233257-R-E-C001

05 May 2021

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GT Homes
16 Danica Esplanade
Te Atatu Peninsula
AUCKLAND, 0610

Dear Clayton,

Re: Soakage Report for 76 Pererika Street, Rotorua (Lot 12, DPS 3016)

(1) Introduction

Stratum Consultants Ltd (Stratum) has been engaged by GT Homes to carry out a soakage assessment for the stormwater disposal associated with the proposed development at 76 Pererika Street, Rotorua.

This report summarises the tests undertaken and provides recommendations on the size and depth of the soakage system required to dispose of stormwater from a (2% AEP) 1 in 50 year, 60-minute storm event as per the building code.

(2) Site Description

The property is located at 76 Pererika Street, Rotorua and legally described as Lot 12, DPS 3016 and is approximately 1012m^2. The site is located approximately 900m south-west of the Rotorua CBD and within the suburb of Victoria.

The site has an existing dwelling and garage which are situated towards the northern end of the lot. The site is generally flat and is covered mainly in lawn. It is proposed to remove all existing buildings on site and build five townhouses.

No stormwater reticulated system is available on the site and it is proposed that stormwater be disposed of via on-site soakage.

(3) Existing Information

One percolation test was carried out to establish the stormwater soakage rate for the property. Additional testing has been undertaken for the Geotechnical Assessment Report (Stratum reference: 233257-M-E-C001). We note the following:

- The ground water table was encountered during site investigations around 4.3m BGL.

- The borehole logs found that the site is underlain by topsoil to 0.3m below existing ground level (bgl). This was underlain with fine to coarse sands and pumice gravel to 4.5m. Sands and Gravels are the more prevalent soils over the depth of testing.

- The proposed soakage design targets the permeable sands and gravels located in the upper 3.5m of soil.

- The general overland flow direction is to the north with minimal fall available out to Pererika Street, hence, a 1:50 year design is considered appropriate for this site.

- The percolation test identifies a soakage rate of 9.83 litres/m^2/min.

(4) Soakage Assessment & Recommendations

The soakage assessment consisted of a hand augered borehole to a depth of 3m below the existing ground. A falling head percolation test was undertaken in accordance with E1 - Surface Water (E1/VM1) of the New Zealand building code.

Our on-site percolation test has identified soakage rate of 9.83 l/m^2/min. This rate has been reduced by a factor of 0.5 to allow for long term performance of the system and potential reduction in soakage over time due to clogging.

Building plans were available at the time of writing this report and recommendations have been provided below for both soak holes and trenches to allow some flexibility when preparing the building consent drainage plans.

To achieve the recommended setbacks, it is proposed to have the soakage system located within the common driveway area to the east.

We recommend the following for a new soakage system on the site:

(i) The soakage system shall accommodate flows for the 1:50 year (2% AEP), 60-minute event.

(ii) The site shall be developed to ensure overland flow is available out to Pererika Street to the north.

(iii) Ensure the base of the soak hole or trench is into the underlying sand and gravel layers. If soils differ from those found in the percolation test, then notify the engineer.

(iv) A single 3.15m deep by 900mm diameter soak hole can dispose of 54m^2 of hardstand or roof area. A standard soak hole detail is attached.

(v) A 3.5m long by 1.2m wide by 2m deep trench can dispose of 100m^2 of hardstand or roof area. This equates to 28.5m^2 of roof / hardstand area per lineal metre of trench. Where possible the trench is to be located parallel with the ground contour to ensure even loading of the trench occurs. A standard soakage trench detail is attached.

(vi) Suitable grit /leaf and sediment traps be installed at the collection points of the stormwater lines to prevent the capture and transfer of material into the system that may lead to blocking and eventual failure of the soakage system.

(vii) A suitable form of surcharge relief shall be installed in the pipe system to facilitate surcharge to overland flow in events that exceed the capacity of the soakage system. We recommend pipe breaks at ground level for the downpipe connections to soak holes and a cesspit / relief overflow for the soakage trench system. See attached standard details.

(viii) The stormwater disposal system is to be maintained as per the attached maintenance table.

(ix) A concept stormwater disposal site plan has been provided to demonstrate that the site has sufficient area available for on-site soakage.

(x) The soakage system shall be located at least 0.5m from any boundary (provided the neighbouring building is 2.5m from the boundary) and no closer than 3m to any building foundations or retaining walls.

(5) Conclusions

Providing the above recommendations are carried out, it is our opinion that the specific designed soakage system is a suitable method of disposing of stormwater from hard and soft surfaces at this location.

(6) Limitations

There will be occasions when the rainfall event exceeds the capacity of the soakage system. As such, there will be some runoff from the site or ponding until the soakage system recovers. The floor level of any building is to be above the surrounding ground levels and the ground shaped to prevent any ponding water entering the building. In addition, overland flow paths should be free from obstruction to prevent inundation of buildings.

This report has been prepared for GT Homes Ltd and the territorial authority for the proposed development at 76 Pererika Street, Rotorua. It is not to be relied upon or used out of context by any other person without reference to Stratum Consultants Ltd. The reliance by other parties on the information or opinions contained in the report shall, without prior review and agreement in writing, be at such parties' sole risk.

The following information is attached:

- Percolation Test
- Soakhole design
- Soakage trench design
- Standard Soakhole & Trench Detail
- Maintenance Table
- Hirds Data
- New Zealand Building Code – Percolation Testing Extract
- Concept stormwater disposal site plan

If you have any further queries, please contact the undersigned.

