
- (C) Vertical Alignments – where public sewer is located:
 - (1) more than twenty feet (20’) above the lowest floor level of the single family residence or a duplex, public sewer may be considered as not being available;
 - (2) more than fifty feet (50’) above the lowest floor level of any other structures, public sewer may be considered as not being available.

(Effective October 19, 2019)

2401-13-07 Public Sewer Connection

The connection of the building sewer to the public sewer shall conform to the requirements of the building and plumbing specifications established by the person responsible for the operations of the public sewer system and applicable rules and regulations of the Republic of Palau. All such connections shall be made gastight and watertight. Any deviation from the prescribed procedures and material must be approved before installation by the person responsible for the operation of the public sewer system.

(Effective October 19, 2019)

2401-13-08 Owner/Operator Wastewater Management Systems

- (A) Where permitted by Sections 2401-13-04 through 2401-13-06 of these Regulations, inclusive, a building may be connected to an owner/operator wastewater management system which complies with all applicable provisions set forth in these Regulations. The type of system shall be determined on the basis of estimated wastewater flow, wastewater constituents, proximity to surface waters, proximity to human habitation, area population density, soil characteristics, proximity to drinking water sources, and vertical separation distance from groundwater table, and shall be designed to provide adequately for treatment for all sanitary sewage or industrial wastewater generated on the property.
- (B) Where conditions are such that an owner/operator wastewater management system cannot be expected to function satisfactorily for commercial, agricultural, aquaculture, or industrial plumbing systems, or for installations where appreciable amounts of industrial or indigestible wastes are produced, or for hotels, hospitals, office buildings or schools or other occupancies producing abnormal quantities of sewage or liquid wastes, the method of wastewater collection, conveyance, treatment, and disposal shall require approval by the Board.
- (C) All owner/operator wastewater management systems that are designed to utilize the absorptive portions of the soil formation must have at least four feet (4') of unsaturated soil between the bottom of the system and the seasonally high ground water level or bedrock.
- (D) All owner/operator wastewater management systems that utilize the absorptive portions of the soil shall be so designed that additional subsurface infiltration areas, equivalent to at least 100% of the required original system, may be installed in the event that the original system fails and cannot absorb all the discharge fluid. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the usefulness of the 100% expansion area for its intended purpose.
- (E) For all properties where the public sewer is not available, no property shall be improved to the extent that exceeds the feasibility of an owner/operator wastewater management system to adequately manage sanitary sewage, industrial wastewater, or agricultural or aquaculture wastewater, in the quantities as determined and by the means provided in these Regulations.

- (F) Where there is insufficient lot area, unsuitable soil conditions, or other limiting features or characteristics that impede adequate sewage treatment and disposal from a building or proposed use of the land as determined by the Board, no building permit shall be issued and no wastewater management system shall be permitted. Where space or soil conditions are potentially marginal or critical, as determined by EQPB, no building permit shall be issued until engineering and test reports satisfactory to the Board have been submitted and approved.
- (G) Where public sewers may be installed at a future date, provision should be made in the building or facility plumbing system for connection to such sewer. Connection to the public sewer shall be required within a one (1) year period after the public sewer is available.
- (H) Nothing contained in these Regulations shall be construed to prevent the Board from requiring more stringent requirements than those contained herein when or where such more stringent requirements are essential to maintain a safe and sanitary condition and/or to prevent harm to the environment.

(Effective October 19, 2019)

PERMITS

2401-13-09 Permit Required

- (A) No construction for buildings, facilities, or other structures, public, commercial, government, or private, may commence without first obtaining a permit from the Board certifying that the following are in compliance with these Regulations:
 - (1) Toilet facilities;
 - (2) Connection to public sewer or owner/operator wastewater management system intended to serve such building(s) or structure(s); and
 - (3) All sanitary facilities, owner/operator wastewater management systems or public sewer connections subject to the provisions of these Regulations shall comply with the terms, conditions, provisions, and management plans for any National, State, or traditional conservation area, preserve, or other protected area as established by law.
- (B) Any person who wishes to make a significant treatment and disposal system modification, as defined by Section 2401-13-03(KK) of these Regulations, shall first obtain a permit from the Board for the proposed activity.

(Effective October 19, 2019)

2401-13-10 Required Information

Before any technical submittal for a permit application, including a project narrative and specific architectural/engineering drawings and specifications, will be reviewed for compliance with EQPB Regulations, architectural/engineering drawings and specifications shall contain the following as a minimum:

- (A) Vicinity Map (See Appendix A). Technical drawings (also termed “plans”) must include a vicinity map that shows location of property, with adjacent streets with names (if named), and other land marks that can easily be identified to show where the proposed project is to be established.
- (B) Site Plan (See Appendix A). Plans must include a site plan, drawn to scale, complete with all dimensions, and must contain the following:
 - (1) Location of all property lines, which must be verified by the Bureau of Lands and Surveys or a designated representative;
 - (2) Property area (e.g. square feet, acres, square meters, hectares);
 - (3) Lot number and zone designation (if applicable);
 - (4) Delineation of public rights of way, easements, and access roads (if applicable);
 - (5) Indication of all existing structures on the lot including location with respect to the lot boundaries as indicated by dimensions;
 - (6) Location of proposed wastewater management system, indicated by dimensions, in relation to property boundaries, public rights of way, easements and access roads, existing structures and utilities, surface waters, public sewer, and existing proposed buildings and structures;
 - (7) Site topography, showing contour lines and finished floor elevation of all existing or proposed buildings and structures;
 - (8) A log of soil formations and ground water levels.
- (C) Description of the complete installation of:
 - (1) Toilet facilities, and
 - (2) Connections to public sewer system, or
 - (3) For owner/operator wastewater management system, information must be provided for the type of collection, conveyance, treatment, and disposal system proposed, including all electrical, mechanical, and chemical treatment components and appurtenances and methods of assembly and installation.
- (D) Regardless of the type of wastewater management system applied for, the permit application should bear the signature of the Palau Public Utilities Corporation for water availability and verification and approval from Palau Public Utilities Corporation, or the operator of the applicable public sewer system, for public sewer connection if public sewer is available.

- (E) Design calculations for a proposed owner/operator wastewater management system are required. The extent and complexity of design calculations is understood to be a function of the complexity of the wastewater collection and treatment processes. The design and design calculations must be prepared by a licensed specialty contractor, original equipment manufacturer, or registered professional engineer and shall be sufficient for the Board to adequately evaluate the performance and effectiveness of the proposed system.
- (F) For systems that will utilize the absorptive portions of the soil, percolation and water table tests for owner/operator wastewater management systems must be conducted by a licensed specialty contractor or registered professional engineer and such tests results should bear the professional's credentials or stamp and signature.
- (G) For systems that will utilize the absorptive portions of the soil, complete individual wastewater disposal system designs and construction details should be included in the engineering drawings and specifications.
- (H) For systems that will utilize an electrical/mechanical/chemical treatment works, calculations and engineering and architectural drawings must be provided that describe all treatment components of the system and the treatment process, including chemical and water quality characteristics of the treated effluent, and point of discharge.
- (I) Three (3) complete sets of the technical submittal including design calculations and architectural/engineering drawings and specifications shall be provided by the applicant, one for the Environmental Quality Protection Board and two additional sets for distribution to other authorities as determined by the Board.
- (J) Such other information as the Board may require.

(Effective October 19, 2019)

2401-13-11 Permit Fees

Permit fees shall be as follows:

- (A) Residential, Government, & Non-Profit = \$10.00
- (B) Commercial/Industrial (excluding hotels, resorts, barracks, apartments, and other short-term or long-term accommodations) = \$50.00
- (C) Commercial hotels, resorts, barracks, apartments, and other short-term or long-term accommodations permit fee shall be based on the number of bedrooms (assuming two-person occupancy per bedroom) as follows:
 - 1. Five (5) bedrooms or less = \$50.00;
 - 2. Between six (6) and ten (10) bedrooms = \$100.00;
 - 3. Between eleven (11) and fifteen (15) bedrooms = \$500.00;
 - 4. Between sixteen (16) and twenty-five (25) bedrooms = \$1,000.00
 - 5. Between twenty-six (26) and one-hundred (100) bedrooms = \$5,000.00; and
 - 6. More than one-hundred (100) bedrooms = \$10,000.00.

7. If the number of occupants per bedroom is more than two (2), then a single room may be considered to be more than one (1) bedroom for the purposes of determining the application fee. For example, if a bedroom is intended for four (4) occupants, that bedroom shall be counted as two (2) bedrooms for purposes of determining the applicable permit fee in this Section. If a bedroom is intended for five (5) occupants, that bedroom shall be counted as three (3) bedrooms for purposes of determining the applicable permit fee in this Section. Etc.

(Effective October 19, 2019)

2401-13-12 Permit Automatically Void When

Any public sewer connection or owner/operator wastewater management system permit shall be void if the work authorized by the permit is not commenced within six (6) months after permit is issued, or if the work is suspended or abandoned for a period of six (6) months at any time after the work has commenced. For just cause stated in writing to the Board, the Board may allow up to a maximum of six (6) months extension of the permit. All such extensions shall be in writing and noted on the permit and in the EQPB file record.

(Effective October 19, 2019)

ESTIMATION OF WASTEWATER FLOW

2401-13-13 Average Daily Flow

The volume flow rate (volume per unit time) of wastewater that is generated from a facility, building, commercial/industrial development, single residences, apartment complex, or other structure is the basis for design for all owner/operator wastewater management systems. The quantity of wastewater generated is also important for the public utility provider that is responsible for operation of the public sewer system. For all new construction and all modification to existing residential, commercial, industrial, government, institutional, and public facilities that have actual or potential generation of wastewater, the average daily volume flow rate shall be estimated in accordance with Table I or Table II.

- (A) For all projects with proposed connection to the public sewer, except for residential dwellings, the values generated from Table I shall be considered the “average” daily flow rate (24-hour period) and shall be used as the basis of project design.
- (B) For all projects that propose an owner/operator wastewater management system, except for residential dwellings that propose to use septic tanks and SWIS or connect to the public sewer, the values generated from Table I shall be considered the “average” quantity of daily flow, and a peaking factor shall be applied to calculate “peak” daily flow as specified in 2401-13-15. All owner/operator wastewater management systems, except for residential dwellings, shall incorporate estimated average and peak daily flows into the project design.

(C) For residential dwellings that propose to connect to the public sewer or that will utilize an owner/operator wastewater management system, the values generated from Table II (see Section 2401-13-20) shall be considered the “average” daily flow rate (24-hour period) and shall be used as the basis of design. Peaking factors are not required for residential dwellings.

TABLE I. TYPICAL WASTEWATER FLOW RATES FOR COMMERCIAL, INSTITUTIONAL, AND RECREATIONAL SOURCES		
Facility	Unit	Flow (gal/unit/day)
<i>Commercial Sources</i>		
Airport	Passenger	3
Apartment building/complex	Person	50
Apartment, resort	Person	60
Automobile service station	Vehicle served	12
	Employee	13
Bar/Cocktail lounge	Customer	3
	Employee	13
	Seat	20
Boarding house	Person	40
Cafeteria	Customer	2
	Employee	10
Coffee shop	Customer	6
	Employee	10
Department store	Toilet room	500
	Employee	10
Hotel (includes urban and resort hotels)	Guest	50
	Employee	10
Industrial building (sanitary waste only)	Employee	13

TABLE I.
TYPICAL WASTEWATER FLOW RATES FOR COMMERCIAL, INSTITUTIONAL, AND RECREATIONAL SOURCES

Facility	Unit	Flow (gal/unit/day)
Laundry (self-service)	Machine	550
	Wash	50
Office	Employee	13
Public lavatory	User	5
Restaurant (with toilet facilities)	Meal served	3
	Conventional	Customer
Short order	Customer	6
Bar/cocktail	Customer	3
Shopping center (with toilet facilities)	Employee	10
	Parking space	2
Store, resort	Customer	3
	Employee	10
Store, variety or general merchandise	Customer	3
	Employee	10
Theater	Seat	3
<i>Institutional Sources</i>		
Assembly hall	Seat	3
Hospital, medical	Bed	165
	Employee	10
Hospital, neurological	Bed	100
	Employee	10
Nursing home	Resident	90
	Employee	10
Prison	Inmate	120
	Employee	10

TABLE I.
TYPICAL WASTEWATER FLOW RATES FOR COMMERCIAL, INSTITUTIONAL, AND RECREATIONAL SOURCES

Facility	Unit	Flow (gal/unit/day)
School, day-only		
With cafeteria, gym, showers	Student	25
With cafeteria only	Student	15
With gym only	Students	13
Without cafeteria, gym, showers	Student	11
School, boarding	Student	75
<i>Recreational Facilities</i>		
Bowling alley	Alley	200
Cabin, resort	Person	40
Camps:		
Pioneer type	Person	25
Children's, with central bath/toilet	Person	45
Day, with meals	Person	15
Day, without meals	Person	13
Luxury, private bath	Person	90
Trailer	Trailer	125
Campground, developed	Person	30
Country club (golf, tennis, swimming)	Guests onsite	100
	Employee	13

TABLE I.
TYPICAL WASTEWATER FLOW RATES FOR COMMERCIAL, INSTITUTIONAL, AND RECREATIONAL SOURCES

Facility	Unit	Flow (gal/unit/day)
Dining hall	Meal served	7
Dormitory/bunkhouse	Person	40
Fairground	Visitor	2
Picnic park (with toilet facilities)	Visitor	8
Swimming pool	Customer	10
	Employee	10
Visitor center	Visitor	5

Source: USEPA OWTS Manual EPA/625/R-00/008 (2002)

(Effective October 19, 2019)

2401-13-14 Peak Daily Flows

Estimated peak daily flows shall be incorporated into the design for an owner/operator wastewater management system for all projects, except for residential dwellings, whether or not the project proposes connection to the public sewer for disposal of treated effluent. A peak daily flow factor of 1.5 shall be applied to the calculated average daily flow (24-hour period). The daily peak factor is applied to owner/operator systems to ensure adequate hydraulic and treatment capabilities for daily variability in flows above the average flow, typical of non-residential dwellings activities.

