

APPENDIX I SUMMIT HUB CALCULATIONS

Stantec UK Ltd

Caversham Bridge House

Waterman Place

Reading, RG1 8DN

Date 26/08/2022 15:21

File summit - infiltration b...

Summit Hub Infiltration Basin

Designed by dahayes

Checked by

Innovyze

Source Control 2020.1

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 2725 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	99.211	0.211	0.1	0.0	0.1	12.3	O K
30 min Summer	99.288	0.288	0.1	0.0	0.1	17.9	O K
60 min Summer	99.373	0.373	0.2	0.0	0.2	24.9	O K
120 min Summer	99.460	0.460	0.2	0.0	0.2	32.9	O K
180 min Summer	99.507	0.507	0.2	0.0	0.2	37.7	O K
240 min Summer	99.541	0.541	0.2	0.0	0.2	41.3	O K
360 min Summer	99.589	0.589	0.2	0.0	0.2	46.7	O K
480 min Summer	99.621	0.621	0.2	0.0	0.2	50.5	O K
600 min Summer	99.645	0.645	0.2	0.0	0.2	53.5	O K
720 min Summer	99.664	0.664	0.2	0.0	0.2	55.8	O K
960 min Summer	99.690	0.690	0.2	0.0	0.2	59.1	O K
1440 min Summer	99.719	0.719	0.3	0.0	0.3	62.9	Flood Risk
2160 min Summer	99.739	0.739	0.3	0.0	0.3	65.7	Flood Risk
2880 min Summer	99.752	0.752	0.3	0.0	0.3	67.6	Flood Risk
4320 min Summer	99.769	0.769	0.3	0.0	0.3	69.8	Flood Risk
5760 min Summer	99.777	0.777	0.3	0.0	0.3	71.1	Flood Risk
7200 min Summer	99.783	0.783	0.3	0.0	0.3	71.8	Flood Risk
8640 min Summer	99.785	0.785	0.3	0.0	0.3	72.2	Flood Risk
10080 min Summer	99.785	0.785	0.3	0.0	0.3	72.2	Flood Risk
15 min Winter	99.232	0.232	0.1	0.0	0.1	13.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	102.890	0.0	0.0	19
30 min Summer	75.214	0.0	0.0	34
60 min Summer	52.662	0.0	0.0	64
120 min Summer	35.159	0.0	0.0	124
180 min Summer	27.099	0.0	0.0	184
240 min Summer	22.505	0.0	0.0	244
360 min Summer	17.247	0.0	0.0	362
480 min Summer	14.238	0.0	0.0	482
600 min Summer	12.250	0.0	0.0	602
720 min Summer	10.821	0.0	0.0	722
960 min Summer	8.881	0.0	0.0	962
1440 min Summer	6.697	0.0	0.0	1440
2160 min Summer	5.062	0.0	0.0	1880
2880 min Summer	4.154	0.0	0.0	2252
4320 min Summer	3.157	0.0	0.0	3028
5760 min Summer	2.613	0.0	0.0	3872
7200 min Summer	2.267	0.0	0.0	4688
8640 min Summer	2.023	0.0	0.0	5536
10080 min Summer	1.837	0.0	0.0	6360
15 min Winter	102.890	0.0	0.0	19