Yours faithfully
Stratum Consultants Ltd

Prepared by:
Conor Corbett
Civil Engineering Technician

Reviewed By:
Craig Pollard
Civil Engineer

Client:	GT Homes Ltd	***Page:***	1
Project Title:	Soakage Assessment	***No of Pages:***	7
Site Address:	76 Pererika Street	***Date Started:***	11/01/2021
City:	Rotorua	***Date Finished:***	1/11/2021
File Number:	233257-R-E-S002	***Logged By:***	SG

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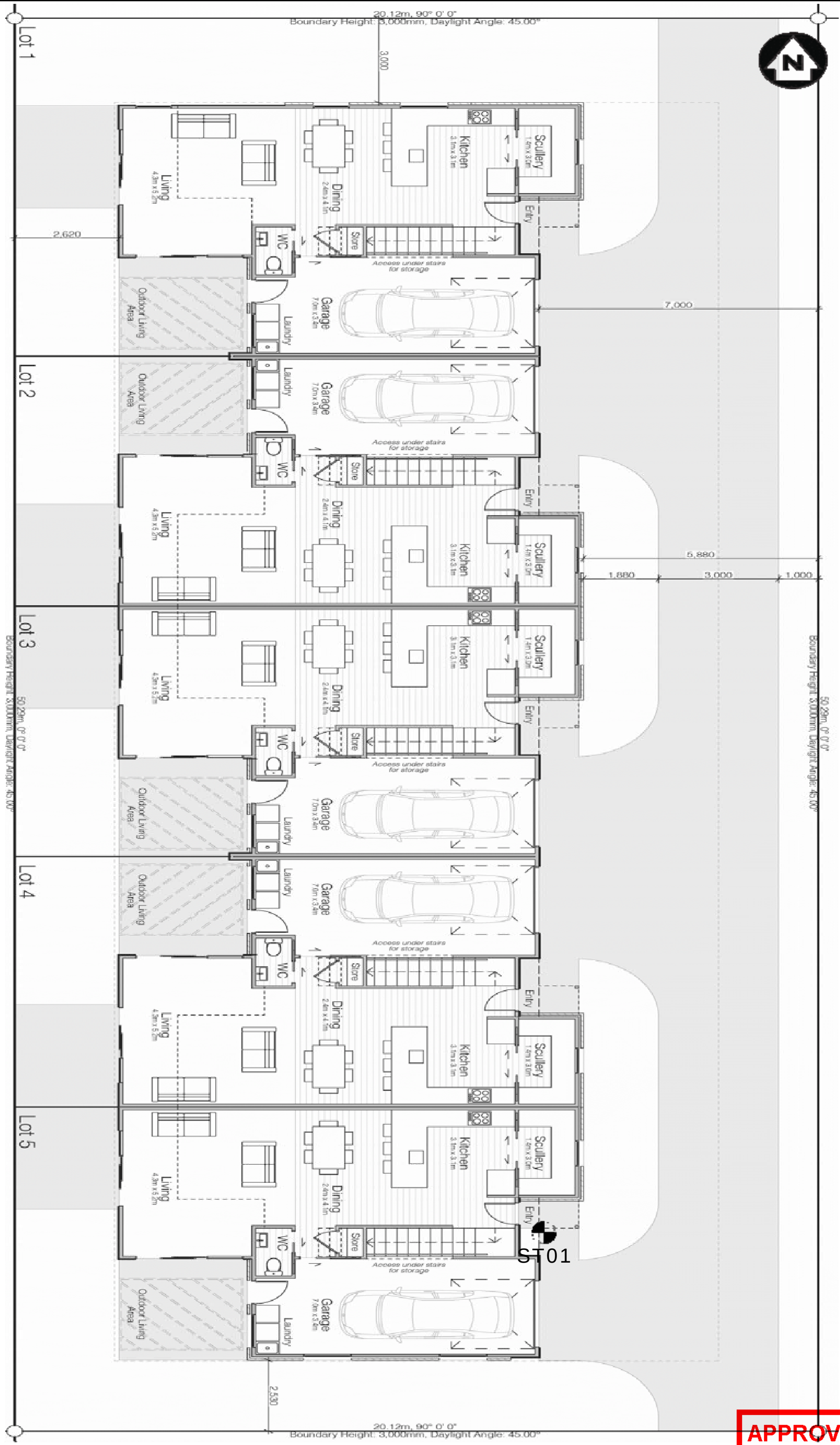
Test Location Sketch

Notes: Sketch of approximate locations only - not to scale



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Project Title: Soakage Assessment
Site Address: 76 Pererika Street
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Checked:

Stormwater Disposal - Percolation Test Results

Borehole No : 1

Test: 1

Depth (m)	Groundwater	Graphic Log	DESCRIPTIONS
0.0m			(TOPSOIL) **SILT** minor fine - medium sand, dark brown, dry - moist, low plasticity.
0.5m		• • •	**SAND** fine - medium, light orangish brown, moist, poorly graded.
1.0m		°○°○	Fine pumiceous **GRAVEL**, light greyish brown, moist, poorly graded.
1.5m		°○°○	Fine pumiceous **GRAVEL** trace fine - coarse sand, light whitish grey, moist, poorly graded.
2.0m		°○°○	Pumiceous **GRAVEL** fine - medium, light greyish brown, moist - wet, poorly graded.
2.5m		°○°○	Pumiceous **GRAVEL** fine - medium, greyish white, moist - wet, poorly graded.
3.0m		°○°○	Pumiceous **GRAVEL** fine - medium, white, wet, poorly graded.
3.5m			Target Depth
4.0m			
4.5m			
5.0m			

