

PLUMBING DESIGN

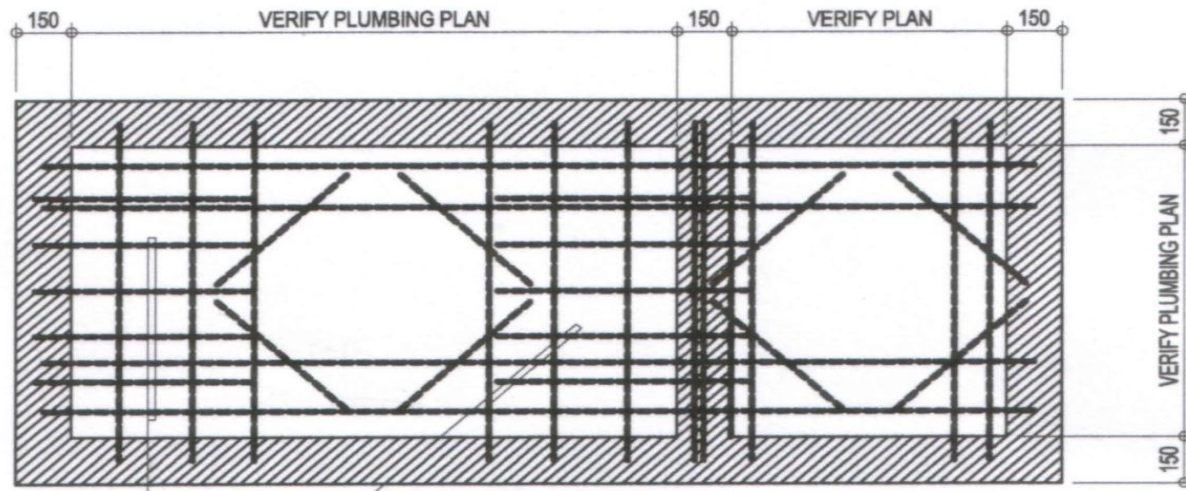
How to Determine the Size of Septic Tank

As per Uniform Plumbing Code 2000

SUNNY B. OJEDA, RMP

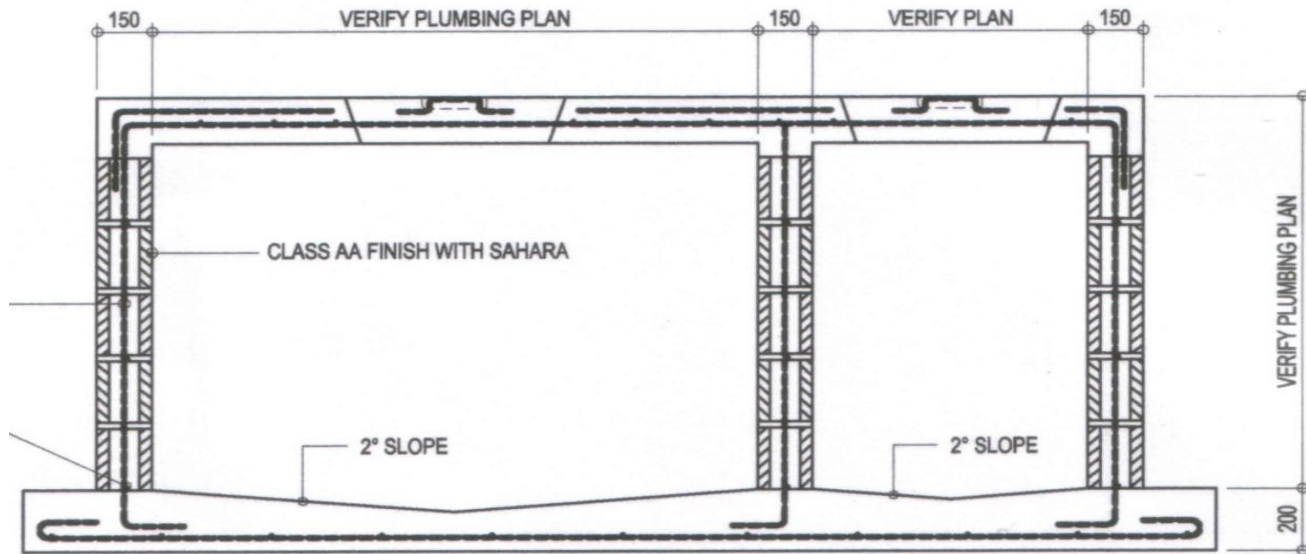
Technical Drafting / Plumbing Trainer
San Jose Del Monte National Trade School
SJDM City, Bulacan





12MM Ø BARS @ 150MM O.C. BOTTOM BARS

12MM Ø BARS @ 150MM O.C. TOP BARS



SEPTIC TANK DETAILS

SCALE:

1:20

SEPTIC TANK SIZING

- Given: 10 units 2-storey commercial building with the following requirements. Find for the DFU Value and Septic Tank Size.

