

Survey Report of Septic Tanks and Soakaway Pits Located in Lai Chi Wo Village

A) Site Survey of Septic Tanks and Soakaway Pits

Further to the site survey conducted in January 2022 at Lot 282(House 93), Taxlord 232 and Lot 233(House 153-155), Lots 234 and 235(House 156-157), Lot 270(House 146), Lot 271(House 147), Lot 272(House 148) and Lot 273(House 149) regarding the dye test of water closet and measurement of septic tank and soakaway pit (The photos and drawings were attached in **Appendix A**).

After the dye test conducted, it was confirmed that the water closet at Lot 282 would discharge water to its own septic tank. For the septic tank outside Lot 270 was served for the water closet at Lot 270 and Lot 271 and the same was also happened at Lot 272 and Lot 273. Lastly, the septic tank between Taxlord 232 and Lot 233 was served not only for the water closet at Taxlord 232 and Lot 233, but also for the water closet at Lot 234 and Lot 235 respectively.

A site measurement of Percolation Test to determine the absorption capacity of existing soil was conducted in June 2020. The results after the time of 28min. for 150mm of water in test pit to seep completely away was shown as follows: -

- i) The time for water to fall 25mm in test pit is 4.67 min.

The purpose of the Lot 282 and Taxlord 232 and Lot 233 would be for food factory. The other lots Lot 270, Lot 271, Lot 272 and Lot 273 were for accommodation use.

The following was the summary of the dimension of existing septic tank and soakaway pit for the houses: -

Table 1 - Existing Dimension of Septic Tank Served House

Lot	House	Existing Septic Tank			Capacity (m3)
		L (mm)	W (mm)	* D (mm)	
282	93	700	1000	780	1.092
		700	1000	780	
270	146	610	1100	650	0.91
271	147	560	1100	770	
272	148	660	1000	900	1.188
273	149	600	1100	900	
232 and 233	153-155	600	1100	840	1.109
234 and 235	156-157	600	1100	840	

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Table 2 - Existing Dimension of Soakaway Pit Served House

Lot	House	Soakaway Pit			Capacity (m3)
		L (mm)	W (mm)	* D (mm)	
282	93	700	1000	780	0.546
270	146	530	1100	800	0.466
271	147				
272	148	500	1040	900	0.468
273	149				
232 and 233	153-155	600	1100	840	0.554
234 and 235	156-157				

Remark:

“*” – The space of 100mm between the tank water level and the bottom level of inlet pipe was excluded.

B) Assumptions & Calculation

Assumptions:

1. The Lot 271 to Lot 272 were for the accommodation use. No waste water from the kitchen sink was discharged to the septic tank. The only soil would be discharged to the septic tank and soakaway pit.

2. The Lot 270 and 273 were the domestic flat. The waste water from the kitchen sink and the soil water from the water closet would be discharged to the septic tank and soakaway pit.

3. For the rest of the houses, the Lot 282 and Taxlord 232 would be applied for the food factory licence and the toilet in the houses would not open for public use. Only the building owner could use the soil fitment.
 - (i) The soil and waste water discharged from soil fitment and kitchen sink would be discharged to the septic tank and soakaway pit. All fitments with Water Efficiency Label would be adopted.
 - (ii) As per the ferry schedule to Lai Chi Wo Village by Kaito, the time was from 9:30am to 3:30pm. Hence, one meal per customer per day was assumed.
 - (iii) Referring to Section 6.2.5.3 of WSD's Technical Requirement for Plumbing Works in Building, the daily fresh water demand for domestic was 135 litres.
 - (iv) Referring to Table 6.2.5.2.1 and Table 6.2.5.6.1 of WSD's Technical Requirement for Plumbing Works in Buildings, the water demand per day for flushing water supply and fresh water supply were 0.03m³ (Residential – Water Closet), 0.04m³ (Commercial – Water Closet) and 0.07m³ (Hotel Double Room).
 - (v) Referring to Table 6.2.5.6.2 of WSD's Technical Requirement for Plumbing Works in Buildings, the daily water demand of Food Factory Licence Lots was 0.025m³/seat. It was assumed that 0.025m³/meal.