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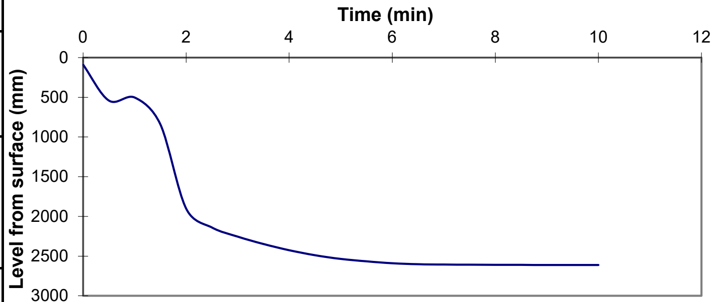
Water level versus time



Time (minutes)	Level Drop (mm)	Cumulative Level Drop (mm)
0.0	0	0
0.3	89.70	89.70
0.6	451.60	541.30
0.9	0.00	541.30
1.3	-37.80	503.50
1.6	338.00	841.50
1.9	0.00	841.50
2.2	1060.50	1902.00
2.5	236.90	2138.90
2.8	0.00	2138.90
3.1	115.00	2253.90
3.4	0.00	2253.90
3.8	93.70	2347.60
4.1	77.70	2425.30
4.4	0.00	2425.30
4.7	63.60	2488.90
5.0	46.20	2535.10
5.3	0.00	2535.10
5.6	30.30	2565.40

Water source flow rate: **15 litres/min**
Water level after presoak: **1.50m**

Augered Hole depth (1): 3000 mm
Presoak hole depth (2): 2700 mm
End test hole depth (3): 2690 mm
Auger Diameter: 100 mm
Water level drop: 2565 mm
Av test depth (2+3)/2: 2695 mm
Depth of topsoil: 300 mm
Permeable Depth (av - topsoil): 2395 mm
modified Hole Diameter: 106 mm
Water Volume Lost: 22.4 litres
Hole Surface Area: 0.41 m^2
Total time of test: 5.625 min

Notes: Borehole Collapsed 300mm during 30 minute pre-soak.
Groundwater not encountered.

when time	0	to	6	min
permeable depth is	2395	to	0	mm
surface area is			0.41	m^2

Soakage rate **9.83 litres/m^2/min**

Tests carried out in accordance with Section E1 of the NZ Building Code

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Soakhole Capacity Spreadsheet - Borehole 1

Flow Rate into soakhole =	1.037	l/s		
Soakage rate of soil =	9.83	l/m²/min		
Soakage reduction factor =	0.50	(WBOPDC DC)		
Design Soakage rate =	4.91	l/m²/min		
Diameter of Hole =	0.900	m		
No Rings (@0.45m high) =	7.000	Depth of Soak hole		3.15

Time	Water Depth start (m)	Surface area (wet) m²	Soakage rate (l/s)	Storage Rate (l/s)	Water Depth finish (m)
0	0	0.636	0.0521	0.9853	0.093
1	0.093	0.899	0.0736	0.9638	0.184
2	0.184	1.156	0.0947	0.9427	0.273
3	0.273	1.407	0.1152	0.9221	0.360
4	0.360	1.653	0.1354	0.9020	0.445
5	0.445	1.893	0.1551	0.8823	0.528
6	0.528	2.129	0.1744	0.8630	0.610
7	0.610	2.359	0.1932	0.8442	0.689
8	0.689	2.584	0.2117	0.8257	0.767
9	0.767	2.804	0.2297	0.8077	0.843
10	0.843	3.020	0.2473	0.7901	0.918
11	0.918	3.230	0.2646	0.7728	0.991
12	0.991	3.436	0.2815	0.7559	1.062
13	1.062	3.638	0.2980	0.7394	1.132
14	1.132	3.835	0.3141	0.7233	1.200
15	1.200	4.028	0.3299	0.7075	1.267
16	1.267	4.217	0.3454	0.6920	1.332
17	1.332	4.401	0.3605	0.6769	1.396
18	1.396	4.582	0.3753	0.6621	1.459
19	1.459	4.758	0.3897	0.6476	1.520
20	1.520	4.931	0.4039	0.6335	1.580
21	1.580	5.100	0.4177	0.6197	1.638
22	1.638	5.265	0.4313	0.6061	1.695
23	1.695	5.427	0.4445	0.5929	1.751
24	1.751	5.585	0.4575	0.5799	1.806
25	1.806	5.739	0.4701	0.5673	1.859
26	1.859	5.891	0.4825	0.5549	1.912
27	1.912	6.039	0.4946	0.5428	1.963
28	1.963	6.183	0.5065	0.5309	2.013
29	2.013	6.325	0.5181	0.5193	2.062
30	2.062	6.464	0.5294	0.5080	2.110
31	2.110	6.599	0.5405	0.4969	2.157
32	2.157	6.731	0.5514	0.4860	2.203
33	2.203	6.861	0.5620	0.4754	2.248
34	2.248	6.988	0.5724	0.4650	2.292
35	2.292	7.112	0.5825	0.4549	2.335
36	2.335	7.233	0.5925	0.4449	2.376
37	2.376	7.352	0.6022	0.4352	2.418

