

On site stormwater disposal calculation

Site: 765 Muhunoa West Road, Ohau
 Client: Grenadier Developments
 Job number: 709
 Territorial authority: HDC
 Regional authority: HRC
 Topography: Sand Dunes
 Ground cover: Assortment of grasses and plants
 Existing drainage: To ground
 Test date: 24/11/2020
 Weather: Sunny
 Location: Cottage

Groundwater: Not encountered
 Rainfall 10% AEP: 89.4 mm
 Rainfall 1% AEP: 141.5 mm
 Secondary Flowpath: Yes
 Site stability: Good
 Soil classification: Fluvial recent
 Soil drainage: Well drained
 Soil permeability: Moderate
 Soil particle size: Sands
 Soil category: 1

Percolation test

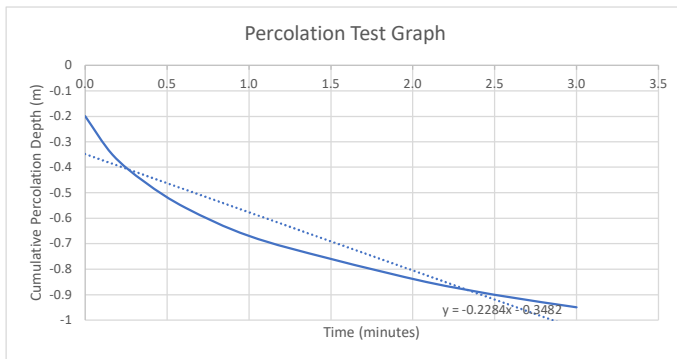
Depth of test pit (m): 0.95
 Test pit diameter (m): 0.1 Test pit area (m²): 0.0079
 Test pit circumference: 0.31

Soil test percolation data:

Interval	Elapsed time	Measurement	Water depth	Diff. depth	Vol. soakage	Average depth	Surface soakage	Soakage rate
mins	mins	mm	m	mm	litres	m	m ²	(litres/m ² /min)
0	0	200	0.75	-	-			
0.166667	0.16666667	350	0.6	150	1.18	0.68	0.2199	32.143
0.2	0.36666667	460	0.49	110	0.86	0.55	0.1791	24.123
0.25	0.61666667	560	0.39	100	0.79	0.44	0.1461	21.505
0.383333	1	670	0.28	110	0.86	0.34	0.1131	19.928
0.5	1.5	760	0.19	90	0.71	0.24	0.0817	17.308
0.583333	2.08333333	850	0.1	90	0.71	0.15	0.0534	22.689
0.416667	2.5	900	0.05	50	0.39	0.08	0.0314	30.000
0.5	3	950	0	50	0.39	0.03	0.0157	50.000

Ave SR* 26.507 litres/m²/min
 FOS (1/4) 6.627 litres/m²/min
 Soak rate 397.61 mm/hr

* Average soak rate does not include the soak rate after the first minute as this is out of keeping



Area 1 Data

Location Hole 12 and 15, bund 3m from base of slope

Storm return period	Storm duration	Rainfall intensity	Q surface runoff	Volume input	Volume output (soak)	Storage volume req'd	Time for pit to empty
years	min	mm/hr	l/s	m ³	m ³	m ³	hrs
100	10	89.44	46.21	27.73	39.76	-12.04	-0.05
	20	57.77	29.85	35.82	79.52	-43.71	-0.18
	30	44.89	23.19	41.75	119.28	-77.53	-0.32
	60	29.23	15.10	54.37	238.57	-184.20	-0.77

Runoff coefficient: 0.2
 Impervious area: 9300 m²
 Soak pit length: (bund) 200 m
 Soak pit width: 3 m
 Soak pit depth: 0.1 m
 Soak pit volume: 60.0 m³
 Percolation rate: 6.627 l/m²/min
 Floor area: 600.0 m²
 Soak rate (floor only): 66.269 l/s

Use the area between the bund and slope as a storage area/soakage device. Thus the bund length is the soak pit length and the width is the distance from bund to slope.
 The depth is the depth of water proposed to pond before soakage. Assume 0.1m of storage height, bunds to be min 1.0m in height.