(Effective October 19, 2019)

2401-13-15 Peak Wet Weather Flow

Estimated peak wet weather flow shall be incorporated into all design elements for all components of the public sewer system. Design basis and calculations shall be provided that support the selected wet weather flow factor that will be applied to the estimated average daily flow. The design basis and calculations shall include such factors that are reasonably expected to contribute to wet weather flow in the wastewater collection, conveyance, and treatment system, including but not limited to, surface runoff, infiltration and inflow, and un-permitted storm water connections (See EPA Guide for Estimating Infiltration and Inflow, June 2014, <http://www.epa.gov/region1/sso/toolbox.html>).

(Effective October 19, 2019)

REQUIREMENTS FOR CONNECTION TO PUBLIC SEWER

2401-13-16 New Construction and Modifications to Existing Wastewater Sources

All proposed new construction or modification to existing facilities, residences, or commercial, government, or public buildings or structures with actual or potential generation of wastewater shall connect to the public sewer, if available as defined in Section 2401-13-03(F), as required in these Regulations.

- (A) The project proponent shall provide a complete technical submittal including architectural/engineering design that includes drawings and specifications to the Palau Public Utilities Corporation or the operator of the applicable public sewer system.
- (B) The project proponent shall provide estimated volume flow rate of wastewater as the basis of design, in accordance with Sections 2401-13-14 through 2401-13-16, as applicable.
- (C) The project proponent must receive approval for connection to the public sewer from the Palau Public Utilities Corporation or the operator of the applicable public sewer system.

(Effective October 19, 2019)

REQUIREMENTS FOR OWNER/OPERATOR WASTEWATER MANAGEMENT SYSTEMS

2401-13-17 Privies, Pit-toilets, Outhouses and Benjos

Single-user sanitary facilities that are limited in construction to a lined or un-lined dug pit with or without an above-ground structural enclosure constitute the most basic form of improved sanitation, and for the purposes of these Regulations, shall be termed privies, pit-toilets, outhouses, or benjos (collectively “pit-toilets”). Construction and use of these facilities are limited to rural areas and agricultural lands, in accordance with:

- (A) A site inspection by EQPB or its authorized representative;
- (B) The maximum use rate allowed is 1 person-use per acre per day;
- (C) The bottom of the pit shall not be greater than 3 feet below the ground surface and shall be separated at least 4 feet vertically from the highest expected ground water level;
- (D) Pit-toilets shall be located at least three-hundred feet (300’) down-slope of any drinking water well source and at least fifty-feet (50’) from a surface water body or dwelling;
- (E) Pit-toilets shall not be located upslope of any surface water which is a drinking water source;
- (F) Final location and construction of pit-toilets shall be approved by the Board.

(Effective October 19, 2019)

2401-13-18 Waterless Composting Toilets

Waterless composting toilets are single-user or multi-user sanitary facilities that consist of a sealed (water-tight) composting/storage container, a ventilation system to maintain aerobic conditions and to disperse gases and odors, and an access door or hatch to remove finished compost material. Waterless composting toilets shall be located at least fifty-feet (50') down-slope of any drinking water well source or at least fifty-feet (50') from a surface water body or dwelling. Graphical representation of composting toilet design can be found in Appendix A of these Regulations. EQPB approved technical resources for design and construction of composting toilets include:

- (A) Design Examples of Waterless Composting Toilets, SOPAC Miscellaneous Report 249 (1997);
- (B) Water Efficiency Technology Fact Sheet, EPA 832-F-99-066 (1999);
- (C) Sustainable Sanitation Manual and Construction Guidelines for a Waterless Composting Toilet, IWP – Pacific Technical Report (International Waters Project) no. 52 (2016).

These technical references are available free from EQPB in hard-copy and electronic format.

(Effective October 19, 2019)

2401-13-19 Sealed Septic Tanks with Subsurface Wastewater Infiltration System (SWIS): Septic Tank Capacity

- (A) Septic tank capacity for residential dwellings. The net volume or effective capacity below the flow line of a residential septic tank, for flows up to 320 gallons per day, must be at least 750 gallons. For flows between 480 and 960 gallons per day, the capacity of the tank must be nominally two (2) days' sewage volume flow. The liquid capacity and size of septic tank as determined by the number of bedrooms in single family or duplex residential units shall be as established in Table II.

TABLE II
GUIDELINES FOR CONSTRUCTION OF RESIDENTIAL SEPTIC TANK: LIQUID CAPACITY

Number of Bedrooms	Sewage Flow (gallons per day)	Minimum Tank Capacity (gallons, nominal)	Recommended Minimum Inside Tank Dimension (L x W x D)
2	320	750	5' x 4' x 5'
3	480	1000	7' x 4' x 5'
4	640	1200	8' x 4' x 5'
5	800	1600	9' x 5' x 5'
6	960	1850	10' x 5' x 5'

Source: USEPA OWTS Manual EPA/625/R-00/008 (2002)

Notes: (1) Dimensions; L=length (ft), W= width (ft), D = depth (ft) of liquid measured from the base slab to invert of outlet tee.

(2) Assumes 2 persons per bedroom, 80 gallons per person per day, and nominal detention time of 2 days.

(B) Large Septic Tanks – for non-residential flows greater than 960 and up to 15,000 gallons per day – the minimum tank capacity must be equal to 1125 gallons plus 75% of daily sewage flow. The formula $V = 1125 + 0.75 Q$ shall be used, where value V is the net liquid volume in gallons, and Q is the calculated average daily sewage volume. Table I may be used to determine average flow per day for determining size of large septic tanks. Septic tanks shall not be permitted for any flows in excess of 15,000 gallons per day.

Example: *A hotel providing en suite shower and toilet, with a restaurant that serves 40 persons 2 meals per day each, for a maximum capacity of 80 persons, has 10 employees. Determine the capacity and dimensions of the septic tank needed. Table I indicates that per day, 50 gallons of sewage per guest, 10 gallons of sewage per employee, 9 gallons per restaurant customer and 3 gallons per meal served. Total estimated daily wastewater flow = $(80 \times 50) + (10 \times 10) + (9 \times 2 \times 40) + (3 \times 2 \times 40) = 5060$ gallons. Q in the formula = 5060 gallons. Then $V = 1125 + 0.75 \times 5060 = 4920$ gallons There are 7.485 gallons in 1 cubic foot. Then $4920 \div 7.485 = 657$ cubic feet. A tank 5 ft deep (liquid), 8 ft wide, and 17 ft long will provide 680 cubic feet.*

(Effective October 19, 2019)

**2401-13-20 Sealed Septic Tanks with Subsurface Wastewater Infiltration System (SWIS):
Septic Tank Location and Construction Standards**

- (A) No component of the system shall be located so that it is nearer to any feature than as specified in Table III, or so that surface drainage from its location may reach any domestic water supply. The distances in Table III are the minimum distance to any water of the Republic, property lines, dwelling, school, public building, or a building used for commercial or industrial purposes or place of assembly.
- (1) Suggested locations of tanks and infiltration fields on varying ground slopes are found in Appendix A.
 - (2) Location shall be such as to provide not less than the stated minimum distances in Table III.
- (B) Septic Tank Design:
- (1) Septic tank design shall be such as to provide access for cleaning, adequate volume for settling, and for sludge and scum storage (See Appendix A). The structural design shall provide for a sound, watertight, durable tank, which will sustain all wheel and soil loads and pressures and will resist corrosion.
 - (2) Liquid capacity shall be based on calculated flows (Table I) or the number of bedrooms (Table II) proposed or reasonably anticipated.
 - (a) The liquid depth of the tank or compartment shall be 5 feet as measured from the base slab to the invert of the effluent tee. A liquid depth greater than 5 feet shall not be considered in determining tank capacity;
 - (b) No tank or compartment thereof shall have an inside horizontal dimension of less than four (4) feet. Scum storage shall equal 15% of the total liquid depth and shall be measured from the top of the liquid level to the top of the vertical leg of the inlet tee and outlet tee, excluding the one-inch (1") high air space at the top of the tank. In no case shall scum storage space be less than seven-inches (7") in height;
 - (c) The upward vertical leg of the inlet and outlet tees shall extend upward to within one-inch (1") of the underside of the cover.
 - (3) The downward vertical legs of the inlet and outlet tees shall be submerged so as to obtain effective retention of scum and sludge. The vertical leg of the outlet tee shall extend downward to a point two feet (2') below the liquid surface. When a partition wall is used to subdivide the tank, it shall have a four-inch (4") diameter minimum opening, with the same invert elevation as the tank outlet tee. The partition wall shall have an opening above the liquid surface so that air can freely exchange on both sides of the partition.
 - (4) The inlet tee invert shall be three-inches (3") above the outlet tee invert.
 - (5) When multi-compartment tanks are used, the volume of the first compartment shall be equal to or greater than that of any other compartment.

- (6) Access to each compartment of the tank shall be provided by an 18" x 18" (minimum) manhole or other removable cover. The inlet and outlet tee connection shall also be accessible through properly placed manholes, handholes or by other easily removed covers.
- (7) Where the top of the septic tank is below the ground level, manholes, when used, shall be built up to ground grade level using rings, risers or other suitable structures.
- (8) The wall of the tank shall not be less than four-inches (4") thick reinforced concrete poured in place or less than eight-inches (8") thick load bearing concrete hollow block reinforced at every sixteen-inches (16") on center laid on a solid foundation and mortar joints well filled, plastered with one-half inch (½") concrete mortar in the inside of the tank. The tank covers and floor slabs shall be not less than four-inch (4") thick reinforced concrete. Septic tank covers may either be poured-in-place or pre-cast. The minimum compressive strength of any concrete septic tank wall, top and covers, or floor shall not be less than 2,500 pounds per square inch (psi).
- (9) All septic tank covers shall be capable of supporting an earth load of not less than three-hundred (300) pounds per square foot where the maximum unsupported span does not exceed three (3) feet.
- (10) After the completion of the septic tank, the inside shall be cleaned and all forms removed, before occupancy permits will be issued.

<p style="text-align: center;">TABLE III SEPTIC SYSTEMS (ALL COMPONENTS) MINIMUM SAFE DISTANCES IN FEET</p>			
From	To Septic Tank	To Distribution Box	To Subsurface Wastewater Infiltration System
Any water of the Republic	50 feet	50 feet	50 feet
Any dwelling, school, public building, a building used for commercial or industrial purpose, or place of assembly	10 feet	20 feet	20 feet
Property boundary lines	5 feet	5 feet	5 feet
Water lines	10 feet	10 feet	10 feet
Wells	50 feet	50 feet	300 feet

Source: US EPA OWTS Manual EPA/625/R-00/008 (2002)

(Effective October 19, 2019)

2401-13-21 Percolation Tests

- (A) The required soil absorption area for treated wastewater disposal using a SWIS for individual residences, where applicable, shall be determined from Table I or Table II and Table IV (see *Example* in Section 2401-13-23).
- (B) If it is determined that the absorption quality of soils in any location is other than those shown in Table IV, the proposed location of the SWIS shall be adjusted according to percolation tests acceptable to the EQPB.
- (C) The number of percolation rate tests shall be determined by the size of the SWIS as follows:
 - (1) For individual lots:
 - (a) For SWIS up to 1,000 square feet, perform two (2) percolation rate tests;
 - (b) For SWIS up to 1,500 square feet, perform three (3) percolation rate tests;
 - (c) For SWIS up to 2,000 square feet, perform four (4) percolation rate tests; and
 - (d) For SWIS more than 2,000 square feet, consult with EQPB staff to determine the appropriate number and location of percolation rate tests.