38	2.418	7.468	0.6117	0.4257	2.458
39	2.458	7.581	0.6210	0.4164	2.497
40	2.497	7.692	0.6301	0.4073	2.535
41	2.535	7.801	0.6390	0.3984	2.573
42	2.573	7.907	0.6477	0.3897	2.610
43	2.610	8.011	0.6562	0.3812	2.646
44	2.646	8.113	0.6645	0.3729	2.681
45	2.681	8.212	0.6727	0.3647	2.715
46	2.715	8.310	0.6806	0.3568	2.749
47	2.749	8.405	0.6884	0.3490	2.782
48	2.782	8.498	0.6960	0.3413	2.814
49	2.814	8.589	0.7035	0.3339	2.846
50	2.846	8.678	0.7108	0.3266	2.877
51	2.877	8.765	0.7179	0.3195	2.907
52	2.907	8.850	0.7249	0.3125	2.936
53	2.936	8.933	0.7317	0.3057	2.965
54	2.965	9.015	0.7384	0.2990	2.993
55	2.993	9.095	0.7449	0.2925	3.021
56	3.021	9.173	0.7513	0.2861	3.048
57	3.048	9.249	0.7576	0.2798	3.074
58	3.074	9.324	0.7637	0.2737	3.100
59	3.100	9.397	0.7697	0.2677	3.125
60	3.125	9.468	0.7755	0.2619	3.150

The above calculation shows that the average flowrate into the design soakhole that can be sustained without overflow is : 1.037 litres per second

The maximum area to be reticulated to each soakhole is therefore calculated as follows:

Rainfall Intensity (2% AEP 60min) =	76.6	mm/hour
C Value for Paved / Roof Areas =	0.90	
C Value for Grassed Areas =	0.3	
Max Paved / Roof Area per soakhole =	**54.1**	m²
Max Grassed Area per soakhole =	**162.4**	m²

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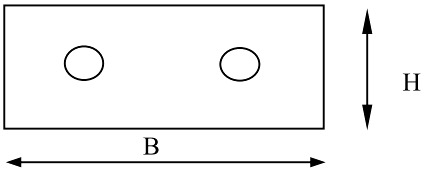
Soakage / storage Analysis

Building & Hardstand Areas

Soakage Trench Detail

Width b = **1.2** m
Height H = **2.0** m
Length L = **3.5** m
Pipe Dia = **0.16** m
No Pipes = **2** No
Trench Vol. Ratio = **0.33**



PIPE STORAGE = 0.14 m^3
TRENCH STORAGE = 2.75 m^3
TOTAL STORAGE CAPACITY = **2.89** m^3

Site Details

Site Area = **100** m^2
Runoff coefficient = **0.9**
Return Period = **50** years

Site Soakage Rate **4.91** **$l/m^2/min$**

Site Soakage Area = B x L +2(H) x L = 18.2 m^2
SITE SOAKAGE CAPACITY = 89.45 l/min

Design Storm Analysis

Duration	Intensity	Q	Runoff	Storage		TOTAL	**Check**
				Stored	Infiltrated	STORAGE	Storage >
min	mm/hr	l/sec	m^3	m^3	m^3	m^3	Runoff
10	182.00	4.55	2.73	2.89	0.89	3.79	OK
20	133.00	3.33	3.99	2.89	1.79	4.68	OK
30	109.00	2.73	4.91	2.89	2.68	5.58	OK
60	76.60	1.92	6.89	2.89	5.37	8.26	OK

* Intensities taken from Niwa RCP8.5 which equates

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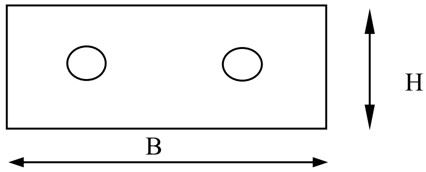
Soakage / storage Analysis

Building & Hardstand Areas

Soakage Trench Detail



Width b =	**1.2**	m
Height H =	**2.0**	m
Length L =	**26**	m
Pipe Dia =	**0.16**	m
No Pipes =	**2**	No
Trench Vol. Ratio =	**0.33**	

PIPE STORAGE =	1.05	m^3
TRENCH STORAGE =	20.45	m^3
TOTAL STORAGE CAPACITY =	**21.50**	m^3

Site Details

Site Area =	**833**	m^2
Runoff coefficient =	**0.9**	
Return Period =	**50**	years
Site Soakage Rate	**4.91**	**$l/m^2/min$**

Site Soakage Area = B x L +2(H) x L = 135.2 m^2

SITE SOAKAGE CAPACITY = 664.45 l/min

Design Storm Analysis

Duration	Intensity	Q	Runoff	Storage		TOTAL	**Check**
				Stored	Infiltrated	STORAGE	Storage >
min	mm/hr	l/sec	m^3	m^3	m^3	m^3	Runoff
10	182.00	37.90	22.74	21.50	6.64	28.14	OK
20	133.00	27.70	33.24	21.50	13.29	34.79	OK
30	109.00	22.70	40.86	21.50	19.93	41.43	OK
60	76.60	15.95	57.43	21.50	39.87	61.36	OK