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Caversham Bridge House Waterman Place Reading, RG1 8DN		Summit Hub Infiltration Basin					
Date 26/08/2022 15:21 File summit - infiltration b...		Designed by dahayes Checked by					
Innovyze		Source Control 2020.1					
Summary of Results for 100 year Return Period (+30%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	99.315	0.315	0.1	0.0	0.1	20.0	O K
60 min Winter	99.407	0.407	0.2	0.0	0.2	27.9	O K
120 min Winter	99.499	0.499	0.2	0.0	0.2	36.9	O K
180 min Winter	99.550	0.550	0.2	0.0	0.2	42.3	O K
240 min Winter	99.587	0.587	0.2	0.0	0.2	46.4	O K
360 min Winter	99.638	0.638	0.2	0.0	0.2	52.5	O K
480 min Winter	99.673	0.673	0.2	0.0	0.2	56.9	O K
600 min Winter	99.699	0.699	0.2	0.0	0.2	60.3	O K
720 min Winter	99.719	0.719	0.3	0.0	0.3	62.9	Flood Risk
960 min Winter	99.748	0.748	0.3	0.0	0.3	66.9	Flood Risk
1440 min Winter	99.781	0.781	0.3	0.0	0.3	71.6	Flood Risk
2160 min Winter	99.806	0.806	0.3	0.0	0.3	75.2	Flood Risk
2880 min Winter	99.816	0.816	0.3	0.0	0.3	76.8	Flood Risk
4320 min Winter	99.831	0.831	0.3	0.0	0.3	79.0	Flood Risk
5760 min Winter	99.836	0.836	0.3	0.0	0.3	79.8	Flood Risk
7200 min Winter	99.837	0.837	0.3	0.0	0.3	79.9	Flood Risk
8640 min Winter	99.835	0.835	0.3	0.0	0.3	79.6	Flood Risk
10080 min Winter	99.829	0.829	0.3	0.0	0.3	78.7	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
30 min Winter	75.214	0.0	0.0	34			
60 min Winter	52.662	0.0	0.0	64			
120 min Winter	35.159	0.0	0.0	122			
180 min Winter	27.099	0.0	0.0	182			
240 min Winter	22.505	0.0	0.0	240			
360 min Winter	17.247	0.0	0.0	358			
480 min Winter	14.238	0.0	0.0	476			
600 min Winter	12.250	0.0	0.0	592			
720 min Winter	10.821	0.0	0.0	708			
960 min Winter	8.881	0.0	0.0	940			
1440 min Winter	6.697	0.0	0.0	1386			
2160 min Winter	5.062	0.0	0.0	2032			
2880 min Winter	4.154	0.0	0.0	2336			
4320 min Winter	3.157	0.0	0.0	3244			
5760 min Winter	2.613	0.0	0.0	4200			
7200 min Winter	2.267	0.0	0.0	5112			
8640 min Winter	2.023	0.0	0.0	5968			
10080 min Winter	1.837	0.0	0.0	6864			
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Caversham Bridge House Waterman Place Reading, RG1 8DN	Summit Hub Infiltration Basin	
Date 26/08/2022 15:21 File summit - infiltration b...	Designed by dahayes Checked by	
Innovyze Source Control 2020.1		

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.213	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.064

Time (mins)		Area
From:	To:	(ha)
0	4	0.064

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Caversham Bridge House Waterman Place Reading, RG1 8DN	Summit Hub Infiltration Basin	
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Model Details

Storage is Online Cover Level (m) 100.000

Infiltration Basin Structure

Invert Level (m) 99.000 Safety Factor 3.0
Infiltration Coefficient Base (m/hr) 0.01188 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01188

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	48.0	1.000	180.0

Weir Overflow Control

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 99.950

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APPENDIX J MOUNTAIN HUB CALCULATIONS