- (e) Where the soil is not uniform or there is more than one type of soil on the lot, one percolation test is required as a minimum at the center of each variation or type of soil of significant extent.
 - (2) For subdivisions or multiple lots, one (1) percolation test per acre is required as a minimum for each area consisting of generally uniform soil of one (1) major type. Where the soil is not uniform or there is more than one (1) type of soil on the lot, one (1) percolation test is required as a minimum at the center of each variation or type of soil of significant extent.
- (D) Percolation. All percolation tests required should be performed in accordance with the following (also, see Appendix A for graphical representations):
- (1) Dig or bore the holes with diameter of twelve-inches (12”) and depth reaching the bottom of the proposed absorption area, but no less than eighteen-inches (18”) deep. The sides of the bore hole should be vertical. Holes can be bored with any post-hole or auger type device.
 - (2) Roughen or scratch the bottom and sides of the hole to provide a natural surface. Remove all loose material from the hole. Place about two-inches (2”) of coarse sand or fine gravel in the hole to prevent bottom scouring when adding water.
 - (3) Fill the hole with clear water to a minimum depth of twelve-inches (12”) over the gravel. By refilling, or by supplying a surplus reservoir of water (e.g., automatic siphon), keep water in hole for at least four (4) hours, and preferably overnight. In granular soils, i.e., GW, GP, GM, SW, SP, or SM classified according to the Unified Soils Classification System (ASTM D2487-11), the test can be made after the water from one (1) filling has seeped away.
 - (4) Percolation rate measurements should be made on the day following the saturation process, except in granular soils as designated in 2401-13-22(D)(3) above.
 - (5) If water remains in the test hole on overnight saturation, adjust water level to a depth of 6 inches over the gravel. From a fixed reference point, measure the drop in water level at approximately thirty (30) minute intervals over a four (4) hour period. The drop which occurs during the final thirty (30) minute period is used to calculate the percolation rate. If a soil or site is determined by the EQPB to be poorly drained with an accompanying high water table, it is unsuitable regardless of percolation test data.
 - (6) If no water remains in the hole after overnight saturation, add clear water to a depth of about six-inches (6”) over the gravel. From a fixed reference point, measure the height of the water surface at approximately thirty (30) minute intervals over a four (4) hour period, refilling the hole to a depth of six-inches (6”) when the percolation rate indicates the hole will run dry before the next reading is made. The drop which occurs during the final thirty (30) minute period is used to calculate the percolation rate. If a hole must be refilled to obtain a final

thirty (30) minute reading, determine from the previous reading the water level drop during that interval and add water until the level above the bottom equals this figure plus one-half inch ($\frac{1}{2}$ "). Continue the test, measuring the drop during the final thirty (30) minute period.

- (7) In granular soils, or other soils in which the first six-inches (6") of water seeps away in less than thirty (30) minutes, after the overnight saturation period, the time interval between measurements can be taken in ten (10) minute intervals over a one (1) hour period. The drop which occurs in the final ten (10) minute period is used to calculate the percolation rate.

(Effective October 19, 2019)

2401-13-22 Requirements for Subsurface Wastewater Infiltration System (SWIS)

- (A) The minimum effective absorption area, in square feet, shall be based on the daily average flow rate (Table I or II), applicable peaking factors, and soil percolation rate (Table IV).
- (B) Subsurface wastewater infiltration system can be constructed if:
 - (1) The SWIS is to be located in an area which is well drained, i.e., no storm water flooding or ponding, and where no storm water is diverted for percolation or sedimentation;
 - (2) The SWIS is to be located in an area which has a ground slope no greater than 15% (fifteen-feet (15') rise or fall in one-hundred feet (100') of horizontal distance);
 - (3) The SWIS is to be located in an area which has safe access, and is not subject to severe erosion;
 - (4) The SWIS is constructed to the required size;
 - (5) No component of the SWIS shall be located so that it is nearer to any feature than as specified in Table III;
 - (6) The SWIS does not exceed the dimensional limitations specified in these Regulations;
 - (7) The percolation test indicates a percolation rate between three-quarters of an inch ($\frac{3}{4}$ ") per hour and thirty-inches (30") per hour (Table IV);
 - (8) The soil test pit did not reveal groundwater within eight feet (8') of the existing ground surface;
 - (9) The soil test pit did not reveal groundwater within four feet (4') of the bottom of the proposed leaching field.
- (C) Total Required Absorption Area. The total needed absorption area of a subsurface wastewater infiltration system shall be determined by using Tables I or II, applicable peaking factors, and Table IV. The applicant shall determine the required soil absorption factor from Table IV, based on the results of the percolation test, and divide the daily sewage flow rate determined in Table I or II, including peaking factors as applicable, by the required soil absorption factor.

Example: A single-family residential dwelling on a lot has 3 bedrooms. The estimated daily sewage flow rate is 480 gallons (Table II). A percolation test is conducted and the final soil percolation rate is determined to be 1.25 inches per hour. According to Table IV, the soil absorption factor is 0.6 gallons per square foot per day. The required leaching area is $480 \div 0.6 = 800$ square feet. A subsurface wastewater infiltration system consisting of trenches, chambers, bed, or seepage pit must provide a soil area of 800 square feet. The Applicant decides to use a trench system. Standard trench width is 3 feet. Trench bottom area begins at connection to perforated pipe from distribution box, and ends 1.5 feet beyond end of perforated drain pipe. For a 40-foot perforated pipe, trench bottom area = 41.5 feet X 3 feet = 124.5 square feet. Seven (7) trenches will result in $124.5 \times 7 = 870$ square feet of total soil absorption area. If 52-foot pipe is used (maximum) then each trench is 53.5 feet X 3 feet = 160.5 square feet, and 5 trenches x 160.5 square feet = 802.5 square feet of total soil absorption area.

TABLE IV. PERCOLATION RATES AND SOIL ABSORPTION FACTORS	
Final Soil Percolation Rate	Required Soil Absorption Factor
¾ inch to 0.99 inch per hour.*	0.5 gal/sq ft/day
1 inch to 1.5 inches per hour.*	0.6 gal/sq ft/day
1.51 inches to 1.99 inches per hour.*	0.8 gal/sq ft/day
2 inches to 3.99 inches per hour	0.9 gal/sq ft/day
4 inches to 5.99 inches per hour.	1.3 gal/sq ft/day
6 inches to 11.99 inches per hour.	1.6 gal/sq ft/day
12 inches to 17.99 inches per hour.	2.2 gal/sq ft/day
18 inches to 30 inches per hour.	2.5 gal/sq ft/day

Source: US EPA OWTS Manual EPA/625/R-00/008 (2002)

*For Final Soil Percolation Rates of less than 2 inches per hour, absorption trenches will be required.

- (E) Absorption Trenches. When soil characteristics and site conditions are acceptable to the Board, a trench system may be used. Minimum required absorption factors are given in Table IV. For a trench type system, the available absorption area is the bottom of the area of the trench. The standard trench width is three-feet (3') (see Appendix A). For purposes of infiltration efficiency, trench systems are preferred over all other SWIS.
- (F) Absorption Bed. When soil characteristics and site conditions are acceptable to the Board, a bed system may be used. Minimum required absorption factors are given in Table IV. For a bed type system, the available absorption area is the entire area of the bed to a distance of one-and-one-half feet (1.5') beyond the peripheral drain lines, and end of pipes. Bed

systems dimensions are given in Table V. For purposes of infiltration efficiency, bed systems are preferred over chambers or seepage pits.

- (G) Leaching Chambers. When soil characteristics and site conditions are acceptable to the Board, a chamber system may be used. Minimum required absorption factors are given in Table IV. For leaching chambers (see Appendix A), the available absorption area is the area under the chamber(s) or as specified by the manufacturer. Dimensions of leaching chambers are governed by the dimensions of the manufactured product. For purposes of infiltration efficiency, chambers are preferred over seepage pits.
- (H) Seepage Pits. When soil characteristics and site conditions are acceptable to the Board, a seepage pit system may be used. Minimum required absorption factors are given in Table IV. For seepage pits, the available absorption area is the bottom area of the pit and the sidewall area to two-feet (2') above the bottom. Seepage pit construction criteria are given in Table VI. For purposes of infiltration efficiency, seepage pits are the least preferred SWIS.
- (I) Construction of Perforated Drain Lines for SWIS:
 - (1) All SWIS construction using leaching trenches or leaching beds shall conform to the dimensional limitation and requirements shown on Table V.

TABLE V. SUBSURFACE WASTEWATER INFILTRATION SYSTEM CONSTRUCTION (TRENCHES AND BEDS)		
Design Parameter	Min.	Max.
Number of drain lines	2lines	7lines
Diameter of drain lines	4 inches	4 inches
Length of drain lines	20feet	52feet
Dimensions of bed configuration	25feet (length) 12feet (width)	60feet (length) 35feet (width)
Spacing of drain lines center to center	3feet	6feet
Distance from drain line to edge of field	3 feet	3 feet
Depth of final cover (total) over drain lines	12inches	24inches
Depth of gravel fill material under drain lines	12inches	24inches
Depth of gravel fill material over drain lines	6inches	12inches
Size of gravel fill (no fines)	¾ inch	1 ½ inch
Depth from bottom of gravel to water	4 feet	No maximum

- (2) Construction of SWIS in filled ground is permitted only if the bottom (bottom of aggregate fill material below drain lines) extends beneath the drain lines to a depth of not greater than twenty-four inches (24") below the original ground surface.
 - (3) Distribution drain lines shall be:
 - (a) Constructed of perforated PVC or PVC-O pipes. Perforations shall be $\frac{1}{2}$ - $\frac{5}{8}$ inch diameter, spaced at six-inches (6") along three (3) rows at the invert (6:00 o'clock position) and at the 4:30 o'clock and the 7:30 o'clock positions.
 - (b) Laid with a slope ranging from flat to not greater than 0.001 foot/foot, as measured along the length of the drain line. The ends of the drain lines shall be capped.
 - (c) Schedule 80 if the drain lines are placed in an area subject to heavy loads, such as from cars or other vehicles. Schedule 40 shall be used in all other areas.
 - (d) Drain lines and washed clean gravel (no fines) in trenches shall then be covered with filter material of geotextile, untreated building paper, straw, or similar porous material to prevent closure of the voids with earth backfill. No earth backfill shall be placed over the filter material cover until after the inspection and acceptance by the Board.
- (J) Construction of Leaching Chambers and Seepage Pits for SWIS.
- (1) An applicant proposing subsurface disposal of treated wastewater effluent may employ leaching chambers or a seepage pit to dispose of primary or secondary treated effluent. This Sub-Section describes the design and construction requirements associated with use of chambers or seepage pits.
 - (2) Chambers shall be installed in accordance with manufacturer's specifications.
 - (3) Chamber and Seepage Pit Criteria. Use of chambers or a seepage pit is allowed if ALL of the following criteria are met:
 - (a) The chamber(s) or seepage pit is to be located in an area which is well drained, i.e., no storm water flooding or ponding and where no storm water is diverted for percolation or sedimentation;
 - (b) The chamber(s) or seepage pit is to be located in an area which has a ground slope no greater than 15% (fifteen-feet (15') rise or fall in one-hundred feet (100') of horizontal distance);
 - (c) The chamber(s) or seepage pit is to be located in an area which has safe access and is not subject to severe erosion;
 - (d) The chamber(s) or seepage pit can be constructed to the required size and configuration specified in this section, while maintaining the setback requirements of these Regulations;

- (e) The percolation test indicates a percolation rate in the range of three-quarters inches ($\frac{3}{4}$ "") per hour to thirty-inches (30") per hour for chambers;
 - (f) The percolation test indicates a percolation rate in the range of three-quarters inches ($\frac{3}{4}$ "") per hour to thirty-inches (30") per hour for seepage pits;
 - (g) The soil test pit did not reveal groundwater within eight feet (8') of the existing ground surface;
 - (h) The soil test pit did not reveal groundwater within four feet (4') from the bottom of the chamber or seepage pit.
- (4) Dimensions Required for Seepage Pits. All seepage pit construction shall conform to the dimensional limitations and requirements shown on Table VI:

TABLE VI. SEEPAGE PIT CONSTRUCTION		
Design Parameter	Min.	Max.
Length / width ratio	1:1	4:1
Total inside depth	2feet	8feet
Percentage openings in wall	2%	4%
Depth of gravel fill below pit floor	24 inches	No maximum
Thickness of gravel fill around pit	24 inches	No maximum
Depth below gravel fill to water table	4 feet	No maximum
Size of gravel	$\frac{3}{4}$ inches (no fines)	2 $\frac{1}{2}$ inches (no fines)
Earthen cover over top of pit	No minimum	24 inches

- (5) Septic Tank to Chamber(s) or Seepage Pits Connection. PVC or PVC-O pipes with tight joints shall be used in connecting the septic tank to the chamber(s) or seepage pits.
- (6) Access to Seepage Pits. Access to the seepage pit shall be provided by an 18" x 18" inch manhole or removable cover. The inlet connection(s) shall also be accessible through properly placed manholes, lift rings, or by easily removed covers.
- (7) Manholes Built to Grade Level. Where the top of the seepage pit is below grade level, manholes, when used, shall be built up to finished grade using risers, rings, or other suitable materials.