* Intensities taken from Niwa RCP8.5 which equates

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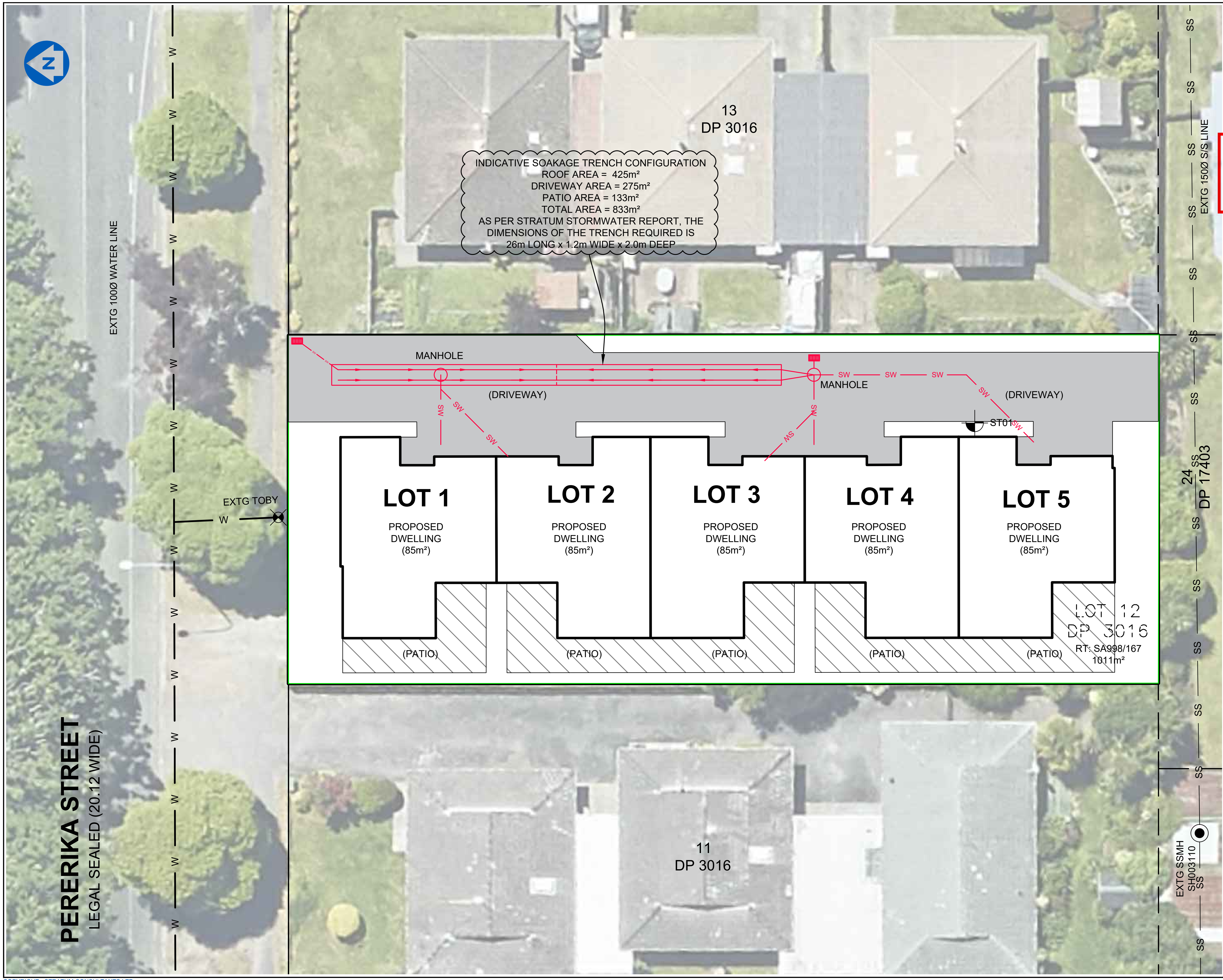
Rainfall intensities (mm/hr) :: RCP8.5 for the period 2081-2100

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	72	53	43.8	31.1	21.2	10.9	6.92	4.32	2.62	1.94	1.56	1.31
2	0.5	79.7	58.6	48.5	34.3	23.6	12.1	7.66	4.75	2.89	2.14	1.72	1.45
5	0.2	107	78.4	64.7	45.7	31.3	16	10.1	6.25	3.79	2.81	2.25	1.89
10	0.1	128	93.5	77.1	54.4	37.1	19	12	7.38	4.47	3.3	2.65	2.23
20	0.05	150	110	90.3	63.6	43.3	22.1	13.9	8.54	5.17	3.81	3.06	2.57
30	0.033	164	120	98.4	69.2	47.1	24	15.1	9.26	5.6	4.13	3.31	2.78
40	0.025	174	127	104	73.2	49.8	25.4	16	9.79	5.91	4.36	3.49	2.93
50	0.02	182	133	109	76.6	52.1	26.5	16.6	10.2	6.16	4.54	3.64	3.05
60	0.017	188	137	113	79.3	53.9	27.4	17.2	10.5	6.36	4.69	3.75	3.14
80	0.012	199	145	119	83.7	56.9	28.9	18.1	11.1	6.69	4.92	3.94	3.3
100	0.01	208	151	124	87.1	59.1	30	18.9	11.5	6.94	5.11	4.09	3.43
250	0.004	243	177	145	101	68.7	34.8	21.8	13.3	7.99	5.87	4.7	3.93



DRAWN: CC	DESIGNED: CC
CHECKED: CP	SURVEYED BY:
OFFICE OF ORIGIN - ROTORUA Ph 07 347 7840	

No.	Date	By	Issue/Revision
A	6-05-21	CC	STORMWATER ASSESSMENT PLAN

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SERVICES NOTE

WHERE EXISTING SERVICES ARE SHOWN, THEY ARE INDICATIVE ONLY AND MAY NOT INCLUDE ALL SITE SERVICES. STRATUM CONSULTANTS LTD DOES NOT WARRANT THAT ALL, OR INDEED ANY SERVICES ARE SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING SERVICES PRIOR TO AND FOR THE DURATION OF THE CONTRACT WORKS.