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Summary of Results for 100 year Return Period (+30%) Half Drain Time : 2948 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 Overflow (l/s)</th><th>Max Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>99.152</td><td>0.152</td><td>0.5</td><td>0.0</td><td>0.5</td><td>50.0</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.213</td><td>0.213</td><td>0.5</td><td>0.0</td><td>0.5</td><td>72.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.284</td><td>0.284</td><td>0.6</td><td>0.0</td><td>0.6</td><td>101.5</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.359</td><td>0.359</td><td>0.7</td><td>0.0</td><td>0.7</td><td>134.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.401</td><td>0.401</td><td>0.7</td><td>0.0</td><td>0.7</td><td>153.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.432</td><td>0.432</td><td>0.8</td><td>0.0</td><td>0.8</td><td>168.6</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.475</td><td>0.475</td><td>0.8</td><td>0.0</td><td>0.8</td><td>190.5</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.506</td><td>0.506</td><td>0.9</td><td>0.0</td><td>0.9</td><td>206.2</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.529</td><td>0.529</td><td>0.9</td><td>0.0</td><td>0.9</td><td>218.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.546</td><td>0.546</td><td>0.9</td><td>0.0</td><td>0.9</td><td>227.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>99.572</td><td>0.572</td><td>0.9</td><td>0.0</td><td>0.9</td><td>241.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>99.600</td><td>0.600</td><td>1.0</td><td>0.0</td><td>1.0</td><td>257.9</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>99.620</td><td>0.620</td><td>1.0</td><td>0.0</td><td>1.0</td><td>269.5</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>99.632</td><td>0.632</td><td>1.0</td><td>0.0</td><td>1.0</td><td>276.6</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>99.647</td><td>0.647</td><td>1.0</td><td>0.0</td><td>1.0</td><td>285.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>99.655</td><td>0.655</td><td>1.0</td><td>0.0</td><td>1.0</td><td>290.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>99.660</td><td>0.660</td><td>1.0</td><td>0.0</td><td>1.0</td><td>293.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>99.662</td><td>0.662</td><td>1.0</td><td>0.0</td><td>1.0</td><td>294.9</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>99.662</td><td>0.662</td><td>1.0</td><td>0.0</td><td>1.0</td><td>294.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.168</td><td>0.168</td><td>0.5</td><td>0.0</td><td>0.5</td><td>56.0</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Overflow Volume (m³)</th><th>Time-Peak 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Summer	99.284	0.284	0.6	0.0	0.6	101.5	O K	120 min Summer	99.359	0.359	0.7	0.0	0.7	134.2	O K	180 min Summer	99.401	0.401	0.7	0.0	0.7	153.6	O K	240 min Summer	99.432	0.432	0.8	0.0	0.8	168.6	O K	360 min Summer	99.475	0.475	0.8	0.0	0.8	190.5	O K	480 min Summer	99.506	0.506	0.9	0.0	0.9	206.2	O K	600 min Summer	99.529	0.529	0.9	0.0	0.9	218.3	O K	720 min Summer	99.546	0.546	0.9	0.0	0.9	227.8	O K	960 min Summer	99.572	0.572	0.9	0.0	0.9	241.8	O K	1440 min Summer	99.600	0.600	1.0	0.0	1.0	257.9	O K	2160 min Summer	99.620	0.620	1.0	0.0	1.0	269.5	O K	2880 min Summer	99.632	0.632	1.0	0.0	1.0	276.6	O K	4320 min Summer	99.647	0.647	1.0	0.0	1.0	285.3	O K	5760 min Summer	99.655	0.655	1.0	0.0	1.0	290.2	O K	7200 min Summer	99.660	0.660	1.0	0.0	1.0	293.3	O K	8640 min Summer	99.662	0.662	1.0	0.0	1.0	294.9	O K	10080 min Summer	99.662	0.662	1.0	0.0	1.0	294.7	O K	15 min Winter	99.168	0.168	0.5	0.0	0.5	56.0	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	15 min 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10080 min Summer	99.662	0.662	1.0	0.0	1.0	294.7	O K																																																																																																																																																																																																																																																																																	
15 min Winter	99.168	0.168	0.5	0.0	0.5	56.0	O K																																																																																																																																																																																																																																																																																	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																																				
15 min Summer	102.890	0.0	0.0	19																																																																																																																																																																																																																																																																																				
30 min Summer	75.214	0.0	0.0	34																																																																																																																																																																																																																																																																																				
60 min Summer	52.662	0.0	0.0	64																																																																																																																																																																																																																																																																																				
120 min Summer	35.159	0.0	0.0	124																																																																																																																																																																																																																																																																																				
180 min Summer	27.099	0.0	0.0	184																																																																																																																																																																																																																																																																																				
240 min Summer	22.505	0.0	0.0	244																																																																																																																																																																																																																																																																																				