- (8) Configuration of Seepage Pits:
 - (a) For a rectangular seepage pit:
 - (i) The walls shall not be less than six-inches (6") thick reinforced concrete poured in place, laid on a solid footing foundation with an open bottom of aggregate fill, provided that a minimum of 2% of the wall area evenly distributed below the bottom of the inlet pipe is perforated to be open to the surrounding soil, or
 - (ii) The walls shall not be less than six-inches (6") thick load bearing concrete hollow block reinforced at every sixteen-inches (16") on center, and laid on a solid footing foundation and placed with horizontal mortared joints with an open bottom of aggregate fill. The vertical joints shall not be mortared, and shall have a clear opening of 3/8 to 5/8 inches between each block.
 - (b) For a circular seepage pit:
 - (iii) Circular seepage pits are acceptable, provided that the wall area has the required minimum 2% openings to the surrounding soil, similar to rectangular seepage pits.
- (9) Seepage Pit Covers. All seepage pit covers shall be capable of supporting earth load of not less than three-hundred (300) pounds per square foot where the maximum unsupported span does not exceed three feet. Where seepage pits may be subject to traffic loads (e.g., parking lot, driveway), the entire structure shall be designed to withstand H-20 loading (AASHTO).
- (10) Cleaning Before Use. After the completion of the seepage pit and before it is put into use, the inside shall be cleaned and all forms removed.
- (K) Distribution Box. A distribution box containing a separate outlet for each distribution line shall be installed for all drain line disposal systems and seepage pits whenever there are two (2) or more drain lines, chambers, or seepage pits. All outlet pipes from the distribution box shall have exactly the same pipe invert elevation.
- (L) Placing Gravel for Drain Lines, Chambers, or Seepage Pits. Before placing gravel filter material in a prepared excavation, all smeared or compacted surfaces shall be removed from the natural soil surface by raking to a depth of one-inch (1") and the loose material removed. Clean stone, free from fines, soils, dust, or debris, varying in sizes from 3/4 inch to 2 1/2 inch shall be placed in the excavation according to dimensions as required in Tables V and VI.

(Effective October 19, 2019)

2401-13-23 Electrical/Mechanical/Chemical Wastewater Treatment Systems with Point Effluent Discharge

- (A) Standards for Design and Construction. The design and construction of all wastewater systems under this section shall generally follow the criteria and recommended practices outlined in the “Recommended Standards for Wastewater Facilities”, by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (“10 State Standards”), latest edition. Chapters 50, 60,70,80,90 and 100 are of particular importance. Copies of the “10 State Standards” may be obtained through Health Research Inc., Health Education Services Division, P.O. Box 7126, Albany, NY 12224, USA, telephone number (518) 439-7286, or on the world wide web. In addition, design, construction, operation practices, and financial requirements shall meet with any specified criteria as may be set forth by the Board for any particular project.
- (B) The policy of the Board is to encourage rather than obstruct the development of new and innovative methods or equipment for the treatment of wastewater that will meet the intent and purpose of these Regulations. The “10 State Standards” are intended as a technical reference and guide. The lack of inclusion in these standards of some types of wastewater treatment processes or equipment should not be construed as precluding their use. The Board may approve various types of wastewater treatment processes and equipment under the conditions that the operational reliability and effectiveness of the process or device shall have been demonstrated and documented for one (1) or more comparably-sized units operating at design load conditions, and that all applicable regulatory requirements are met. To determine whether new or innovative processes and equipment or applications have reasonable and substantial likelihood of success, the Board may require the following:
- (1) Monitoring or observations, including test results and engineering evaluations that demonstrate the efficiency of such processes and equipment;
 - (2) Detailed description of the test methods;
 - (3) Analysis of influent and effluent waste constituents, including appropriately-composited samples, under various ranges of influent strength, flow rates and waste temperatures (including diurnal variations) over a sufficient length of time to demonstrate performance under the range of climatic and other conditions which may be encountered for the proposed installations; and/or
 - (4) Other appropriate information. The Board may require that the appropriate sampling and testing be conducted and evaluations be made under the supervision of a competent process engineer other than those employed by the manufacturer, patent holder, construction contractor, or project proponent.
- (C) Requirements to achieve secondary treatment standards. All systems permitted under this section shall meet, at a minimum, secondary effluent treatment standards as given in Table VII. Other parameters may be of concern in treated wastewater effluent, in addition to those listed in Table VII, and will be determined by the Board following waste characterization for influent and effluent waste streams.

TABLE VII SECONDARY TREATMENT STANDARDS		
Parameter	30-day average	7-day average
BOD ₅	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
BOD ₅ and TSS removal (concentration)	Not less than 85%	--
Ph	within the limits of 6.0-9.0	

Source: US EPA NPDES Permit Writer's manual, EPA-833-k-10-001 (2010)

(D) Chemical/biological analyses for wastewater parameters shall be included for influent and effluent for all proposed electrical/mechanical/chemical treatment works, to characterize the waste stream and demonstrate removal efficiencies, including:

- (1) Total suspended solids (mg/L)
- (2) pH
- (3) Biochemical oxygen demand (5-day) (mg/L)
- (4) Chemical oxygen demand (mg/L)
- (5) Total nitrogen (mg/L)
- (6) Ammonia (mg/L)
- (7) Total phosphorous (mg/L)
- (8) Oil and grease (mg/L)
- (9) Escherichia coli bacteria (cfu/100 mL)
- (10) Enterococcus bacteria (cfu/100 mL)
- (11) Priority Pollutant Scan per US EPA Priority Pollutant List (40 CFR Part 423, Appendix A).

The Board may require additional parameters or analyses depending on the analytical results and the type of treatment works proposed. All analyses shall be conducted by a laboratory certified by the US EPA or at a laboratory approved by the EQPB.

(E) Wastewater treatment systems utilizing electrical/mechanical/chemical processes shall be designed and operated to produce, at a minimum, a secondary treated effluent and control of priority pollutants. A secondary treated effluent may be disposed of through (listed in order of preference):

- (1) connection to the public sewer;
- (2) a subsurface wastewater infiltration system, such as a leaching field system, subject to the requirements of these Regulations;
- (3) a wastewater holding tank (with the minimum capacity as required by Section 2401-13-25) with wastewater to be removed by a certified hauler to an approved wastewater disposal site; and/or
- (4) direct discharge to waters of the Republic, subject to the EQPB Water Quality Standards (Chapter 2401-11). Direct discharge to waters of the Republic is disfavored and shall be avoided when other wastewater disposal methods are

possible. Any person who wishes to directly discharge into waters of the Republic shall minimize said discharge through wastewater recycling and any other methods approved by the Board intended to reduce the amount of discharge.

- (F) Receiving Water Monitoring. All owner/operator systems permitted under this section that utilize a point source discharge of treated wastewater effluent to waters of the Republic shall conduct receiving water monitoring in accordance with the following criteria:
- (1) Prior to discharge of treated wastewater effluent, the system owner/operator shall conduct a baseline water quality assessment in the area of the proposed point discharge. The baseline assessment will include all parameters of Chapter 2401-11 Marine and Freshwater Quality Regulations;
 - (2) Monitoring events will be conducted on a semi-annual (twice yearly) basis or upon request;
 - (3) Monitoring events will generally correspond to the Palau “Rainy Season” (typically June through August) and “Dry Season” (typically February through March);
 - (4) Receiving water sampling stations shall be established by latitude and longitude and shall remain fixed upon Board approval and shall not be changed unless approved by the Board;
 - (5) A minimum of five (5) sampling stations shall be established, including one (1) station directly over the point of discharge, and one (1) station each at a distance of one-hundred (100) meters from the point of discharge, at true compass bearings of northeast (045°), southeast (135°), southwest (225°) and northwest (315°).
 - (6) Water samples shall be collected at each station according to depth of water:
 - (a) For waters ten-meters (10m) or less, one (1) sample one-meter (1m) below surface and one (1) sample mid-depth;
 - (b) For waters greater than ten-meters (10m), one (1) sample one-meter (1m) below surface, one (1) sample mid-depth, and one (1) sample one-meter (1m) above bottom;
 - (7) Receiving water monitoring results shall be submitted to EQPB within ninety (90) calendar days after completion of each semi-annual monitoring event.
 - (8) All receiving water sampling and monitoring must be conducted using acceptable scientific practices in accordance with the applicable US EPA method or as specified in the current Standard Methods for the Examination of Water and Wastewater (APHA, AWWA, WEF, latest edition).
 - (9) Receiving water parameters for each semi-annual monitoring event shall include:
 - (a) Total suspended solids (mg/L)
 - (b) pH
 - (c) Biochemical oxygen demand (5-day) (mg/L)
 - (d) Chemical oxygen demand (mg/L)
 - (e) Total nitrogen (mg/L)

- (f) Ammonia (mg/L)
 - (g) Total phosphorous (mg/L)
 - (h) Oil and grease (mg/L)
 - (i) Escherichia coli bacteria (cfu/100 mL)
 - (j) Enterococcus bacteria (cfu/100 mL)
- (10) Receiving water quality monitoring requirements are subject to change by EQPB if ecological conditions indicate that the point source discharge has an unacceptable level of degradation impact on water quality as determined by EQPB.

(Effective October 19, 2019)

2401-13-24 Wastewater Holding Tanks

- (A) Where lot size and/or soil type are such that methods of on-site wastewater disposal described herein cannot be utilized, the storing of a residence's or commercial operation's wastewater in water-tight tanks (holding tanks), with periodic pumping by certified hauler (see Section 2401-13-34), may be permitted in very limited circumstances. The purpose of permitting holding tanks is to provide land owners with some economic beneficial use of the land without compromising environmental quality or public health. The Board may also require holding tanks to serve as a fail-safe in the event of Electrical/Mechanical/Chemical Wastewater Treatment System failure.
- (B) Holding tanks are not seen as a viable long-term solution to on-site treatment and disposal of wastewater, because of:
 - (1) Continuing costs.
 - (2) Potential for illicit connections to drains, ditches, or surface water.
 - (3) Lack of regulatory management resources to assure proper system maintenance and operation.
- (C) Holding tank systems must be approved by EQPB prior to construction of the residence or commercial establishment intended to be served by such system.
- (D) Conditions for New Holding Tanks. New holding tanks, designed for the purpose of containing wastewater without the release to the surrounding soil, shall be permitted only if all of the following conditions are met:
 - (1) There is no available public sewer;
 - (2) The site and/or soil conditions are such that a SWIS is not feasible;
 - (3) The holding tank system serves residential or commercial uses with average daily wastewater flows less than 10,000 gallons per day, as determined by Table I or II of these Regulations;
 - (4) The holding tank is designed and constructed with a storage capacity equal to at least five (5) days of average daily wastewater flow for residences and at least three (3) days of peak daily wastewater flow for commercial operations;

- (5) The holding tank system is provided with a septic tank sized in accordance with Section 2401-13-20.
 - (6) The holding tank meets the setback requirements for septic tanks, as listed in Table III of these Regulations.
 - (7) The owner of the holding tank system submits a copy of a written contract for wastewater pumping service. The contract must be made with a licensed hauler, and must include a commitment to pump the holding tank daily, in an amount equal to at least the average daily sewage flow. The term of the agreement must be for at least ninety (90) days. Copies of all subsequent hauler's contract(s) must be submitted to EQPB prior to expiration of current contract. All holding tank owners must have contracts with a licensed hauler;
 - (8) The Board may require submission of a five-year economic analysis, comparing the total costs associated with the holding tank/hauling system versus the following alternatives:
 - (a) Connection to the public sewer;
 - (b) Purchase/lease of additional land necessary to construct an owner/operator wastewater treatment system in accordance with requirements of these Regulations;
 - (c) Change of use of the building to a non-water consuming ("dry") use, such as warehousing.
 - (d) In addition, the source(s) of revenue necessary to cover costs of the holding tank/hauling system must be identified.
- (E) All holding tanks shall be constructed in accordance with the following standards:
- (1) All holding tanks shall be monitored with a water level device suitably designed for wastewater service. The water level device shall be connected to an audible alarm. The alarm setting shall be made between 66% and 75% of the holding tank's liquid capacity. The alarm shall not be disarmed by the holding tank owner, hauler, or any other individual, without first obtaining approval from EQPB.
 - (2) All holding tanks shall be water-tight.
 - (3) The wall of the holding tank shall not be less than four-inches (4") thick reinforced concrete poured in place or less than eight-inches (8") thick load bearing concrete hollow block reinforced at every sixteen-inches (16") on center laid on a solid foundation and mortar joints well filled, plastered with ½ inch concrete mortar in the inside of the tank. The holding tank cover and floor slab shall be not less than four-inch (4") thick reinforced concrete. Holding tank covers may either be poured-in-place or pre-cast.
 - (4) The minimum compressive strength of any concrete holding tank wall, top and covers, or floor shall not be less than 2,500 pounds per square inch (psi).

- (5) All holding tank covers shall be capable of supporting an earth load of not less than three-hundred (300) pounds per square foot where the maximum unsupported span does not exceed three (3) feet.
 - (6) After the completion of the holding tank, the inside shall be cleaned and all forms removed, before occupancy permits will be issued.
- (F) Conditions for Existing Holding Tanks. Any modification to an existing holding tank will be treated as a significant treatment and disposal system modification and shall require a permit pursuant to Section 2401-13-10(B). All modifications to existing holding tanks must meet the holding tank standards listed above in this Section.

(Effective October 19, 2019)

2401-13-25 Operator Certification

EQPB may require that Operators demonstrate qualifications to operate and maintain the applicable wastewater collection, conveyance, treatment, and disposal system by providing evidence of relevant training or certification.

(Effective October 19, 2019)

2401-13-26 Management of Bio-solids

The management of bio-solids, also known as sewage sludge, in a dried or liquid form, shall comply with US EPA Regulations as specified in the most current 40 CFR, Chapter I, Subchapter O, Part 503. These regulations may be accessed for free at <https://gov.ecfr.io/cgi-bin/ECFR>.