GT HOMES LTD
76 PERERIKA STREET
ROTORUA

PROPOSED DEVELOPMENT CONCEPT STORMWATER DISPOSAL SITE PLAN

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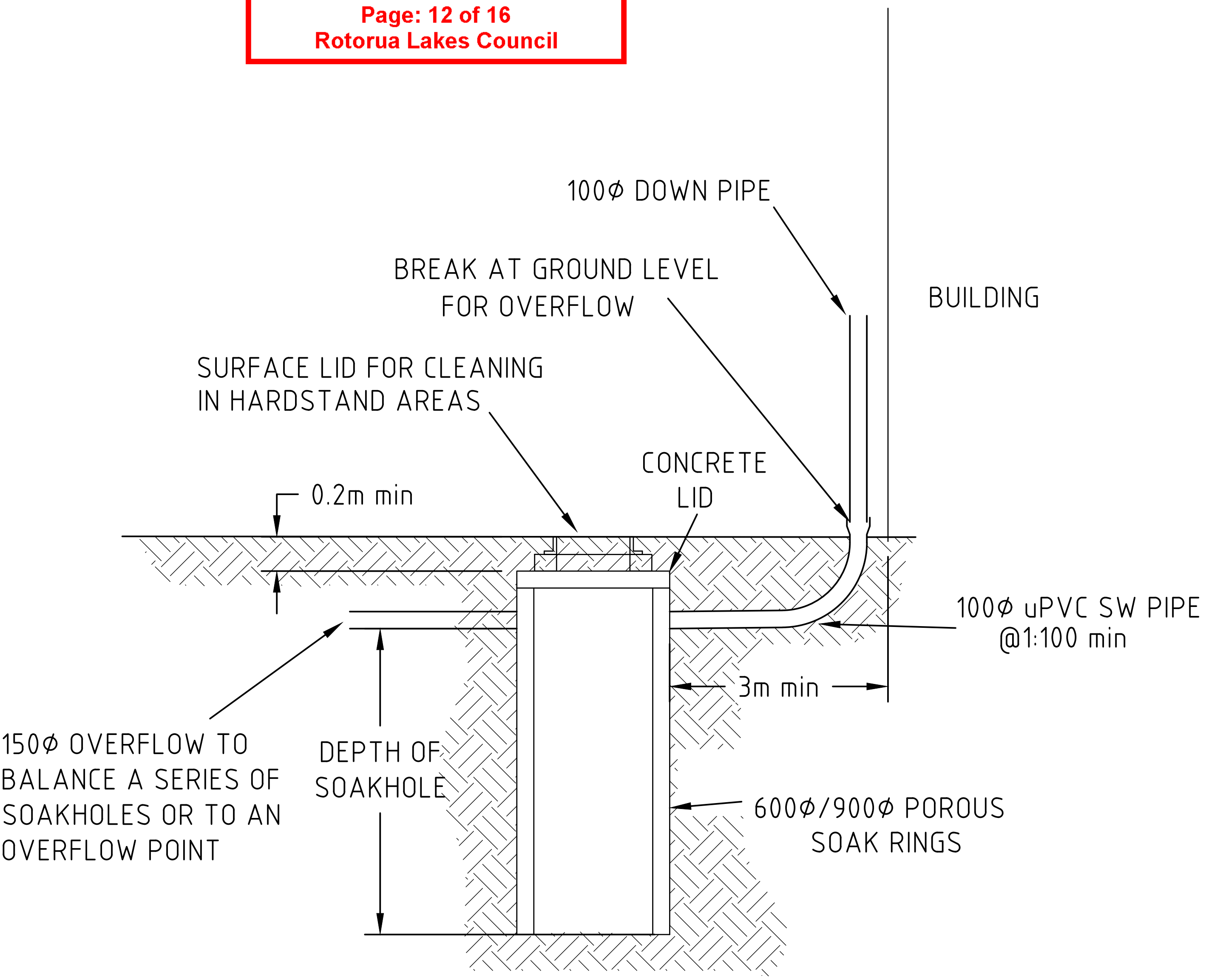
SCALE: 1:200		ORIGINAL DWG. SIZE A3
DRAWING No.	SHEET No.	ISSUE
233257-R-E-D001	01	A



150Ø HIGH LEVEL OVERFLOW TO BE PROVIDED TO COUNCIL DRAINS WHERE POSSIBLE & AGREED

SOAKHOLE DETAIL: 15m OR MORE FROM BANK

DRAWN: CC	**GT HOMES LTD**		
CHECKED:	**76 PERERIKA STREET**		
DESIGNED:	**ROTORUA**		
OFFICE: ROTORUA	**TYPICAL SOAKHOLE DETAIL**		
SCALE: NTS			
ORIGINAL DWG. SIZE A4			
A / MAR 21 / CP / ISSUED FOR INFORMATION	DRAWING No. **233257-R-E-D100**	SHEET No. **01**	ISSUE **A**
No. / Date / By / Issue/Revision			

