



REUBY & STAGG LTD.

CONSULTING CIVIL & STRUCTURAL ENGINEERS

PLANNING CONDITIONS 20 AND 22

SURFACE WATER STRATEGY,

CONVALESCENT SITE, RUSTINGTON, LITTLEHAMPTON

EXISTING LAUNDRY, HOUSE AND DAIRY

Reuby & Stagg Ltd. has been instructed to provide a surface water drainage strategy for Phase 1 of the development at Rustington Convalescent Home, in line with the requirements of Conditions 20 and 22 of planning permission R/187/16/PL. This Strategy should be read in conjunction with the following documents that are included in the Appendices.

- Flood Risk Assessment and Surface Water Drainage Strategy – 14-185-05 – January 2015 – Odyssey Markides
- GE16334 Rustington Soakage Test Letter JT01 180228 - 28th February 2018 – Geo – Environmental.

CONDITION

20. Prior to the commencement of development of each phase full details of the proposed surface water drainage scheme for the relevant phase shall be submitted to and approved in writing by the Local Planning Authority.

The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, the recommendations of the SUDS Manual produced by CIRIA.

Winter groundwater monitoring to establish highest annual ground water levels and Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage.

No unit shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be maintained in good working order in perpetuity.

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies GEN7 and GEN9 of the Arun District Council Local Plan.

Revision G 7th June 2018

Registered Office:
St. James House, 8 Overcliffe, Gravesend, Kent DA11 0HJ
Registered England & Wales No: 5084692

M E Reuby, RR Stagg, G Bedford, A V Gadd, R Barclay

Kent Office:

22. Prior to the commencement of each phase of development full details of the maintenance and management of the SUDs system is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturers recommended design life. Upon completed construction of the SuDs System, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual.

Reason: To ensure the efficient maintenance and on going operation of the SuDs system and to ensure the best practice in line with guidance set out in 'The SuDs Manual' CIRIA publication ref: C697 Chapter 22.

EXISTING CONDITION

Phase 1 of the development includes the conversion of three existing two-storey buildings with impermeable roofs and permeable landscaped external areas.

The current impermeable surfaces of the site either discharge to an existing soakaway or are directly connected to the adjacent Boating lake. The existing surface water does not discharge into the local Southern Water surface water system.

DESIGN

As outlined in the Flood Risk Assessment, the site is mainly situated within Flood Zone 1 (based upon Environment Agency Flood mapping). All existing and proposed buildings are situated within Flood Zone 1.

An infiltration test has been undertaken in accordance with BRE365; the results of which are included as an appendix. The testing concluded that the sub-strata's encounter a worst-case soakage rate of 4.617×10^{-6} , which provides a suitable medium for infiltration.

Ground water monitoring was undertaken between 19th April 2017 and 1st February 2018, which concluded the highest ground water level to be 2.26m below ground level. Soakaways have therefore been designed to be no deeper than 1.26m below ground level.

The redevelopment of the site will increase the impermeable area. Although the discharge flow and volume of water shall be greater as a result, the proposed soakaways have been designed in line with guidance set out in policy GEN7 and GEN9 of the Arun District Council Local Plan. The soakaways and associated drainage system have been designed and shall be constructed in accordance with Approved Document H of the Building Regulations and the recommendations of the SUDS Manual.

In brief, the proposed external paving construction will be of a porous nature and the new soakaways have been designed to accommodate the 100 Year storm event inclusive of climate change without flooding. All storm durations have been designed for, with the 180, 600 and 960min duration storm being the worst case. The MicroDrainage WinDes calculations and design drawing are included in the appendices.

In the event of sewer exceedance or drainage failure, the soakaways are situated in areas lower than the finished floor levels of the buildings and therefore the properties are not at risk of flooding. Flood water from sewer exceedance or drainage failure will flow south towards the proposed carriageway which will provide above ground storage.

MAINTENANCE AND MANAGEMENT OF SUDS SYSTEM

The following table sets out the maintenance regime specific to each element of the drainage system. This regime should be followed throughout the lifetime of the development, to ensure proper functioning of the system and to limit the risk of flooding due to poor operation.

The financial management and arrangements for the replacement of major components at the end of the manufacturers recommended design life will be dealt with by the management company with ground rents collected from the owners to cover the replacement costs

Drainage Element	Inspection / Maintenance	Frequency	Remedial Action	Responsible Party
Roof Drainage	Clean gutters and downpipes	Annually	Repair as necessary	Home owners for dwellings, Management Company for flats
Below ground drainage runs and chambers	CCTV drain runs and jet wash. Inspect chambers for debris	Every 5 years Annually	Repair as necessary Remove debris and sediment as required	Home owners for dwellings, Management Company for flats
Silt Traps	Inspect silt traps	Monthly for 1 st year of operation and then annually thereafter	Remove sediment and debris as required	Home owners for dwellings, Management Company for flats
Permeable Paving	Sweep and vacuum paving Inspect for evidence of poor performance	End of winter, mid-summer and end of autumn. 48hrs following heavy rainfall	Take up defective area of block paving and replace bedding layer and geotextile	Management Company

Produced by
Chris Vivian
BSc.(Hons) C.Eng MIMStructE
Director
For And On Behalf Of Reuby & Stagg Ltd.

APPENDIX

Carpenter House Soakaway 1

Reuby & Stagg Ltd		Page 1																																	
Dewey House 55 High Street Ringwood BH24 1AE	Rustington Convalescent Home Carpenters House Reuby & Stagg 10379																																		
Date 19/06/2018	Designed by PJ																																		
File 10379 Carpenters House ...	Checked by RHB																																		
Elstree Computing Ltd		Source Control 2018.1																																	
<u>Rainfall Details</u> <table><tr><td>Rainfall Model</td><td>FSR</td><td>Winter Storms</td><td>Yes</td></tr><tr><td>Return Period (years)</td><td>30</td><td>Cv (Summer)</td><td>0.750</td></tr><tr><td>Region</td><td>England and Wales</td><td>Cv (Winter)</td><td>0.840</td></tr><tr><td>M5-60 (mm)</td><td>19.000</td><td>Shortest Storm (mins)</td><td>15</td></tr><tr><td>Ratio R</td><td>0.350</td><td>Longest Storm (mins)</td><td>10080</td></tr><tr><td>Summer Storms</td><td>Yes</td><td>Climate Change %</td><td>+0</td></tr></table> <u>Time Area Diagram</u> Total Area (ha) 0.005 <table><thead><tr><th colspan="2">Time (mins)</th><th>Area</th></tr><tr><th>From:</th><th>To:</th><th>(ha)</th></tr></thead><tbody><tr><td>0</td><td>4</td><td>0.005</td></tr></tbody></table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	30	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.000	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins)		Area	From:	To:	(ha)	0	4	0.005
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Model Details

Storage is Online Cover Level (m) 3.850

Cellular Storage Structure

Invert Level (m) 2.580 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01662 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01662

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	10.0	10.0	1.300	0.0	15.7
0.100	10.0	11.3	1.400	0.0	15.7
0.200	10.0	12.5	1.500	0.0	15.7
0.300	10.0	13.8	1.600	0.0	15.7
0.400	10.0	15.1	1.700	0.0	15.7
0.500	0.0	15.7	1.800	0.0	15.7
0.600	0.0	15.7	1.900	0.0	15.7
0.700	0.0	15.7	2.000	0.0	15.7
0.800	0.0	15.7	2.100	0.0	15.7
0.900	0.0	15.7	2.200	0.0	15.7
1.000	0.0	15.7	2.300	0.0	15.7
1.100	0.0	15.7	2.400	0.0	15.7
1.200	0.0	15.7	2.500	0.0	15.7