360 min Summer	17.247	0.0	0.0	362																																																																																																																																																																																																																																																																																				
480 min Summer	14.238	0.0	0.0	482																																																																																																																																																																																																																																																																																				
600 min Summer	12.250	0.0	0.0	602																																																																																																																																																																																																																																																																																				
720 min Summer	10.821	0.0	0.0	722																																																																																																																																																																																																																																																																																				
960 min Summer	8.881	0.0	0.0	962																																																																																																																																																																																																																																																																																				
1440 min Summer	6.697	0.0	0.0	1440																																																																																																																																																																																																																																																																																				
2160 min Summer	5.062	0.0	0.0	1972																																																																																																																																																																																																																																																																																				
2880 min Summer	4.154	0.0	0.0	2336																																																																																																																																																																																																																																																																																				
4320 min Summer	3.157	0.0	0.0	3112																																																																																																																																																																																																																																																																																				
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7200 min Summer	2.267	0.0	0.0	4760																																																																																																																																																																																																																																																																																				
8640 min Summer	2.023	0.0	0.0	5624																																																																																																																																																																																																																																																																																				
10080 min Summer	1.837	0.0	0.0	6456																																																																																																																																																																																																																																																																																				
15 min Winter	102.890	0.0	0.0	19																																																																																																																																																																																																																																																																																				
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Stantec UK Ltd		Page 2					
Caversham Bridge House Waterman Place Reading, RG1 8DN		Mountain Hub Infil Basin					
Date 26/08/2022 15:11 File Mountain hub - infiltra...		Designed by dahayes Checked by					
Innovyze		Source Control 2020.1					
Summary of Results for 100 year Return Period (+30%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	99.235	0.235	0.6	0.0	0.6	81.7	O K
60 min Winter	99.313	0.313	0.7	0.0	0.7	113.8	O K
120 min Winter	99.394	0.394	0.7	0.0	0.7	150.5	O K
180 min Winter	99.440	0.440	0.8	0.0	0.8	172.5	O K
240 min Winter	99.473	0.473	0.8	0.0	0.8	189.4	O K
360 min Winter	99.521	0.521	0.9	0.0	0.9	214.3	O K
480 min Winter	99.554	0.554	0.9	0.0	0.9	232.3	O K
600 min Winter	99.579	0.579	0.9	0.0	0.9	246.2	O K
720 min Winter	99.599	0.599	1.0	0.0	1.0	257.3	O K
960 min Winter	99.627	0.627	1.0	0.0	1.0	273.9	O K
1440 min Winter	99.661	0.661	1.0	0.0	1.0	293.9	O K
2160 min Winter	99.686	0.686	1.1	0.0	1.1	309.5	O K
2880 min Winter	99.697	0.697	1.1	0.0	1.1	316.3	O K
4320 min Winter	99.711	0.711	1.1	0.0	1.1	325.2	Flood Risk
5760 min Winter	99.717	0.717	1.1	0.0	1.1	328.9	Flood Risk
7200 min Winter	99.719	0.719	1.1	0.0	1.1	330.0	Flood Risk
8640 min Winter	99.717	0.717	1.1	0.0	1.1	329.0	Flood Risk
10080 min Winter	99.712	0.712	1.1	0.0	1.1	325.9	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
30 min Winter	75.214	0.0	0.0	34			
60 min Winter	52.662	0.0	0.0	64			
120 min Winter	35.159	0.0	0.0	122			
180 min Winter	27.099	0.0	0.0	182			
240 min Winter	22.505	0.0	0.0	240			
360 min Winter	17.247	0.0	0.0	358			
480 min Winter	14.238	0.0	0.0	476			
600 min Winter	12.250	0.0	0.0	594			
720 min Winter	10.821	0.0	0.0	708			
960 min Winter	8.881	0.0	0.0	942			
1440 min Winter	6.697	0.0	0.0	1398			
2160 min Winter	5.062	0.0	0.0	2052			
2880 min Winter	4.154	0.0	0.0	2648			
4320 min Winter	3.157	0.0	0.0	3288			
5760 min Winter	2.613	0.0	0.0	4256			
7200 min Winter	2.267	0.0	0.0	5184			
8640 min Winter	2.023	0.0	0.0	6056			
10080 min Winter	1.837	0.0	0.0	6960			
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Stantec UK Ltd		Page 3
Caversham Bridge House Waterman Place Reading, RG1 8DN	Mountain Hub Infil Basin	
Date 26/08/2022 15:11 File Mountain hub - infiltra...	Designed by dahayes Checked by	
Innovyze Source Control 2020.1		