PUBLIC All Floors As per TABLE 7-3	Quantity	DFU Value	DFU
Water Closet	10		
Lavatory in set	5		
Urinal	5		
Shower	2		
Floor Drain	10		
Grease Trap / Receptor**	5	3	
Kitchen Sink	5		

TABLE 7-3

Drainage Fixture Unit Values (DFU)

RNPC 1999 DFU Value is different
from Uniform Plumbing Code 2000

Inch	mm
1-1/4	32
1-1/2	40
2	50
2-1/2	65
3	80

Plumbing Appliance, Appurtenance or Fixture	Min. Size Trap and Trap Arm ⁷	Private	Public	Assembly ⁸
Bathtub or Combination Bath/Shower	1-1/2"	2.0	2.0	
Bidet.....	1-1/4"	1.0		
Bidet.....	1-1/2"	2.0		
Clothes Washer, domestic, standpipe ⁵	2"	3.0	3.0	3.0
Dental Unit, cuspidor	1-1/4"		1.0	1.0
Dishwasher, domestic, with independent drain	1-1/2" ²	2.0	2.0	2.0
Drinking Fountain or Watercooler (per head)	1-1/4"	0.5	0.5	1.0
Food-waste-grinder, commercial	2"		3.0	3.0
Floor Drain, emergency	2"		0.0	0.0
Floor Drain (for additional sizes see Section 702)	2"	2.0	2.0	2.0
Shower single head trap	2"	2.0	2.0	2.0
Multi-head, each additional	2"	1.0	1.0	1.0
Lavatory, single.....	1-1/4"	1.0	1.0	1.0
Lavatory in sets of two or three.....	1-1/2"	2.0	2.0	2.0

Sinks

Bar	1-1/2"	1.0		
Bar	1-1/2" ²		2.0	2.0
Clinical	3"		6.0	6.0
Commercial with food waste	1-1/2" ²		3.0	3.0
Special Purpose	1-1/2"	2.0	3.0	3.0
Special Purpose	2"	3.0	4.0	4.0
Special Purpose	3"		6.0	6.0
Kitchen, domestic	1-1/2" ²	2.0	2.0	
(with or without food-waste-grinder and/or dishwasher)				
Laundry	1-1/2"	2.0	2.0	2.0
(with or without discharge from a clothes washer)				
Service or Mop Basin	2"		3.0	3.0
Service or Mop Basin	3"		3.0	3.0
Service, flushing rim	3"		6.0	6.0
Wash, each set of faucets			2.0	2.0
Urinal, integral trap 1.0 GPF ²	2"	2.0	2.0	5.0
Urinal, integral trap greater than 1.0 GPF	2"	2.0	2.0	6.0
Urinal, exposed trap	1-1/2" ²	2.0	2.0	5.0
Water Closet, 1.6 GPF Gravity Tank ⁶	3"	3.0	4.0	6.0

TABLE K-2
Capacity of Septic Tanks*

Single Family Dwellings – Number of Bedrooms	Multiple Dwelling Units or Apartments – One Bedroom Each	Other Uses: Maximum Fixture Units Served per Table 7-3	Minimum Septic Tank Capacity in	
			Gallons	(liters)
1 or 2		15	750	(2838)
3		20	1000	(3785)
4	2 units	25	1200	(4542)
5 or 6	3	33	1500	(5678)
	4	45	2000	(7570)
	5	55	2250	(8516)
	6	60	2500	(9463)
	7	70	2750	(10,409)
	8	80	3000	(11,355)
	9	90	3250	(12,301)
	10	100	3500	(13,248)

SEPTIC TANK SIZING

Given: 10 units 2-storey commercial building with the following requirements. Find for the DFU Value and Septic Tank Size.

PUBLIC All Floors As per TABLE 7-3	Quantity	DFU Value	DFU
Water Closet	10	4	40
Lavatory in set	5	2	10
Urinal	5	2	10
Shower	2	2	4
Floor Drain	10	2	10
Grease Trap / Receptor**	5	3	15
Kitchen Sink	5	3	15
Total			104
<p>As per on Table K-2 100 DFU = 13,248 liters</p> <p>4 DFU (15 DFU) = 2838 liters</p> <p>Total of 16,086 liters or 16.08 m³</p>			

K-5 SEPTIC TANK CONSTRUCTION

Uniform Plumbing Code 2000

Septic tanks shall have a minimum of two (2) compartments. The inlet compartment of any septic tank shall be not less than **two-thirds ($2/3$)** of the total capacity of the tank, nor less than five hundred (500) gallons (2.0 m^3) liquid capacity, and shall be at least three (3) feet (**914 mm**) in width and five (5) feet (**1524 mm**) in length. Liquid depth shall be not less than two (2) feet (610 mm) and six (6) inches (152 mm) nor more than six (6) feet (1829 mm). The secondary compartment of any septic tank shall have a minimum capacity of two hundred fifty (250) gallons (1.0 m^3) and a maximum capacity of **one-third ($1/3$)** of the total capacity of such tank. In septic tanks having over fifteen hundred (1500) gallons (6.0 m^3) capacity, the secondary compartment may be not less than five (5) feet (1524mm) in length.

K-5 SEPTIC TANK CONSTRUCTION

Uniform Plumbing Code 2000

Formula: **Digestive Chamber** = Tank volume x two-thirds

Secondary or LC = Tank volume x one-thirds

Solution: **Digestive Chamber** $10.70\text{m}^3 = 16.08\text{m}^3 \times 0.666\text{m}^3$

Therefore 2.98m x 2.00m x 1.8m is sufficient for DC

Leaching Chamber $5.35\text{m}^3 = 16.08\text{m}^3 \times 0.333\text{m}^3$

Therefore 1.48m x 2.00m x 1.8m is sufficient for LC

*** The minimum size of digestive chamber must be not less than 0.90 m in width and 1.52 m in length and 1.80m in depth.