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Summer</td><td>2.731</td><td>0.151</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>600 min Summer</td><td>2.731</td><td>0.151</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>2.731</td><td>0.151</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>2.729</td><td>0.149</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>2.722</td><td>0.142</td><td>0.0</td><td>1.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>2.709</td><td>0.129</td><td>0.0</td><td>1.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>2.696</td><td>0.116</td><td>0.0</td><td>1.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>2.673</td><td>0.093</td><td>0.0</td><td>0.9</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>2.655</td><td>0.075</td><td>0.0</td><td>0.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>2.641</td><td>0.061</td><td>0.0</td><td>0.6</td><td>O K</td></tr><tr><td>8640 min 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Summer</td><td>5.539</td><td>0.0</td><td>474</td></tr><tr><td>720 min Summer</td><td>4.832</td><td>0.0</td><td>536</td></tr><tr><td>960 min Summer</td><td>3.892</td><td>0.0</td><td>672</td></tr><tr><td>1440 min Summer</td><td>2.866</td><td>0.0</td><td>940</td></tr><tr><td>2160 min Summer</td><td>2.108</td><td>0.0</td><td>1360</td></tr><tr><td>2880 min Summer</td><td>1.693</td><td>0.0</td><td>1756</td></tr><tr><td>4320 min Summer</td><td>1.242</td><td>0.0</td><td>2508</td></tr><tr><td>5760 min Summer</td><td>0.996</td><td>0.0</td><td>3224</td></tr><tr><td>7200 min Summer</td><td>0.839</td><td>0.0</td><td>3896</td></tr><tr><td>8640 min Summer</td><td>0.730</td><td>0.0</td><td>4576</td></tr><tr><td>10080 min Summer</td><td>0.648</td><td>0.0</td><td>5248</td></tr><tr><td>15 min Winter</td><td>68.836</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	2.646	0.066	0.0	0.6	O K	30 min 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Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	2.678	0.098	0.0	0.9	O K
60 min Winter	2.702	0.122	0.0	1.2	O K
120 min Winter	2.726	0.146	0.0	1.4	O K
180 min Winter	2.738	0.158	0.0	1.5	O K
240 min Winter	2.745	0.165	0.0	1.6	O K
360 min Winter	2.751	0.171	0.0	1.6	O K
480 min Winter	2.753	0.173	0.0	1.6	O K
600 min Winter	2.752	0.172	0.0	1.6	O K
720 min Winter	2.751	0.171	0.0	1.6	O K
960 min Winter	2.748	0.168	0.0	1.6	O K
1440 min Winter	2.737	0.157	0.0	1.5	O K
2160 min Winter	2.717	0.137	0.0	1.3	O K
2880 min Winter	2.697	0.117	0.0	1.1	O K
4320 min Winter	2.663	0.083	0.0	0.8	O K
5760 min Winter	2.639	0.059	0.0	0.6	O K
7200 min Winter	2.627	0.047	0.0	0.5	O K
8640 min Winter	2.622	0.042	0.0	0.4	O K
10080 min Winter	2.618	0.038	0.0	0.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	45.828	0.0	33		
60 min Winter	29.238	0.0	62		
120 min Winter	18.112	0.0	120		
180 min Winter	13.534	0.0	178		
240 min Winter	10.952	0.0	236		
360 min Winter	8.106	0.0	348		
480 min Winter	6.544	0.0	454		
600 min Winter	5.539	0.0	548		
720 min Winter	4.832	0.0	570		
960 min Winter	3.892	0.0	722		
1440 min Winter	2.866	0.0	1026		
2160 min Winter	2.108	0.0	1468		
2880 min Winter	1.693	0.0	1872		
4320 min Winter	1.242	0.0	2636		
5760 min Winter	0.996	0.0	3280		
7200 min Winter	0.839	0.0	3888		
8640 min Winter	0.730	0.0	4584		
10080 min Winter	0.648	0.0	5256		
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Dewey House 55 High Street Ringwood BH24 1AE		Rustington Convalesent Home Carpenters House Reuby & Stagg 10379																																																																																																																																																																																																																					
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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 909 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>2.701</td><td>0.121</td><td>0.0</td><td>1.1</td><td>O K</td></tr><tr><td>30 min Summer</td><td>2.741</td><td>0.161</td><td>0.0</td><td>1.5</td><td>O K</td></tr><tr><td>60 min Summer</td><td>2.784</td><td>0.204</td><td>0.0</td><td>1.9</td><td>O K</td></tr><tr><td>120 min Summer</td><td>2.827</td><td>0.247</td><td>0.0</td><td>2.3</td><td>O K</td></tr><tr><td>180 min Summer</td><td>2.849</td><td>0.269</td><td>0.0</td><td>2.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>2.862</td><td>0.282</td><td>0.0</td><td>2.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>2.876</td><td>0.296</td><td>0.0</td><td>2.8</td><td>O K</td></tr><tr><td>480 min Summer</td><td>2.883</td><td>0.303</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>2.885</td><td>0.305</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>720 min Summer</td><td>2.884</td><td>0.304</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>960 min Summer</td><td>2.882</td><td>0.302</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>2.873</td><td>0.293</td><td>0.0</td><td>2.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>2.857</td><td>0.277</td><td>0.0</td><td>2.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>2.840</td><td>0.260</td><td>0.0</td><td>2.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>2.806</td><td>0.226</td><td>0.0</td><td>2.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>2.775</td><td>0.195</td><td>0.0</td><td>1.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>2.748</td><td>0.168</td><td>0.0</td><td>1.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>2.725</td><td>0.145</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>2.704</td><td>0.124</td><td>0.0</td><td>1.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>2.716</td><td>0.136</td><td>0.0</td><td>1.3</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>124.633</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>83.789</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>53.779</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.337</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.832</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.006</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.706</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.818</td><td>0.0</td><td>480</td></tr><tr><td>600 min Summer</td><td>9.966</td><td>0.0</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.665</td><td>0.0</td><td>672</td></tr><tr><td>960 min Summer</td><td>6.943</td><td>0.0</td><td>782</td></tr><tr><td>1440 min Summer</td><td>5.071</td><td>0.0</td><td>1038</td></tr><tr><td>2160 min Summer</td><td>3.696</td><td>0.0</td><td>1448</td></tr><tr><td>2880 min Summer</td><td>2.949</td><td>0.0</td><td>1848</td></tr><tr><td>4320 min Summer</td><td>2.142</td><td>0.0</td><td>2680</td></tr><tr><td>5760 min Summer</td><td>1.705</td><td>0.0</td><td>3456</td></tr><tr><td>7200 min Summer</td><td>1.427</td><td>0.0</td><td>4184</td></tr><tr><td>8640 min Summer</td><td>1.235</td><td>0.0</td><td>4936</td></tr><tr><td>10080 min Summer</td><td>1.093</td><td>0.0</td><td>5656</td></tr><tr><td>15 min Winter</td><td>124.633</td><td>0.0</td><td>19</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	2.701	0.121	0.0	1.1	O K	30 min Summer	2.741	0.161	0.0	1.5	O K	60 min Summer	2.784	0.204	0.0	1.9	O K	120 min Summer	2.827	0.247	0.0	2.3	O K	180 min Summer	2.849	0.269	0.0	2.6	O K	240 min Summer	2.862	0.282	0.0	2.7	O K	360 min Summer	2.876	0.296	0.0	2.8	O K	480 min Summer	2.883	0.303	0.0	2.9	O K	600 min Summer	2.885	0.305	0.0	2.9	O K	720 min Summer	2.884	0.304	0.0	2.9	O K	960 min Summer	2.882	0.302	0.0	2.9	O K	1440 min Summer	2.873	0.293	0.0	2.8	O K	2160 min Summer	2.857	0.277	0.0	2.6	O K	2880 min Summer	2.840	0.260	0.0	2.5	O K	4320 min Summer	2.806	0.226	0.0	2.1	O K	5760 min Summer	2.775	0.195	0.0	1.9	O K	7200 min Summer	2.748	0.168	0.0	1.6	O K	8640 min Summer	2.725	0.145	0.0	1.4	O K	10080 min Summer	2.704	0.124	0.0	1.2	O K	15 min Winter	2.716	0.136	0.0	1.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	124.633	0.0	19	30 min Summer	83.789	0.0	34	60 min Summer	53.779	0.0	64	120 min Summer	33.337	0.0	122	180 min Summer	24.832	0.0	182	240 min Summer	20.006	0.0	242	360 min Summer	14.706	0.0	362	480 min Summer	11.818	0.0	480	600 min Summer	9.966	0.0	600	720 min Summer	8.665	0.0	672	960 min Summer	6.943	0.0	782	1440 min Summer	5.071	0.0	1038	2160 min Summer	3.696	0.0	1448	2880 min Summer	2.949	0.0	1848	4320 min Summer	2.142	0.0	2680	5760 min Summer	1.705	0.0	3456	7200 min Summer	1.427	0.0	4184	8640 min Summer	1.235	0.0	4936	10080 min Summer	1.093	0.0	5656	15 min Winter	124.633	0.0	19
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Dewey House 55 High Street Ringwood BH24 1AE		Rustington Convalesent Home Carpenters House Reuby & Stagg 10379			
Date 19/06/2018		Designed by PJ			
File 10379 Carpenters House ...		Checked by RHB			
Elstree Computing Ltd		Source Control 2018.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	2.761	0.181	0.0	1.7	O K
60 min Winter	2.809	0.229	0.0	2.2	O K
120 min Winter	2.858	0.278	0.0	2.6	O K
180 min Winter	2.883	0.303	0.0	2.9	O K
240 min Winter	2.899	0.319	0.0	3.0	O K
360 min Winter	2.916	0.336	0.0	3.2	O K
480 min Winter	2.926	0.346	0.0	3.3	O K
600 min Winter	2.930	0.350	0.0	3.3	O K
720 min Winter	2.931	0.351	0.0	3.3	O K
960 min Winter	2.928	0.348	0.0	3.3	O K
1440 min Winter	2.916	0.336	0.0	3.2	O K
2160 min Winter	2.893	0.313	0.0	3.0	O K
2880 min Winter	2.867	0.287	0.0	2.7	O K
4320 min Winter	2.817	0.237	0.0	2.2	O K
5760 min Winter	2.772	0.192	0.0	1.8	O K
7200 min Winter	2.733	0.153	0.0	1.5	O K
8640 min Winter	2.700	0.120	0.0	1.1	O K
10080 min Winter	2.673	0.093	0.0	0.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.789	0.0	33		
60 min Winter	53.779	0.0	62		
120 min Winter	33.337	0.0	122		
180 min Winter	24.832	0.0	180		
240 min Winter	20.006	0.0	238		
360 min Winter	14.706	0.0	354		
480 min Winter	11.818	0.0	468		
600 min Winter	9.966	0.0	578		
720 min Winter	8.665	0.0	688		
960 min Winter	6.943	0.0	894		
1440 min Winter	5.071	0.0	1110		
2160 min Winter	3.696	0.0	1576		
2880 min Winter	2.949	0.0	2020		
4320 min Winter	2.142	0.0	2892		
5760 min Winter	1.705	0.0	3688		
7200 min Winter	1.427	0.0	4464		
8640 min Winter	1.235	0.0	5184		
10080 min Winter	1.093	0.0	5848		
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Carpenters House Soakaway 2

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Dewey House 55 High Street Ringwood BH24 1AE	Rustington Convalescent Home Carpenters House Reuby & Stagg 10379																																		
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<u>Rainfall Details</u> <table><tr><td>Rainfall Model</td><td>FSR</td><td>Winter Storms</td><td>Yes</td></tr><tr><td>Return Period (years)</td><td>30</td><td>Cv (Summer)</td><td>0.750</td></tr><tr><td>Region</td><td>England and Wales</td><td>Cv (Winter)</td><td>0.840</td></tr><tr><td>M5-60 (mm)</td><td>19.000</td><td>Shortest Storm (mins)</td><td>15</td></tr><tr><td>Ratio R</td><td>0.350</td><td>Longest Storm (mins)</td><td>10080</td></tr><tr><td>Summer Storms</td><td>Yes</td><td>Climate Change %</td><td>+0</td></tr></table> <u>Time Area Diagram</u> Total Area (ha) 0.005 <table><thead><tr><th colspan="2">Time (mins)</th><th>Area</th></tr><tr><th>From:</th><th>To:</th><th>(ha)</th></tr></thead><tbody><tr><td>0</td><td>4</td><td>0.005</td></tr></tbody></table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	30	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.000	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins)		Area	From:	To:	(ha)	0	4	0.005
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Date 19/06/2018	Designed by PJ	
File 10379 Carpenters House ...	Checked by RHB	
Elstree Computing Ltd		Source Control 2018.1

Model Details

Storage is Online Cover Level (m) 4.150

Cellular Storage Structure

Invert Level (m) 3.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01662 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01662

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	10.0	10.0	1.300	0.0	15.7
0.100	10.0	11.3	1.400	0.0	15.7
0.200	10.0	12.5	1.500	0.0	15.7
0.300	10.0	13.8	1.600	0.0	15.7
0.400	10.0	15.1	1.700	0.0	15.7
0.500	0.0	15.7	1.800	0.0	15.7
0.600	0.0	15.7	1.900	0.0	15.7
0.700	0.0	15.7	2.000	0.0	15.7
0.800	0.0	15.7	2.100	0.0	15.7
0.900	0.0	15.7	2.200	0.0	15.7
1.000	0.0	15.7	2.300	0.0	15.7
1.100	0.0	15.7	2.400	0.0	15.7
1.200	0.0	15.7	2.500	0.0	15.7

