STEVENSON ASSOCIATES

ST MARY'S ROAD, DARFIELD

Soakaway Tests and Drainage Proposals

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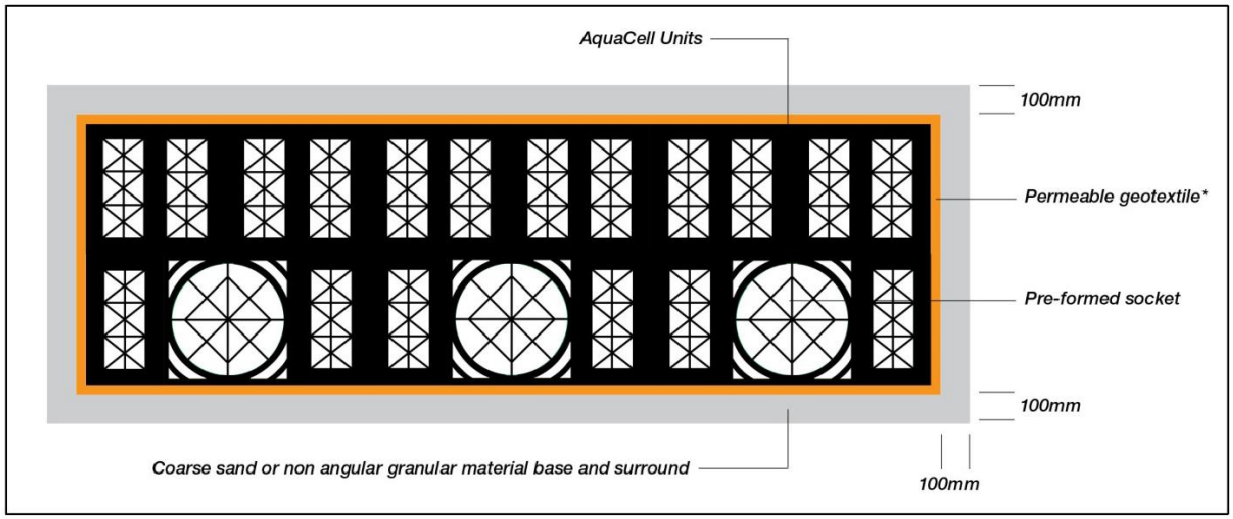
EXISTING GROUND / SOAKAWAY TEST

1 Permeability tests in line with BRE Digest 365 were carried out on 25th June 2018.

2 The excavated trench revealed a shallow depth of topsoil over brown sandy subsoil to a depth of around 1m. Below that depth the sandy soil had signs of clay deposits (approximately 25% to 30%) and at a depth of 1250mm a bedrock of mudstone was encountered.

SOAKAWAY DESIGN

3 Due to changing ground conditions with depth it would be prudent to utilise the upper 1m layer of soil if draining by infiltration and therefore if the available depth for soakaways is limited, storage within the structure needs to be maximised using a modular crate cell system (StormCell, AquaCell etc.) rather than a 'conventional' stone matrix (cf. 95% - 30% voids). It is proposed to construct soakaways 1 cell unit deep (500mm).



4 The current edition of BRE Digest 365 indicates that soakaways should be designed not to flood during 1 in 100-year storms and additional allowances made for climate changes.

5 Storms of various lengths have been assessed to show the critical storm to be that of 24 hours whereby 8 cubic metres of water will need to be stored. Calculations show that a soakaway 8.5m by 2m in size will be required for each block of semi-detached houses covering 98 square metres (see appended calculations).

M. Stevenson

Michael Stevenson

27th July 2018

APPENDIX 1 – INFILTRATION TESTS

PERMEABILITY TEST

Weather: Hot and dry
Ground: sandy-soils down to 1m with a little clay below that before mustone at 1250

St Mary's Road, Darfield
25th July 2018

Time	Duration (mins)	Depth [dip] (m)	Width	Length	Pit Depth	Permeability (per section)	Permeability 75%-25%
			0.32	2	1.22		
08:40:00	0	0.450					
08:55:00	14	0.490				7.40E-06	
09:10:00	30	0.530				6.78E-06	
09:30:00	50	0.580				7.16E-06	
09:45:00	65	0.610				6.03E-06	
10:05:00	85	0.640				4.70E-06	
10:20:00	100	0.680				8.78E-06	