4. The surface area of existing soakaway pits were indicated as follows: -

Table 3 – Available Surface Area (3-side wall area + Bottom area) of Existing Soakaway Pits

Lot	House	Soakaway Pit			Total Available Surface Area (m ²)
		L (mm)	W (mm)	D (mm)	
282	93	700	1000	780	2.572
270	146	530	1100	800	2.311
271	147				
272	148	500	1040	900	2.356
273	149				
232 and 233	153-155	600	1100	840	2.592
234 and 235	156-157				

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Calculation:

Based on the above assumptions, the estimated total fluid capacity for the septic tanks were calculated and shown as follows: -

Table 4 - Summary of Calculation of Estimated Total Fluid Capacity

Lot	House No.	Domestic Flat (No. of People)	Double Room (No. of People)	Total No. of Water Closet	Max. No. of Customer	Total No. of meals (1 meal /Customer)	Soil Capacity (m3)	Waste Water Capacity (m3)	Estimated Total fluid capacity (m3)
282	93	--	--	1	10	10	0.04	0.25	0.29
270	146	1	--	1	--	--	0.03	0.135	0.275
271	147	--	2	1	--	--	0.04	0.07	
272	148	--	2	1	--	--	0.04	0.07	0.275
273	149	2	--	1	--	--	0.03	0.135	
232	153	--	--	1	10	10	0.04	0.25	0.29
233	155	--	--	--	(for Lot 232)				
234	156	--	--	--					
235	157	--	--	--					

Referring to the test result of percolation test, the time for water to fall 25mm in test pit was 4.67 minutes. In accordance with EPD’s requirement “Drainage and Health Requirements for Village Type Houses”, the allowable loading of drain trench bottom area and pit percolation area in 2 minutes were 130 (litre/m2/day) and 175 (litre/m2/day), and in 5 minutes were 98 (litre/m2/day) and 130 (litre/m2/day) respectively. By the interpolation method, the allowable loading of drain trench bottom area and pit percolation area in 4.67 minutes were 101.52 litre/m2/day and 134.95 litre/m2/day. The following Table 5 was the allowable loading of the existing soakaway pit.

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Table 5 – Allowable Loading of Existing Soakaway Pit

Lot	House No.	Existing Soakaway Pit				
		L (mm)	W (mm)	D (mm)	Total Available Surface Area (m ²)	Allowable Loading (m ³ /day)
282	93	700	1000	780	2.572	0.323
270 271	146 147	530	1100	800	2.311	0.292
272 273	148 149	500	1040	900	2.356	0.3
232 233 234 235	153 155 156 157	600	1100	840	2.592	0.327

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Conclusion

Based on the calculation result shown in Table 4 and Table 5 of Section B, the existing septic tank and soakaway pit could handle the required daily fluid capacity as shown in Table 6 and Table 7.

Table 6 – Comparison of Septic Tank Capacity between Existing Available and Required

Lot	House No.	Existing Septic Tank				Required Capacity (m3/day)
		L (mm)	W (mm)	D (mm)	Capacity (m3/day)	
282	93	700	1000	780	1.092	0.29
		700	1000	780		
270	146	610	1100	650	0.91	0.275
271	147	560	1100	770		
272	148	660	1000	900	1.188	0.275
273	149	600	1100	900		
232	153	600	1100	840	1.109	0.29
233	155	600	1100	840		
234	156					
235	157					

Table 7 – Comparison of Soakaway Pit Allowable Loading between Existing Available and Required

Lot	House No.	Existing Soakaway Pit				Required Allowable Loading (m3/day)
		L (mm)	W (mm)	D (mm)	Allowable Loading (m3/day)	
282	93	700	1000	780	0.323	0.29
270	146	530	1100	800	0.292	0.275
271	147					
272	148	500	1040	900	0.3	0.275
273	149					
232	153	600	1100	840	0.327	0.29
233	155					
234	156					
235	157					