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Summer</td><td>3.251</td><td>0.151</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>600 min Summer</td><td>3.251</td><td>0.151</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>3.251</td><td>0.151</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>3.249</td><td>0.149</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>3.242</td><td>0.142</td><td>0.0</td><td>1.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>3.229</td><td>0.129</td><td>0.0</td><td>1.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>3.216</td><td>0.116</td><td>0.0</td><td>1.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>3.193</td><td>0.093</td><td>0.0</td><td>0.9</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>3.175</td><td>0.075</td><td>0.0</td><td>0.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>3.161</td><td>0.061</td><td>0.0</td><td>0.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>3.152</td><td>0.052</td><td>0.0</td><td>0.5</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>3.147</td><td>0.047</td><td>0.0</td><td>0.4</td><td>O K</td></tr><tr><td>15 min Winter</td><td>3.174</td><td>0.074</td><td>0.0</td><td>0.7</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>68.836</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>45.828</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>29.238</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>18.112</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>13.534</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>10.952</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>8.106</td><td>0.0</td><td>358</td></tr><tr><td>480 min Summer</td><td>6.544</td><td>0.0</td><td>410</td></tr><tr><td>600 min Summer</td><td>5.539</td><td>0.0</td><td>474</td></tr><tr><td>720 min Summer</td><td>4.832</td><td>0.0</td><td>536</td></tr><tr><td>960 min Summer</td><td>3.892</td><td>0.0</td><td>672</td></tr><tr><td>1440 min Summer</td><td>2.866</td><td>0.0</td><td>940</td></tr><tr><td>2160 min Summer</td><td>2.108</td><td>0.0</td><td>1360</td></tr><tr><td>2880 min Summer</td><td>1.693</td><td>0.0</td><td>1756</td></tr><tr><td>4320 min Summer</td><td>1.242</td><td>0.0</td><td>2508</td></tr><tr><td>5760 min Summer</td><td>0.996</td><td>0.0</td><td>3224</td></tr><tr><td>7200 min Summer</td><td>0.839</td><td>0.0</td><td>3896</td></tr><tr><td>8640 min Summer</td><td>0.730</td><td>0.0</td><td>4576</td></tr><tr><td>10080 min Summer</td><td>0.648</td><td>0.0</td><td>5248</td></tr><tr><td>15 min Winter</td><td>68.836</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	3.166	0.066	0.0	0.6	O K	30 min Summer	3.187	0.087	0.0	0.8	O K	60 min Summer	3.209	0.109	0.0	1.0	O K	120 min Summer	3.229	0.129	0.0	1.2	O K	180 min Summer	3.239	0.139	0.0	1.3	O K	240 min Summer	3.245	0.145	0.0	1.4	O K	360 min Summer	3.249	0.149	0.0	1.4	O K	480 min Summer	3.251	0.151	0.0	1.4	O K	600 min Summer	3.251	0.151	0.0	1.4	O K	720 min Summer	3.251	0.151	0.0	1.4	O K	960 min Summer	3.249	0.149	0.0	1.4	O K	1440 min Summer	3.242	0.142	0.0	1.3	O K	2160 min Summer	3.229	0.129	0.0	1.2	O K	2880 min Summer	3.216	0.116	0.0	1.1	O K	4320 min Summer	3.193	0.093	0.0	0.9	O K	5760 min Summer	3.175	0.075	0.0	0.7	O K	7200 min Summer	3.161	0.061	0.0	0.6	O K	8640 min Summer	3.152	0.052	0.0	0.5	O K	10080 min Summer	3.147	0.047	0.0	0.4	O K	15 min Winter	3.174	0.074	0.0	0.7	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	68.836	0.0	19	30 min Summer	45.828	0.0	33	60 min Summer	29.238	0.0	62	120 min Summer	18.112	0.0	122	180 min Summer	13.534	0.0	182	240 min Summer	10.952	0.0	242	360 min Summer	8.106	0.0	358	480 min Summer	6.544	0.0	410	600 min Summer	5.539	0.0	474	720 min Summer	4.832	0.0	536	960 min Summer	3.892	0.0	672	1440 min Summer	2.866	0.0	940	2160 min Summer	2.108	0.0	1360	2880 min Summer	1.693	0.0	1756	4320 min Summer	1.242	0.0	2508	5760 min Summer	0.996	0.0	3224	7200 min Summer	0.839	0.0	3896	8640 min Summer	0.730	0.0	4576	10080 min Summer	0.648	0.0	5248	15 min Winter	68.836	0.0	18
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Reuby & Stagg Ltd				Page 4	
Dewey House 55 High Street Ringwood BH24 1AE		Rustington Convalesent Home Carpenters House Reuby & Stagg 10379			
Date 19/06/2018		Designed by PJ			
File 10379 Carpenters House ...		Checked by RHB			
Elstree Computing Ltd		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	3.198	0.098	0.0	0.9	O K
60 min Winter	3.222	0.122	0.0	1.2	O K
120 min Winter	3.246	0.146	0.0	1.4	O K
180 min Winter	3.258	0.158	0.0	1.5	O K
240 min Winter	3.265	0.165	0.0	1.6	O K
360 min Winter	3.271	0.171	0.0	1.6	O K
480 min Winter	3.273	0.173	0.0	1.6	O K
600 min Winter	3.272	0.172	0.0	1.6	O K
720 min Winter	3.271	0.171	0.0	1.6	O K
960 min Winter	3.268	0.168	0.0	1.6	O K
1440 min Winter	3.257	0.157	0.0	1.5	O K
2160 min Winter	3.237	0.137	0.0	1.3	O K
2880 min Winter	3.217	0.117	0.0	1.1	O K
4320 min Winter	3.183	0.083	0.0	0.8	O K
5760 min Winter	3.159	0.059	0.0	0.6	O K
7200 min Winter	3.147	0.047	0.0	0.5	O K
8640 min Winter	3.142	0.042	0.0	0.4	O K
10080 min Winter	3.138	0.038	0.0	0.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	45.828	0.0	33		
60 min Winter	29.238	0.0	62		
120 min Winter	18.112	0.0	120		
180 min Winter	13.534	0.0	178		
240 min Winter	10.952	0.0	236		
360 min Winter	8.106	0.0	348		
480 min Winter	6.544	0.0	454		
600 min Winter	5.539	0.0	548		
720 min Winter	4.832	0.0	570		
960 min Winter	3.892	0.0	722		
1440 min Winter	2.866	0.0	1026		
2160 min Winter	2.108	0.0	1468		
2880 min Winter	1.693	0.0	1872		
4320 min Winter	1.242	0.0	2636		
5760 min Winter	0.996	0.0	3280		
7200 min Winter	0.839	0.0	3888		
8640 min Winter	0.730	0.0	4584		
10080 min Winter	0.648	0.0	5256		
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Reuby & Stagg Ltd				Page 5																																																																																																																																																																																																																			
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Summer</td><td>3.403</td><td>0.303</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>3.405</td><td>0.305</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>720 min Summer</td><td>3.404</td><td>0.304</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>960 min Summer</td><td>3.402</td><td>0.302</td><td>0.0</td><td>2.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>3.393</td><td>0.293</td><td>0.0</td><td>2.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>3.377</td><td>0.277</td><td>0.0</td><td>2.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>3.360</td><td>0.260</td><td>0.0</td><td>2.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>3.326</td><td>0.226</td><td>0.0</td><td>2.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>3.295</td><td>0.195</td><td>0.0</td><td>1.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>3.268</td><td>0.168</td><td>0.0</td><td>1.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>3.245</td><td>0.145</td><td>0.0</td><td>1.4</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>3.224</td><td>0.124</td><td>0.0</td><td>1.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>3.236</td><td>0.136</td><td>0.0</td><td>1.3</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>124.633</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>83.789</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>53.779</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.337</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.832</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.006</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.706</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.818</td><td>0.0</td><td>480</td></tr><tr><td>600 min Summer</td><td>9.966</td><td>0.0</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.665</td><td>0.0</td><td>672</td></tr><tr><td>960 min Summer</td><td>6.943</td><td>0.0</td><td>782</td></tr><tr><td>1440 min Summer</td><td>5.071</td><td>0.0</td><td>1038</td></tr><tr><td>2160 min Summer</td><td>3.696</td><td>0.0</td><td>1448</td></tr><tr><td>2880 min Summer</td><td>2.949</td><td>0.0</td><td>1848</td></tr><tr><td>4320 min Summer</td><td>2.142</td><td>0.0</td><td>2680</td></tr><tr><td>5760 min Summer</td><td>1.705</td><td>0.0</td><td>3456</td></tr><tr><td>7200 min Summer</td><td>1.427</td><td>0.0</td><td>4184</td></tr><tr><td>8640 min Summer</td><td>1.235</td><td>0.0</td><td>4936</td></tr><tr><td>10080 min Summer</td><td>1.093</td><td>0.0</td><td>5656</td></tr><tr><td>15 min Winter</td><td>124.633</td><td>0.0</td><td>19</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	3.221	0.121	0.0	1.1	O K	30 min Summer	3.261	0.161	0.0	1.5	O K	60 min Summer	3.304	0.204	0.0	1.9	O K	120 min Summer	3.347	0.247	0.0	2.3	O K	180 min Summer	3.369	0.269	0.0	2.6	O K	240 min Summer	3.382	0.282	0.0	2.7	O K	360 min Summer	3.396	0.296	0.0	2.8	O K	480 min Summer	3.403	0.303	0.0	2.9	O K	600 min Summer	3.405	0.305	0.0	2.9	O K	720 min Summer	3.404	0.304	0.0	2.9	O K	960 min Summer	3.402	0.302	0.0	2.9	O K	1440 min Summer	3.393	0.293	0.0	2.8	O K	2160 min Summer	3.377	0.277	0.0	2.6	O K	2880 min Summer	3.360	0.260	0.0	2.5	O K	4320 min Summer	3.326	0.226	0.0	2.1	O K	5760 min Summer	3.295	0.195	0.0	1.9	O K	7200 min Summer	3.268	0.168	0.0	1.6	O K	8640 min Summer	3.245	0.145	0.0	1.4	O K	10080 min Summer	3.224	0.124	0.0	1.2	O K	15 min Winter	3.236	0.136	0.0	1.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	124.633	0.0	19	30 min Summer	83.789	0.0	34	60 min Summer	53.779	0.0	64	120 min Summer	33.337	0.0	122	180 min Summer	24.832	0.0	182	240 min Summer	20.006	0.0	242	360 min Summer	14.706	0.0	362	480 min Summer	11.818	0.0	480	600 min Summer	9.966	0.0	600	720 min Summer	8.665	0.0	672	960 min Summer	6.943	0.0	782	1440 min Summer	5.071	0.0	1038	2160 min Summer	3.696	0.0	1448	2880 min Summer	2.949	0.0	1848	4320 min Summer	2.142	0.0	2680	5760 min Summer	1.705	0.0	3456	7200 min Summer	1.427	0.0	4184	8640 min Summer	1.235	0.0	4936	10080 min Summer	1.093	0.0	5656	15 min Winter	124.633	0.0	19
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360 min Summer	3.396	0.296	0.0	2.8	O K																																																																																																																																																																																																																		
480 min Summer	3.403	0.303	0.0	2.9	O K																																																																																																																																																																																																																		
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Dewey House 55 High Street Ringwood BH24 1AE		Rustington Convalesent Home Carpenters House Reuby & Stagg 10379			
Date 19/06/2018		Designed by PJ			
File 10379 Carpenters House ...		Checked by RHB			
Elstree Computing Ltd		Source Control 2018.1			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	3.281	0.181	0.0	1.7	O K
60 min Winter	3.329	0.229	0.0	2.2	O K
120 min Winter	3.378	0.278	0.0	2.6	O K
180 min Winter	3.403	0.303	0.0	2.9	O K
240 min Winter	3.419	0.319	0.0	3.0	O K
360 min Winter	3.436	0.336	0.0	3.2	O K
480 min Winter	3.446	0.346	0.0	3.3	O K
600 min Winter	3.450	0.350	0.0	3.3	O K
720 min Winter	3.451	0.351	0.0	3.3	O K
960 min Winter	3.448	0.348	0.0	3.3	O K
1440 min Winter	3.436	0.336	0.0	3.2	O K
2160 min Winter	3.413	0.313	0.0	3.0	O K
2880 min Winter	3.387	0.287	0.0	2.7	O K
4320 min Winter	3.337	0.237	0.0	2.2	O K
5760 min Winter	3.292	0.192	0.0	1.8	O K
7200 min Winter	3.253	0.153	0.0	1.5	O K
8640 min Winter	3.220	0.120	0.0	1.1	O K
10080 min Winter	3.193	0.093	0.0	0.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.789	0.0	33		
60 min Winter	53.779	0.0	62		
120 min Winter	33.337	0.0	122		
180 min Winter	24.832	0.0	180		
240 min Winter	20.006	0.0	238		
360 min Winter	14.706	0.0	354		
480 min Winter	11.818	0.0	468		
600 min Winter	9.966	0.0	578		
720 min Winter	8.665	0.0	688		
960 min Winter	6.943	0.0	894		
1440 min Winter	5.071	0.0	1110		
2160 min Winter	3.696	0.0	1576		
2880 min Winter	2.949	0.0	2020		
4320 min Winter	2.142	0.0	2892		
5760 min Winter	1.705	0.0	3688		
7200 min Winter	1.427	0.0	4464		
8640 min Winter	1.235	0.0	5184		
10080 min Winter	1.093	0.0	5848		
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Laundry and Dairy Building with Associated Car Park - Soakaway 3