(Effective October 19, 2019)

2401-13-27 Recycling and Reuse of Treated Wastewater Effluent

- (A) The recycling and reuse of treated wastewater effluent from an owner/operator wastewater treatment system, for beneficial use in irrigation for landscaping or agriculture, will be evaluated by EQPB on a specific case-by-case basis. The reuse of treated wastewater effluent in an open system where contact with people is unavoidable and of indeterminable degree has significant potential to expose the public to disease vectors if not managed properly. The reuse of treated wastewater effluent shall require Board approval.
- (B) All requests to recycle and reuse wastewater effluent for irrigation shall be developed and designed in accordance with the requirements of ISO 16075 – Guidelines for Treated Wastewater Use for Irrigation Projects, most recent edition. ISO 16075 may be accessed for free at <https://www.iso.org>.
- (C) The Board may also consider requests to recycle and reuse treated wastewater effluent for use in flushing toilets. In such cases, the project proponent must demonstrate the ability to effectively treat the effluent to comply with US standards and will be required to conduct

regular sampling and analysis on the treated wastewater effluent intended for reuse. Requests will be considered for approval by the Board on a case-by-case basis.

(Effective October 19, 2019)

2401-13-28 Marine Vessels

- (A) The requirements of MARPOL Annex IV, and any amendments thereto in force, shall apply to every vessel of 400 gross tons and above, and every vessel of less than 400 gross tons certified to carry more than 15 persons. The Regulations of MARPOL Annex IV are hereby incorporated into these regulations as if fully stated herein. Any discharges of sewage from vessels in violation of the Regulations of MARPOL Annex IV shall constitute a violation of these regulations.
- (B) Every vessel less than 400 gross tons and every vessel certified to carry less than 15 persons that produces and/or stores or carries wastewater within the territorial seas of Palau will be required to maintain a log of all discharges of sewage from the vessel. The log, which is available from the EQPB Office, must be submitted no later than the 5th day of the following month. (ex. The discharge log for May must be submitted no later than June 5th.)

(Effective October 19, 2019)

2401-13-29 Temporary Toilet Facilities (TTF)

- (A) Temporary Toilet Facilities Required. Temporary Toilet Facilities (TTF), also known as Type 4 toilet facilities, shall be provided for:
 - (1) Any construction job-site or custom/event site where working toilets connected to an approved type sanitary disposal system are insufficient or unavailable or such facilities are determined to be not readily available for the need of the workers/event attendees.
 - (2) The term “readily available” as used in this Section, shall be defined as being within three-hundred feet (300’) of the work/event area. Facilities which are within this distance but are not under the direct control of the developer/contractor/event coordinator shall require a written authorization from the owner of such facilities that unrestricted access to these toilet facilities will be available to the workers/event attendees for the entire period of the construction project or event.
 - (3) All arrangements for TTF sanitary facilities must be made and in place before any construction/event activities may proceed.
- (B) Standards:
 - (1) Temporary Toilet Facilities may be chemical, recirculating or combustion providing they comply with current Palau Codes.
 - (2) The minimum number of TTF required for the construction/event site shall be in accordance with Table VIII.

- (3) Any construction site requiring an EQPB permit must provide proof that the minimum required numbers of toilet facilities are available or will be available for the period of time that the permits are valid.

TABLE VIII NUMBER OF TTF REQUIRED FOR CONSTRUCTION SITES	
No. of TTF Users	Minimum Number of Units
1 to 15	1
16 to 30	2
31 to 51	3
52 to 72	4
73 to 93	5
Over 93	1 additional unit per 20 site workers

- (C) Failure to Provide Required TTF. In addition to any other remedies provided by law, any construction site not complying with the minimum number of TTF will be given a written warning and given 48 hours to comply. Failure to comply within the given period will result in the revocation of any EQPB permit required for the project which will result in temporary suspension of construction at the site.

(Effective October 19, 2019)

INSPECTION AND CERTIFICATION OF OCCUPANCY

2401-13-30 Inspection and Notices

- (A) Each project shall be subject to regular inspection by representatives by the EQPB staff or Board to assure that construction of septic tanks, subsurface wastewater infiltration systems, toilet facilities, and connections to public sewers, and any and all other related construction is in compliance with approved plans and specifications, and in accordance with the EQPB Regulations.
- (B) The EQPB must be notified twenty-four (24) hours in advance of any concrete pouring and all such concrete work must be performed in the presence of an EQPB inspector.
- (C) All construction work such as septic tank or subsurface wastewater infiltration system installation must be inspected by an EQPB inspector prior to covering or concealment.
- (D) Failure to comply with the requirements of this Section may result in unnecessary delays to the project or a suspension of work or denial of a Certification of Occupancy and an order to remove or uncover portions or all of the offending structures.

(Effective October 19, 2019)

2401-13-31 Final Inspection

After completion of the project, final inspection shall be conducted by EQPB of all disposal systems, sewer connections, and toilet facilities to ensure that work was performed in accordance with the approved plans and specifications issued as part of the permit and that EQPB Regulations and requirements are met.

(Effective October 19, 2019)

2401-13-32 Certificate of Occupancy

After a final inspection satisfactory to EQPB has been documented for the project pursuant to Section 2401-13-32, and said inspection indicates that the work performed was done in accordance with approved plans and specifications and has met all EQPB requirements, the Chairman shall issue a Certificate of Occupancy.

(Effective October 19, 2019)

CLEANING OF WASTEWATER DISPOSAL SYSTEMS AND DISPOSAL OF WASTEWATER, SLUDGE, SEPTAGE, AND SCUM

2401-13-33 Registration Certificate Required

No person shall engage in the business of cleaning the public sewer system, an owner/operator wastewater treatment system, or a temporary toilet facility, or disposing of the wastes there from, unless a Registration Certificate has first been issued by the EQPB.

(A) Standards for Operation. Such cleaning and/or disposal operations shall be conducted in conformity with the following requirements and in accordance with all applicable Regulations:

- (1) The name, phone number, and address of the person shall be legibly lettered on both sides of each vehicle used for cleaning purposes;
- (2) Every vehicle used for cleaning purposes shall be equipped with a watertight tank or body and the exterior shall be maintained in a clean and sanitary condition. Sewage waste shall not be transported in an open body vehicle;
- (3) All portable receptacles used for transporting liquid or solid waste shall be watertight, equipped with tight-fitting lids, and shall be cleaned daily;
- (4) All pumps, hose lines, and vehicle components shall be properly maintained in accordance with the vehicle's operations and maintenance manual so as to prevent leakage. An English copy of the vehicle's operations and maintenance manual must be kept inside the vehicle;
- (5) Approval in writing shall be obtained from the Board for every site at which the person plans to discharge the waste material collected. The approval may be given after consultation with the operator of the public sewer system;

- (6) The hose or any similar device used for discharging waste must be inserted into the receiving manhole to a depth of approximately two (2) feet, to prevent any spray or spillage in the surrounding area;
 - (7) Every precaution must be taken to prevent any public nuisance or health hazard which may be caused by the cleaning and disposal operation service.
- (B) Registration Certificate Standards.
- (1) A Registration Certificate shall be issued to any person properly making application, who is not less than twenty-one (21) years of age, has successfully demonstrated the ability to operate the equipment, and only after the place or places and manner of cleaning and disposal proposed by said applicant are approved by the EQPB.
 - (2) A certificate issued pursuant to this section is not transferrable and shall expire one (1) year from the date of issuance. A certificate may be renewed for an ensuing year by making application for renewal, upon determination of the applicant's observance of sanitary laws, ordinance, and directions. Such application shall have the effect of extending the validity of the current Registration Certificate until a new certificate is issued or the renewal of the registration is denied by the EQPB.
 - (3) Failure to comply with these Regulations may result in the revocation or suspension of the Registration Certificate. Any applicant whose Registration Certificate is suspended must correct all discrepancies and deficiencies noted in the suspension within thirty (30) days, otherwise the Registration Certificate may be revoked.
 - (4) Registration under these Regulations shall not be construed as imparting in any manner, the existing powers and duties of the other national government agencies of the Republic of Palau or the state governments of the Republic of Palau under other laws.

(Effective October 19, 2019)

2401-13-34 Maintenance

(A) General.

- (1) Pit-toilet facilities, composting facilities, owner/operator wastewater disposal systems, and connections from the building sewer to the public sewer shall be maintained at all times in good repair and in a clean and sanitary condition.
- (2) The owner of the property is primarily responsible for the completeness of all structures, good repair, cleanliness, and maintenance of all wastewater facilities. Wastewater disposal systems and connections from a building sewer to the public sewer shall be in compliance with all applicable Regulations of the Republic of Palau, and any other standard sanitation practices.

(B) Septic Tank Maintenance.

- (1) Owners of septic tanks shall empty and clean the tank or pit when solids accumulation reaches 60% of the fluid capacity, or as necessary, and the contents disposed of in such place and manner in conformance with Section 2401-13-34 and as authorized by the Board.
 - (2) Septic tanks should be inspected by the owner at intervals not greater than 2 years to determine the rates of scum and sludge accumulation. The inlet and outlet structures and key joints should be inspected for damage after each pump-out.
 - (3) The septic tank should be cleaned whenever either of the following condition exists:
 - (a) The bottom of the scum layer is within three-inches (3") of the top of the vertical leg of the inlet / outlet tee; or
 - (b) The sludge level is within twenty-four inches (24") of the bottom of the vertical leg of the outlet tee.
 - (4) Septic tank sludge shall be disposed of by hauling to a sewage treatment facility whenever this is possible. When no treatment facilities are available, sludge may be disposed of, upon approval of the Board, in accordance with Section 2401-13-27.
- (C) Prevention of Odor. All non-water carriage sewage treatment and disposal systems including those for Type 3 and Type 4 toilet facilities, shall be covered as often as necessary with earth or lime to exclude flies and prevent odor (Type 3) or serviced/pumped when wastes accumulate to the maximum usable storage volume (Type 4).
- (D) Abandonment of System. Each septic tank and subsurface wastewater infiltration system shall be properly filled with earth when replaced by an approved new system. Pit-toilets and all similar Type 3 toilet facilities shall be sealed with earth when the level of accumulated waste reaches within one (1) foot of the ground surface.
- (E) Repair, Replacement, and Removal. Any pit-toilet facility, composting facility, owner/operator wastewater disposal system, or connections from a building sewer to a public sewer, which fails to comply with the provisions of these Regulations, shall be repaired, altered, cleaned, emptied, and/or removed and replaced by the owner of the property at the owner's sole cost. The Board may issue any Order deemed necessary setting forth the parameters, terms, and conditions of such repair, alteration, cleaning, emptying, or removal and replacement.
- (F) Grease Traps. In order to be effective, grease traps shall be operated properly and cleaned regularly to prevent the escape of appreciable quantities of grease. Removal of contents and cleaning shall be done when 50% of the grease-retention capacity remains. See Appendix A for grease trap design example.

(Effective October 19, 2019)

ENFORCEMENT AND MISCELLANEOUS

2401-13-35 Enforcement

- (A) Disposal of Sewage Prohibited. It shall be unlawful to dispose of un-treated, semi-treated, or treated sewage, or wastewater, into any river, stream, pond, well, reservoir, waters of the Republic of Palau, or into/onto the ground unless prior written approval is given by the Board or its authorized representative.
- (B) Prohibition on Release of Support Without Permit. No person shall release a building permit, funds, equipment, and/or materials to build to those engaged in the construction, installation, or modification of toilet facilities and/or wastewater treatment and disposal systems until such time as an EQPB Permit has been issued pursuant to these Regulations or a determination has been made by the Board that no permit is required.
- (C) Stop Work Orders. In the event a project is commenced without a permit, or work performed is not in accordance with approved plans and specifications or any approved changes or revisions thereto, or unsafe construction practices are found and continued after sufficient warnings by the EQPB, a Stop Work Order shall be issued and take effect until non-compliance is resolved and corrected.
- (D) Compliance Orders.
 - (1) In addition to any other remedies provided by law, when an investigation reveals that in the course of construction, pit-toilet facilities, composting facilities, owner/operator wastewater management systems, or building sewer connections to a public sewer have been constructed or altered in violation of any provision of the EQPB permit or these Regulations, the EQPB may issue an administrative order directing those persons not complying with the requirements of the permit or these Regulations to:
 - (a) Comply forthwith; or
 - (b) In the event of a threatened violation, take appropriate remedial or preventative action.
 - (2) A person who is adversely affected by such order may request, within ten(10) days of receipt of such order, the EQPB to hold a public hearing on the order.
- (E) Penalties. Any person who violates any provision of this regulation shall be subject to a civil penalty not to exceed \$10,000 per day of such violation. Such funds shall be deposited into the EQPB Mitigation Trust Fund as provided by Title 24, Section 131 of the Palau National Code.

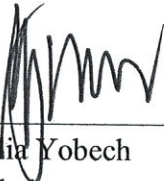
(Effective October 19, 2019)

2401-13-36 Miscellaneous Provisions

- (A) Severability. If any provision of these Regulations or the application of any provision of these Regulations to any person or circumstance is held invalid, the application of such provision to other persons or circumstances and the remainder of these Regulations shall not be affected.
- (B) Repealer. These Regulations contained herein shall replace the Republic of Palau Environmental Quality Protection Board "Toilet Facilities and Wastewater Disposal Systems Requirements" currently in effect in the Republic of Palau.