Appendix A

House 93



Tank Volume:

T1: $W\ 0.7m \times L\ 1m \times D\ 0.88m = 0.616\ m^3$

T2: $W\ 0.7m \times L\ 1m \times D\ 0.88m = 0.616\ m^3$

T3: $W\ 0.7m \times L\ 1m \times D\ 0.88m = 0.616\ m^3$

Total Tank Volume: $1.848\ m^3$

House 153, 155 & 156, 157



Tank Volume:

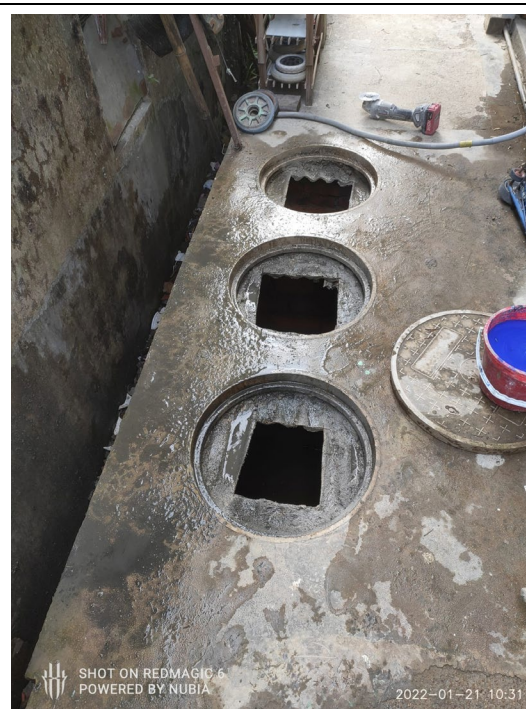
T1: $W\ 0.6m \times L\ 1.1m \times D\ 0.94m = 0.6204\ m^3$

T2: $W\ 0.6m \times L\ 1.1m \times D\ 0.94m = 0.6204\ m^3$

T3: $W\ 0.6m \times L\ 1.1m \times D\ 0.94m = 0.6204\ m^3$

Total Tank Volume: $1.8612\ m^3$

House 146, 147



Tank Volume:

T1: $W\ 0.61m \times L\ 1.1m \times D\ 0.75m = 0.50325\ m^3$

T2: $W\ 0.56m \times L\ 1.1m \times D\ 0.87m = 0.53592\ m^3$

T3: $W\ 0.53m \times L\ 1.1m \times D\ 0.9m = 0.5247\ m^3$

Total Tank Volume: $1.56387m^3$

House 148, 149



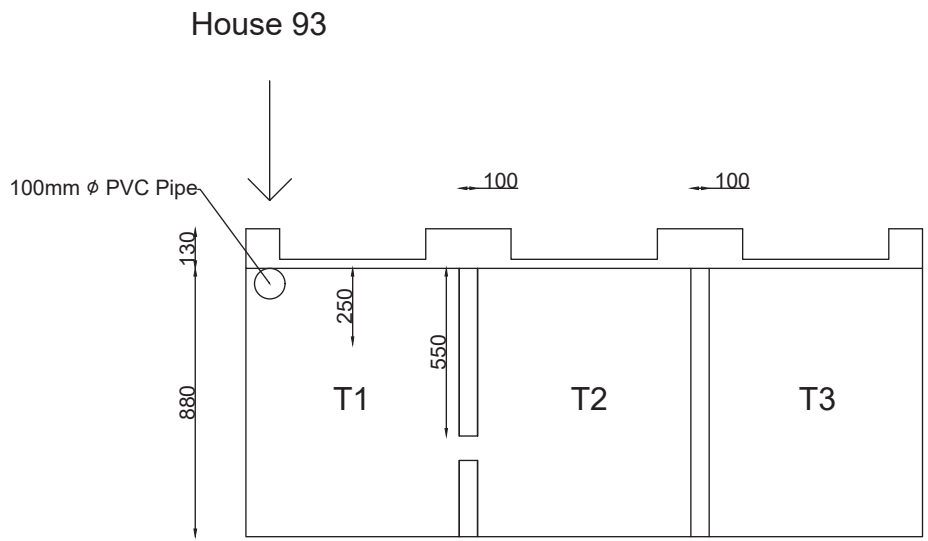
Tank Volume:

T1: $W\ 0.66m \times L\ 1m \times D\ 1m = 0.66\ m^3$

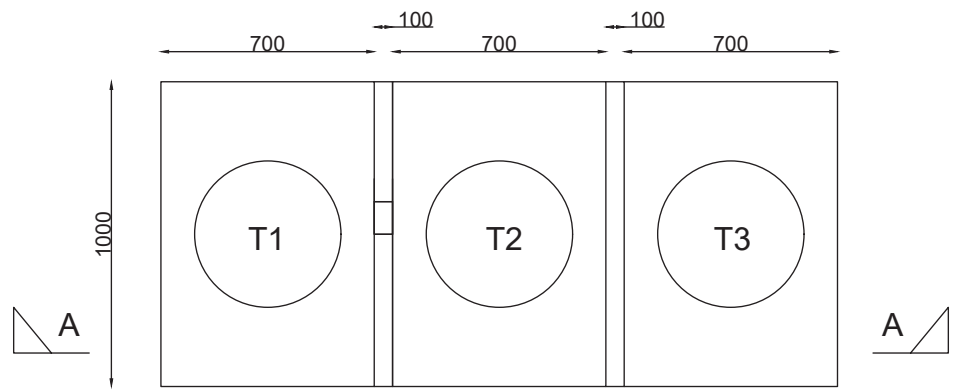
T2: $W\ 0.6m \times L\ 1.1m \times D\ 1m = 0.66\ m^3$

T3: $W\ 0.5m \times L\ 1.04m \times D\ 1m = 0.52\ m^3$

Total Tank Volume: $1.84m^3$



Section A-A



Top View - House 93

REVISION	DATE
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PROJECT NO.
YF2103

SUBMITTAL REF.
Q01

SUBMISSION TITLE
Septic tank and open-up and survey at four locations in Lai Chi Wo Village

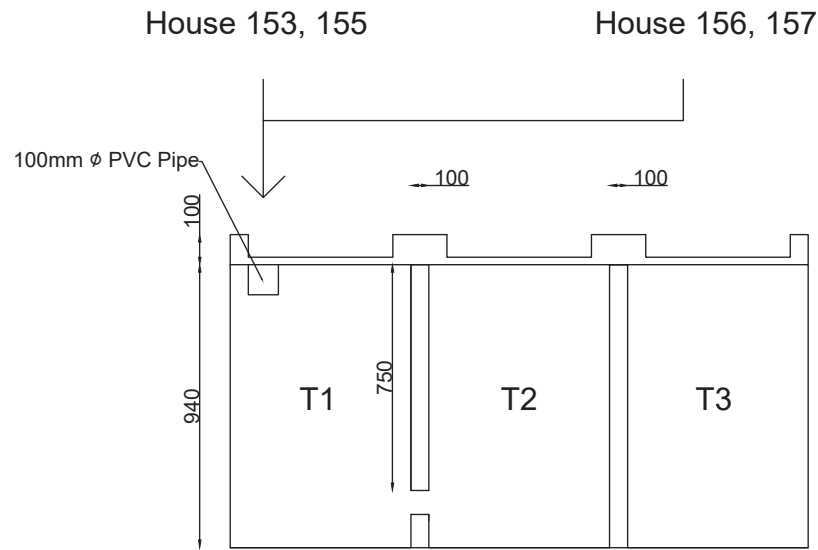
DRAWING TITLE
Shop Drawing of Septic Tank