Design Figure	6.81E-06

Design Figure is carried over into 'Soakaway Design'

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PERMEABILITY TEST

Weather: Hot and dry
Ground: sandy-soils down to 1m with a little clay below that before mustone at 1250

St Mary's Road, Darfield
25th July 2018

Time	Duration (mins)	Depth [dip] (m)	Width 0.32	Length 2	Pit Depth 1.22	Permeability (per section)	Permeability 75%-25%
10:30:00	0	0.425					
10:35:00	5	0.440				7.45E-06	
10:45:00	15	0.465				6.35E-06	
10:55:00	25	0.485				5.21E-06	
11:10:00	39	0.500				2.85E-06	
11:25:00	55	0.525				4.25E-06	
11:40:00	70	0.545				3.72E-06	
12:00:00	90	0.575				4.32E-06	
12:15:00	105	0.600				4.97E-06	
12:30:00	120	0.620				4.10E-06	
12:45:00	135	0.640				4.21E-06	
13:00:00	150	0.655				3.24E-06	

Design Figure	4.61E-06

Design Figure is carried over into 'Soakaway Design'

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APPENDIX 2 - SOAKAWAY SIZE CALCULATION

SOAKAWAY SIZE CALCULATION

St Mary's Road, Darfield

				100-YEAR STORM	STORM + 30%
M5-60 =19mm		Duration (min)		Rainfall (mm/hr)	Rainfall (mm/hr)
r= 0.4					
		15		93.27	121.25
		30		61.29	79.68
Infiltration rate		60	- 1 hr	38.41	49.93
(worse case)	4.61E-06	120	- 2hrs	23.28	30.26
		180	- 3hrs	17.15	22.30
Infiltration		240	- 4 hrs	13.73	17.85
Test 1	6.81E-06	360	- 6 hrs	9.97	12.96
Test 2	4.61E-06	720	-12 hrs	5.75	7.48
Test 3	1.11E+09	1440	- 24 hrs	3.29	4.28

SOAKAWAY SIZE	
Length (m)	8.5
Width (m)	2
Depth (m)	0.5
StormCell	
Soakaway	
1/2 Internal side area (m2)	5.25
95% Voids	8.075

DRAINED AREA (sq.m) 98 for 1 pair of semi's

		INFLOW (m3)	OUTFLOW (m3)	STORAGE REQUIRED	SIZE OK	
15 minute		2.97	0.01	2.96	Pass	
30 minute		3.90	0.02	3.88	Pass	
60 minute	- 1 hr	4.89	0.05	4.84	Pass	
120 minute	-2 hrs	5.93	0.13	5.80	Pass	
180 minute	- 3 hrs	6.55	0.21	6.34	Pass	
240 minute	-4 hrs	7.00	0.30	6.70	Pass	
360 minute	-6 hrs	7.62	0.49	7.13	Pass	
720 minute	-12 hrs	8.79	1.04	7.75	Pass	
1440 minute	- 24 hrs	10.06	2.09	7.97	Pass	Critical Storm

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APPENDIX 3 – SOAKAWAY LAYOUT

Drawing No.	Rev No.
MNR001 -004	

BLOCK PLAN OF SITE
SCALE 1:200 AT A3

DO NOT SCALE: Contractor to check all dimensions and report any omissions or errors

NOTES

Rev	Description	By	Chk	App	Date

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MR. N ROBINSON

Drawing Title
PROPOSED PLANS 3 BED SEMI

Address
21 ST. MARYS ROAD
DARFIELD
BARNSLEY
S73 9LQ

Project Title:
PROPOSED NEW HOUSING DEVELOPMENT

Purpose of Issue:
PLANNING

Drawing Status
FIRST ISSUE

Scale at A3	Drawn By	Date
AS SHOWN	JRB	15/06/2018
Checked By	Date	Approved By	Date
	15/06/2018		15/06/2018
Project No.	Drawing No.	Revision
MNR001	004	

APPROVAL ☒ INFORMATION ☐ TENDER ☐ CONTRACT ☐ CONSTRUCTION ☐