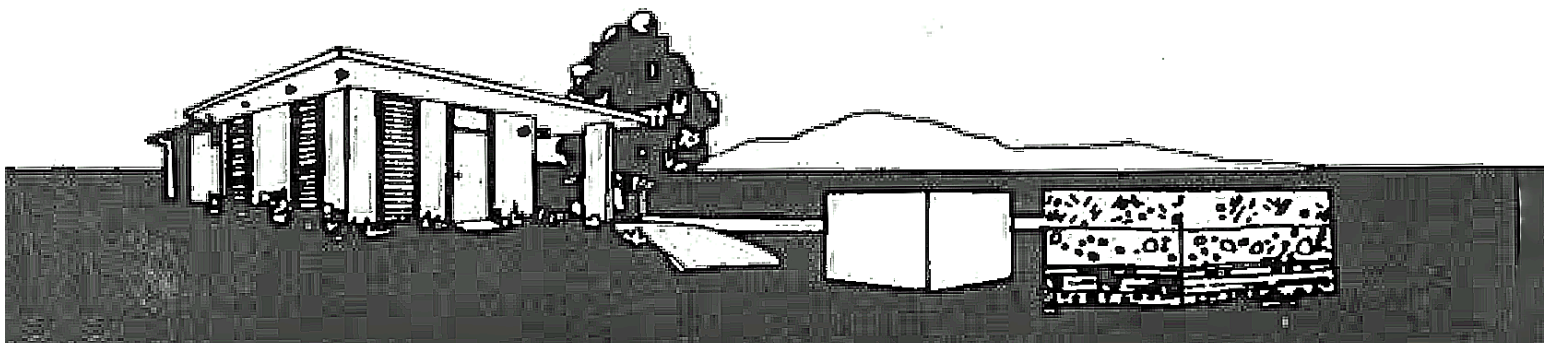


INDIVIDUAL WASTEWATER SYSTEM REGULATIONS



GUAM ENVIRONMENTAL PROTECTION AGENCY

1984

***“ALL LIVING THINGS
OF THE EARTH
ARE ONE”***



**GUAM ENVIRONMENTAL PROTECTION AGENCY
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Message from the Guam Environmental Protection Agency Administrator

Although the Government of Guam is making substantial progress in extending municipal sewer systems throughout the Island, many rural areas will remain unsewered for an indefinite period of time. Guam law allows homes and businesses to utilize individual wastewater systems where public sewers are not available. In order to protect the environment and public health of our citizens, all individual wastewater systems must be constructed and permitted in compliance with Guam E.P.A. regulations. The cost of a septic tank and leach field is high and homeowners want to be sure their money is being spent for a properly built system which will last. The best assurance of this is a permit issued by Guam E.P.A., for the construction and operation of the system. Guam E.P.A. inspectors will review your plans, or those of your contractor, to make sure the proposed system is properly designed. Upon completion of construction, Guam E.P.A. inspectors will visit your home or business and verify that the system has been built according to your plans. Besides assuring a properly built system, this Guam E.P.A. permit is required by law.

I encourage all homeowners and building contractors to become familiar with these regulations and to follow the permit process described herein. You, the homeowner, are responsible for acquiring all permits, clearances and easement agreements. We further suggest you deal only with contractors currently licensed by the Guam Contractors License Board. This is the best guarantee all of these requirements will be met.


FRED M. CASTRO

GUAM E.P.A. Administrator

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GUAM ENVIRONMENTAL PROTECTION AGENCY

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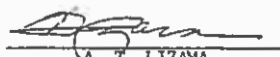
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REVISION TO
INDIVIDUAL WASTEWATER REGULATIONS

NEW TITLE:

ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEM REGULATIONS
FOR RESIDENTIAL SEPTIC TANK AND LEACHING SYSTEM
AND TEMPORARY TOILET FACILITIES

Adopted July 2, 1987


A. T. LIZAMA
Board Chairman

APPROVED:


ELIZABETH BARRETT-ANDERSON
Attorney General

ATTESTED TO: DONNA M. CRUZ
Board Secretary

Date: 9/1/87

"ALL LIVING THINGS OF THE EARTH ARE ONE"

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ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEM REGULATIONS
FOR RESIDENTIAL SEPTIC TANK AND LEACHING SYSTEM,
AND TEMPORARY TOILET FACILITIES

SECTION I. AUTHORITY

- A. Section 45106 of Chapter 45, Title 10 of the GCA authorizes the Guam Environmental Protection Agency to adopt such regulations as may be necessary to implement Chapter 48, Toilet Facilities and Sewage Disposal, of Title 10.

SECTION II. PURPOSE

The purpose of these regulations is:

- A. Protect the health of the septic tank user and his neighbors.
- B. To establish minimum standards that will ensure that wastes discharged:
1. Will not pollute or contaminate the waters of any bathing beach, shellfish breeding grounds, or stream or groundwater source which could be used for public or domestic water supply purposes or for recreational purposes;
 2. Will not pose a health hazard by being accessible to children;
 3. Will not give rise to a nuisance due to odor or unsightly appearance;
 4. Will not violate any other laws or regulations governing water pollution or sewage disposal.

SECTION III DEFINITIONS

- A. "Administrator" - means the Administrator of Guam Environmental Protection Agency or his duly authorized representative.
- B. "Individual Sewage Disposal System" means a system designed and installed to dispose of sewage from a single building or group of buildings located on one lot. Such a system may consist of a septic tank, together with a leaching field or seepage pit, or other treatment unit.
- C. "Septic Tank" means a water tight receptable which receives the discharge of sewage and is designed and constructed so as to retain solids, digest organic matter through a period of detention, and allow the liquids to discharge into a subsurface leaching system.
- D. "Leaching System" means a subsurface system of open-jointed or perforated piping bedded in crushed rock or coral where septic tank effluent may seep or leach into the surrounding porous soil.
- E. "Sewage or Wastewater" means untreated or insufficiently treated human excreta, food wastes disposed of through sewers, washwater, liquid wastes from residences, commercial buildings, public buildings, agricultural operations, and industrial establishments or other places of assembly, and such diluting water as may have entered the waste disposal system.
- F. "House Sewer or Building Drain" means that part of the lowest piping of a drainage system which receives the discharge from all waste lines and other drainage pipes inside the walls of the building except those discharging grease and oil, and conveys it to the building sewer pipe beginning 5 feet outside the building walls. Rain water from roof drains or any source shall not be diverted to the said system.

- G. "Water of the Territory" means all shore waters surrounding Guam, streams, lakes, springs, irrigation system, marshes, water courses, waterways, drainage system, and other bodies of water, surface and underground, natural or artificial, publicly or privately owned.
- H. "Public Sewer" means a common sewage collection system serving more than one lot, directly controlled by public authority.
- I. "Abutting Property" means that property, which lies next to any road, street or easement in which a public sewer is located. The boundary of the private property abutting the sewer need not physically touch the sewer easement so long as that piece of land separating the sewer easement from the abutting property consists of a public right of way, easement, road, or street not owned or controlled by another private owner, so that the abutting property owner would be required to obtain a private easement in order to connect this property with that of the sewer.
- J. "Cesspool" means excavation which receives or is intended to receive untreated sewage and from which the liquid directly seeps or reaches into surrounding porous soil. No cesspool construction is allowed under EIR regulations.
- K. "Adjacent Homeowners" means homeowners where residences are adjacent to and abut a road, street or other way or easement on which a sewer is installed.
- L. "Privy" means a structure and excavation for the disposal of human excreta by non-water carriage methods and includes the term pit privy, trench latrine, and bored-hole latrine.
- M. "Single Family Residence" means a building designed exclusively for occupancy for one family and containing only one dwelling unit.

- N. "Duplex" means a detached building containing two dwelling units. This is the same definition as found in Title XIV Section 17002 for a two-family dwelling.
- O. "Type 2" means a toilet flushed with water and connected to a septic tank and leaching system.
- P. "Type 3" means privy type, including pit privy, trench latrine and bored-hole latrine.
- Q. "Agency" means Guam Environmental Protection Agency (GEPA).

SECTION IV - NON-AVAILABILITY OF PUBLIC SEWER

- A. When public sewer intended to serve any lot or premises, is not available in any thoroughfare or right of way abutting such lot or premises, drainage piping from any building or works shall be connected to an approved private sewage disposal system.
- B. The public sewer may be considered as not being available to a single family residence or duplex or any residential building, when such public sewer is located more than two hundred (200) feet away from any proposed single family residential unit or duplex, or any existing residential building on any lot or premises which abuts and is served by such public sewer.

The Administrator may grant exemption for a single-family residential unit or duplex where a public sewer is less than 200 ft. away from the building and such residential building can not be connected to the public sewer by gravity due to obstructions. Exemption may only be granted by the Administration, if the Administrator is convinced that after written findings an exemption will not jeopardized the general public health and welfare.

- C. Vertical Alignments - Where public sewer is available to a particular building and sewer location is, (1) more than twenty (20) feet above the lowest floor level of the single family residence or a duplex; or (2) more than fifty (50) feet above the lowest floor level of any other structures, public sewer may be considered as not being available.