DRAWING NO.	SCALE
01	A3

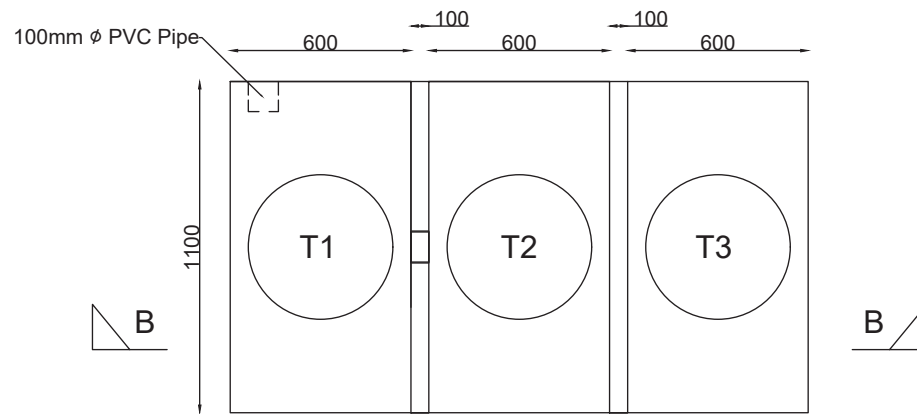


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Section B-B



Top View - House 153, 155 & 156, 157

REVISION	DATE
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PROJECT NO.
YF2103

SUBMITTAL REF.
Q01

SUBMISSION TITLE
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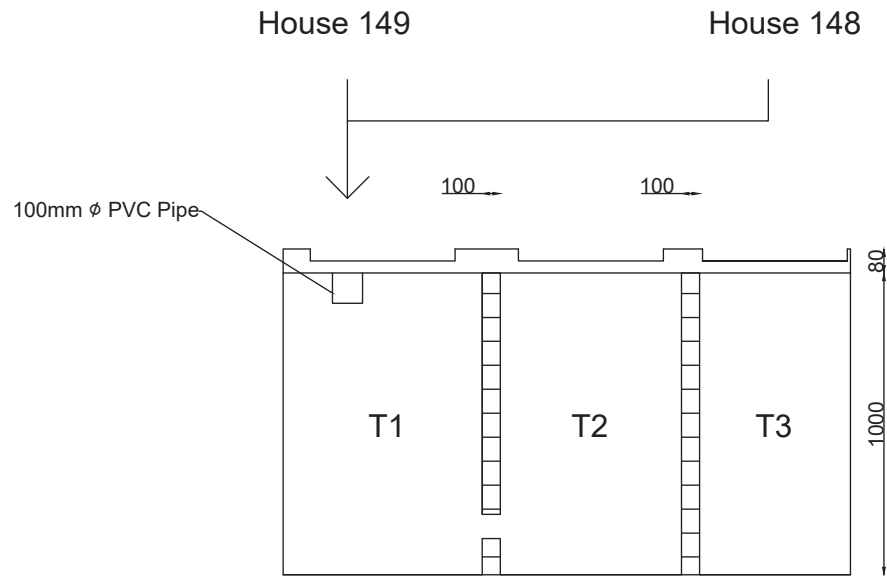
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Shop Drawing of Septic Tank