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Dewey House 55 High Street Ringwood BH24 1AE	Rustington Convalescent Home Laundry & Dairy Reuby & Stagg 10379																																		
Date May 2018	Designed by PJ																																		
File 10379 Laundry Dairy & C...	Checked by RHB																																		
Elstree Computing Ltd		Source Control 2015.1																																	
<u>Rainfall Details</u> <table><tr><td>Rainfall Model</td><td>FSR</td><td>Winter Storms</td><td>Yes</td></tr><tr><td>Return Period (years)</td><td>30</td><td>Cv (Summer)</td><td>0.750</td></tr><tr><td>Region</td><td>England and Wales</td><td>Cv (Winter)</td><td>0.840</td></tr><tr><td>M5-60 (mm)</td><td>19.000</td><td>Shortest Storm (mins)</td><td>15</td></tr><tr><td>Ratio R</td><td>0.350</td><td>Longest Storm (mins)</td><td>10080</td></tr><tr><td>Summer Storms</td><td>Yes</td><td>Climate Change %</td><td>+0</td></tr></table> <u>Time Area Diagram</u> Total Area (ha) 0.059 <table><thead><tr><th colspan="2">Time (mins)</th><th>Area</th></tr><tr><th>From:</th><th>To:</th><th>(ha)</th></tr></thead><tbody><tr><td>0</td><td>4</td><td>0.059</td></tr></tbody></table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	30	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.000	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins)		Area	From:	To:	(ha)	0	4	0.059
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Date May 2018	Designed by PJ	
File 10379 Laundry Dairy & C...	Checked by RHB	
Elstree Computing Ltd		Source Control 2015.1

Model Details

Storage is Online Cover Level (m) 3.750

Cellular Storage Structure

Invert Level (m) 2.790 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01662 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01662

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	65.0	65.0	1.300	0.0	79.5
0.100	65.0	68.2	1.400	0.0	79.5
0.200	65.0	71.4	1.500	0.0	79.5
0.300	65.0	74.7	1.600	0.0	79.5
0.400	65.0	77.9	1.700	0.0	79.5
0.500	0.0	79.5	1.800	0.0	79.5
0.600	0.0	79.5	1.900	0.0	79.5
0.700	0.0	79.5	2.000	0.0	79.5
0.800	0.0	79.5	2.100	0.0	79.5
0.900	0.0	79.5	2.200	0.0	79.5
1.000	0.0	79.5	2.300	0.0	79.5
1.100	0.0	79.5	2.400	0.0	79.5
1.200	0.0	79.5	2.500	0.0	79.5