Soakager rate is conservative as it has been reduced by a FOS of 4

Area 2 Data

Hole 17 and Hole 11

Storm return period	Storm duration	Rainfall intensity	Q surface runoff	Volume input	Volume output (soak)	Storage volume req'd	Time for pit to empty
years	min	mm/hr	l/s	m ³	m ³	m ³	hrs
100	10	89.44	48.20	28.92	59.64	-30.72	-0.13
	20	57.77	31.13	37.36	119.28	-81.93	-0.34
	30	44.89	24.19	43.55	178.93	-135.38	-0.57
	60	29.23	15.75	56.71	357.85	-301.14	-1.26

Runoff coefficient: 0.2
 Impervious area: 9700 m²
 Soak pit length: 300 m
 Soak pit width: 3 m
 Soak pit depth: 0.1 m
 Soak pit volume: 90.0 m³
 Percolation rate: 6.627 l/m²/min
 Floor area: 900.0 m²
 Soak rate (floor only): 99.403 l/s

Area 3 Data

Hole 4

Storm return period	Storm duration	Rainfall intensity	Q surface runoff	Volume input	Volume output (soak)	Storage volume req'd	Time for pit to empty
years	min	mm/hr	l/s	m ³	m ³	m ³	hrs
100	10	89.44	16.15	9.69	27.83	-18.14	-0.08
	20	57.77	10.43	12.52	55.67	-43.15	-0.18
	30	44.89	8.11	14.59	83.50	-68.91	-0.29
	60	29.23	5.28	19.00	167.00	-148.00	-0.62

Runoff coefficient: 0.2
 Impervious area: 3250 m²
 Soak pit length: 140 m
 Soak pit width: 3 m
 Soak pit depth: 0.1 m
 Soak pit volume: 42.0 m³
 Percolation rate: 6.627 l/m²/min
 Floor area: 420.0 m²
 Soak rate (floor only): 46.388 l/s

Area 4 Data

Hole 14

Storm return period	Storm duration	Rainfall intensity	Q surface runoff	Volume input	Volume output (soak)	Storage volume req'd	Time for pit to empty
years	min	mm/hr	l/s	m ³	m ³	m ³	hrs
100	10	89.44	6.46	3.88	15.90	-12.03	-0.05
	20	57.77	4.17	5.01	55.67	-50.66	-0.21
	30	44.89	3.24	5.84	83.50	-77.66	-0.33
	60	29.23	2.11	7.60	167.00	-159.40	-0.67

Runoff coefficient: 0.2
 Impervious area: 1300 m²
 Soak pit length: 80 m
 Soak pit width: 3 m
 Soak pit depth: 0.1 m
 Soak pit volume: 24.0 m³
 Percolation rate: 6.627 l/m²/min
 Floor area: 240.0 m²
 Soak rate (floor only): 26.507 l/s

Area 5 Data

Hole 7

Storm return period	Storm duration	Rainfall intensity	Q surface runoff	Volume input	Volume output (soak)	Storage volume req'd	Time for pit to empty
years	min	mm/hr	l/s	m ³	m ³	m ³	hrs
100	10	89.44	64.59	38.76	15.90	22.85	0.10
	20	57.77	41.72	50.07	55.67	-5.60	-0.02
	30	44.89	32.42	58.36	83.50	-25.14	-0.11
	60	29.23	21.11	76.00	167.00	-90.99	-0.38

Runoff coefficient: 0.2
 Impervious area: 13000 m²
 Soak pit length: 530 m
 Soak pit width: 3 m
 Soak pit depth: 0.1 m
 Soak pit volume: 159.0 m³
 Percolation rate: 6.627 l/m²/min
 Floor area: 1590.0 m²
 Soak rate (floor only): 175.612 l/s