DRAWING NO.	SCALE
02	NTS

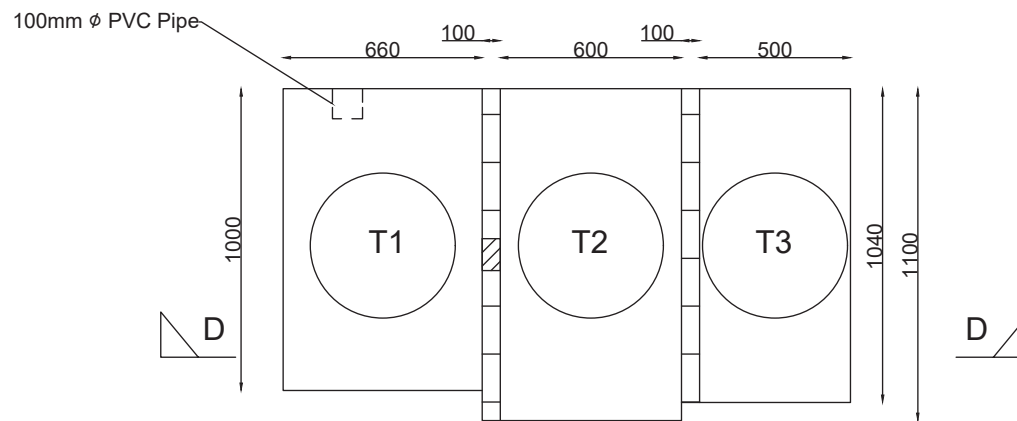


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Section D-D



Top View - House 148, 149

REVISION	DATE

PROJECT NO.
YF2103

SUBMITTAL REF.
Q01

SUBMISSION TITLE
Septic tank and open-up and survey at four locations in Lai Chi Wo Village

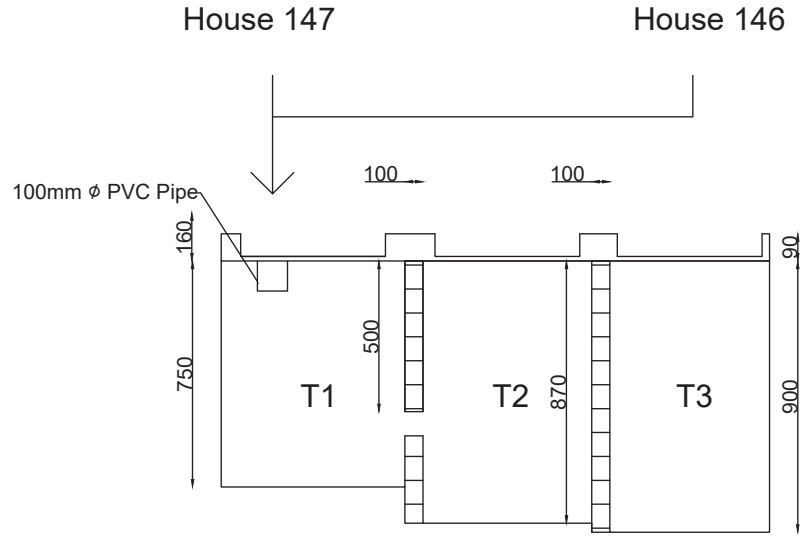
DRAWING TITLE
Shop Drawing of Septic Tank

DRAWING NO. SCALE
03 NTS

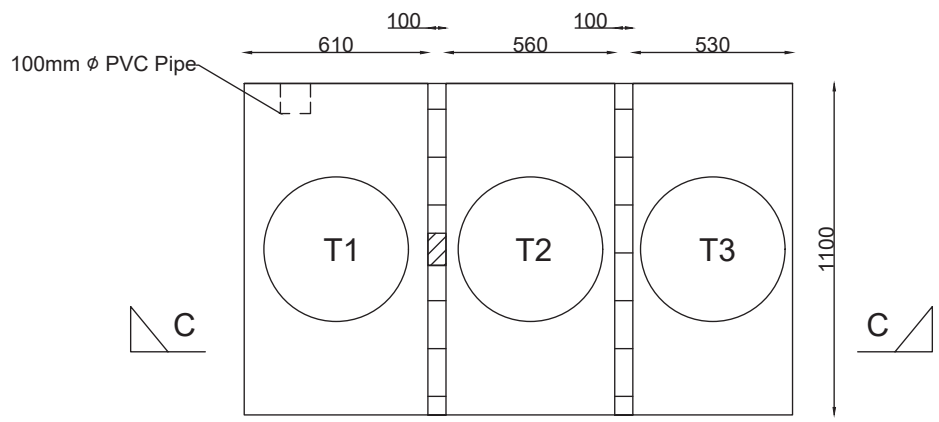


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Section C-C



Top View - House146, 147

REVISION	DATE
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PROJECT NO.

SUBMITTAL REF.

SUBMISSION TITLE
 Septic tank and open-up and survey at four locations in Lai Chi Wo Village

DRAWING TITLE
 Shop Drawing of Septic Tank

DRAWING NO. 04	SCALE NTS
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