Exemptions, where the vertical distances between lowest floor level and the sewer is less than 20 feet, may be granted by the Administrator for a single-family residential unit or duplex when by written findings it is determined that the public health and welfare will not be jeopardize.

- D. Where water is available from PUAG, but a public sewer is not available, toilet facilities shall be type 2.

SECTION V - PRIVATE SEWAGE DISPOSAL SYSTEM (GENERAL)

- A. Where permitted by Section IV of this regulations, a building may be connected to a private sewage disposal system which complies with other provisions set forth in these regulations. The type of system shall be determined on the basis of location, soil porosity, and ground water level and shall be designed to receive all sanitary sewage from the property. The system, except as otherwise provided, shall consist of a septic tank with effluent discharge into a sub-surface disposal field.
- B. Where conditions are such that the above system cannot be expected to function satisfactorily for commercial, agricultural and industrial plumbing systems; for installations where appreciable amounts of industrial or indigestible waste are produced; for hotels, hospitals, office buildings, schools; for occupancies producing abnormal quantities of sewage or liquid wastes; the method of sewage treatment and disposal shall be first approved by the Administrator. Special sewage disposal systems for minor, limited or temporary uses shall be first approved by the Administrator.

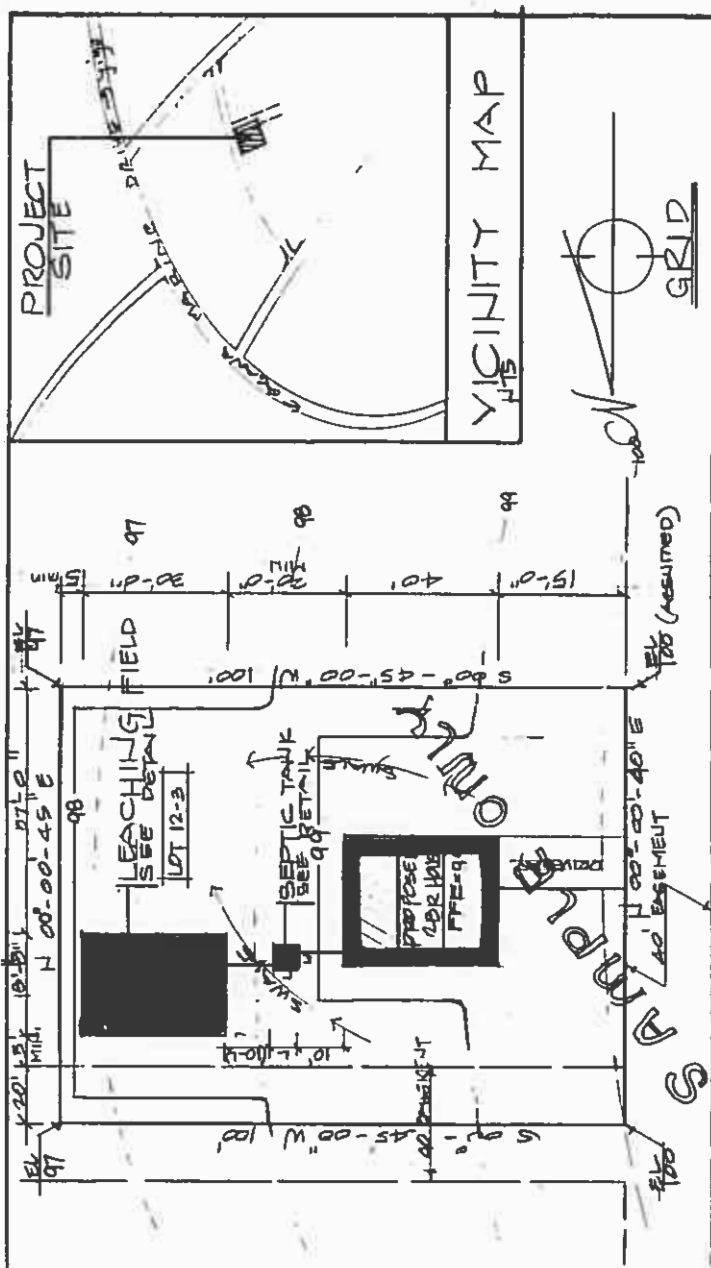
- C. Disposal systems shall be designed to utilize the absorptive portions of the soil formation. Where the ground water level extends to within twelve (12) feet or less of the ground surface or where the upper soil depth is insufficient and the underlying stratum is rock or impervious soil, a septic tank and disposal field system may not be installed.
- D. All lots served by an on site disposal system shall contain sufficient reserve area which would permit at least 100% replacement of the proposed leach field system. No division of the lot or erection of structures on the lot shall be made if such division or structure impairs the functional usefulness of the designated 100% expansion area.
- E. No property shall be improved in excess of its capacity to properly absorb sewage effluent in the quantities and by the means provided in these regulations.
- F. When there is insufficient lot area or improper soil conditions for adequate sewage disposal from a building or proposed use of the land as determined by the Administrator, no building permit shall be issued and no private sewage disposal shall be permitted. Where space or soil conditions are critical, no building permit shall be issued until engineering data and test reports satisfactory to the Administrator have been submitted and approved.
- G. Where public sewers may be installed at a future date, provision should be made in the household plumbing system for connection to such sewer upon notification by the Administrator within 5 years period after it is available.

- H. New septic tanks, leaching fields, outhouses or other on-site sewage disposal systems shall not be permitted within flood hazard areas. All sewage disposal lines shall be connected to government sewerage at the developer's expense. Sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharges from the systems into flood waters (Section IV. E. Standards for Flood Hazard Area Management, Floor Hazard and Wetland Area Rules and Regulations). Variances to such standard or procedure may be granted through appeal to the Territorial Planning Commission which may grant such variances only upon written findings that applicant satisfied all the criteria outlined granting variances under Section 17502 (a) - (d) of the Government Code of Guam.
- I. Nothing contained in these regulations shall be construed to prevent the Administrator from requiring compliance with higher requirements than those contained herein where such higher requirements are essential to maintain a safe and sanitary condition.
- J. No wastewater disposal system installations, constructions, repairs or additions shall be made by the owner of the property without written permit from the Agency.
- K. Any person whose application for a permit under this regulations has been denied shall be notified in writing as to the reason for denial and such person may within 15 days after date of official notification, shall file a written request for a hearing before the Agency. Such hearing shall be held by the Agency within 30 days after receipt of the request and upon reasonable notice to the applicant. The Board of Directors of the Agency shall affirm, modify, or revoke the denial, or issue the permit on the basis of the evidence presented at the hearing.

- L. The design criteria presented in these regulations can only be applied to systems utilized by residential units up to and including a four-plex dwelling. Systems which must serve larger residential complexes, commercial, or industrial facilities must be based on design criteria specific to the facility. The standard guidance presented within these regulations is not considered adequate for such facilities.
- M. Approval of Administrator required. No toilet or sewage facilities or single-family residences, subdivisions, apartments, motels, hotels or other multihousing facilities, commercial buildings, institutions, and industrial facilities, may be constructed without the approval of the Administrator, or put into operation without his inspection and approval.

SECTION VI - PERMIT APPLICATION ISSUANCE PROCEDURES AND REQUIREMENTS FOR WASTEWATER DISPOSAL SYSTEMS

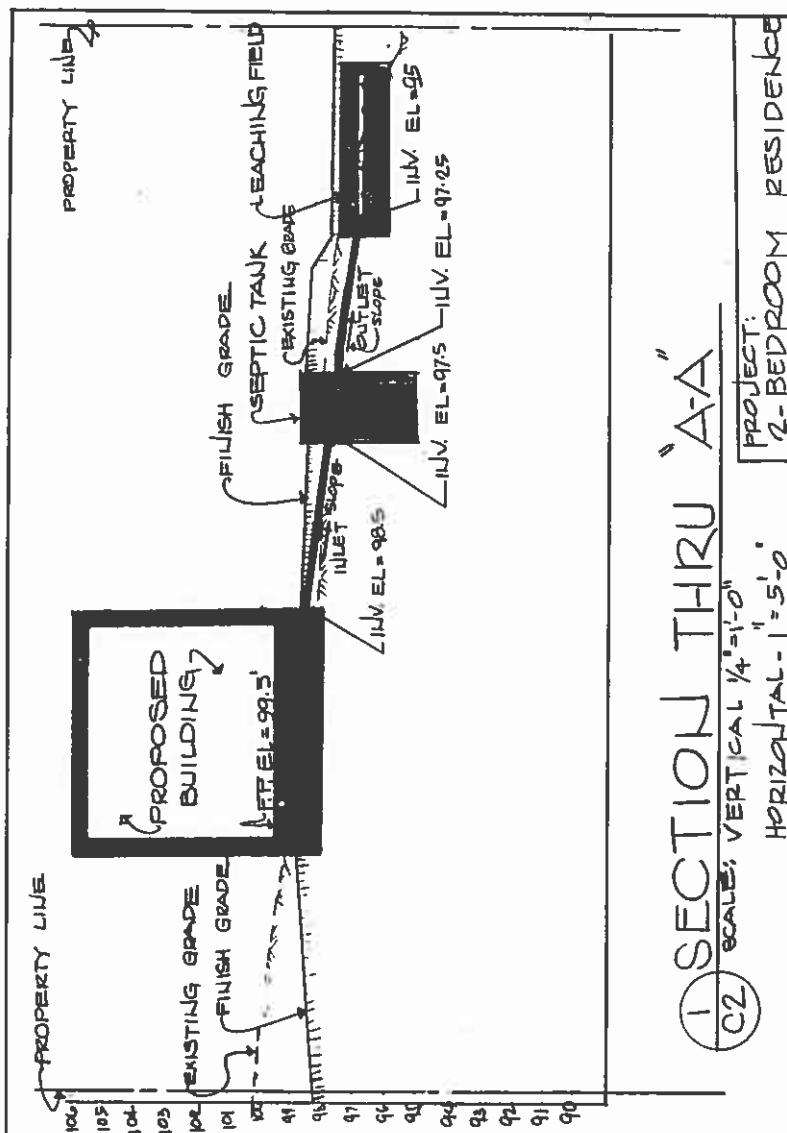
- A. Before specific plans and specifications for individual wastewater disposal system permit application are reviewed for compliance with Clean Environmental Protection Agency (CEPA) regulations, such plans and specifications shall contain the following as minimum:
1. Vicinity Map - plans must include vicinity map to locate property showing adjacent streets with names and other land marks that can easily locate the property where the proposed improvement is to be established.
 2. Plot and Grading Plan (DWG-C-1) - plans must include a plot and grading plan, drawn to scale and completely dimensioned, showing direction and approximate slope of the ground surface, and must contain the following:



PROJECT:	2-BEDROOM RESIDENCE
OWNER:	MR. MRS. JOHN SIPAG
CONTRACTOR:	APOLLO CONSTRUCTION CO.
ENGINEER:	MR. ANTONIO PAGI, PE LICENSE NO. 0001
SHEET	C-1

1. PLOT, GRADING PLAN
1" = 10'-0"

- a. Delineation of property boundaries, lot number and zone designation;
- b. Delineation of public rights of way, easements and access roads, if applicable;
- c. Indication of location of all present or proposed or existing retaining walls, drainage channels, water supply lines or walls, paved areas and structures on the plot with relation to lot lines and structures.
- d. Location of proposed or existing sewage facilities in relation to property boundaries, public rights of way, easements and access roads, existing structures and utilities, and the proposed building;
- e. A description of the complete installation including quality, kind and grade of materials, equipment, construction, workmanship, and methods of assembly and installation.
- f. A log of soil formation and ground water levels as determined by the test holes dug, in accordance with the requirements of the Administrator, at the location of the proposed leaching system.
- g. Topography of the area, showing contour lines and floor elevation of the existing or proposed building.
- h. Profile of existing ground and elevations of flowline along sewerline as per cross-section plan drawing (DWG-C-2).



SECTION THRU "A-A"

SCALE: VERTICAL $\frac{1}{4}" = 1'-0"$
HORIZONTAL - $1" = 5'-0"$

PROJECT:	2-BEDROOM RESIDENCE
OWNER:	MR. MRS. JOHN SPAG
CONTRACTOR:	APOLLO CONSTRUCTION
ENGINEER:	MR. ANTIPOLO PASILIPAN
SHEET	LICENSE NO. 68511 PC-C-2

3. Regardless of the type of disposal system applied for, the permit application should bear the signature of the Public Utility Agency of Guam (PUAG) for water and sewer availability verification, and approval for sewer connection if sewers are available and location of connection point. The Department of Land Management must process the plans for verification of property boundary, confirmation of ownership, zoning and itemization Territorial Planning Commission (TPC)/Territorial Seashore Protection Commission (TSPC) of conditions prior to GEPA review and their signature must be included on the Building Permit Application Form.
 - a. When a property is within the wetland zone, review and clearance and approval from Land Management, Bureau of Planning, ACOE, Department of Agriculture is required prior to GEPA review and their signature must be included with Building Permit application.
4. Design calculation of the proposed wastewater disposal system is required and the design must be done by a licensed specialty contractor or registered professional engineer.
5. A log of soil formation, percolation and water table tests should be done by a registered professional engineer and such test results should bear his stamp and signature. This requirement may be waived by the Agency, if the Agency has sufficient information to determine the suitability of the soil conditions.
6. Complete septic tank and leaching field or aeration tank and leaching field design and construction details must be included in the building plans and specifications.

- B. A building permit application form, completely filled out with name(s) and address of applicant, job location, lot, block and tract numbers, and area of lot in square feet or square meters.
- C. Three (3) complete sets of building plans, one for the Environmental Protection Agency (EPA) and the other two (2) for distribution to other agencies.
- D. Septic Tank Permit Validity - Any septic tank permit shall be void if the work authorized by said permit is not commenced within three (3) months after its issuance; or is suspended or abandoned for a period of three (3) months at any time the work has commenced; provided that for just cause stated in writing to the Administrator, the Administrator may allow up to a maximum of three (3) months extension. All such extensions shall be in writing and noted on the septic tank permit and in the individual wastewater records of the Section of Individual Wastewater Program.
- E. No building permit or certificate of occupancy under the Building Law of Guam shall be issued without prior compliance with the requirements of the above Section VI.

SECTION VII - CAPACITY OF SEPTIC TANKS

- A. The net volume or effective capacity below the flow line of a septic tank, for flows up to 500 gpd, should be at least 750 gallons. For flows between 500 and 1500 gpd, the capacity of the tank should equal to at least 1-1/2 days sewage flow. The liquid capacity and sizes of septic tank as determined by the number of bedrooms or duplex units in any dwelling occupancies shall be as established in Table 1 - "Guidelines for Construction of Septic Tank (Liquid Capacity)".

TABLE I
GUIDELINES FOR CONSTRUCTION OF SEPTIC TANK
(LIQUID CAPACITY)

Number of Bedrooms	Recommended Sewage Flow * (Gallons) GPD	Recommended Minimum Tank Capacity (Gallons)	Recommended Minimum Inside Tank Dimension L.W. D.
2	480	750	6' x 4' x 6'
3	720	1,080	7'-6" x 4' x 6'
4	960	1,440	7' x 6' x 6'
5	1,200	1,800	7' x 7' x 6'
6	1,440	2,160	8.5' x 7' x 6'

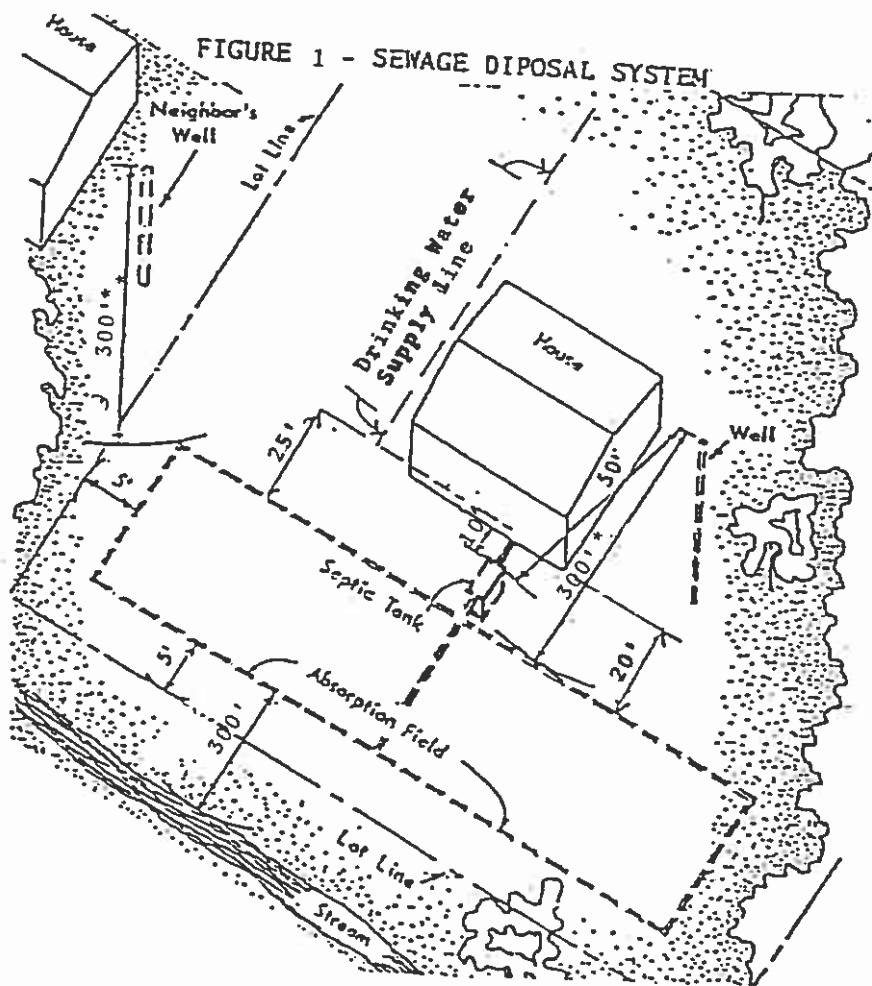
Source: GEPA, Rural Islandwide Facilities Plan, Table 5-2,
Page 5-17.