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.213	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.261

Time (mins)		Area
From:	To:	(ha)
0	4	0.261

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Stantec UK Ltd		Page 4
Caversham Bridge House Waterman Place Reading, RG1 8DN	Mountain Hub Infil Basin	
Date 26/08/2022 15:11 File Mountain hub - infiltra...	Designed by dahayes Checked by	
Innovyze Source Control 2020.1		

Model Details

Storage is Online Cover Level (m) 100.000

Infiltration Basin Structure

Invert Level (m) 99.000 Safety Factor 3.0
Infiltration Coefficient Base (m/hr) 0.01188 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01188

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	300.0	1.000	807.0

Weir Overflow Control

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 99.950

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APPENDIX K FOREST HUB CALCULATIONS

Stantec UK Ltd		Page 1																																																																																																																																																																																																																																																																																		
Caversham Bridge House Waterman Place Reading, RG1 8DN		Forest Hub Soakaways																																																																																																																																																																																																																																																																																		
Date 09/08/2022 12:05 File FOREST HUB SOAKAWAY.SRCX		Designed by dahayes Checked by																																																																																																																																																																																																																																																																																		
Innovyze		Source Control 2020.1																																																																																																																																																																																																																																																																																		
Summary of Results for 100 year Return Period (+30%) Half Drain Time : 1656 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 Overflow (l/s)</th><th>Max Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>98.717</td><td>0.217</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>98.815</td><td>0.315</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.1</td><td>O K</td></tr><tr><td>60 min Summer</td><td>98.938</td><td>0.438</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1.5</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.075</td><td>0.575</td><td>0.0</td><td>0.0</td><td>0.0</td><td>2.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.155</td><td>0.655</td><td>0.0</td><td>0.0</td><td>0.0</td><td>2.3</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.215</td><td>0.715</td><td>0.0</td><td>0.0</td><td>0.0</td><td>2.5</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.300</td><td>0.800</td><td>0.0</td><td>0.0</td><td>0.0</td><td>2.8</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.358</td><td>0.858</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.399</td><td>0.899</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.429</td><td>0.929</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.3</td><td>O K</td></tr><tr><td>960 min Summer</td><td>99.467</td><td>0.967</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>99.503</td><td>1.003</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>99.534</td><td>1.034</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>99.548</td><td>1.048</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>99.552</td><td>1.052</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>99.543</td><td>1.043</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>99.532</td><td>1.032</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.6</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>99.518</td><td>1.018</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.6</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>99.502</td><td>1.002</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3.5</td><td>O K</td></tr><tr><td>15 min Winter</td><td>98.743</td><td>0.243</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.9</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>Overflow Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>102.890</td><td>0.0</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>75.214</td><td>0.0</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>52.662</td><td>0.0</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>35.159</td><td>0.0</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>27.099</td><td>0.0</td><td>0.0</td><td>184</td></tr><tr><td>240 min Summer</td><td>22.505</td><td>0.0</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>17.247</td><td>0.0</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>14.238</td><td>0.0</td><td>0.0</td><td>482</td></tr><tr><td>600 min Summer</td><td>12.250</td><td>0.0</td><td>0.0</td><td>602</td></tr><tr><td>720 min Summer</td><td>10.821</td><td>0.0</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>8.881</td><td>0.0</td><td>0.0</td><td>960</td></tr><tr><td>1440 min Summer</td><td>6.697</td><td>0.0</td><td>0.0</td><td>1212</td></tr><tr><td>2160 min Summer</td><td>5.062</td><td>0.0</td><td>0.0</td><td>1596</td></tr><tr><td>2880 min Summer</td><td>4.154</td><td>0.0</td><td>0.0</td><td>1992</td></tr><tr><td>4320 min Summer</td><td>3.157</td><td>0.0</td><td>0.0</td><td>2848</td></tr><tr><td>5760 min Summer</td><td>2.613</td><td>0.0</td><td>0.0</td><td>3688</td></tr><tr><td>7200 min Summer</td><td>2.267</td><td>0.0</td><td>0.0</td><td>4472</td></tr><tr><td>8640 min Summer</td><td>2.023</td><td>0.0</td><td>0.0</td><td>5280</td></tr><tr><td>10080 min Summer</td><td>1.837</td><td>0.0</td><td>0.0</td><td>6144</td></tr><tr><td>15 min Winter</td><td>102.890</td><td>0.0</td><td>0.0</td><td>19</td></tr></tbody></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	98.717	0.217	0.0	0.0	0.0	0.8	O K	30 min Summer	98.815	0.315	0.0	0.0	0.0	1.1	O K	60 min Summer	98.938	0.438	0.0	0.0	0.0	1.5	O K	120 min Summer	99.075	0.575	0.0	0.0	0.0	2.0	O K	180 min Summer	99.155	0.655	0.0	0.0	0.0	2.3	O K	240 min Summer	99.215	0.715	0.0	0.0	0.0	2.5	O K	360 min Summer	99.300	0.800	0.0	0.0	0.0	2.8	O K	480 min Summer	99.358	0.858	0.0	0.0	0.0	3.0	O K	600 min Summer	99.399	0.899	0.0	0.0	0.0	3.2	O K	720 min Summer	99.429	0.929	0.0	0.0	0.0	3.3	O K	960 min Summer	99.467	0.967	0.0	0.0	0.0	3.4	O K	1440 min Summer	99.503	1.003	0.0	0.0	0.0	3.5	O K	2160 min Summer	99.534	1.034	0.0	0.0	0.0	3.6	O K	2880 min Summer	99.548	1.048	0.0	0.0	0.0	3.7	O K	4320 min Summer	99.552	1.052	0.0	0.0	0.0	3.7	O K	5760 min Summer	99.543	1.043	0.0	0.0	0.0	3.7	O K	7200 min Summer	99.532	1.032	0.0	0.0	0.0	3.6	O K	8640 min Summer	99.518	1.018	0.0	0.0	0.0	3.6	O K	10080 min Summer	99.502	1.002	0.0	0.0	0.0	3.5	O K	15 min Winter	98.743	0.243	0.0	0.0	0.0	0.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	15 min Summer	102.890	0.0	0.0	19	30 min Summer	75.214	0.0	0.0	34	60 min Summer	52.662	0.0	0.0	64	120 min Summer	35.159	0.0	0.0	124	180 min Summer	27.099	0.0	0.0	184	240 min Summer	22.505	0.0	0.0	242	360 min Summer	17.247	0.0	0.0	362	480 min Summer	14.238	0.0	0.0	482	600 min Summer	12.250	0.0	0.0	602	720 min Summer	10.821	0.0	0.0	720	960 min Summer	8.881	0.0	0.0	960	1440 min Summer	6.697	0.0	0.0	1212	2160 min Summer	5.062	0.0	0.0	1596	2880 min Summer	4.154	0.0	0.0	1992	4320 min Summer	3.157	0.0	0.0	2848	5760 min Summer	2.613	0.0	0.0	3688	7200 min Summer	2.267	0.0	0.0	4472	8640 min Summer	2.023	0.0	0.0	5280	10080 min Summer	1.837	0.0	0.0	6144	15 min Winter	102.890	0.0	0.0	19