Weir Overflow Control

Discharge Coef 0.544 Width (m) 0.300 Invert Level (m) 3.190

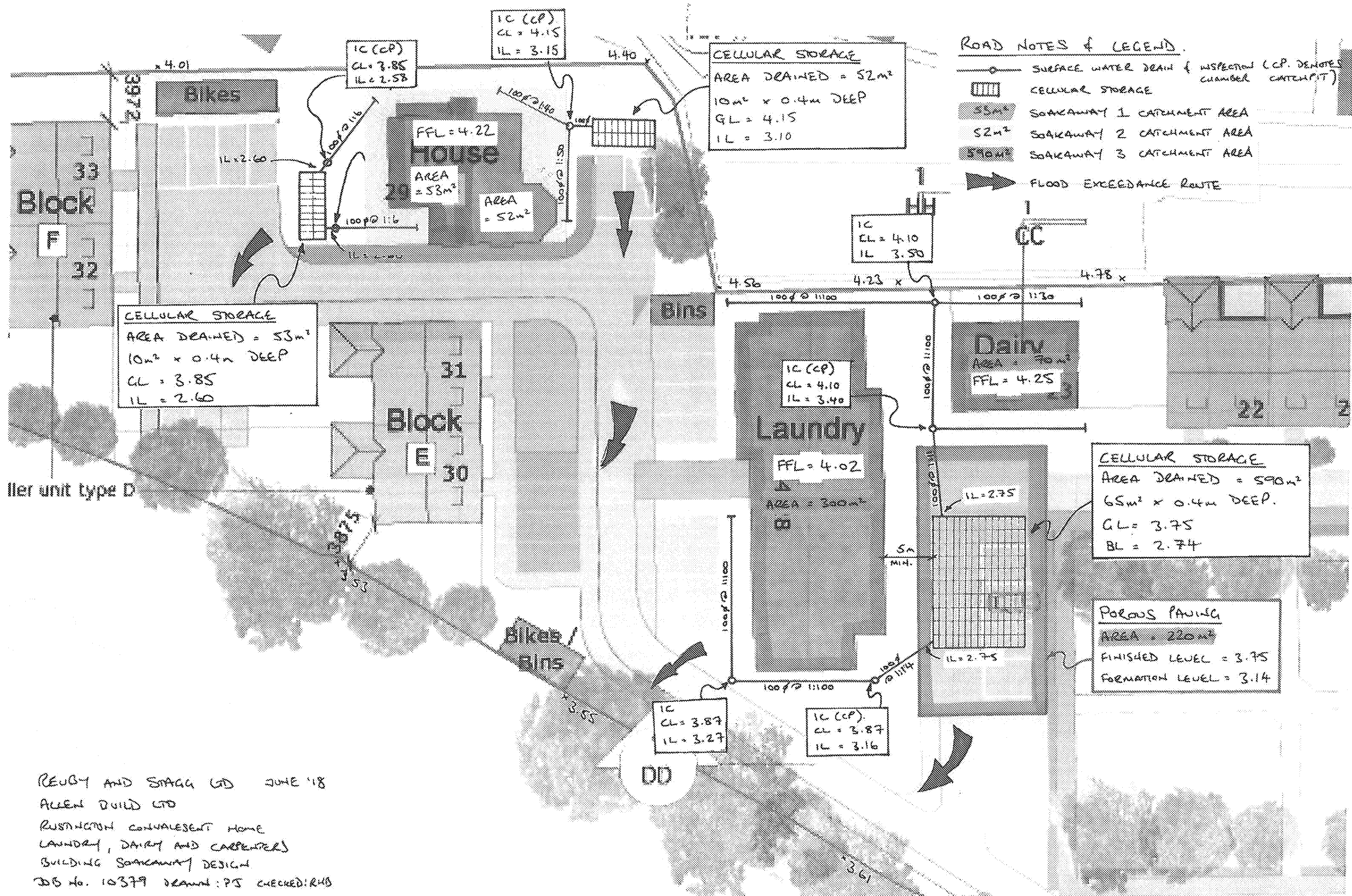
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Dewey House 55 High Street Ringwood BH24 1AE			Rustington Convalesent Home Laundry & Dairy Reuby & Stagg 10379				
Date May 2018			Designed by PJ				
File 10379 Laundry Dairy & C...			Checked by RHB				
Elstree Computing Ltd			Source Control 2015.1				
<u>Summary of Results for 30 year Return Period</u> Half Drain Time : 1132 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	2.911	0.121	0.2	0.0	0.2	7.5	O K
30 min Summer	2.951	0.161	0.2	0.0	0.2	9.9	O K
60 min Summer	2.992	0.202	0.2	0.0	0.2	12.5	O K
120 min Summer	3.035	0.245	0.2	0.0	0.2	15.1	O K
180 min Summer	3.058	0.268	0.2	0.0	0.2	16.6	O K
240 min Summer	3.073	0.283	0.2	0.0	0.2	17.5	O K
360 min Summer	3.092	0.302	0.2	0.0	0.2	18.7	O K
480 min Summer	3.103	0.313	0.2	0.0	0.2	19.3	O K
600 min Summer	3.109	0.319	0.2	0.0	0.2	19.7	O K
720 min Summer	3.111	0.321	0.2	0.0	0.2	19.8	O K
960 min Summer	3.111	0.321	0.2	0.0	0.2	19.8	O K
1440 min Summer	3.107	0.317	0.2	0.0	0.2	19.6	O K
2160 min Summer	3.095	0.305	0.2	0.0	0.2	18.8	O K
2880 min Summer	3.081	0.291	0.2	0.0	0.2	18.0	O K
4320 min Summer	3.052	0.262	0.2	0.0	0.2	16.2	O K
5760 min Summer	3.024	0.234	0.2	0.0	0.2	14.4	O K
7200 min Summer	2.997	0.207	0.2	0.0	0.2	12.8	O K
8640 min Summer	2.973	0.183	0.2	0.0	0.2	11.3	O K
10080 min Summer	2.951	0.161	0.2	0.0	0.2	9.9	O K
15 min Winter	2.926	0.136	0.2	0.0	0.2	8.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
15 min Summer	68.836	0.0	0.0	19			
30 min Summer	45.828	0.0	0.0	34			
60 min Summer	29.238	0.0	0.0	64			
120 min Summer	18.112	0.0	0.0	124			
180 min Summer	13.534	0.0	0.0	182			
240 min Summer	10.952	0.0	0.0	242			
360 min Summer	8.106	0.0	0.0	362			
480 min Summer	6.544	0.0	0.0	482			
600 min Summer	5.539	0.0	0.0	600			
720 min Summer	4.832	0.0	0.0	720			
960 min Summer	3.892	0.0	0.0	876			
1440 min Summer	2.866	0.0	0.0	1112			
2160 min Summer	2.108	0.0	0.0	1512			
2880 min Summer	1.693	0.0	0.0	1928			
4320 min Summer	1.242	0.0	0.0	2728			
5760 min Summer	0.996	0.0	0.0	3528			
7200 min Summer	0.839	0.0	0.0	4328			
8640 min Summer	0.730	0.0	0.0	5096			
10080 min Summer	0.648	0.0	0.0	5848			
15 min Winter	68.836	0.0	0.0	19			
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Dewey House 55 High Street Ringwood BH24 1AE			Rustington Convalesent Home Laundry & Dairy Reuby & Stagg 10379				
Date May 2018 File 10379 Laundry Dairy & C...			Designed by PJ Checked by RHB				
Elstree Computing Ltd			Source Control 2015.1				
Summary of Results for 30 year Return Period							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	2.970	0.180	0.2	0.0	0.2	11.1	O K
60 min Winter	3.017	0.227	0.2	0.0	0.2	14.0	O K
120 min Winter	3.066	0.276	0.2	0.0	0.2	17.0	O K
180 min Winter	3.093	0.303	0.2	0.0	0.2	18.7	O K
240 min Winter	3.111	0.321	0.2	0.0	0.2	19.8	O K
360 min Winter	3.133	0.343	0.2	0.0	0.2	21.2	O K
480 min Winter	3.147	0.357	0.2	0.0	0.2	22.0	O K
600 min Winter	3.155	0.365	0.2	0.0	0.2	22.6	O K
720 min Winter	3.160	0.370	0.2	0.0	0.2	22.9	O K
960 min Winter	3.163	0.373	0.2	0.0	0.2	23.0	O K
1440 min Winter	3.155	0.365	0.2	0.0	0.2	22.6	O K
2160 min Winter	3.140	0.350	0.2	0.0	0.2	21.6	O K
2880 min Winter	3.119	0.329	0.2	0.0	0.2	20.3	O K
4320 min Winter	3.075	0.285	0.2	0.0	0.2	17.6	O K
5760 min Winter	3.031	0.241	0.2	0.0	0.2	14.9	O K
7200 min Winter	2.991	0.201	0.2	0.0	0.2	12.4	O K
8640 min Winter	2.954	0.164	0.2	0.0	0.2	10.1	O K
10080 min Winter	2.922	0.132	0.2	0.0	0.2	8.2	O K
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)		
30 min Winter	45.828		0.0	0.0	33		
60 min Winter	29.238		0.0	0.0	62		
120 min Winter	18.112		0.0	0.0	122		
180 min Winter	13.534		0.0	0.0	180		
240 min Winter	10.952		0.0	0.0	238		
360 min Winter	8.106		0.0	0.0	356		
480 min Winter	6.544		0.0	0.0	470		
600 min Winter	5.539		0.0	0.0	584		
720 min Winter	4.832		0.0	0.0	698		
960 min Winter	3.892		0.0	0.0	916		
1440 min Winter	2.866		0.0	0.0	1198		
2160 min Winter	2.108		0.0	0.0	1624		
2880 min Winter	1.693		0.0	0.0	2100		
4320 min Winter	1.242		0.0	0.0	2980		
5760 min Winter	0.996		0.0	0.0	3808		
7200 min Winter	0.839		0.0	0.0	4616		
8640 min Winter	0.730		0.0	0.0	5360		
10080 min Winter	0.648		0.0	0.0	6056		
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Reuby & Stagg Ltd							Page 5
Dewey House			Rustington Convalescent Home				
55 High Street			Laundry & Dairy				
Ringwood BH24 1AE			Reuby & Stagg 10379				
Date May 2018			Designed by PJ				
File 10379 Laundry Dairy & C...			Checked by RHB				
Elstree Computing Ltd			Source Control 2015.1				
Summary of Results for 100 year Return Period (+40%)							
Half Drain Time : 1292 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	3.011	0.221	0.2	0.0	0.2	13.7	O K
30 min Summer	3.086	0.296	0.2	0.0	0.2	18.3	O K
60 min Summer	3.167	0.377	0.2	0.0	0.2	23.3	O K
120 min Summer	3.211	0.421	0.2	1.6	1.8	25.8	O K
180 min Summer	3.218	0.428	0.2	2.4	2.5	26.0	O K
240 min Summer	3.222	0.432	0.2	2.9	3.1	26.1	O K
360 min Summer	3.224	0.434	0.2	3.2	3.4	26.2	O K
480 min Summer	3.222	0.432	0.2	3.0	3.1	26.1	O K
600 min Summer	3.221	0.431	0.2	2.8	3.0	26.1	O K
720 min Summer	3.220	0.430	0.2	2.6	2.8	26.0	O K
960 min Summer	3.217	0.427	0.2	2.2	2.4	25.9	O K
1440 min Summer	3.212	0.422	0.2	1.7	1.9	25.8	O K
2160 min Summer	3.208	0.418	0.2	1.3	1.4	25.6	O K
2880 min Summer	3.205	0.415	0.2	1.0	1.1	25.5	O K
4320 min Summer	3.201	0.411	0.2	0.6	0.8	25.3	O K
5760 min Summer	3.199	0.409	0.2	0.4	0.6	25.2	O K
7200 min Summer	3.197	0.407	0.2	0.3	0.5	25.1	O K
8640 min Summer	3.195	0.405	0.2	0.2	0.4	25.0	O K
10080 min Summer	3.194	0.404	0.2	0.1	0.3	24.9	O K
15 min Winter	3.038	0.248	0.2	0.0	0.2	15.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	Overflow volumes to be stored in porous paving sub- base. Porous paving sub-base volume = 220m2 x 0.4d = 88m3 88 x 0.3 = 26.4m3 storage available		
15 min Summer	124.633	0.0	0.0	19			
30 min Summer	83.789	0.0	0.0	34			
60 min Summer	53.779	0.0	0.0	64			
120 min Summer	33.337	0.0	3.4	100			
180 min Summer	24.832	0.0	6.3	122			
240 min Summer	20.006	0.0	8.2	152			
360 min Summer	14.706	0.0	10.8	214			
480 min Summer	11.818	0.0	12.5	276			
600 min Summer	9.966	0.0	13.7	338			
720 min Summer	8.665	0.0	14.5	398			
960 min Summer	6.943	0.0	15.5	520			
1440 min Summer	5.071	0.0	15.9	768			
2160 min Summer	3.696	0.0	14.9	1144			
2880 min Summer	2.949	0.0	13.6	1528			
4320 min Summer	2.142	0.0	11.1	2300			
5760 min Summer	1.705	0.0	8.7	3112			
7200 min Summer	1.427	0.0	6.4	3960			
8640 min Summer	1.235	0.0	4.2	4840			
10080 min Summer	1.093	0.0	2.2	5744			
15 min Winter	124.633	0.0	0.0	19			
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Reuby & Stagg Ltd							Page 6
Dewey House 55 High Street Ringwood BH24 1AE			Rustington Convalesent Home Laundry & Dairy Reuby & Stagg 10379				
Date May 2018 File 10379 Laundry Dairy & C...			Designed by PJ Checked by RHB				
Elstree Computing Ltd			Source Control 2015.1				
Summary of Results for 100 year Return Period (+40%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	3.122	0.332	0.2	0.0	0.2	20.5	O K
60 min Winter	3.209	0.419	0.2	1.4	1.5	25.7	O K
120 min Winter	3.231	0.441	0.2	4.3	4.5	26.3	O K
180 min Winter	3.235	0.445	0.2	4.9	5.1	26.4	O K
240 min Winter	3.234	0.444	0.2	4.7	4.9	26.4	O K
360 min Winter	3.229	0.439	0.2	3.9	4.1	26.3	O K
480 min Winter	3.225	0.435	0.2	3.4	3.6	26.2	O K
600 min Winter	3.222	0.432	0.2	3.0	3.1	26.1	O K
720 min Winter	3.220	0.430	0.2	2.6	2.8	26.0	O K
960 min Winter	3.216	0.426	0.2	2.1	2.3	25.9	O K
1440 min Winter	3.211	0.421	0.2	1.5	1.7	25.7	O K
2160 min Winter	3.207	0.417	0.2	1.1	1.3	25.6	O K
2880 min Winter	3.204	0.414	0.2	0.8	1.0	25.4	O K
4320 min Winter	3.200	0.410	0.2	0.5	0.7	25.3	O K
5760 min Winter	3.198	0.408	0.2	0.4	0.6	25.2	O K
7200 min Winter	3.197	0.407	0.2	0.3	0.5	25.1	O K
8640 min Winter	3.195	0.405	0.2	0.2	0.4	25.0	O K
10080 min Winter	3.194	0.404	0.2	0.1	0.3	24.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	Overflow volumes to be stored in porous paving sub-base. Porous paving sub-base volume = 220m2 x 0.4d = 88m3 88 x 0.3 = 26.4m3 storage available		
30 min Winter	83.789	0.0	0.0	34			
60 min Winter	53.779	0.0	1.1	60			
120 min Winter	33.337	0.0	6.9	86			
180 min Winter	24.832	0.0	10.3	116			
240 min Winter	20.006	0.0	12.5	148			
360 min Winter	14.706	0.0	15.5	212			
480 min Winter	11.818	0.0	17.6	272			
600 min Winter	9.966	0.0	19.0	332			
720 min Winter	8.665	0.0	20.1	394			
960 min Winter	6.943	0.0	21.5	512			
1440 min Winter	5.071	0.0	22.5	754			
2160 min Winter	3.696	0.0	21.8	1144			
2880 min Winter	2.949	0.0	20.1	1500			
4320 min Winter	2.142	0.0	16.8	2292			
5760 min Winter	1.705	0.0	13.3	3088			
7200 min Winter	1.427	0.0	9.8	3960			
8640 min Winter	1.235	0.0	6.5	4872			
10080 min Winter	1.093	0.0	3.3	5888			
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REUBY AND STAGG LTD JUNE '18
 ALLEN BUILD LTD
 RUSTICATION CONVALESCENT HOME
 LAUNDRY, DAIRY AND CARPENTERS
 BUILDING SOAKAWAY DESIGN
 DB No. 10379 DRAINED: PS CHECKED: RMB