Manual of Septic Tank Practice - U.S. Department of
Health, Education and Welfare.

Public Health Service Publication #526

SECTION VIII - LOCATION AND INSTALLATION OF SEWAGE DISPOSAL SYSTEM

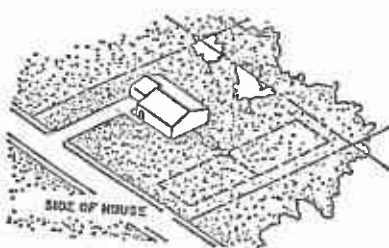
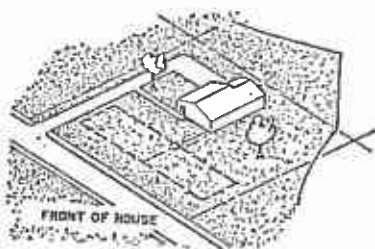
- A. No part of the system shall be located so that it is nearer to any water supply than outlined in Figure 1 and Table II, or so that surface drainage from its location may reach any domestic water supply. The distances given in Figure 1 and Table I are the minimum distances to any water of the territory, property lines, dwelling, school, public building, or a building used for commercial, or industrial purposes or as a place of assembly.
- B. Suggested location of tank and disposal field on varying ground slopes (Figures 2)



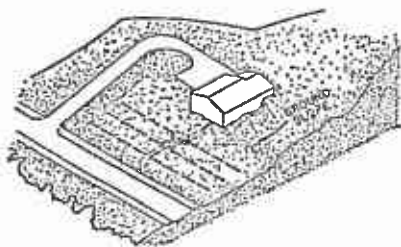
(*) See Notes on Table II

B. Suggested location of tank and disposal field on varying ground slopes (Figures 2)

In locating the septic tank, consider future extension of a public sewer so that a minimum rerouting of the building sewer will be necessary.



Illustrates the location when ground slopes to the side.



When the ground slopes to the front of the house, the tank and field should be located as shown.



Illustrates the location when ground slopes to the rear.

- C. Location shall be such as to provide not less than the stated minimum distances in Table II.

TABLE II
MINIMUM SAFE HORIZONTAL DISTANCES IN FEET

From	To			
	Privy	Septic Tank	Absorption Bed	Absorption Field
1. Any water of the Territory		300'	300'	300'
2. Any dwelling, school, public building, or a building used for commercial or industrial purpose.	20'	10'	20'	20'
3. Property boundary lines		5'	5'	5'
4. Water lines		10'		
5. Wells		300*	300*	300*

- Note: 1. Should there be any legislative amendment to any minimum safe distance requirement, the latest amendment shall govern.
2. No septic tank shall be constructed in a position not easily accessible for emptying or cleaning.
- *3. Minimum distance from well to sources of bacterial contamination.

<u>Formation</u>	<u>Minimum Acceptable Distance</u>
Favorable (Unconsolidated)	300 feet. Lesser distances only on Administrator's approval following comprehensive sanitary survey of proposed site and immediate surroundings.
Unknown	300 feet only after comprehensive geological survey of the site and its surroundings has established, to the satisfaction of the Administrator, that favorable formations exist.
Poor (Consolidated)	Safe distances can only be established following both the comprehensive geological and comprehensive sanitary surveys. These surveys also permit determining the direction in which a well may be located with respect to sources of contamination. In no case should the acceptable distance be less than 300 feet.

SECTION IX - AREA OF DISPOSAL FIELDS

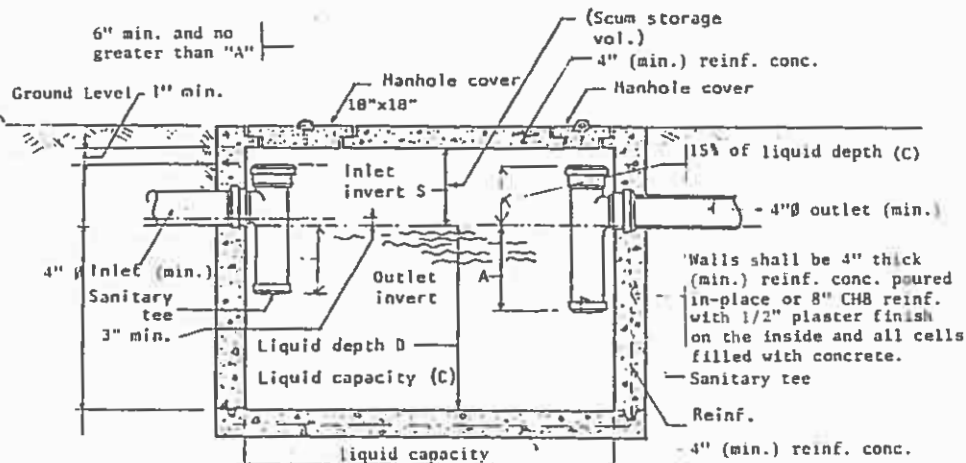
The minimum effective absorption area required for disposal fields in square feet of leachfield bed, shall be predicated on the required size of septic tank for the type of soil percolation rate as established in Table III - "Guidelines for Construction of Septic Tank and Leachfield on Guam".

SECTION X - SEPTIC TANK DESIGN AND CONSTRUCTION (FIGURES 3 and 3A)

- A. Septic tank design shall be such as to provide access for cleaning, adequate volume for settling, and for sludge and scum storage. The structural design shall provide for a sound durable tank which will sustain all loads and pressures and will resist corrosion.
- B. Location shall be such as to provide not less than the stated distances in Figure 1 and Table II.
- C. Liquid capacity shall be based on the number of bedrooms proposed or reasonably anticipated and shall be at least as required in Table I.
 1. The liquid depth of the tank or compartment thereof shall be five (5) feet and not more than six (6) feet. A liquid depth greater than six (6) feet shall not be considered in determining tank capacity;
 2. No tank or compartment thereof shall have an inside horizontal dimension of less than four (4) feet or 48 inches. Scum storage shall equal 15% of the total liquid depth and shall be measured from the top of the liquid level to the vertical top of the inlet tee and outlet tee excluding the one (1) inch air space at the top of the tank. In no case shall this area be less than seven (7) inches;

3. The vertical leg of the inlet tee shall extend not less than six (6) inches below the liquid surface and above the liquid surface as required in (c)(2) above.
- D. Inlet and outlet connections shall be submerged so as to obtain effective retention of scum and sludge. The inlet invert shall be at least three (3) inches above the outlet invert. Access to both inlet and outlet connections shall be provide through manholes or inspection ports.
- E. The vertical leg of the outlet tee shall extend upward to within 1 inch of the underside of the cover and downward to a point which is 40% of the liquid depth below the liquid surface. When a partition wall is used to subdivide the tank, it shall have a 4 inch diameter minimum opening, with the same invert elevation as the tank outlet (See Figure 3A). The partition wall opening shall have an outlet device equivalent to the tank inlet or outlet, so that outside air can enter both sides of the partition.
- F. When multi-compartment tanks are used, the volume of the first compartment shall be equal to or greater than that of any compartment.
- G. Access to each compartment of the tank shall be provided by a 18" x 18" minimum manhole or removable cover. The inlet and outlet tee connections shall also be accessible through properly placed manholes, handholes or by easily removed covers.
- H. Where the top of the septic tank is below ground grade level, manholes shall be built up to ground grade level.

Figure 3



SECTION

A - Approx. 40% of the depth D.

D - 5' depth to 6' max. depth. Greater than 6 ft. should not be considered in tank capacity.

S - Not less than 20% of the liquid capacity, C.

1. Septic tank size, depends on number of bedrooms contemplated in the dwelling served. Refer to Table 1 for septic tank size.

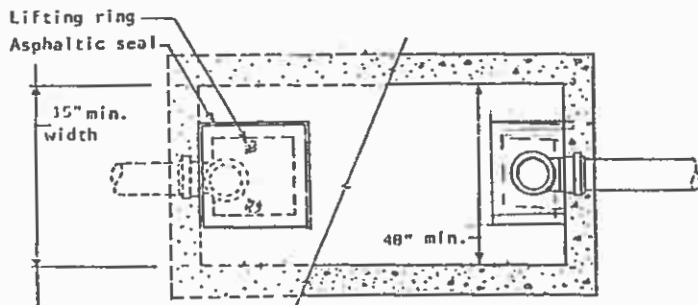
2. Schedule of concrete reinforcement (Min.)