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																																																																													
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480 min Summer	99.358	0.858	0.0	0.0	0.0	3.0	O K																																																																																																																																																																																																																																																																													
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2160 min Summer	99.534	1.034	0.0	0.0	0.0	3.6	O K																																																																																																																																																																																																																																																																													
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4320 min Summer	99.552	1.052	0.0	0.0	0.0	3.7	O K																																																																																																																																																																																																																																																																													
5760 min Summer	99.543	1.043	0.0	0.0	0.0	3.7	O K																																																																																																																																																																																																																																																																													
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10080 min Summer	99.502	1.002	0.0	0.0	0.0	3.5	O K																																																																																																																																																																																																																																																																													
15 min Winter	98.743	0.243	0.0	0.0	0.0	0.9	O K																																																																																																																																																																																																																																																																													
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																																
15 min Summer	102.890	0.0	0.0	19																																																																																																																																																																																																																																																																																
30 min Summer	75.214	0.0	0.0	34																																																																																																																																																																																																																																																																																
60 min Summer	52.662	0.0	0.0	64																																																																																																																																																																																																																																																																																
120 min Summer	35.159	0.0	0.0	124																																																																																																																																																																																																																																																																																
180 min Summer	27.099	0.0	0.0	184																																																																																																																																																																																																																																																																																
240 min Summer	22.505	0.0	0.0	242																																																																																																																																																																																																																																																																																
360 min Summer	17.247	0.0	0.0	362																																																																																																																																																																																																																																																																																
480 min Summer	14.238	0.0	0.0	482																																																																																																																																																																																																																																																																																
600 min Summer	12.250	0.0	0.0	602																																																																																																																																																																																																																																																																																
720 min Summer	10.821	0.0	0.0	720																																																																																																																																																																																																																																																																																
960 min Summer	8.881	0.0	0.0	960																																																																																																																																																																																																																																																																																
1440 min Summer	6.697	0.0	0.0	1212																																																																																																																																																																																																																																																																																
2160 min Summer	5.062	0.0	0.0	1596																																																																																																																																																																																																																																																																																