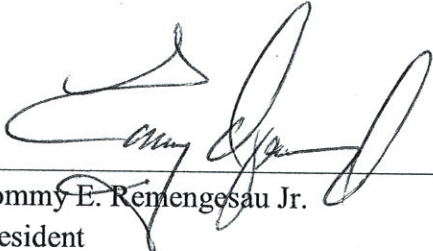
(Effective October 19, 2019)

The above amendments to the Environmental Quality Protection Board's Wastewater Treatment and Disposal Regulations are hereby adopted this 19th day of September 2019:



Elia Yobech
Chairman
Environmental Quality Protection Board

The above amendments to the Environmental Quality Protection Board's Wastewater Treatment and Disposal Regulations are hereby approved this 30th day of September 2019:



Tommy E. Remengesau Jr.
President

APPENDIX A

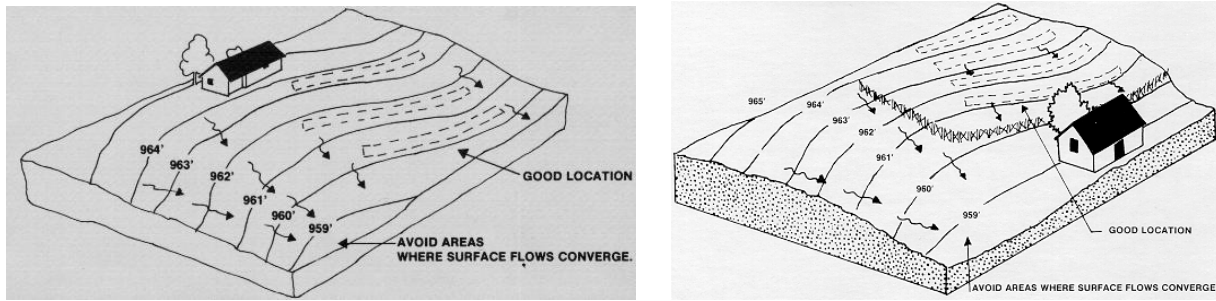


Figure 1. Typical Selection for Location; Sealed Septic Tank and SWIS based on Topography

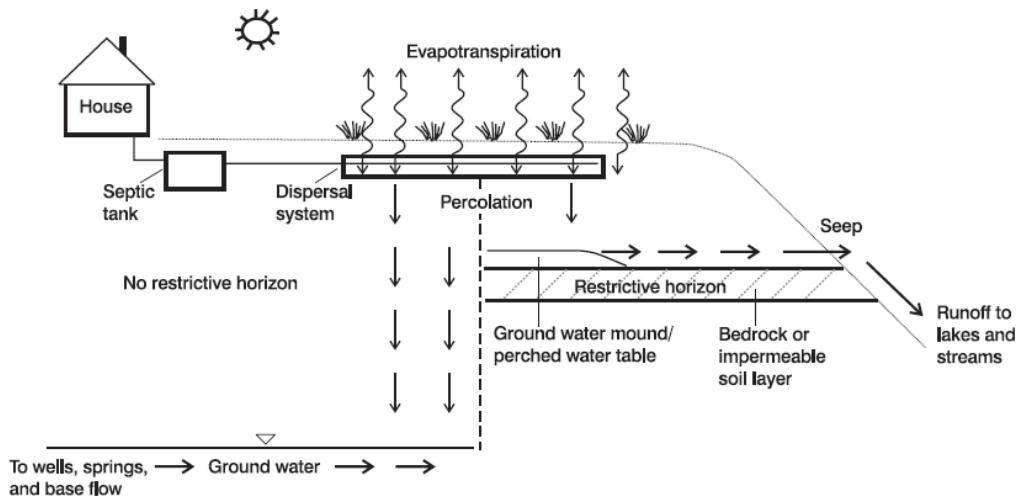


Figure 2. Operational Concept for Sealed Septic Tank and SWIS (trench, bed, or chamber system)

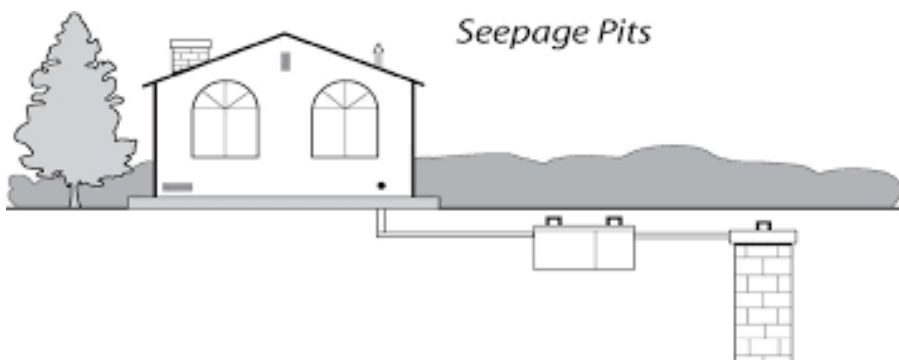


Figure 3. Operational Concept for Sealed Septic Tank and SWIS (seepage pit system)

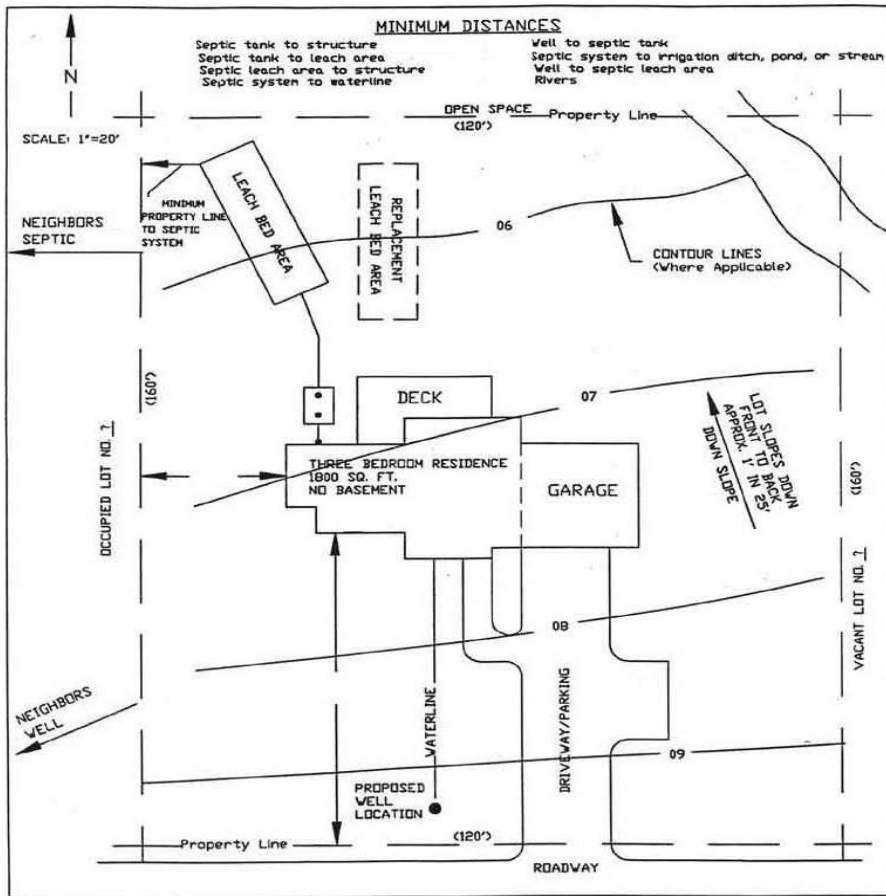


Figure 4. Typical Site Plan for Sealed Septic Tank and SWIS (dimensions to be provided by Applicant)

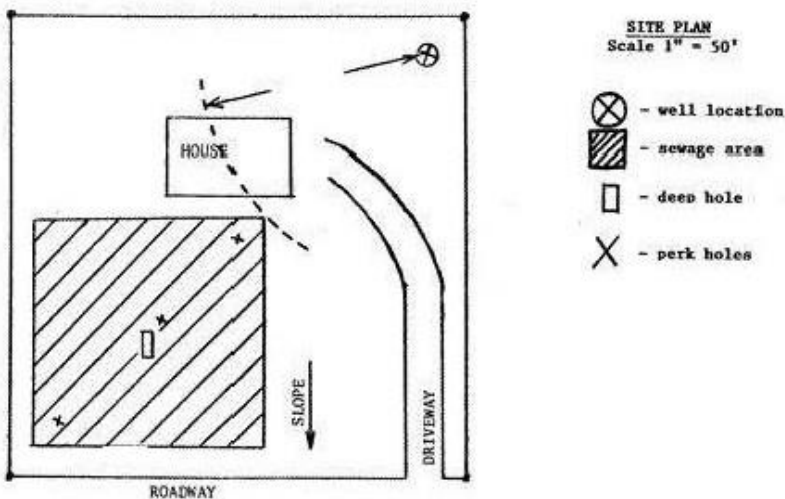


Figure 5. Typical Percolation Test Site Plan (dimensions to be provided by Applicant)

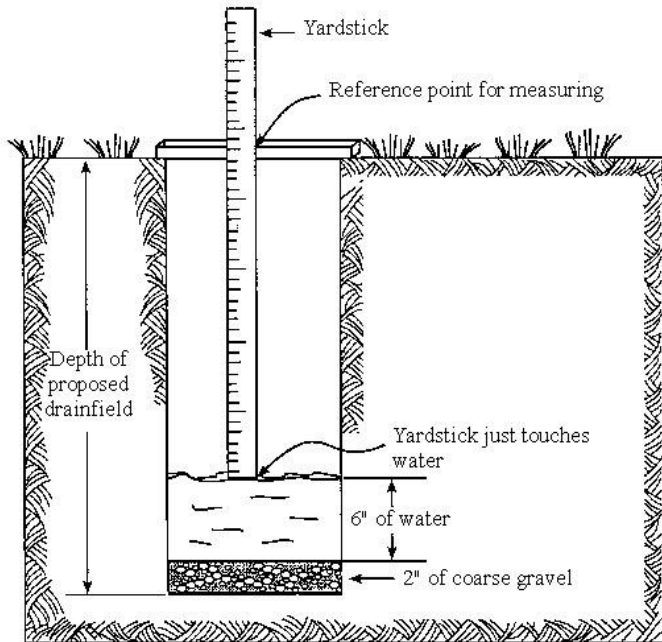


Figure 6. Typical Percolation Test Hole (methods in field may vary, so long as accurate and representative results are obtained)

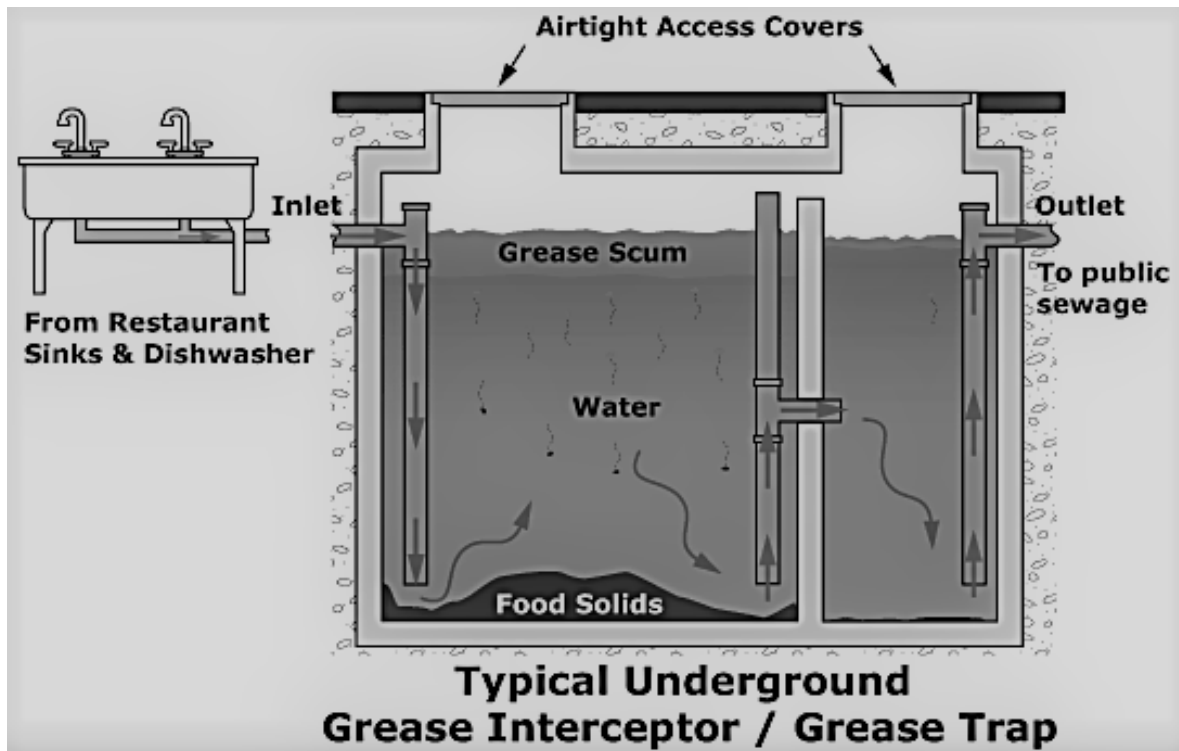


Figure 7. Typical Grease Trap (Applicant to consult with EQPB for capacity and dimensions)