A. Cover - #4 at 8" O.C. EW.

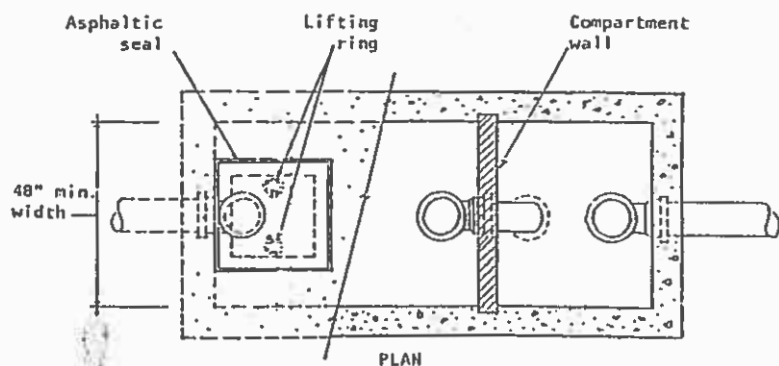
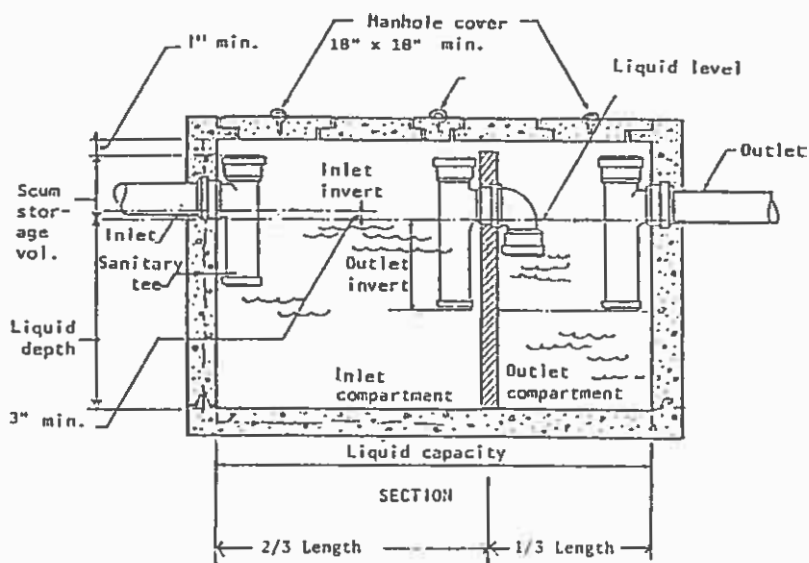
B. Walls - 1. Conc. PIP - #4 at 10" O.C. EW.

2. CHU - #4 vert. bar at 16" O.C. and 8" OUR-O-WALL at every two layers.

C. Bottom slab - #4 at 16" O.C. EW.



PLAN
SINGLE COMPARTMENT SEPTIC TANK



DOUBLE COMPARTMENT SEPTIC TANK

- I. The wall of the tank shall not be less than 4 inches thick reinforced concrete poured in place, or less than 8 inches thick load bearing concrete hollow block reinforced at every 16" on center laid on a solid foundation and mortar joints well filled, plastered with 1/2 inch concrete mortar in the inside of the tank. The tank covers and floor slabs shall be not less than 6 inch 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 2500 psi (pound per square inch).
- J. All septic tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot where the maximum coverage does not exceed three (3) feet.
- K. After the completion of the septic tank, the inside shall be cleaned and all forms removed, before occupancy permits will be issued.

SECTION XI - PERCOLATION TESTS

- A. Individual residences. The absorption area for disposal field for individual residences whenever applicable shall be computed or determined from Table III when sufficient information about area soils is available.
- B. All proposed site shall be subjected to percolation tests acceptable to the Administrator if it is determined that insufficient information exists concerning the permeability characteristics of soils within the proposed site.

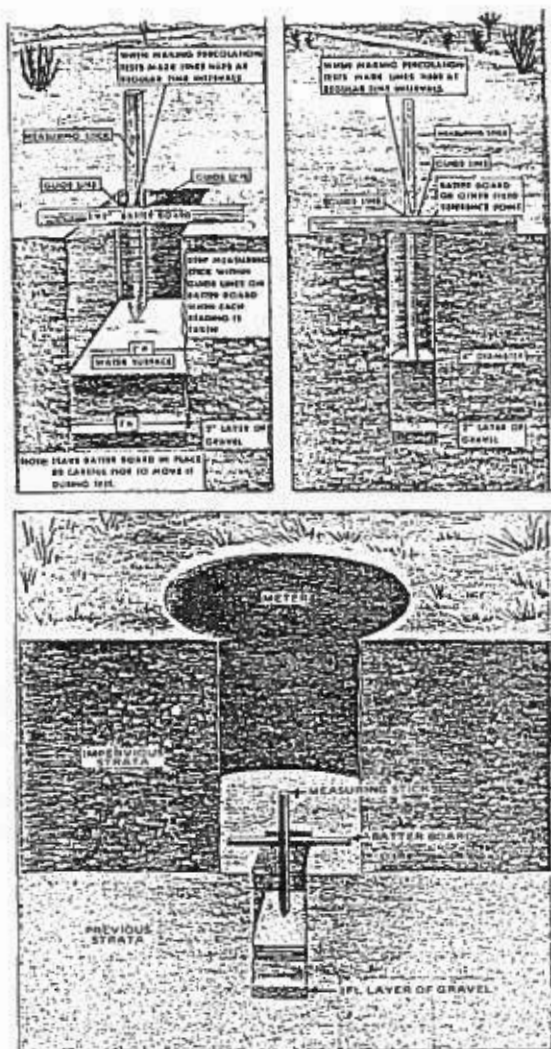
1. For individual lots, one (1) percolation test per lot is required as a minimum, and shall be performed at the location of the proposed field. Where the soil is not uniform or there is more than one type of soil on the lot, one percolation test is required as a minimum at the center of each variation or type of soil that exists within the disposal field area.
2. For subdivisions or multiple lots, a sufficient number of percolation tests must be performed to determine the general acceptability of the area. Final disposal field size must be based on a minimum of one test per site.

C. Test Procedure (FIGURE 5)

All percolation tests required should be performed in accordance with the following:

1. Dig or bore the holes with horizontal dimensions from 4 to 12 inches and vertical sides to the depth of the bottom of the proposed absorption device. Holes can be bored with 4 inch diameter post-hole type auger.
2. Roughen or scratch the bottom and sides of the holes to provide a natural surface. Remove all loose materials from the hole. Place about 2 inches of coarse sand or fine gravel in the hole to prevent bottom scouring.
3. Fill the hole with clear water to a minimum depth of 12 inches over the gravel. By refilling, or by supplying a surplus reservoir of water (automatic siphon), keep water in hole for at least four hours, and preferably overnight. In granular soils, i.e., GW, GP, SW, or SP classified according to the Unified Soils Classification System," the test can be made after the water from one filling has seeped away.

Figure 5 - METHODS OF MAKING PERCOLATION TESTS



SOURCE: Public Health and Social Services, No. 526

4. Percolation rate measurements should be made on the day following the saturation process, except in sandy soils.
5. If water remains in the test hole after overnight saturation, adjust the depth to 6 inches over the gravel. From a fixed reference point, measure the drop in water level at approximately 30-minute intervals over a 4-hour period. The drop which occurs during the final 30-minute period is used to calculate the percolation rate. It must be noted that if a soil or site is determined 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 6 inches over the gravel. From a fixed reference point, measure the height of the water surface at approximately 30 minute intervals over a 4-hour period, refilling the hole to a depth of 6 inches when the percolation rate indicates the hole will run dry before the next reading is made. The drop which occurs during the final 30-minute period is used to calculate the percolation rate. It should be noted that if a hole must be refilled to obtain a final 30-minute reading, determine from the previous reading the water level drop during that interval add water until the level above the bottom equals this figure plus one-half inch. Continue the test, measuring the drop during the final 30-minute period.

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

SECTION XII - SUBSURFACE ABSORPTION FIELD

A. Bed Construction (Figure 4)

Where percolation rates are faster than 1" per 30 minutes and soil characteristics and site conditions are acceptable to the Administrator, an absorption bed system may be installed.

B. Trench Construction (Figure 5)

Where percolation rates are 1" per 30 minutes or slower but faster than 1" per 60 minutes and all other soil conditions and site characteristics are acceptable to the Administrator, an absorption trench system must be installed.

Minimum required absorption areas are given in Table III. For a bed type system this represents the floor area of the bed. For a trench type system this represents the bottom area of the trench. The standard trench width is three feet.

TABLE III
GUIDELINES FOR CONSTRUCTION OF SEPTIC TANK
AND LEACHFIELD ON GUAM

<u>Number of Bedrooms</u>	<u>Wastewater Flow (gpd)</u>	<u>Septic Tank Capacity (gal)</u>	<u>Percolation Test Rate</u>	<u>Required Absorption Area (SF)</u>
2	480	750	1" - 5 min	250
			1" - 10 min	330
			1" - 15 min	380
			1" - 30 min	500
			1" - 45 min	600
			1" - 60 min	800
3	750	1,080	1" - 5 min	328
			1" - 10 min	450
			1" - 15 min	554
			1" - 30 min	800
			1" - 45 min	900
			1" - 60 min	1,200
4	960	1,440	1" - 5 min	436
			1" - 10 min	600
			1" - 15 min	738
			1" - 30 min	1,070
			1" - 45 min	1,200
			1" - 60 min	1,600
5	1,200	1,800	1" - 5 min	545
			1" - 10 min	750
			1" - 15 min	924
			1" - 30 min	1,340
			1" - 45 min	1,500
			1" - 60 min	2,000
6	1,440	2,160	1" - 5 min	660
			1" - 10 min	900
			1" - 15 min	1,100
			1" - 30 min	1,600
			1" - 45 min	1,800
			1" - 60 min	2,400

Source: GEPA, Rural Islandwide Facilities Plan, Table 5-2, Page 5-17.