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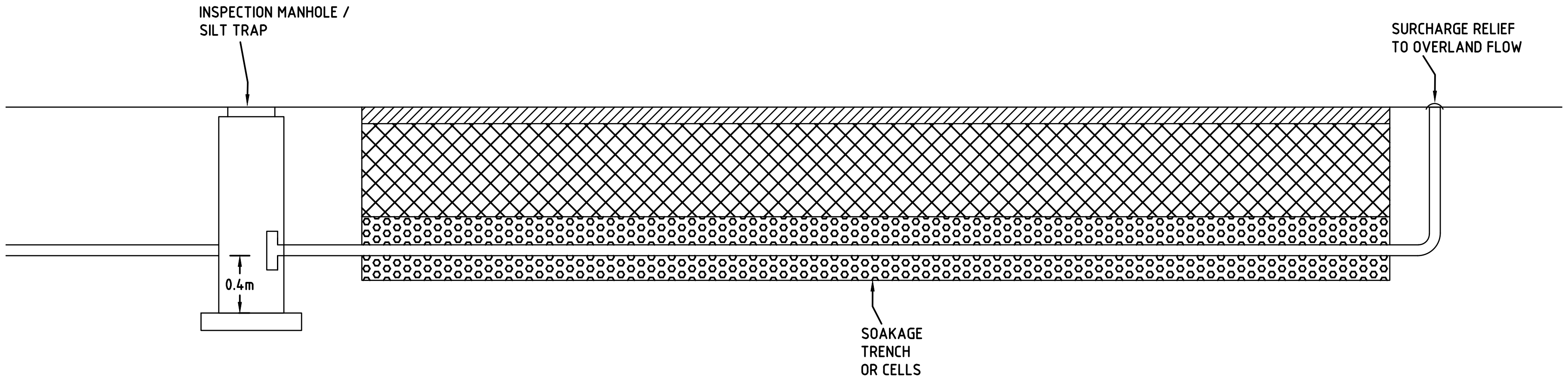
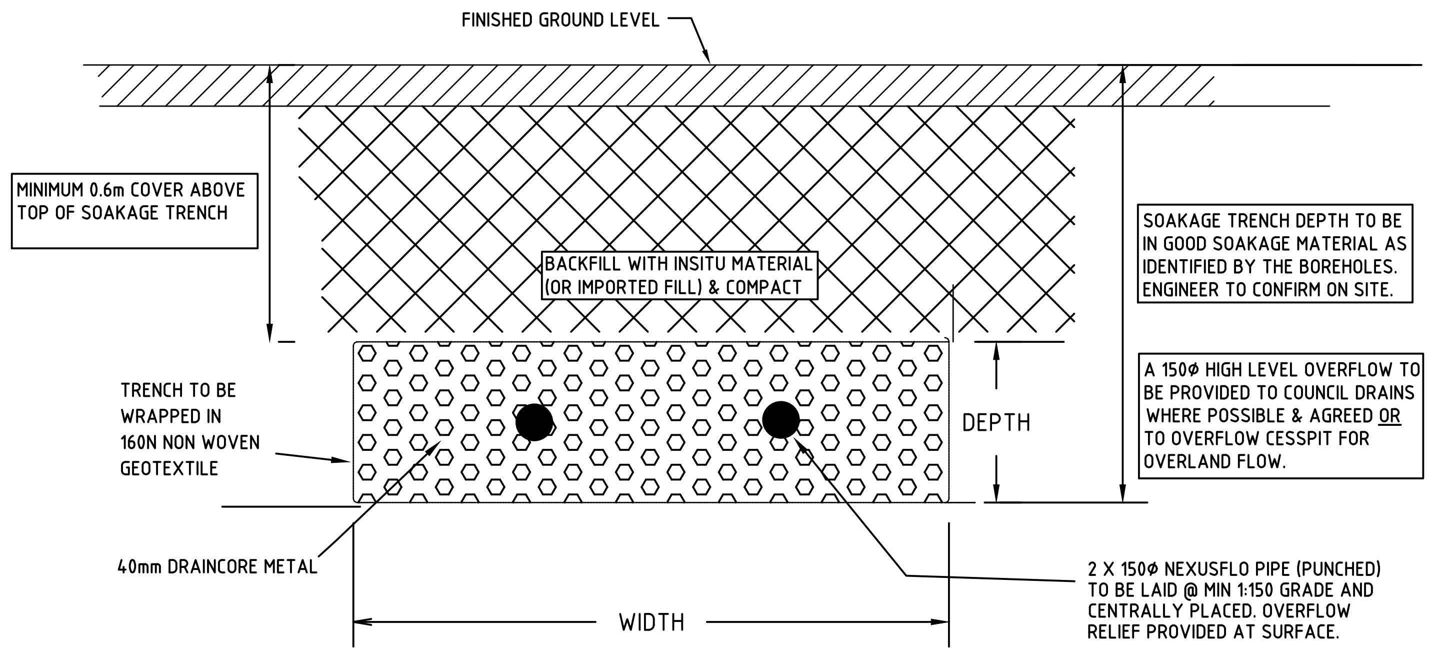


TYPICAL SOAKAGE TRENCH - PROFILE



TYPICAL SOAKAGE TRENCH - SECTION

DRAWN: CP	DESIGNED: CP
CHECKED: CP	SURVEYED BY:

OFFICE OF ORIGIN - ROTORUA Ph 07 347 7840

No.	Date	By	Issue/Revision
A	MAR 21	CP	FOR INFORMATION
	-	-	-
	-	-	-

NOTES/KEY:

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TYPICAL TRENCH DETAIL

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SCALE: N.T.S ORIGINAL DWG. SIZE A3

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233257-R-E-D100	02	A

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Table 1: Maintenance Recommendations