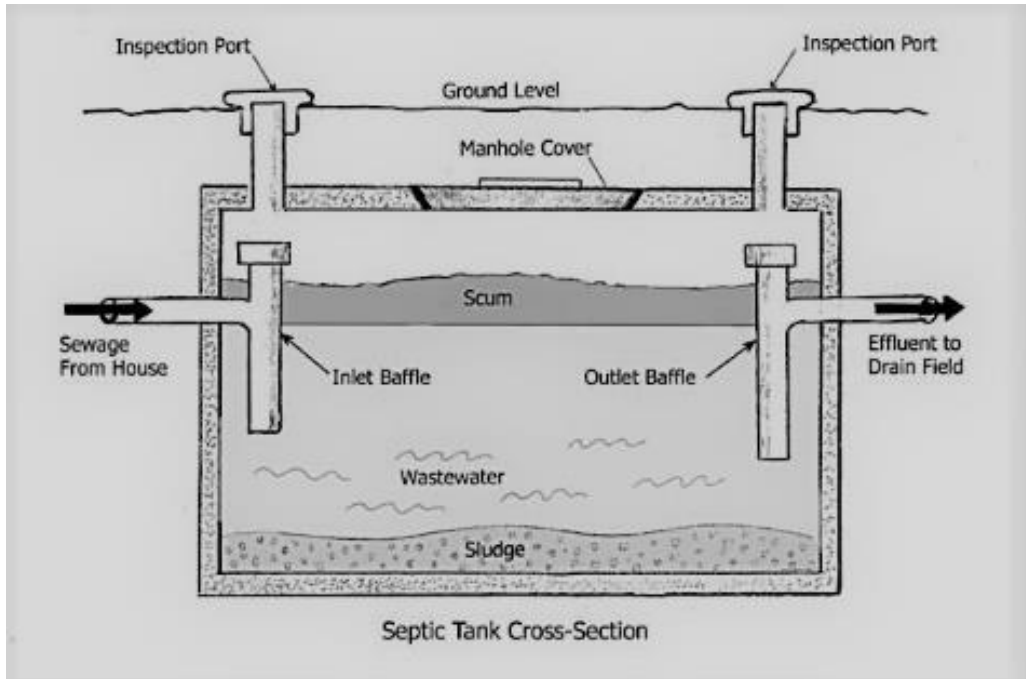


Figure 8. Typical Single-Compartment Sealed Septic Tank (dimensions per 2401-13-20)

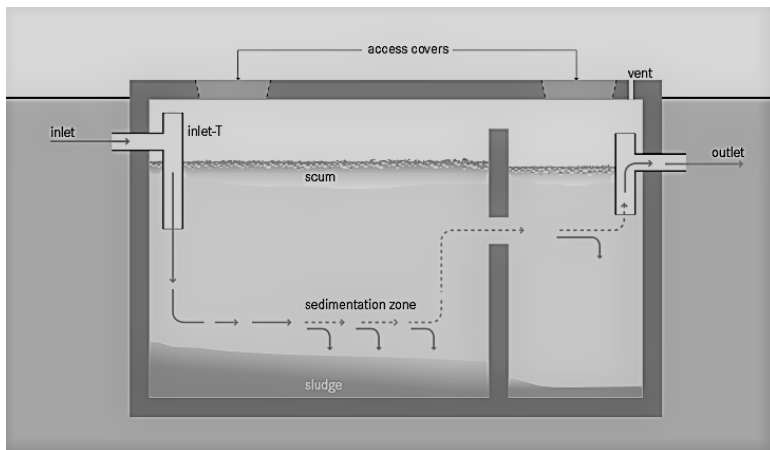
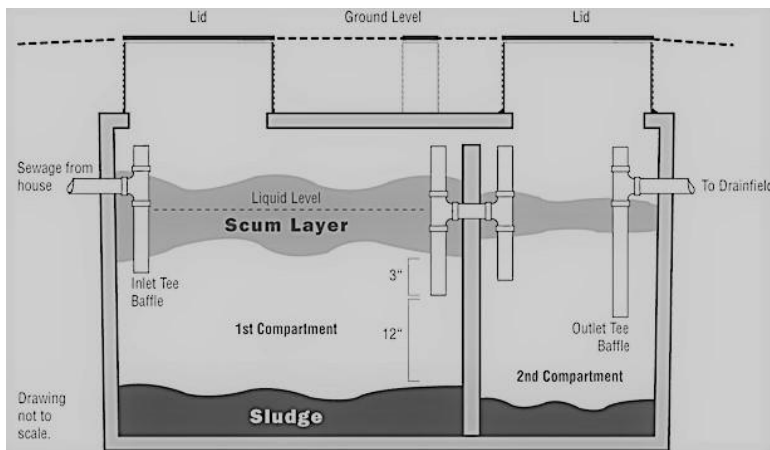
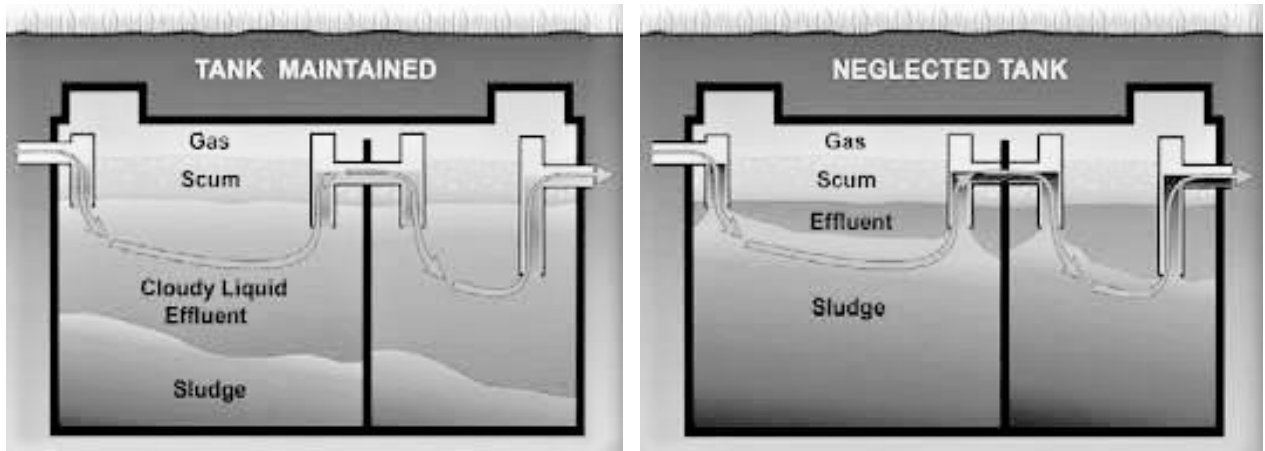


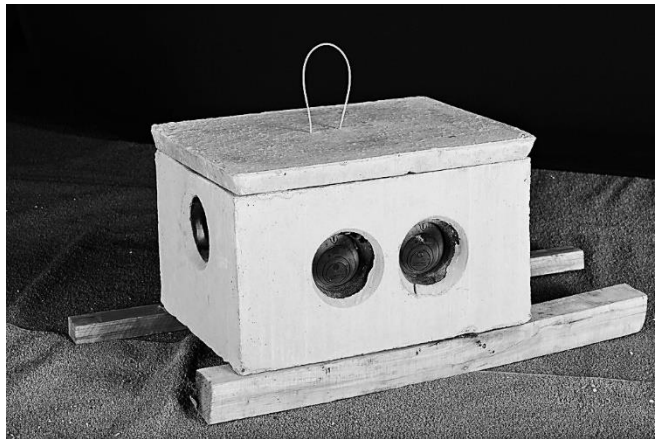
Figure 9. Typical Dual-Compartment Sealed Septic Tank (dimensions per 2401-13-20)



(a) Properly maintained septic tank

(b) Poorly maintained septic tank

Figure 10. Typical Internal Conditions for Sealed Septic Tank



(a) Pre-cast concrete D-box



(b) Plastic molded D-box

Figure 11. Typical Distribution Box (D-box)



Figure 12. Example of D-box Installation (all outlet pipes at same invert elevation)

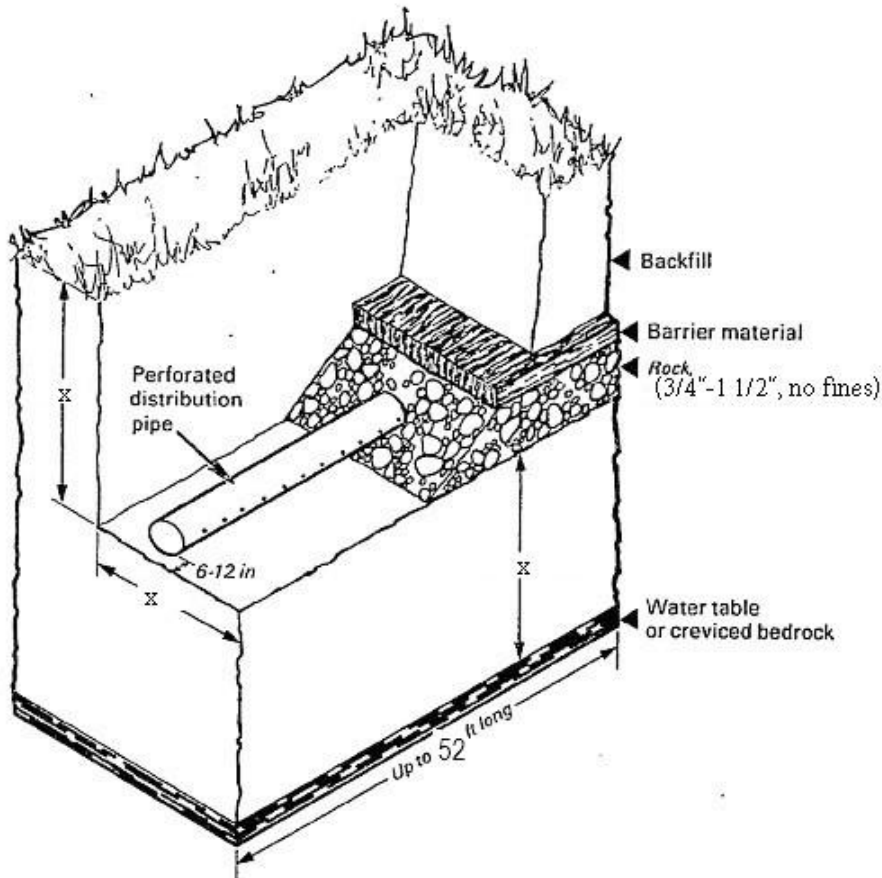


Figure 13. Typical Trench Construction (dimensions per Table V, 2401-13-20)

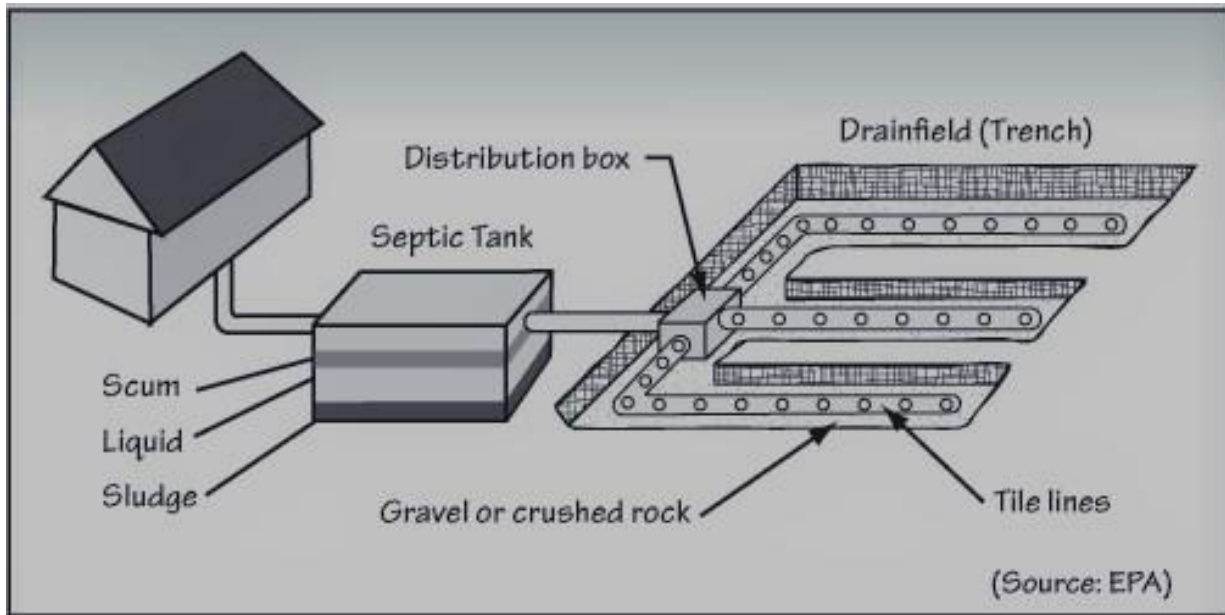


Figure 14. Typical Trench Layout (Conceptual)