TABLE III-A
RECOMMENDED MINIMUM LEACHFIELD SIZES

No. of Bed-Room	Daily Sewage Flow Gallons * (GPD)	Tank Capacity (Gallons)	Percolation Test Rate	Required Absorption Area Gal/SF/Day	Leaching Field Dimension W x L	Absorption Area (Sq. Feet)
2	480	750	1- 5 Min.		12' x 21'	250 sq.ft.
			1-10 Min.		18' x 20'	330 sq.ft.
			1-15 Min.		18' x 22'	380 sq.ft.
			1-30 Min.		Trench	500 sq.ft.
			1-45 Min.		System	600 sq.ft.
			1-60 Min.		Required	800 sq.ft.
3	750	1,080	1- 5 Min.	2.2g/da.	18' x 19'	328 sq.ft.
			1-10 Min.	1.6g/da.	18' x 25'	450 sq.ft.
			1-15 Min.	1.3g/da.	18' x 31'	554 sq.ft.
			1-30 Min.	0.9g/da.	Trench	800 sq.ft.
			1-45 Min.	0.8g/da.	System	900 sq.ft.
			1-60 Min.	0.6g/da.	Required	1,200 sq.ft.
4	960	1,440	1- 5 Min.		18' x 25'	436 sq.ft.
			1-10 Min.		18' x 34'	600 sq.ft.
			1-15 Min.		18' x 41'	
			1-30 Min.		or 24 x 31	738 sq.ft.
			1-45 Min.		Trench	1,070 sq.ft.
			1-60 Min.		System Required	1,200 sq.ft. 1,600 sq.ft.
5	1,200	1,800	1- 5 Min.		18' x 31'	545 sq.ft.
			1-10 Min.		18' x 42'	750 sq.ft.
			1-15 Min.		24' x 38'	924 sq.ft.
			1-30 Min.		Trench	1,340 sq.ft.
			1-45 Min.		System	1,500 sq.ft.
			1-60 Min.		Required	2,000 sq.ft.
6	1,440	2,160	1- 5 Min.		18' x 37'	660 sq.ft.
			1-10 Min.		24' x 38'	900 sq.ft.
			1-15 Min.		30' x 37'	1,100 sq.ft.
			1-30 Min.		Trench	1,600 sq.ft.
			1-45 Min.		System	1,800 sq.ft.
			1-60 Min.		Required	2,400 sq.ft.

B. Subsurface leaching system, if found to be applicable by percolation test, should be designed and constructed in accordance with Table III and III-A, and the following items:

1. The minimum distances given below shall be used when determining where the disposal field can be located:
 - a. Sources of domestic water supplies - - - 300 ft.
 - b. Water of the territory - - - - - 300 ft.
 - c. Dwellings
 - i. Septic tank - - - - - 10 ft.
 - ii. Leaching system - - - - - 20 ft.
 - iii. Privy - - - - - 20 ft.
 - d. Property lines - - - - - 5 ft.
 - e. Wells - - - - - 300 ft.

Note: When existing wells are involved or exceptionally coarse soil formations are encountered, the 300 foot-distance from any water supply shall be evaluated and separations maintained in accordance with the recommendations of the Administrator.

C. Construction of a leach field in filled ground is not acceptable.

1. All leaching fields shall be constructed within the following standards:

TABLE IV
SUBSURFACE LEACHING FIELD CONSTRUCTION DETAILS

Item	Unit	Bed		Trench	
		Max.	Min.	Max.	Min.
Number of Distribution Drain lines	----	7	2	8	2
Distance from drain line along perimeter of leachbed	feet	3	3	1-1/2	--
Length of Leach Field	feet	100	21	100'	--
Width of Leach Field	feet	50	12	3'	3'
Depth of Leach Field Bottom	inches	48	24	48	24
Depth of coarse material:					
Under pipe (Min.)	inches		6		6
Over pipe (Min.)	inches		2		2
Total (Min.)	inches		12		12
Size of coarse material	inches	2-1/2	3/4	2-1/2	3/4
Depth of backfill over coarse material	inches	36	12	36	12
Distance bet. drain lines center to center	feet	6	-	--	6

(Exception to the above table may be made by GEPA when soil conditions warrant.)

D. Distribution drain lines shall be constructed of perforated PVC pipes or perforated clay pipes or other approved materials may be used, provided that sufficient openings are available for distribution drain lines of the effluent into the leach bed area.

E. Before placing filter material or drain lines in a prepared excavation, all smeared or compacted surfaces shall be removed from leaching bed area by raking to a depth of 1-inch and the loose material removed. Clean stone, gravel slag or similar filter material acceptable to the Administrator, varying in sizes from 3/4" to 2-1/2" shall be placed in the trench to the depth and grade required in Table IV and Figure 4 and Figures 5, 5A and 5B.

Drain lines shall then be covered with filter material to the minimum depth required on Table IV and the entire bed or trench area covered with untreated building paper, straw, or similar porous material which will prevent closure of voids within the gravel fill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance by the Administrator or his authorized representative.

F. Connections between a septic tank and main distribution line shall be laid with approved pipe with water tight joints on natural ground or compacted fill.

G. Disposal or leaching field shall be constructed as follows:

	<u>Bed</u>	<u>Trench</u>
Minimum number of drain lines	2	4
Maximum length of each line	100 feet	100'
Minimum bottom width of leachfield....	12 feet	3'
Maximum bottom width of leachfield....	50 feet	3'

	<u>Bed</u>	<u>Trench</u>
Minimum bottom width of leachfield....	21 feet	3
Maximum bottom length of leachfield...	103 feet	103'
Minimum spacing of drain lines center to center	6 feet	6'
Preferred depth of cover of lines	24 inches	24"
Minimum depth of each cover over lines	12 inches	12"
Minimum filter material under drain .. lines	6 inches	6"
Minimum filter material over drain ... lines	2 inches	2"
Minimum Total Filter Material	12 inches	12"
* Maximum grade of lines	6 inches	100'
* Minimum grade of lines	3 inches	100'

Note: * When perforated pipe is used it shall be laid level and with the end of the line capped. Where leaching beds are permitted, distribution drain lines in leaching beds shall not be more than six (6) feet apart on centers and no part of the perimeter of the leaching bed shall be more than three (3) feet from a distribution drain line. When necessary on sloping ground to prevent excessive line slope, leach lines or leach beds shall be stepped. The lines between each horizontal section shall be made with watertight joints and shall be utilized to the maximum capacity before the effluent shall pass to the next lower leach line or bed. The lines between each horizontal leaching section shall be made with approved watertight joints.