2880 min Summer	4.154	0.0	0.0	1992																																																																																																																																																																																																																																																																																
4320 min Summer	3.157	0.0	0.0	2848																																																																																																																																																																																																																																																																																
5760 min Summer	2.613	0.0	0.0	3688																																																																																																																																																																																																																																																																																
7200 min Summer	2.267	0.0	0.0	4472																																																																																																																																																																																																																																																																																
8640 min Summer	2.023	0.0	0.0	5280																																																																																																																																																																																																																																																																																
10080 min Summer	1.837	0.0	0.0	6144																																																																																																																																																																																																																																																																																
15 min Winter	102.890	0.0	0.0	19																																																																																																																																																																																																																																																																																
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Stantec UK Ltd							Page 2
Caversham Bridge House Waterman Place Reading, RG1 8DN			Forest Hub Soakaways				
Date 09/08/2022 12:05 File FOREST HUB SOAKAWAY.SRCX			Designed by dahayes Checked by				
Innovyze			Source Control 2020.1				
<u>Summary of Results for 100 year Return Period (+30%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	98.853	0.353	0.0	0.0	0.0	1.2	O K
60 min Winter	98.991	0.491	0.0	0.0	0.0	1.7	O K
120 min Winter	99.146	0.646	0.0	0.0	0.0	2.3	O K
180 min Winter	99.237	0.737	0.0	0.0	0.0	2.6	O K
240 min Winter	99.305	0.805	0.0	0.0	0.0	2.8	O K
360 min Winter	99.402	0.902	0.0	0.0	0.0	3.2	O K
480 min Winter	99.469	0.969	0.0	0.0	0.0	3.4	O K
600 min Winter	99.517	1.017	0.0	0.0	0.0	3.6	O K
720 min Winter	99.554	1.054	0.0	0.0	0.0	3.7	O K
960 min Winter	99.602	1.102	0.0	0.0	0.0	3.9	O K
1440 min Winter	99.645	1.145	0.0	0.0	0.0	4.0	O K
2160 min Winter	99.676	1.176	0.0	0.0	0.0	4.1	O K
2880 min Winter	99.687	1.187	0.0	0.0	0.0	4.2	O K
4320 min Winter	99.675	1.175	0.0	0.0	0.0	4.1	O K
5760 min Winter	99.647	1.147	0.0	0.0	0.0	4.0	O K
7200 min Winter	99.616	1.116	0.0	0.0	0.0	3.9	O K
8640 min Winter	99.583	1.083	0.0	0.0	0.0	3.8	O K
10080 min Winter	99.548	1.048	0.0	0.0	0.0	3.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
30 min Winter	75.214	0.0	0.0	33			
60 min Winter	52.662	0.0	0.0	64			
120 min Winter	35.159	0.0	0.0	122			
180 min Winter	27.099	0.0	0.0	180			
240 min Winter	22.505	0.0	0.0	240			
360 min Winter	17.247	0.0	0.0	356			
480 min Winter	14.238	0.0	0.0	472			
600 min Winter	12.250	0.0	0.0	588			
720 min Winter	10.821	0.0	0.0	700			
960 min Winter	8.881	0.0	0.0	924			
1440 min Winter	6.697	0.0	0.0	1342			
2160 min Winter	5.062	0.0	0.0	1668			
2880 min Winter	4.154	0.0	0.0	2132			
4320 min Winter	3.157	0.0	0.0	3068			
5760 min Winter	2.613	0.0	0.0	3928			
7200 min Winter	2.267	0.0	0.0	4824			
8640 min Winter	2.023	0.0	0.0	5696			
10080 min Winter	1.837	0.0	0.0	6552			
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Stantec UK Ltd		Page 3																																	
Caversham Bridge House Waterman Place Reading, RG1 8DN	Forest Hub Soakaways																																		
Date 09/08/2022 12:05	Designed by dahayes																																		
File FOREST HUB SOAKAWAY.SRCX	Checked by																																		
Innovyze		Source Control 2020.1																																	
<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>100</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>20.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.213</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+30</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.004 <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>0.004</td> </tr> </tbody> </table>			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)	20.000	Shortest Storm (mins)	15	Ratio R	0.213	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+30	Time (mins)		Area	From:	To:	(ha)	0	4	0.004
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)	20.000	Shortest Storm (mins)	15																																
Ratio R	0.213	Longest Storm (mins)	10080																																
Summer Storms	Yes	Climate Change %	+30																																
Time (mins)		Area																																	
From:	To:	(ha)																																	
0	4	0.004																																	
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Stantec UK Ltd		Page 4										
Caversham Bridge House Waterman Place Reading, RG1 8DN	Forest Hub Soakaways											
Date 09/08/2022 12:05 File FOREST HUB SOAKAWAY.SRCX	Designed by dahayes Checked by											
Innovyze Source Control 2020.1												
<u>Model Details</u> Storage is Online Cover Level (m) 100.000 <u>Lined Soakaway Structure</u> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Infiltration Coefficient Base (m/hr) 0.01188</td> <td style="width: 50%;">Ring Diameter (m) 1.20</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr) 0.01188</td> <td>Pit Multiplier 1.5</td> </tr> <tr> <td>Safety Factor 3.0</td> <td>Number Required 2</td> </tr> <tr> <td>Porosity 0.30</td> <td>Cap Volume Depth (m) 0.000</td> </tr> <tr> <td>Invert Level (m) 98.500</td> <td>Cap Infiltration Depth (m) 0.000</td> </tr> </table> <u>Weir Overflow Control</u> Discharge Coef 0.544 Width (m) 0.500 Invert Level (m) 99.900			Infiltration Coefficient Base (m/hr) 0.01188	Ring Diameter (m) 1.20	Infiltration Coefficient Side (m/hr) 0.01188	Pit Multiplier 1.5	Safety Factor 3.0	Number Required 2	Porosity 0.30	Cap Volume Depth (m) 0.000	Invert Level (m) 98.500	Cap Infiltration Depth (m) 0.000
Infiltration Coefficient Base (m/hr) 0.01188	Ring Diameter (m) 1.20											
Infiltration Coefficient Side (m/hr) 0.01188	Pit Multiplier 1.5											
Safety Factor 3.0	Number Required 2											
Porosity 0.30	Cap Volume Depth (m) 0.000											
Invert Level (m) 98.500	Cap Infiltration Depth (m) 0.000											
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APPENDIX L ARRIVAL BUILDING CALCULATIONS

