Proposed Dwelling
Land adj Fir Tree Cottage
Chapel Lane
Billingley

Oct 2015
Ref 12.44

Surface Water Soakaway Test and Design

There are no surface water drains in the vicinity of the site. In accordance with the requirements if Sustainable Urban Drainage Solutions (SUDs) discharge of surface water from roof areas into the ground by infiltration has been considered.

The enclosed information illustrates how surface water drainage can be discharged using StormCell construction 3 metres by 4 metres by 1.3m deep below the incoming pipe invert, providing a total of 14.82 cubic metres of storage.

Information enclosed:

- Results of 2No site percolation tests
- Soakaway size calculation
- Emptying chart

The location of the proposed soakaway is shown on the application drawing ref P1 Site Plan and Drainage Layout which forms part of the application documents.

Details of soakaway requirements provided by:

Stevenson Associates
Unit 2 Monk Fryston
Leeds
LS25 5EX

PERMEABILITY TEST

Fir Tree Cottage,
Chapel Lane
Billingley

Time	Duration (mins)	Depth [dip] (m)	Width	Length	Pit Depth	Permeability	Permeability
			0.3	2.4	1.42	(per section)	75%-25%
10:53:00	0	0.430					
11:30:00	37	0.645				1.27E-05	
12:10:00	77	0.860				1.49E-05	
12:40:00	107	0.990				1.53E-05	
13:40:00	167	1.070				5.66E-06	
15:00:00	247	1.160				5.70E-06	
16:00:00	307	1.220				6.12E-06	
17:00:00	367	1.280				7.33E-06	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	

Design Figure (adjust for central area) 1.01E-05

Design Figure is carried over into 'Soakaway Design'

STEVENSON ASSOCIATES
Unit 2, Hillcrest
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PERMEABILITY TEST

Fir Tree Cottage,
Chapel Lane
Billingley

Time	Duration (mins)	Depth [dip] (m)	Width 0.3	Length 2.4	Pit Depth 1.42	Permeability (per section)	Permeability 75%-25%
10:04:00	0	0.800					
10:14:00	9	0.870				2.41E-05	
10:34:00	30	0.960				1.49E-05	
10:47:00	43	0.980				5.86E-06	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	
00:00:00	invalid	0.000				Invalid	
	invalid	0.000				Invalid	
	invalid	0.000				Invalid	
	invalid	0.000				Invalid	
	invalid	0.000				Invalid	
	invalid	0.000				Invalid	
	invalid	0.000				Invalid	
	invalid	0.000				Invalid	

Design Figure (adjust for central area) 1.49E-05

Design Figure is carried over into 'Soakaway Design'

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SOAKAWAY SIZE CALCULATION

Fir Tree Cottage, Billingley

Barnsley
M5-60 = 19mm
r= 0.35

Infiltration rate (worse case) 1.01E-05

Infiltration
Test 1 1.49E-05
Test 2 1.01E-05
Test 3 1.00E+00

Duration (min)		**30-YEAR STORM** Rainfall (mm/hr)	**30-YEAR STORM + 30%** Rainfall (mm/hr)
15		65.34	84.94
30		44.61	57.99
60	- 1 hr	29.24	38.01
120	- 2hrs	18.59	24.17
180	- 3hrs	14.08	18.30
240	- 4 hrs	11.50	14.95
360	- 6 hrs	8.64	11.23
720	-12 hrs	5.27	6.85
1440	- 24 hrs	3.20	4.16
2880	-48 hrs	1.93	2.51