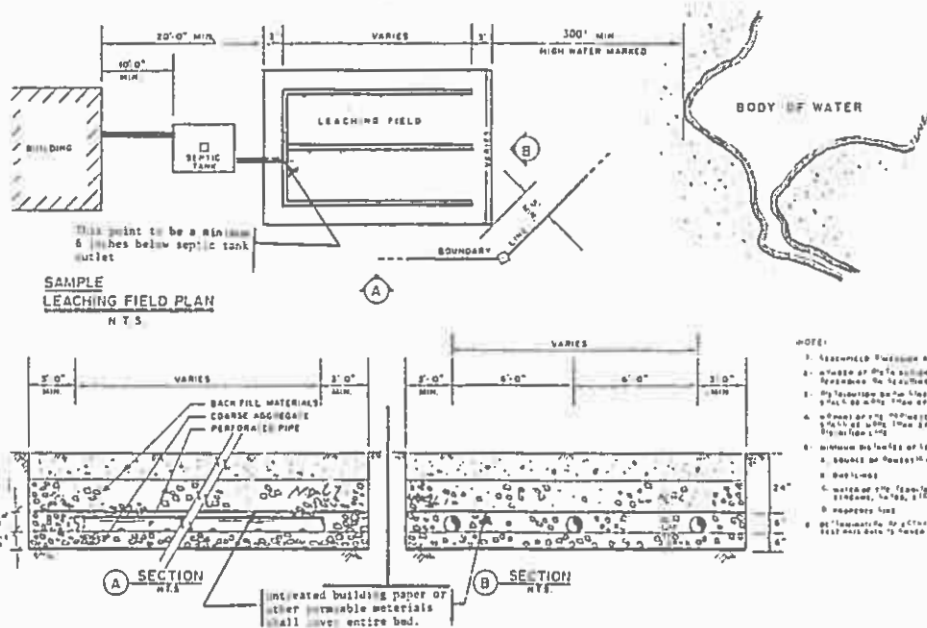


Figure 4

TYPICAL TRENCH SYSTEM

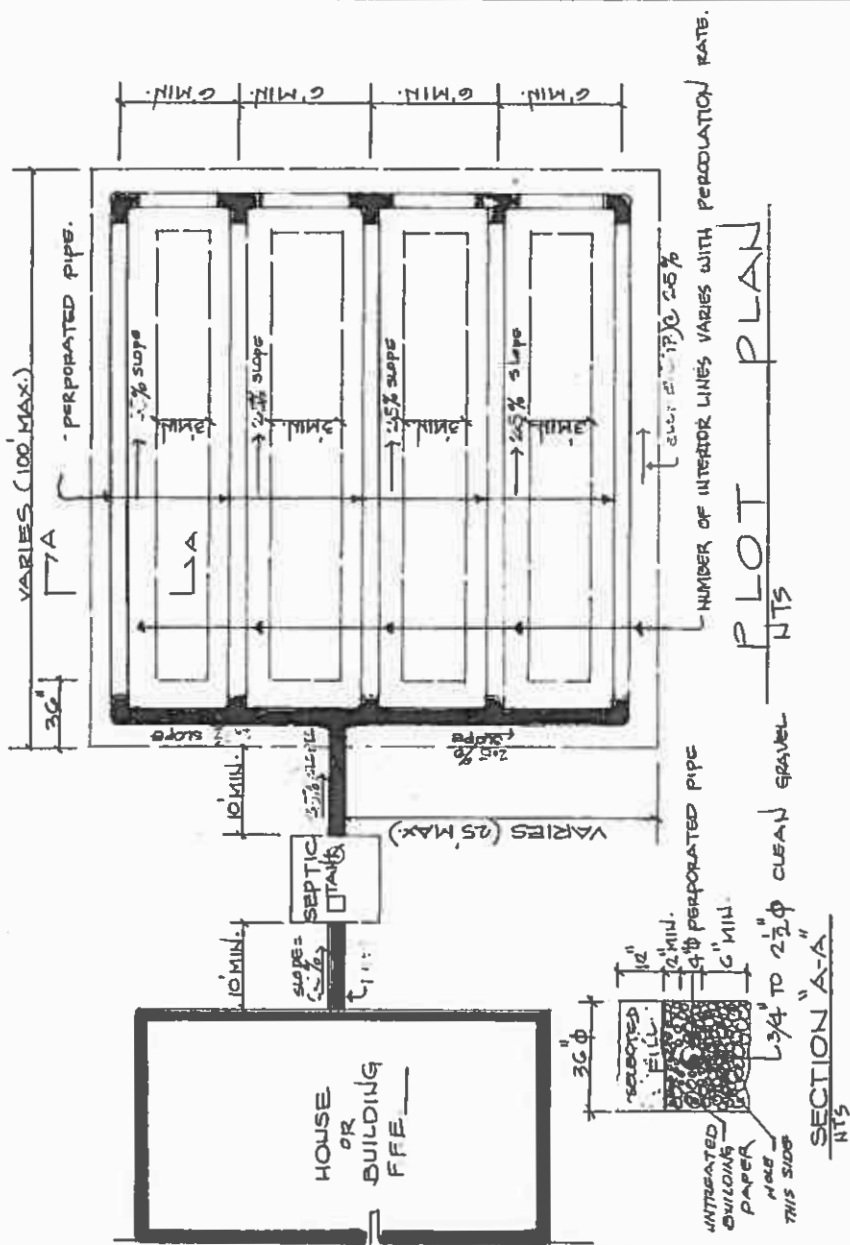
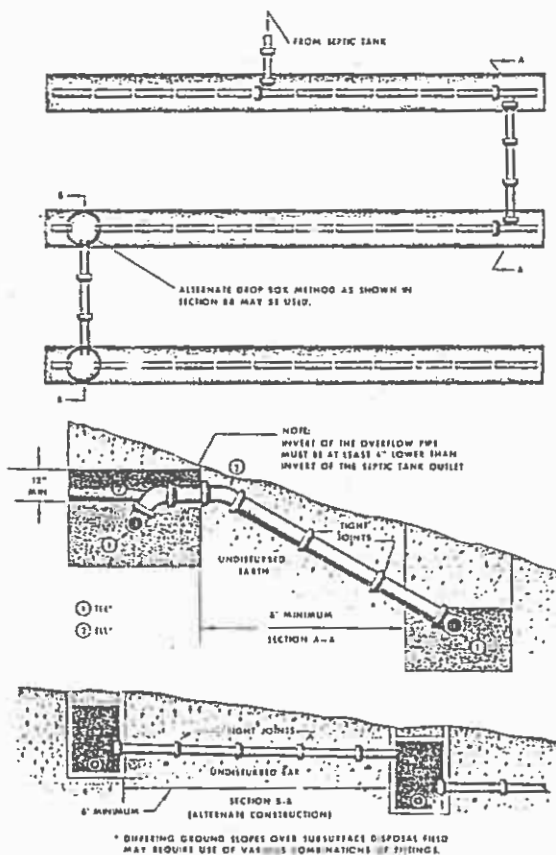
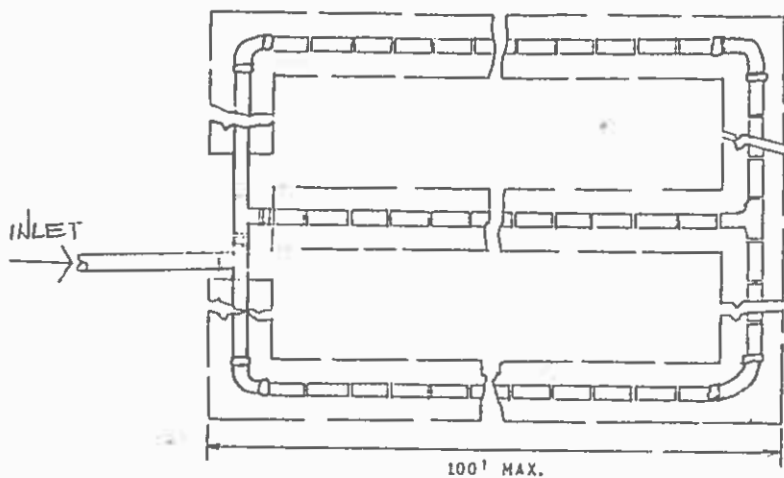


Figure 5

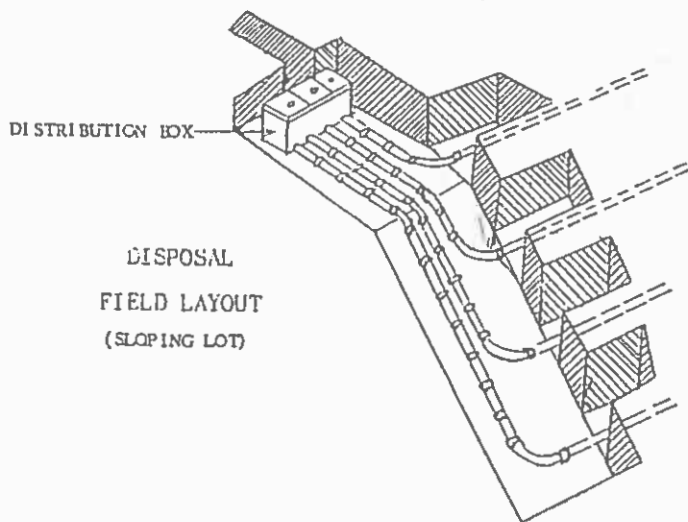


A relief line arrangement for serial distribution.

Figure 5A



DISPOSAL FIELD LAYOUT
(LEVEL LOT)



DISPOSAL
FIELD LAYOUT
(SLOPING LOT)

Figure 5B

Section XIII INSPECTION OF WORK IN PROGRESS.

The project shall be inspected on regular basis by inspectors from the Guam Environmental Protection Agency (GEPA) to assure that construction of septic tanks and leaching systems or grease trap are in compliance with approved plans and specifications, and in accordance with the Guam Environmental Protection Agency regulations.

NOTE: In accordance with GEPA standards:

- (a) Schedule of concrete pouring must be made twenty-four (24) hours in advance and work must be performed in the presence of a Environmental Inspector.
- (b) Inspection before covering. No cover shall be placed over any septic tank, until the depth and other interior dimensions of such septic tank, have been inspected and approved by the Administrator.
- (c) It shall be the duty of the permit holders pursuant to this regulation to notify the Agency issuing the permit when (a) and/or (b) above are ready for inspection.

Failure to comply with the above requirements may result in unnecessary delays to the project or a suspension of work or denial of a Certificate of Occupancy and an order to remove portions or all of the offending structures.

After completion of the project, final inspection by a GEPA inspector shall be conducted on septic tanks and leaching systems to assure that the work is in accordance with the approved plans and specifications and that GEPA requirements are met.

Section XIV STOP WORK ORDERS.

In the event a project is commenced without a septic tank and leaching system 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 continued after sufficient warnings by the Administrator or his authorized representatives, a STOP WORK ORDER shall be issued and take effect until the conflict is resolved.

Section XV CERTIFICATE OF OCCUPANCY.

After final inspection of the septic tank and leaching system indicates that the work performed was done in accordance with approved plans and specifications and has met all GEPA requirements, the Administrator or his authorized representative shall issue a Certificate of Occupancy.

SECTION XVI TEMPORARY TOILET FACILITIES (TTF)

A. Temporary Toilet Facilities (TTF) shall be provided for:

- (i) any construction job-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 needs of the employees.
- (a) The number of facilities required, whether permanent, temporary or combination thereof shall be in accordance with the requirements detailed in Table VI.

