

BMC

BELL MUNRO CONSULTING LTD.

**Roundstone Lane
Angmering
Soakaway Designs
Revision A**

**Structural Calculations
September 2018**

	Initials	Signature	Date
Prepared by:	A.M		September '18
Checked by:	S.J.B		September '18
Approved by:	S.J.B		September '18

Bell Munro Consulting Ltd.
Consulting Civil and Structural Engineers
Turing House
5 Archway
Manchester
M15 5RL

Ref: J5762

Bell Munro Consulting Ltd				Page 1																																																																																																																																																																																																																			
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Model Details

Storage is Online Cover Level (m) 0.000

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr) 0.00000	Ring Diameter (m) 3.00
Infiltration Coefficient Side (m/hr) 0.24900	Pit Multiplier 1.5
Safety Factor 3.0	Number Required 2
Porosity 0.30	Cap Volume Depth (m) 4.000
Invert Level (m) -4.500	Cap Infiltration Depth (m) 2.500

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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 16 minutes. <table><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><tr><td>15 min Summer</td><td>-2.164</td><td>2.836</td><td>29.7</td><td>30.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>-1.224</td><td>3.776</td><td>29.7</td><td>37.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>-1.005</td><td>3.995</td><td>29.7</td><td>39.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>-1.712</td><td>3.288</td><td>29.7</td><td>34.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>-2.348</td><td>2.652</td><td>28.6</td><td>29.2</td><td>O K</td></tr><tr><td>240 min Summer</td><td>-2.651</td><td>2.349</td><td>25.4</td><td>25.9</td><td>O K</td></tr><tr><td>360 min Summer</td><td>-3.079</td><td>1.921</td><td>20.7</td><td>21.2</td><td>O K</td></tr><tr><td>480 min Summer</td><td>-3.363</td><td>1.637</td><td>17.7</td><td>18.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>-3.568</td><td>1.432</td><td>15.5</td><td>15.8</td><td>O K</td></tr><tr><td>720 min Summer</td><td>-3.723</td><td>1.277</td><td>13.8</td><td>14.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>-3.944</td><td>1.056</td><td>11.4</td><td>11.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>-4.203</td><td>0.797</td><td>8.6</td><td>8.8</td><td>O K</td></tr><tr><td>15 min Winter</td><td>-1.598</td><td>3.402</td><td>29.7</td><td>34.9</td><td>O K</td></tr><tr><td>30 min Winter</td><td>-0.371</td><td>4.629</td><td>29.7</td><td>42.8</td><td>O K</td></tr><tr><td>60 min Winter</td><td>-0.506</td><td>4.494</td><td>29.7</td><td>42.6</td><td>O K</td></tr><tr><td>120 min Winter</td><td>-1.869</td><td>3.131</td><td>29.7</td><td>33.0</td><td>O K</td></tr><tr><td>180 min Winter</td><td>-2.562</td><td>2.438</td><td>26.3</td><td>26.9</td><td>O K</td></tr><tr><td>240 min 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Summer</td><td>9.966</td><td>0.0</td><td>316</td></tr><tr><td>720 min Summer</td><td>8.665</td><td>0.0</td><td>376</td></tr><tr><td>960 min Summer</td><td>6.943</td><td>0.0</td><td>498</td></tr><tr><td>1440 min Summer</td><td>5.071</td><td>0.0</td><td>738</td></tr><tr><td>15 min Winter</td><td>124.633</td><td>0.0</td><td>20</td></tr><tr><td>30 min Winter</td><td>83.789</td><td>0.0</td><td>29</td></tr><tr><td>60 min Winter</td><td>53.779</td><td>0.0</td><td>46</td></tr><tr><td>120 min Winter</td><td>33.337</td><td>0.0</td><td>78</td></tr><tr><td>180 min Winter</td><td>24.832</td><td>0.0</td><td>108</td></tr><tr><td>240 min Winter</td><td>20.006</td><td>0.0</td><td>138</td></tr><tr><td>360 min Winter</td><td>14.706</td><td>0.0</td><td>200</td></tr><tr><td>480 min Winter</td><td>11.818</td><td>0.0</td><td>260</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	-2.164	2.836	29.7	30.9	O K	30 min Summer	-1.224	3.776	29.7	37.6	O K	60 min Summer	-1.005	3.995	29.7	39.1	O K	120 min Summer	-1.712	3.288	29.7	34.1	O K	180 min Summer	-2.348	2.652	28.6	29.2	O K	240 min Summer	-2.651	2.349	25.4	25.9	O K	360 min Summer	-3.079	1.921	20.7	21.2	O K	480 min Summer	-3.363	1.637	17.7	18.0	O K	600 min Summer	-3.568	1.432	15.5	15.8	O K	720 min Summer	-3.723	1.277	13.8	14.1	O K	960 min Summer	-3.944	1.056	11.4	11.6	O K	1440 min Summer	-4.203	0.797	8.6	8.8	O K	15 min Winter	-1.598	3.402	29.7	34.9	O K	30 min Winter	-0.371	4.629	29.7	42.8	O K	60 min Winter	-0.506	4.494	29.7	42.6	O K	120 min Winter	-1.869	3.131	29.7	33.0	O K	180 min Winter	-2.562	2.438	26.3	26.9	O K	240 min Winter	-2.924	2.076	22.4	22.9	O K	360 min Winter	-3.390	1.610	17.4	17.7	O K	480 min Winter	-3.674	1.326	14.3	14.6	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	28	60 min Summer	53.779	0.0	44	120 min Summer	33.337	0.0	76	180 min Summer	24.832	0.0	104	240 min 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Turing House
5 Archway
Manchester M15 5RL

Roundstone Lane
Angmering
Revision A

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Date 10/09/2018
File 5762 SOAKAWAYS.SRCX
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Designed by A Morris
Checked by S Berry



XP Solutions

Source Control 2018.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	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)	1440
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.215

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.103	4 8	0.056	8 12	0.056

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<u>Model Details</u> Storage is Online Cover Level (m) 0.000 <u>Lined Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00000</td> <td>Ring Diameter (m)</td> <td>3.00</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>6.48000</td> <td>Pit Multiplier</td> <td>1.5</td> </tr> <tr> <td>Safety Factor</td> <td>3.0</td> <td>Number Required</td> <td>1</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>4.500</td> </tr> <tr> <td>Invert Level (m)</td> <td>-5.000</td> <td>Cap Infiltration Depth (m)</td> <td>2.750</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00000	Ring Diameter (m)	3.00	Infiltration Coefficient Side (m/hr)	6.48000	Pit Multiplier	1.5	Safety Factor	3.0	Number Required	1	Porosity	0.30	Cap Volume Depth (m)	4.500	Invert Level (m)	-5.000	Cap Infiltration Depth (m)	2.750
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