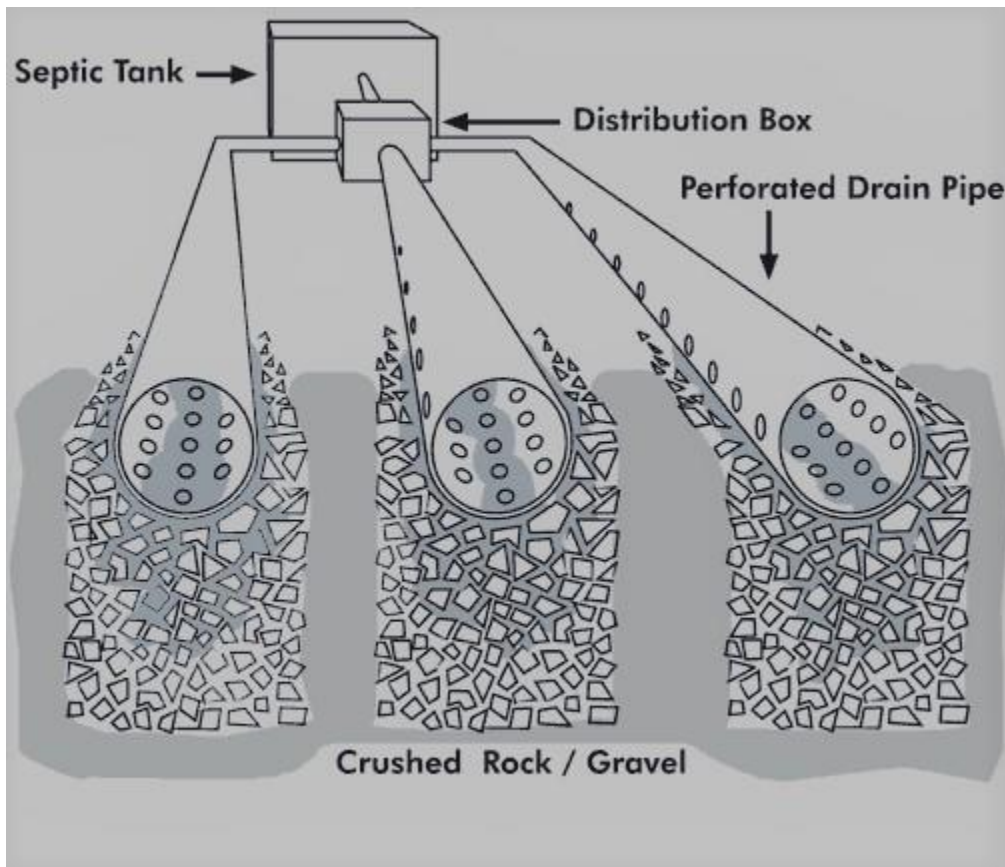


Figure 15. Typical Trench Layout (Conceptual)



Figure 16. Typical Trench Construction (Partial)



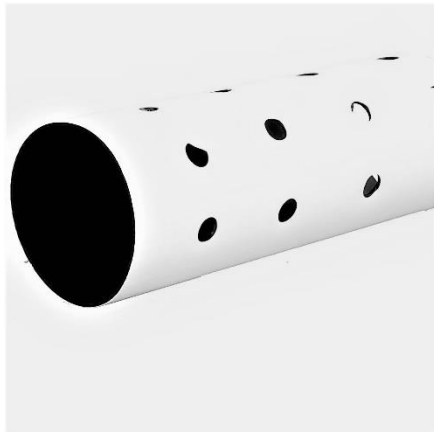
Figure 17. Typical Bed Construction (Partial)



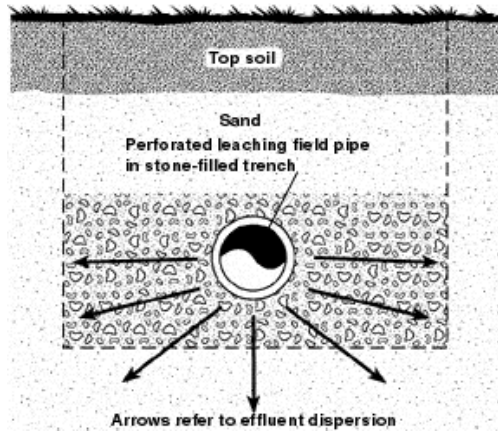
Figure 18. Typical Bed Construction (Partial)



Figure 19. Typical Bed Construction (Partial)

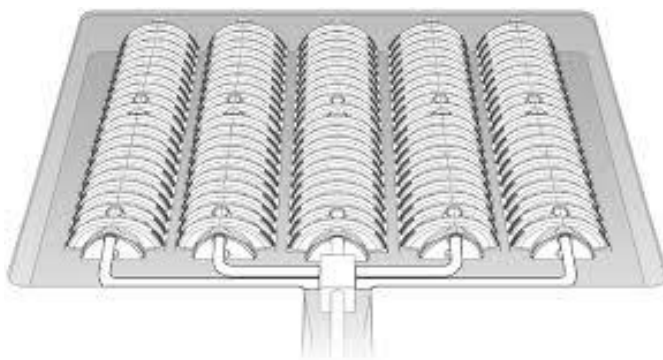


(a) Typical Drain Field Pipe
(holes 1/2-3/4 inches, placed downward)



(b) Operational Concept for Drain Field Pipe
(trench or bed system)

Figure 20. Perforated Pipe in Trench or Bed System (dimensions per 2401-13-20)



(a) Five-Chamber System with D-box



(b) Typical Manufactured Plastic Chamber

Figure 21. Typical Leaching Chamber Installation

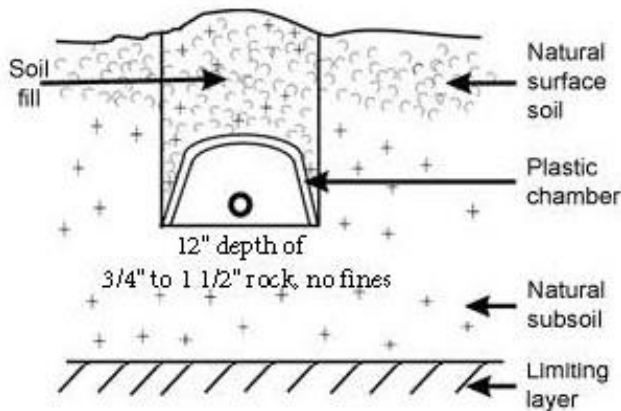
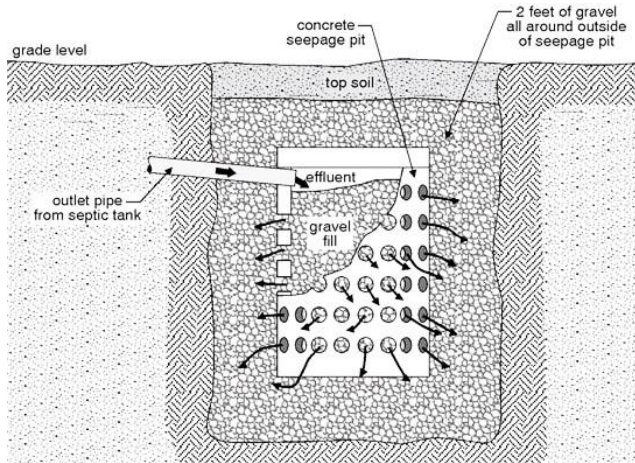
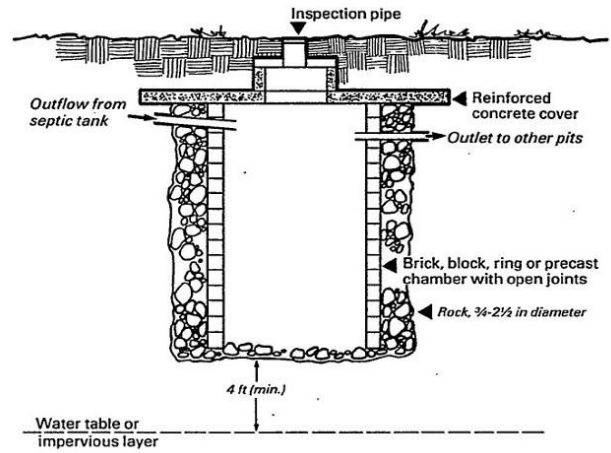


Figure 22. Typical Leaching Chamber Installation; Cross-Section

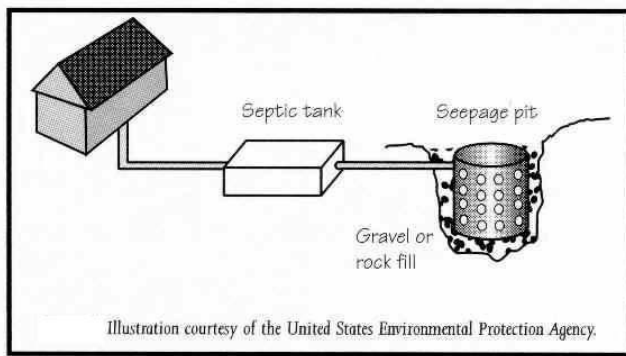


(a) Pre-cast concrete seepage pit



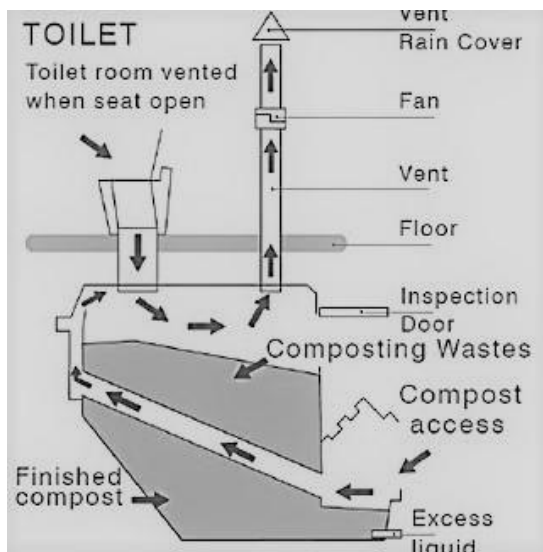
(b) Constructed seepage pit

Figure 23. Typical Seepage Pit Installation (dimensions per 2401-13-20)

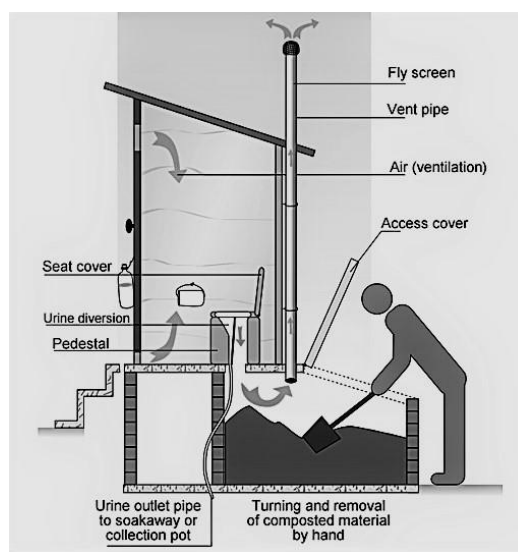


Schematic of a Seepage Pit (Dry Well)

Figure 24. Typical Arrangement; Sealed Septic Tank with Seepage Pit for SWIS



(a)



(b)

Figure 25. Operational Concept for Waterless Composting Toilet

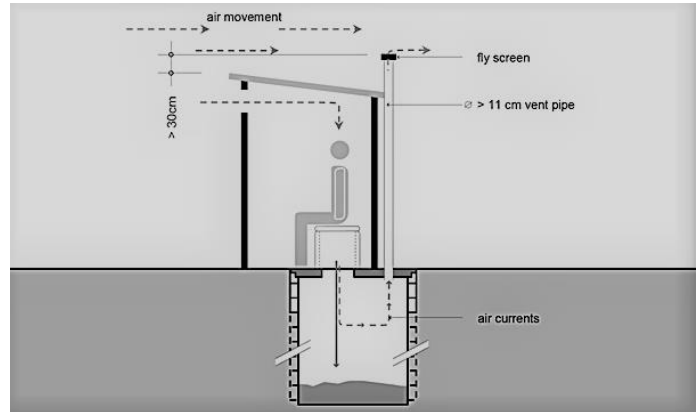
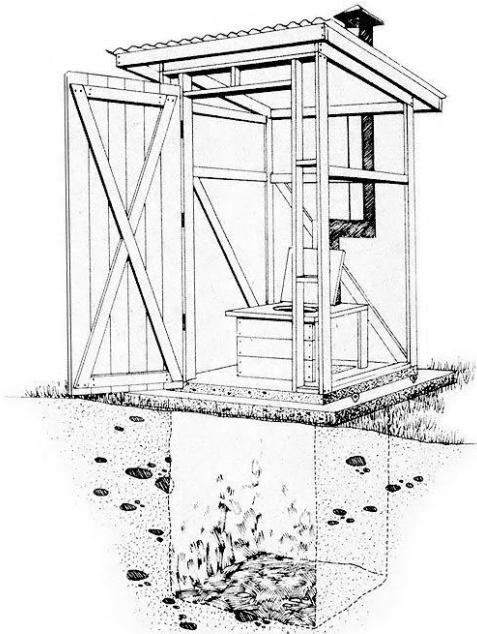


Figure 26. Typical Pit Toilet Construction