NOTES

- 1 THE DRAWING IS COPYRIGHT.
- 2 THE CONTRACTOR AND HIS SUBCONTRACTOR ARE TO VERIFY DIMENSIONS ON SITE PRIOR TO MAKING SHOP DRAWINGS OR COMMENCING MANUFACTURE.
- 3 DO NOT SCALE THIS DRAWING. THE CONTRACTOR IS TO BRING TO THE NOTICE OF THE ENGINEER ANY DISCREPANCIES CONTAINED IN THIS DRAWING PRIOR TO WORK COMMENCEMENT.
- 4 ALL 150mm and 225mm DIAMETER PIPES TO BE EXTRA STRENGTH VITRIFIED CLAY PIPES (SEE NOTE 15).
- 5 ALL PIPES OF 300mm DIAMETER OR GREATER TO BE CLASS M CONCRETE.
- 6 ALL PIPE MATERIALS TO BE CONSISTENT BETWEEN MANHOLES.
- 7 ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH SEWERS FOR ADOPTION 7TH EDITION, THE SPECIFICATION FOR HIGHWAY WORKS 1998 AND ALL SUBSEQUENT AMENDMENTS AND LOCAL AUTHORITIES DESIGN GUIDE. WHERE THERE IS CONFLICT BETWEEN THESE DOCUMENTS THE MATTER SHALL BE REFERRED TO THE ENGINEER.
- 8 FOR CONSTRUCTION DETAILS OF MANHOLES AND SEWERS REFER TO SEWERS FOR ADOPTION AND UNDERGROUNDS STANDARD DETAILS WHICH CAN BE OBTAINED FROM THE LOCAL OFFICE.
- 9 INVERT LEVELS OF EXISTING SEWERS TO BE CONFIRMED ON SITE BEFORE ANY SEWER WORK UNDERGROUN. ANY DISCREPANCIES FOUND SHOULD BE NOTIFIED TO ENGINEERS.
- 10 WHERE SEWERS HAVE LESS THAN 1.2m OF COVER UNDER ROADS AND 0.9m COVER ELSEWHERE PIPES ARE TO HAVE A 150mm CONCRETE BED AND SURROUND.
- 11 PLASTIC CHAMBERS AND RINGS SHALL COMPLY WITH BS EN 13396-1 AND BS EN 13396-2 OR HAVE EQUIVALENT PERFORMANCE AND ABLE TO COMPLY WITH THE REQUIREMENTS OF BS EN 12411 OF REGULATIONS 2010.
- 12 WHERE HOUSE DRAINAGE IS TAKEN THROUGH BLOCK CARE IS TO BE TAKEN THAT FOUNDATION LEVELS AND DRAINAGE RUNS DO NOT CLASH.
- 13 ALL ADAPTABLE MANHOLES TO HAVE A MINIMUM CLEAR OPENING OF 675mmx75mm AND GRADE DA00 UNO.
- 14 ALL BELOW GROUND DRAINAGE TO BE 100mm⁴ UNLESS OTHERWISE INDICATED WITH A MIN. GRADIENT AS FOLLOWS:-

S.W. : 100mm Dia. 1:100

S.W. : 150mm Dia. 1:150

F.W. : 100mm Dia. 1:80

F.W. : 150mm Dia. 1:150
- 15 ALL ADAPTABLE DRAINAGE MATERIALS SHOULD COMPLY WITH THE REQUIREMENTS OF PART E CIVIL ENGINEERING SPECIFICATION INCLUDED WITH SEWERS FOR ADOPTION 7TH EDITION WHICH IS DRAWN FROM CESM 7TH EDITION BUT IS NOT A FULL REPRODUCTION.

HEALTH & SAFETY:

ALL WORKS TO BE CARRIED OUT BY A CONTRACTOR COMPETENT TO UNDERTAKE THE CONSTRUCTION OF WORKS AS INDICATED ON THIS DRAWING. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE JOB SPECIFIC RISK ASSESSMENT. THE HAZARDS NOTED ARE IN ADDITION TO THE NORMAL HAZARDS AND RISKS FACED BY A COMPETENT CONTRACTOR WHEN DRAINING WITH THE TYPE OF WORKS DETAILED ON THIS DRAWING.

PLANNING

NOT FOR CONSTRUCTION

SUBJECT TO TECHNICAL APPROVAL

Rev	date	description	PJ initials
P2	07/06/18	CATCHPIPT MANHOLE ADDED	PJ
P1	2/10/5/16	INITIAL ISSUE	PJ

Project
Ruslington Convalsent Homes

Client / Architect	Title
Allen Build	Drainage Construction Details

RS

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date	May 2018	scale	As Shown	size	project no.	drawing no.	revision
drawn	PJ			A1	10379	SK251	P2
checked	RHB						

DRAIN BEDDING DETAIL

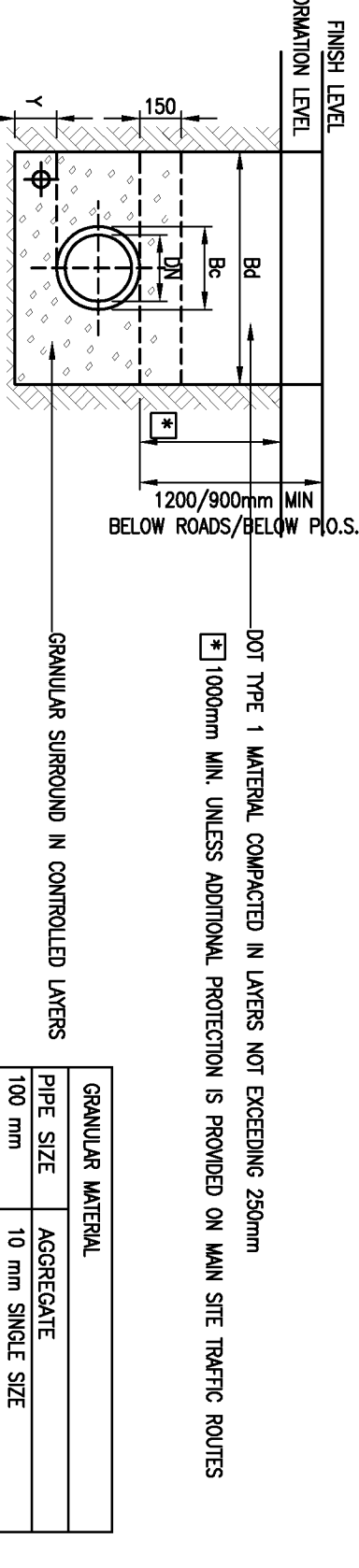
DIMENSION Y = IN ROCK, CONCRETE OR WED SOLIS CONTAINING ROCK BEDDING. IN SOFT SOILS, Y SHALL BE THE DEPTH OF THE TRENCH BELOW THE BOTTOM OF THE TRENCH. IN SOILS THAT ARE NOT LESS THAN 50mm UNDER COLLARS IN SOILS THAT PERMIT AN OPEN TRENCH BOTTOM TO BE EXCAVATED Y=1/6 Bc OR 150 mm WHICH EVER IS GREATER, BUT NOT LESS THAN 50 mm UNDER COLLARS

NOTES

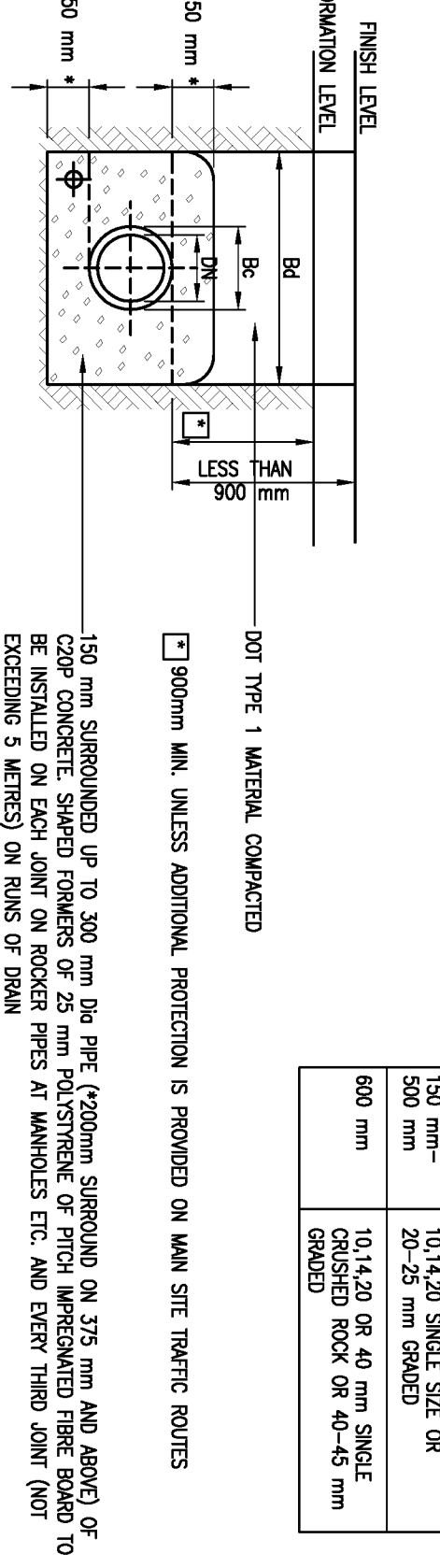
- 1) FOR PIPES EXCEEDING 600 mm DIA REFER TO ENGINEER
- 2) IN WET OR SOFT GROUND SEEK GUIDANCE FROM ENGINEER
- 3)THE BEDDINGS MAY BE ADORPED FOR CERTAIN SUB-SOIL CONDITIONS AT THE ENGINEERS DISCRETION
- 4) THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL PROTECTION IN AREAS SUBJECT TO LOADS FROM SITE TRAFFIC. THE CONTRACTOR SHALL IDENTIFY THESE ZONES AND RESTRICT TRAFFIC ELDERWHERE
- 5) SEE ALSO BS 8301
- 6) FOR GREATER TRENCH WIDTHS SEEK GUIDANCE FROM ENGINEER

FORMATION LEVEL	ASSUMED MAX PERMISSIBLE TRENCH WIDTH Bc (mm)	DIMENSION Y FOR PENETRABLE SOLIS (mm)
100	100	100
150	150	150
200	200	200
250	250	250
300	300	300
350	350	350
400	400	400
450	450	450
500	500	500
550	550	550
600	600	600

