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.

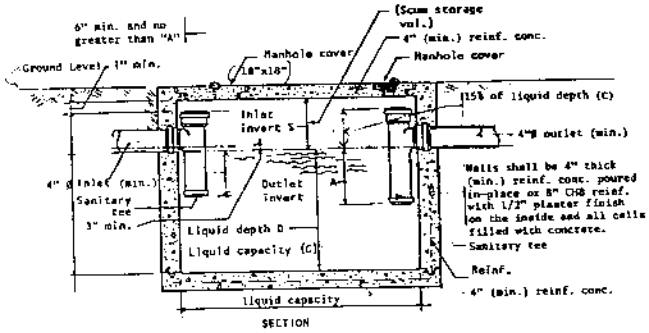
E. The vertical leg of the outlet tee shall extend upward to within 1 inch of the underside of the cover and downward to a point which is 40% of the liquid depth below the liquid surface. When a partition wall is used to subdivide the tank, it shall have a 4 inch diameter minimum opening, with the same 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

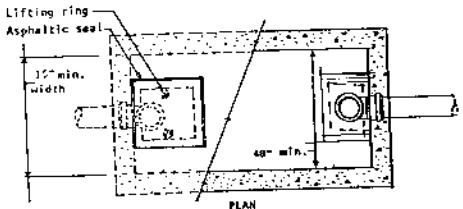


A - Approx. 40% of the depth D.
D - 5' depth to 6' max. depth. Greater than 6 ft. should not be considered in tank capacity.
S - Not less than 20% of the liquid capacity C.

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

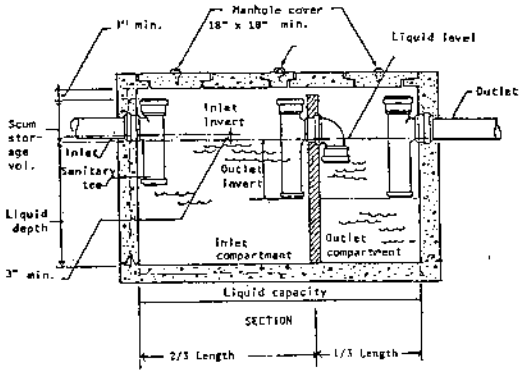
2. Schedule of concrete reinforcement (Min.)

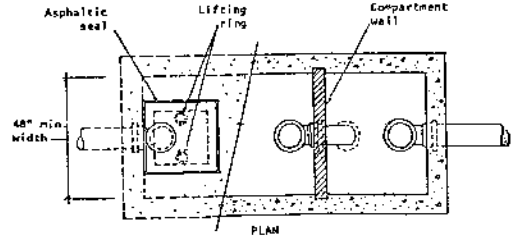
A. Cover - #4 at 8" O.C. EW.
B. Walls - 1. Conc. PIP - #4 at 10" O.C. EW.
2. CMU - #4 vert. bar at 16" O.C. and 8" DUR-O-WALL at every two layers.
C. Bottom slab - #4 at 10" O.C. EW.



SINGLE COMPARTMENT SEPTIC TANK

Figure 3A





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 areas 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 mimumum of one test per site.

C. Test Procedure (FIGURE 5)

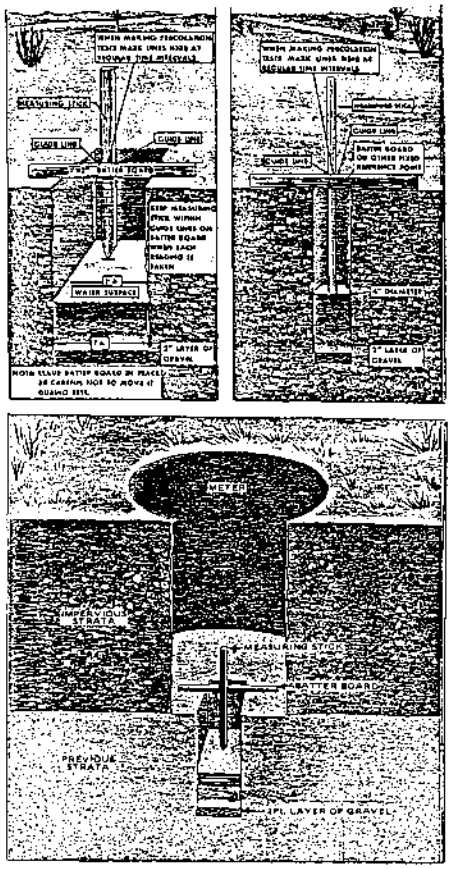
All percolation tests required should be performed in accordance with the following:

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

Number of Bedrooms	Wastewater Flow (gpd)	Septic Tank Capacity (gal)	Percolation Test Rate	Required Absorption Area (SF)
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	545
			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'	545 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' or 24 x 31	738 sq.ft.
			1-30 Min.		Trench	1,070 sq.ft.
			1-45 Min.		System	1,200 sq.ft.
			1-60 Min.		Required	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 leachfield 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 Max.	Bed Min.	Trench Max.	Trench 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:

	Bed	Trench
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'

	Bed	Trench
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 earch 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.

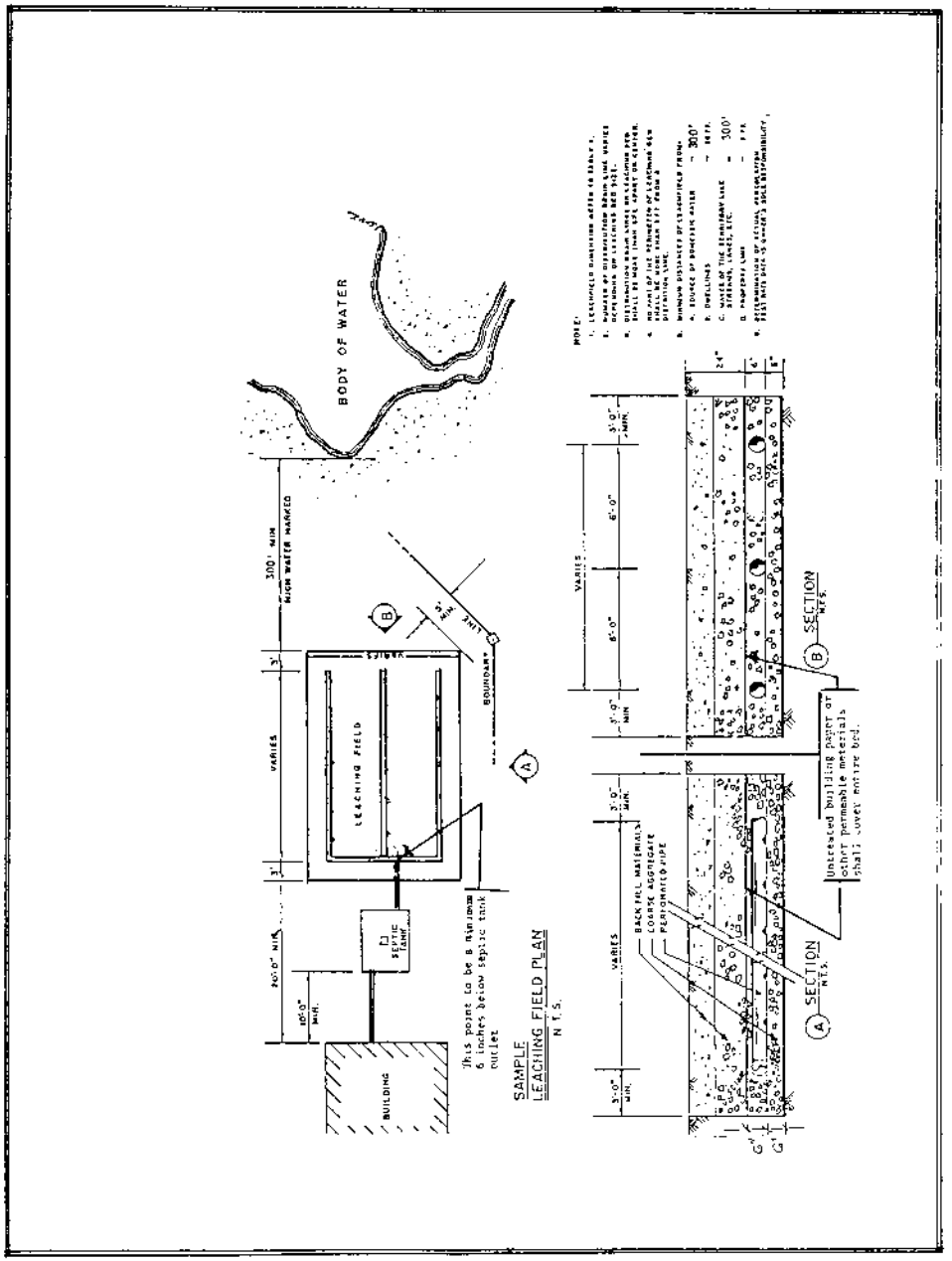


Figure 4

TYPICAL TRENCH SYSTEM

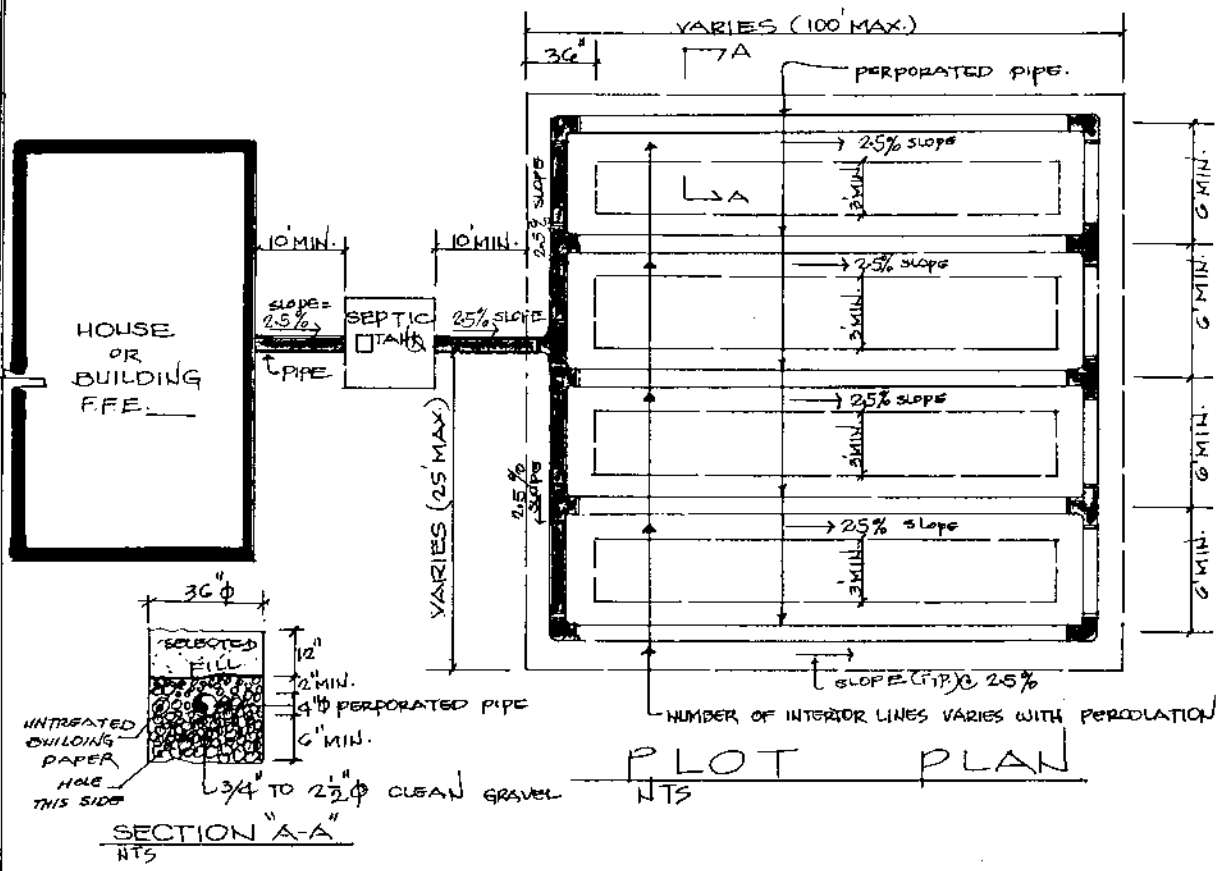


Figure 5

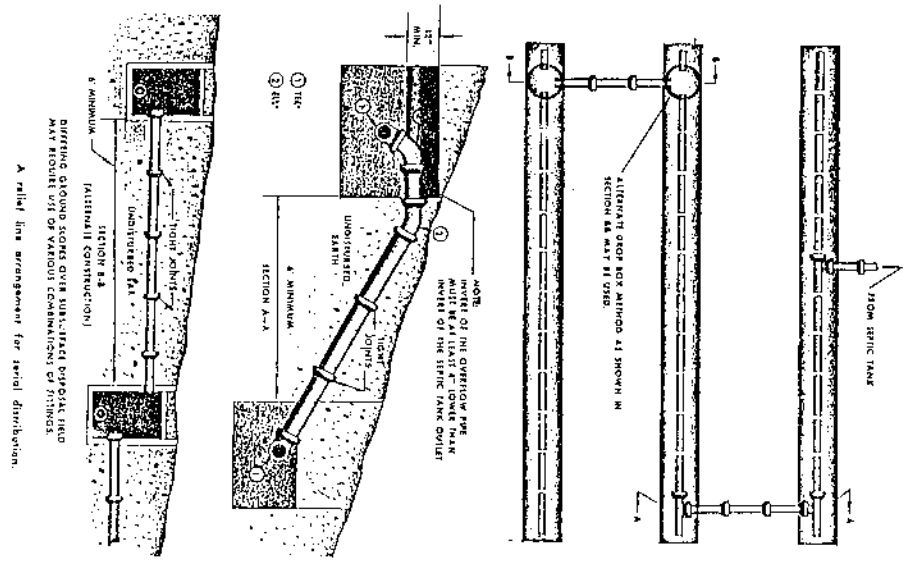
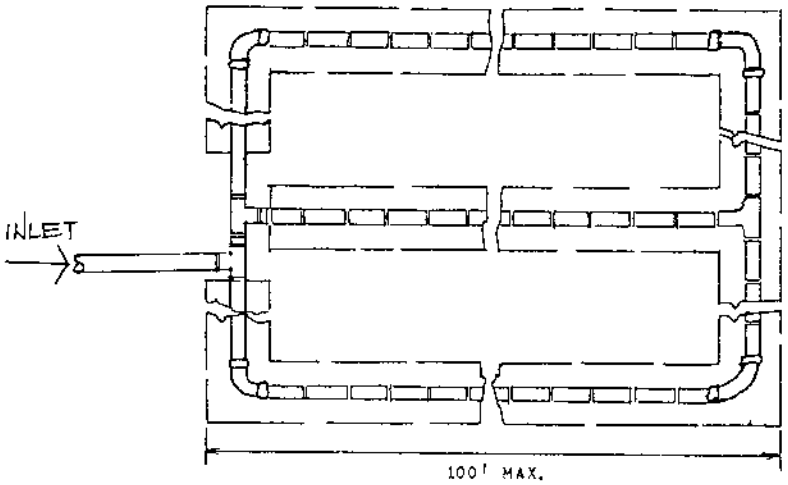


Figure 5A



DISPOSAL FIELD LAYOUT
(LEVEL LOT)

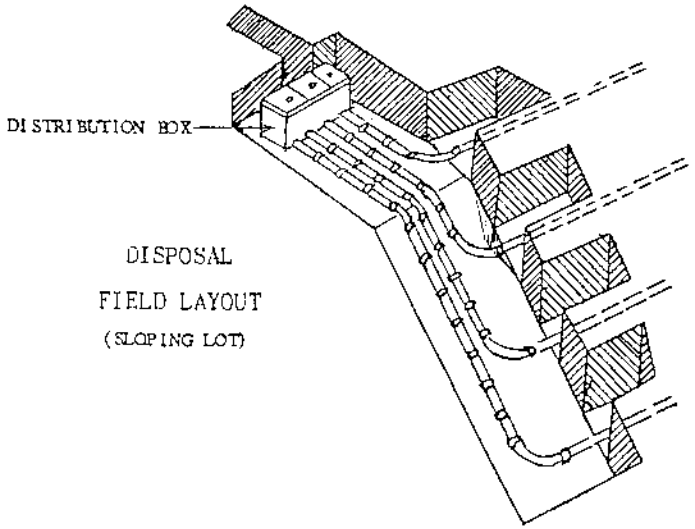


Figure 5B

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.