- (b) The term readily available as used in item (i) above, shall be defined as being within 300 feet of the work area. Facilities which are within this distance but are not under the direct control of the developer/contractor shall require a written authorization/certification from the owner of such facilities that unrestricted access to these toilet facilities will be available to the contractors workers for the entire period of the construction project.
- (c) All arrangements for sanitary facilities must be made and in place before any clearing or construction may proceed.
- (ii) any carnival, fair, sporting event, outdoor concert or large public gathering requiring a permit, hereafter, collectively referred to as a "special event", where adequate working toilet facilities connected to a sanitary sewer does not exist. Adequacy shall be determined from the Table VII - Toilet Receptacles Required for Special Events.
- B. Temporary Toilet Facilities may be chemical, recirculating or combustion providing they comply with existing Guam Codes.
- C. The minimum number of TTF required for construction site shall be based in accordance with Table VI below:
- (i) Table VI - Number of TTF required for construction sites

<u>Number of Employees</u>	<u>Minimum Numbers of Units</u>
1 to 15	1
16 to 30	2
31 to 51	3
52 to 72	4
73 to 93	5
Over 93	1 Add'l unit/20 employees

- (ii) The minimum number of temporary toilet receptacles at any special event shall be in accordance with Table VII below:

TABLE VII

Toilet Receptacles Required for Special Events (Minimum)

		Number of Hours									
		1	2	3	4	5	6	7	8	9	10
1,000	or below	1	1	1	2	2	2	3	3	3	4
	2,000	1	2	2	3	4	4	5	6	6	7
	3,000	1	2	3	4	5	6	7	8	9	10
	4,000	2	3	4	6	7	8	9	12	12	14
	5,000	2	4	5	7	9	10	12	15	17	19
	6,000	2	4	6	8	10	12	14	16	18	20
	7,000	3	5	7	10	12	14	17	19	21	24
	8,000	3	6	8	11	14	16	19	22	24	27
	9,000	3	6	9	12	15	18	21	24	27	30
	10,000	4	7	10	14	17	20	24	27	30	34

Ref. Satellite Industries of Minneapolis, Minn.
Portable Sanitation Unit Calculator for
Special Events.

- D. Any construction site or special event requiring GEPA approval for permitting will provide proof that the minimum required number of toilet facilities are available or will be available for the period of time that the permits are valid.

E. Failure to comply

- (i) 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 the GEPA approval required for the building permit which will temporarily suspended all construction at this site.

- (ii) Any special event not meeting the minimum number of TTF will have its permit to operate immediately suspended.

Section XVII CLEANING WASTEWATER SYSTEM, DISPOSAL OF WASTEWATER, REQUIREMENTS AND PROCEDURES

- A. No person shall engage in the business of cleaning individual sewage disposal system or disposing of the wastes therefrom unless; a business license has been secured from the Department of Revenue and Taxation, and Registration has been issued to him by the administrator. Such business shall be conducted in conformity with the following requirements and in accordance with the regulations.
1. The name 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 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 and hose lines shall be properly maintained so as to prevent leakage.
 5. Approval in writing shall be obtained from the Administrator for every site at which the person plans to discharge the waste material collected. The approval may be given after consultation with Public Utility Agency of Guam.

6. The hose or any similar devise used for discharging waste must be inserted into the earmarked manhole to a depth of approximately two (2) feet, to prevent any spray or spillage into the surrounding area.
 7. Every precaution must be taken to prevent any public nuisance or health hazard which may be caused by their service.
- B. Registration shall be issued to any person properly making application therefor, who is not less than twenty-one (21) years of age, has successfully demonstrated the ability to handle the equipment, and only after the place or places and manner of disposal of the cleanings proposed by said applicant are approved by the Administrator.
- C. Registration issued pursuant to these Regulations is not transferable and shall expire December 30th of each year. A Registration may be renewed for an ensuing year by making application for renewal of the registration, 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 until a new registration is received or the applicant is notified by the Administrator that the renewal of the registration has been refused?
- D. All persons, who are registered to clean individual sewage disposal system i.e. holding tank etc; or to dispose of the wastewater therefrom, shall file with the Administrator a statement giving the name and the address of the owner or tenant of each and every one of the premises where an individual sewage disposal system has been cleaned by said registrant, or his employer, or by others on his behalf. The report must be submitted on a monthly basis, covering a 4 weeks period.

- E. Non-compliance of the requirements of these regulations may result in the revocation or suspension of the applicant's registration. Any applicant whose registration is suspended must correct all discrepancies noted in the suspension within 30 days, otherwise his registration may be revoked.
- F. Registration under these regulations shall not be construed as impairing in any manner, the existing powers and duties of the Department of Public Health and Social Services, Public Utility Agency of Guam, Department of Public Safety, Department of Revenue and Taxation, and Department of Commerce under other laws.

Section XVIII. MAINTENANCE

- A. Maintenance of septic tanks and leaching fields shall be the responsibility of the owner, lessee, occupant, or person in possession of property, unless mutually agreeable arrangements are made with a private company.
- B. Owners of septic tanks shall empty and clean the tank or pit when necessary, or when ordered by the Administrator in the interest of public health, and the contents disposed of in such place and manner as shall be authorized by the Administrator.
- C. Septic Tanks should be inspected by the owner at intervals of no more than 3 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.
- D. The tank should be cleaned whenever:
 - 1. the bottom of the scum layer is within 3 inches of the bottom of the outlet device;

2. the sludge level is within 8 in. of the bottom of the outlet device.

E. Septic tank sludges and Temporary Toilet Sludges shall be disposed of by hauling to a sewage treatment facility. If for some unique reason disposal cannot be done at an approved facility land spreading of waste may be considered on a specific case by case basis. The specifics of each request will be evaluated separately and a permit obtained from GEPA for each separate request. Any such disposal can only take place after review and approval by the Administrator and only done under the direct supervision of GEPA staff.

F. In order to be effective, grease traps must be operated properly and cleaned regularly to prevent the escape of appreciable quantities of grease. The frequency of cleaning at any given installation can best be determined by experience based on observation. Generally, cleaning should be done when 75% of the grease-retention capacity has been reached. At restaurants, pumping frequencies range from once a week to once every 2 or 3 months.

SECTION XIX APPENDIX A - SAMPLE DESIGN ILLUSTRATION

A. Flow Estimate

Given: 3BR House with washing machine and garbage grinder
2 person per bedroom
75 gallons per person per day

Additional: 40% of flow for washing machine
20% of flow for garbage grinder

Flow: $3BR \times 2 \text{ person/Br} \times 75 \text{ gal/Person/Day}$
 $= 450 \text{ gallons/day}$

$$\begin{aligned}
 \text{Total Flow: } & 450 + 40\% (450) + 20\% (450) \\
 & 450 + 60\% (450) \\
 & 450 + 270 \\
 & = 720 \text{ gallons/day}
 \end{aligned}$$

B. Septic Tank Design - (Three Bedroom House)

V = Total flow + 50% (total flow) (provision for detention period for treatment inside septic tank).

$$\begin{aligned}
 V &= 720 + 50\% (720) \\
 &= 720 + 360 \\
 &= 1080 \text{ gallons} \\
 &= \underline{1080} \text{ gallons} \\
 &= 7.48 \text{ gal/cu.ft.} \\
 &= 144.3 \text{ cubic feet}
 \end{aligned}$$

Depth = 5'-0" + 1'-0" Air Space

Try Width = 4'-0"

$$\text{Therefore length} = \frac{144}{5 \times 4} = 7.22' \text{ say } 7'-6''$$

Septic Tank Dimension = 7'-6" x 4'W x 5'D

Volume = 7'-6" x 4' x 5' = 150 cu. ft.

$$\frac{150}{144}$$

$$\text{Check: } 1.5 \frac{L}{W} \quad 2.5 \frac{L}{W} \quad \text{ratio} = 1.88$$

Adopt Septic Tank Dimension = 7'-6" x 4'W x 6'D

C. Absorption Area: (Three Bedroom)

Total Flow = 720 gallons

Say percolation rate of 1" - 15 minutes

$$\begin{aligned}
 \frac{720}{1.3} &= 545 \text{ sq. ft.} \\
 1.3
 \end{aligned}$$

Actual percolation rate determined by testing.

1. Leaching Field:

Note: (Separation of Leaching Pipe shall be
6 ft. on center)

Say Width = 18'-0"

Length = $\frac{545}{18}$ = 30.2 ft. say 31 feet

18

Therefore length field size = 18'W x 31'L

XX. PENALTY

- A. Any person who violates any provisions of this regulations or who refuses or neglects to comply with any lawful order issued by the Administrator shall be guilty of misdemeanor and subject to a fine not to exceed \$1,000.00. Each day of violation shall constitute a separate offense (Section 48126, (a) Title 10, GCA).
- B. Any penalty imposed pursuant to sub-section (A) of this Section shall not be bar to enforcement of this Chapter or the rules and regulations in force pursuant thereto or orders made pursuant to this Chapter by injunction or other remedy, to institute and maintain in the name of territory all such enforcement proceedings (Section 48126 (b), Title 10, GCA).