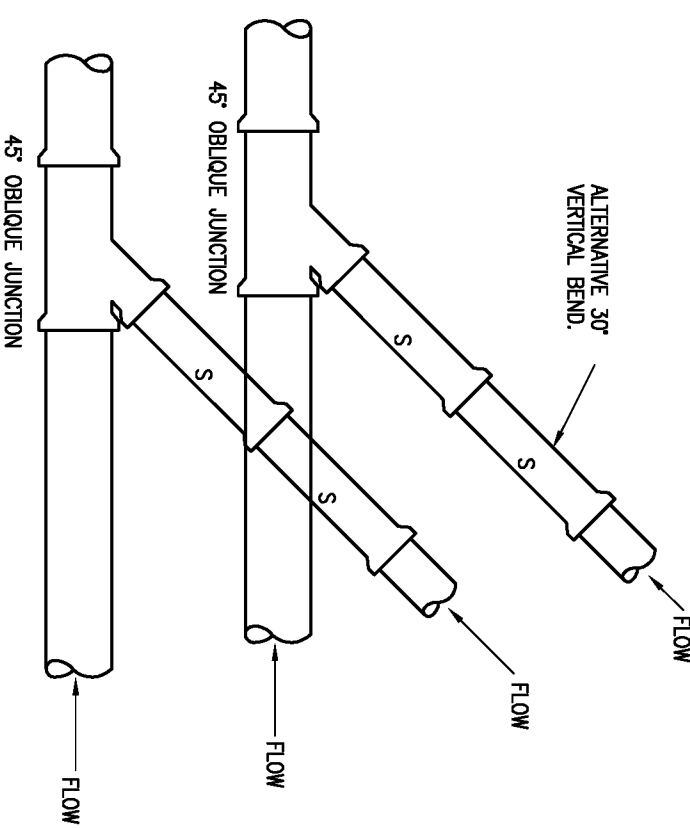
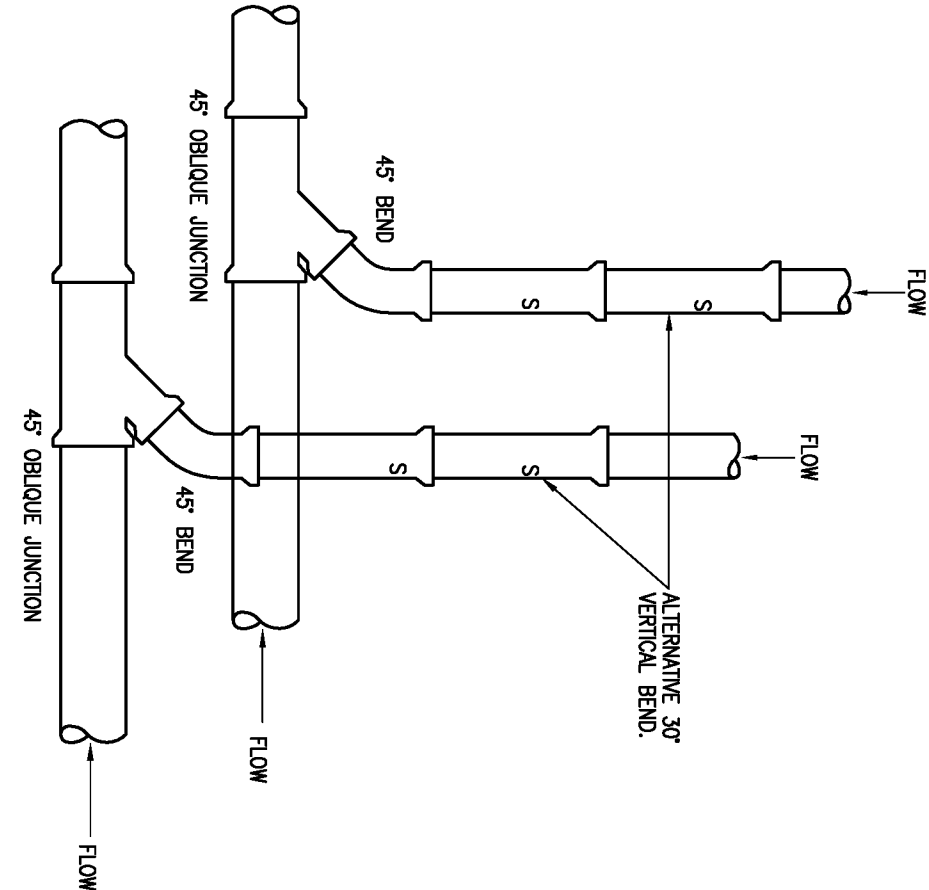
CLASS B GRANULAR BED



CLASS S GRANULAR SURROUND

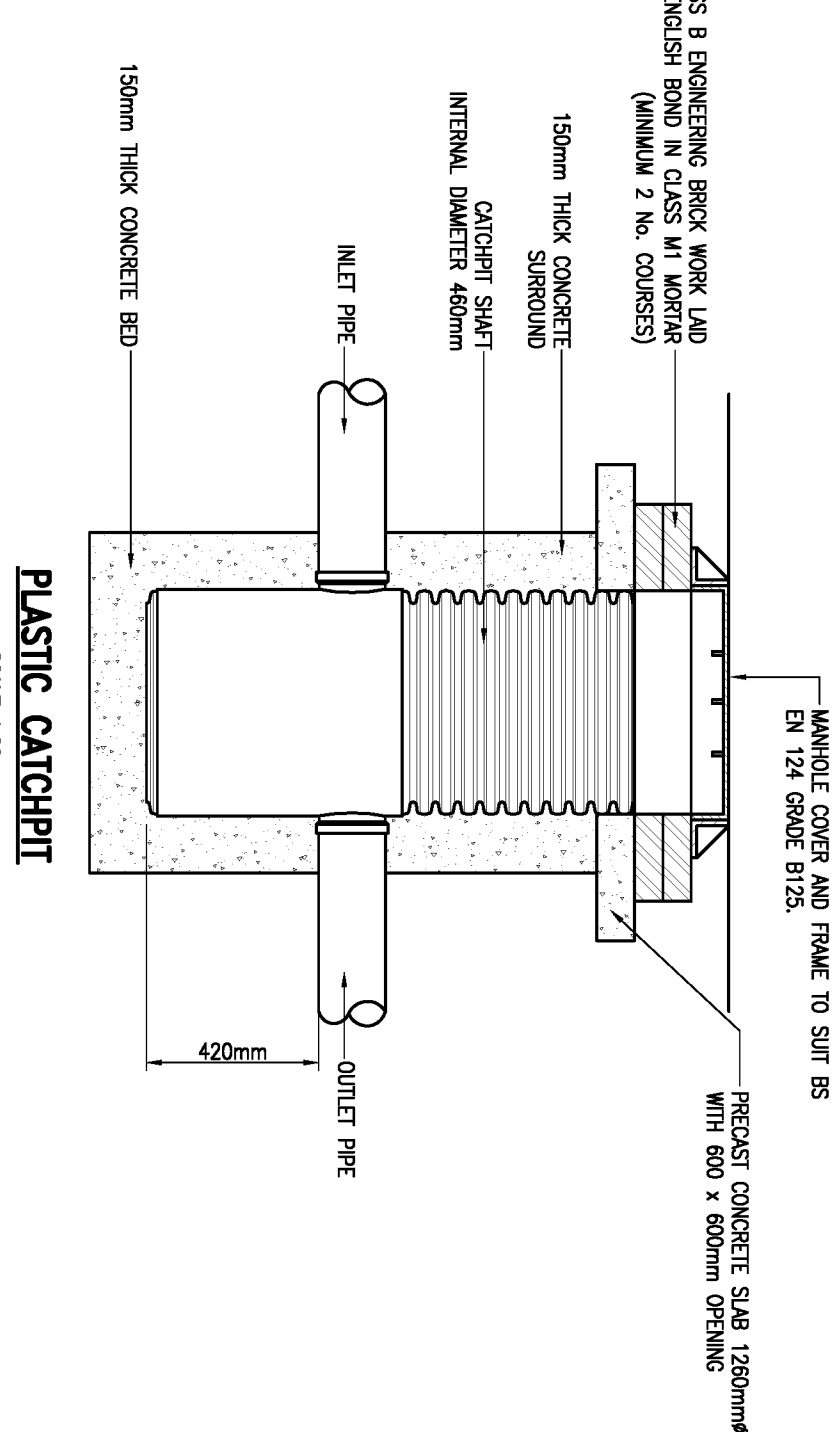


CLASS Z CONCRETE BED & SURROUND (C.B.S.)



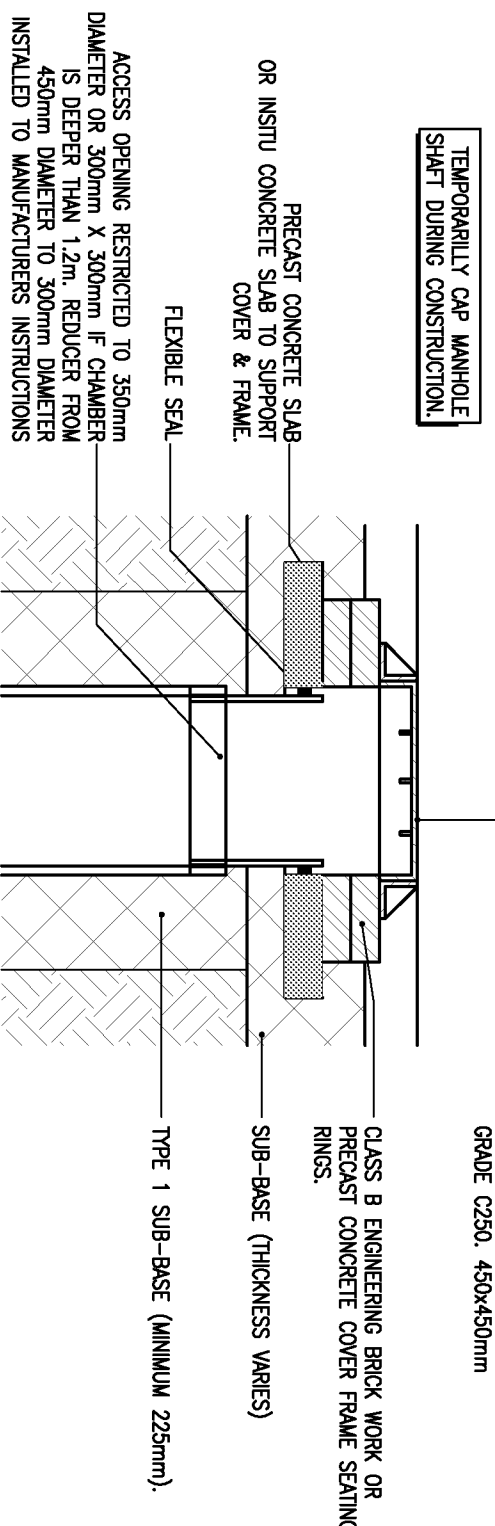
BRANCH CONNECTIONS

BRANCH CONNECTIONS TO BE 150mm MINIMUM DIAMETER.
S= SPECIAL SHORT LENGTH
PIPE 600mm LONG.