SOAKAWAY SIZE

Length (m)	3
Width (m)	4
Depth (m)	1.3

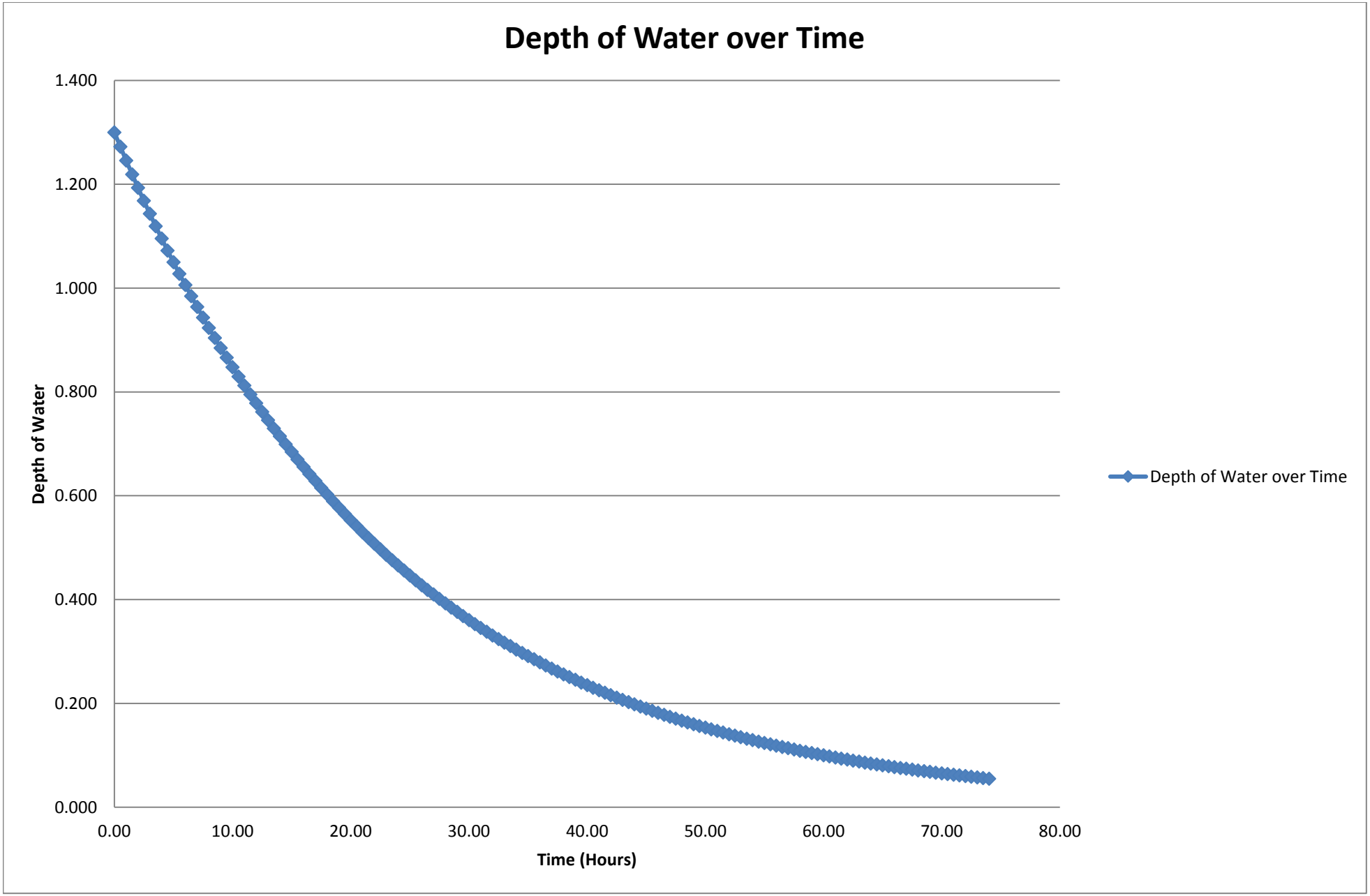
StormCell Soakaway

1/2 Internal side area (m2)	9.1
95% Voids	14.82

DRAINED AREA (sq.m) 220

		INFLOW (m3)	OUTFLOW (m3)	STORAGE REQUIRED	SIZE OK		
15 minute		4.67	0.03	4.65	Pass		15
30 minute		6.38	0.07	6.31	Pass		30
60 minute	- 1 hr	8.36	0.19	8.18	Pass		60
120 minute	-2 hrs	10.63	0.47	10.16	Pass		120
180 minute	- 3 hrs	12.08	0.81	11.27	Pass		180
240 minute	-4 hrs	13.16	1.17	11.98	Pass		240
360 minute	-6 hrs	14.83	1.98	12.85	Pass		360
720 minute	-12 hrs	18.09	3.96	14.13	Pass	Critical Storm	720
1440 minute	- 24 hrs	21.96	7.92	14.05	Pass		1440
2880 minute	- 48 hrs	26.50	15.84	10.66	Pass		2880

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Depth of Water over Time
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Depth of Water
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
Time (Hours)
Depth of Water over Time