Component	Recommended Actions	Who?	Frequency
Tank hatches and covers	Inspect for correct fit and seal. Particularly important for underground tanks to prevent ingress of contaminated surface water and entry by children.	Owner	Monthly
Overflow, outlet pipes & orifices	Inspect for blockage and clean of necessary. Check flap valves and/or vector screens.	Owner	3 Monthly
In-line leaf and debris diverters	Inspect and clear away any accumulated leaves or debris	Owner	
Roof, gutters, down pipes & gutter screens	Inspect and remove debris and accumulated sediment. Prune any overhanging branches. If the roof and gutters need to be cleaned, the flow into the raintank should be temporarily diverted to prevent ingress of dirty water to the tank.	Owner Owner	
Tank	Inspect the tank for leaks, sediment build up and structural integrity. A professional tank cleaning contractor should be employed to clean out the tank when the sludge level gets close to the pump inlet. Most raintanks have a design life of 25 years or more. Tanks older than 25 years should be regularly assessed and replaced if necessary.	Owner/ Professional	
Roof, gutters, down pipes & gutter screens	Inspect and remove debris and accumulated sediment. Prune any overhanging branches. If the roof and gutters need to be cleaned, the flow into the raintank should be temporarily diverted to prevent ingress of dirty water to the tank.	Professional	6 Monthly

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COMMENT:

1. The low pressure air test is highly susceptible to temperature fluctuations during the test period. A 1°C change during the 5 minute test period will cause a pressure change of 30 mm water gauge or 60% of the permitted change.
2. Failure to soak ceramic and concrete pipes can cause highly variable results.

8.3 High pressure air test

a) Pressurise pipeline to 25 kPa.

b) Wait at least 2 minutes to ensure temperature stabilisation.

c) Disconnect air supply.

d) Measure the time taken (minutes) for the pressure to drop to 17 kPa.

e) The pipeline is acceptable if the time taken exceeds that given for the appropriate pipe size in Table 6.

Table 6: Time For Pressure Drop Versus Internal Pipe Diameter
Paragraph 8.3 e)

Internal pipe diameter (mm)	**Time for permissable pressure drop** (minutes)
90	3
100	3
150	4
225	6

9.0 Disposal to Soak Pit

9.0.1 Where the collected *surface water* is to be discharged to a soak pit, the suitability of the natural ground to receive and dispose of the water without causing damage or nuisance to neighbouring property, shall be demonstrated to the satisfaction of the *territorial authority*.

COMMENT:

Means of demonstrating the suitability of the ground are outside of the scope of this Verification Method. Disposal of *surface water* to a soak pit may also require a resource management consent.

9.0.2 Field testing of soakage shall be carried out as follows:

a) Bore test holes of 100 mm to 150 mm diameter to the depth of the proposed soak pit. If groundwater is encountered in the bore test hole then this depth shall be taken as the depth of the soak pit.

b) Fill the hole with water and maintain full for at least 4 hours, (unless the soakage is so great that the hole completely *drains* in a short time).

c) Fill the hole with water to within 750 mm of ground level, and record the drop in water level against time, at intervals of no greater than 30 minutes, until the hole is almost empty, or over 4 hours, whichever is the shortest.

d) Plot the drop in water level against time on a graph, and the soakage rate in mm/hr is determined from the minimum slope of the curve. If there is a marked decrease in soakage rate as the hole becomes nearly empty, the lower rates may be discarded and the value closer to the average can be adopted.

9.0.3 The soak pit shall be designed utilising soakage and storage in accordance with 9.0.5 and 9.0.6 to ensure that *surface water* is discharged without overflowing. The rainfall intensity used in the design of the soak pit shall be that of an event having a duration of 1 hour and a 10% probability of occurring annually. Either local rainfall intensity curves produced by the *territorial authority* or rainfall frequency duration information produced by NIWA shall be used to determine the rainfall intensity.

COMMENT:

This Verification Method does not cover the design of soak pits with overflows discharging to *outfalls*. Such soak pits are often provided to retain water until peak flows in the *outfall* have passed and it is normally considered sufficient to design them for an event having a 10 minute duration and a 10% probability of occurring annually.

9.0.4 The soak pit shall comprise either a rock filled hole (see Figure 13 (a)) or a lined chamber (see Figure 13 (b)). Both of these options shall be enclosed in filter cloth complying with AS 3706.1. The filter cloth shall have a mass per unit area of 140 grams/m^2 and a minimum thickness of 0.45 mm.

9.0.5 The volume of storage required in the soak pit, V_{stor} (m^3), shall be calculated by:

$V_{stor} = R_c - V_{soak}$

where

R_c = run-off discharged from catchment to soak pit in 1 hour (m^3).

V_{soak} = volume disposed of by soakage in 1 hour (m^3).

and

R_c = 10CIA

where

C = run-off coefficient (see Table 1).

I = rainfall intensity (mm/hr) based on 1 hour duration of an event having a 10% probability of occurring annually.

Amend 5 Jul 2001

A = area (hectares) of the catchment discharging to the soak pit.

and

$V_{soak} = A_{sp}S_r/1000$

where

A_{sp} = area of the base of the soak pit (m^2).

S_r = soakage rate (mm/hr) determined from 9.0.2.

COMMENT:
Generally where the test results show a soakage rate of greater than 500 mm/hour, soakage rather than storage will be the main mechanism to remove the water. Where the soakage rate is significantly less than 500 mm/hour, storage will become the dominant factor. Intermediate soakage rates will require a design utilising both in the proportions necessary to ensure the water will dissipate before it overflows from the pit.

9.0.6 Where the soak pit comprises a rock filled hole (see Figure 13 (a)) then the volume of the hole shall be calculated as V_{stor} divided by 0.38.

Amend 10 Jan 2017

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