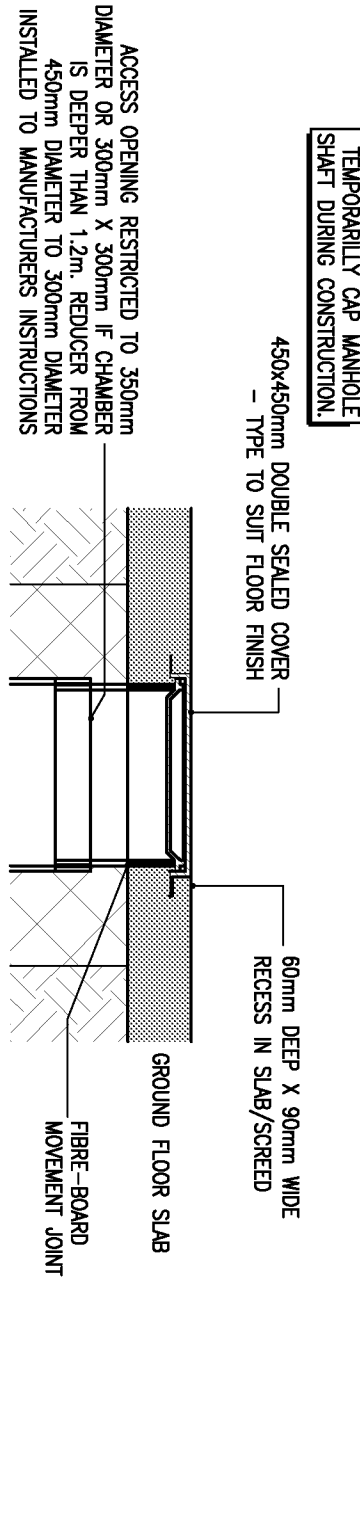


SCALE 1:20

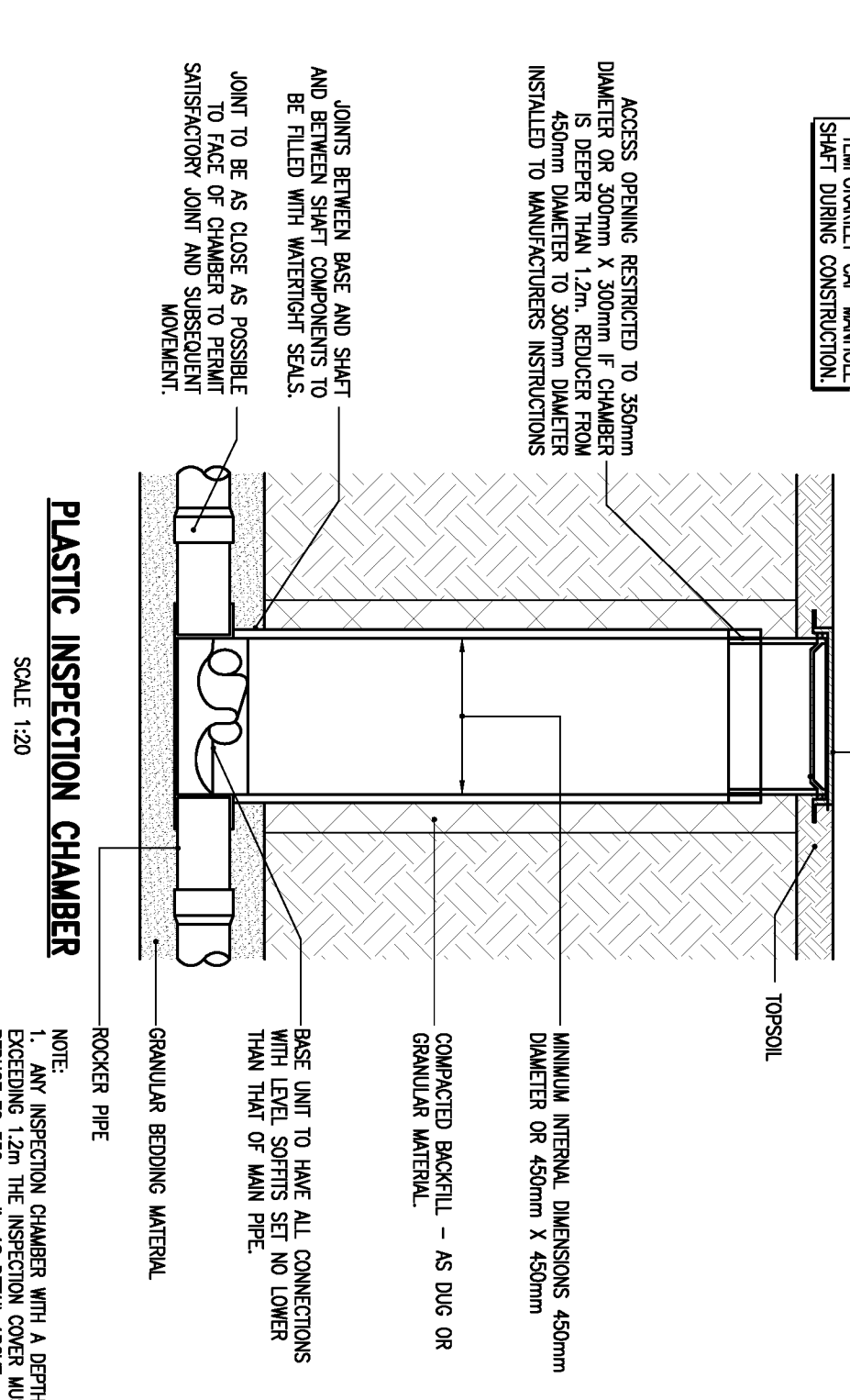
SITED IN DOMESTIC DRIVEWAYS/PAVED AREAS



SITED IN BUILDINGS



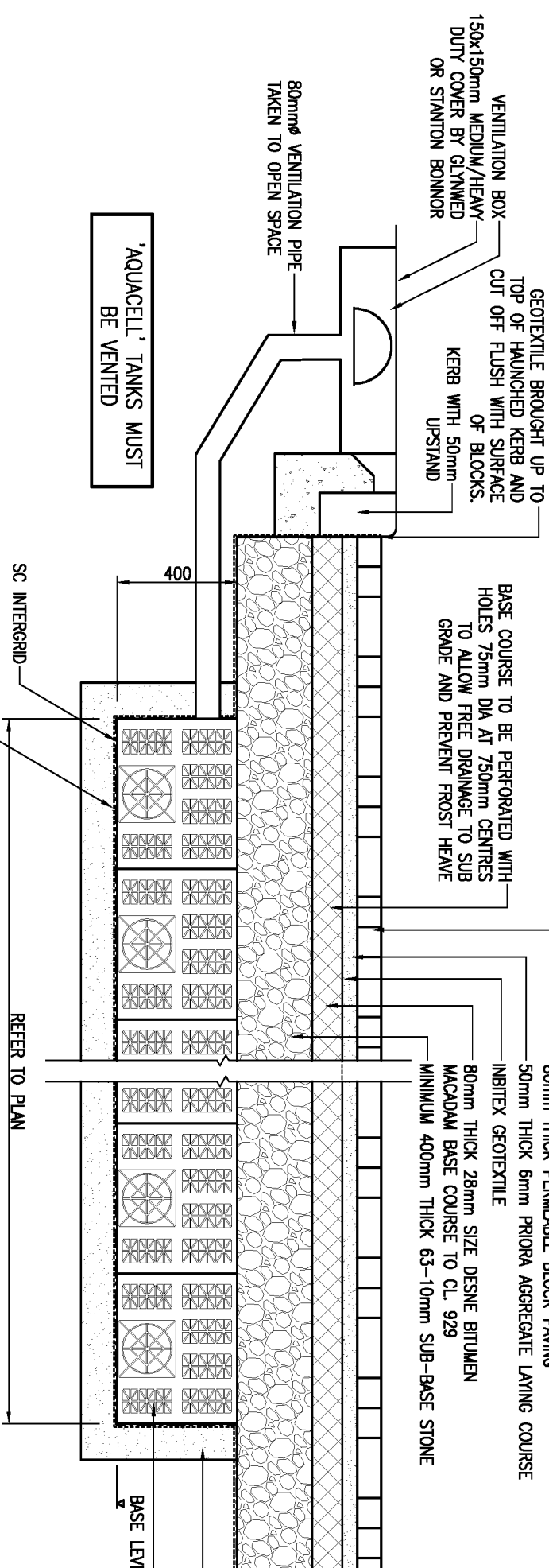
SITED IN SOFT LANDSCAPED AREAS



PLASTIC INSPECTION CHAMBER

SCALE 1:20

NOTE:
1. ANY INSPECTION CHAMBER WITH A DEPTH EXCEEDING 1.2m THE INSPECTION COVER MUST REDUCE TO 300mm OR AS LOCAL ADOPT.
2. PLASTIC INSPECTION CHAMBERS AS SPECIFIED BY COUNCIL/OWN OR SIMILAR AND APPROVED.



POROUS PAVING ROAD CONSTRUCTION OVER AQUACELL STORAGE UNIT

TYPICAL SECTION

NOT TO SCALE

RS

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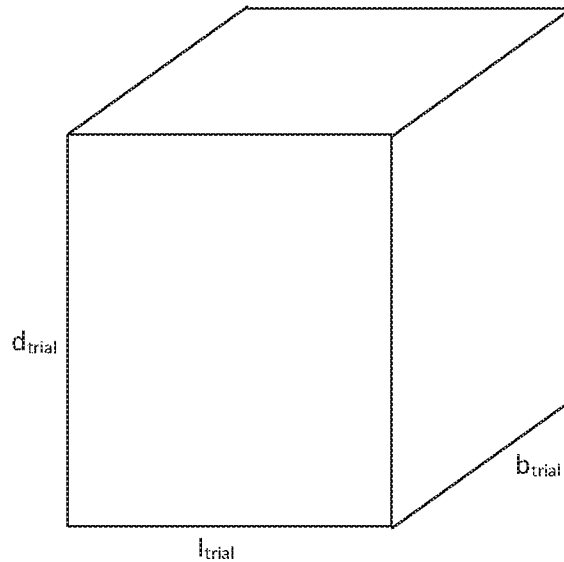
Telephone: 01425 484400

Facsimile: 01425 484409

Email: admin@reuby-stagg.co.uk



Soil Infiltration Rate (BRE Digest 365)



SOAK AWAY TEST NO: 2

Length of Trial Pit $l_{\text{trial}} = 0.30\text{m}$

Width of Trial Pit $b_{\text{trial}} = 0.30\text{m}$

Depth of Trial Pit $d_{\text{trial}} = 1.00\text{m}$

Free Volume (if fill used) $V_{\text{trial}} = 35\%$

75% depth of pit: $d_{75}: (d_{\text{trial}} \times 0.75) = 0.75\text{m}$

50% depth of pit: $d_{50}: (d_{\text{trial}} \times 0.50) = 0.50\text{m}$

25% depth of pit: $d_{25}: (d_{\text{trial}} \times 0.25) = 0.25\text{m}$

Test 1 – time to fall from 75% depth to 25% depth = $T_1 = 14,126 \text{ Seconds}$

Longest time to fall from 75% depth to 25% depth = $T_{lg} = \text{Max}(T_1, T_2, T_3) = 14,126 \text{ Seconds}$

Storage Volume from 75% depth to 25% depth = $V_{p75_25} = (l_{\text{trial}} \times b_{\text{trial}} \times (d_{75} - d_{25})) \times V_{\text{trial}} = 0.045\text{m}^3$

Internal surface area to 50% depth = $A_{p50} = ((l_{\text{trial}} \times b_{\text{trial}}) + (l_{\text{trial}} + b_{\text{trial}}) \times 2 \times d_{50}) = 0.69\text{m}^2$

Surface area of soakaway to 50% storage depth $A_{s50} = 2 \times (l_{\text{trial}} + b_{\text{trial}}) \times d_{\text{trial}} / 2 = 0.60\text{m}^2$

Soil infiltration rate = $F = V_{p75_25} / (A_{p50} \times T_{lg}) = 46.17 \times 10^{-7} \text{ m/s}$