Stantec UK Ltd								Page 1
Caversham Bridge House Waterman Place Reading, RG1 8DN		Arrival Building Basin						
Date 26/08/2022 16:25 File Arrival building basin....		Designed by dahayes Checked by						
Innovyze		Source Control 2020.1						
Summary of Results for 100 year Return Period (+30%)								
Half Drain Time : 647 minutes.								
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status	
15 min Summer	99.289	0.289	0.1	0.0	0.1	5.3	O K	
30 min Summer	99.365	0.365	0.2	0.0	0.2	7.7	O K	
60 min Summer	99.441	0.441	0.2	0.0	0.2	10.5	O K	
120 min Summer	99.509	0.509	0.3	0.0	0.3	13.6	O K	
180 min Summer	99.542	0.542	0.3	0.0	0.3	15.2	O K	
240 min Summer	99.563	0.563	0.3	0.0	0.3	16.3	O K	
360 min Summer	99.587	0.587	0.3	0.0	0.3	17.6	O K	
480 min Summer	99.599	0.599	0.3	0.0	0.3	18.4	O K	
600 min Summer	99.608	0.608	0.3	0.0	0.3	18.9	O K	
720 min Summer	99.614	0.614	0.3	0.0	0.3	19.2	O K	
960 min Summer	99.621	0.621	0.3	0.0	0.3	19.7	O K	
1440 min Summer	99.625	0.625	0.3	0.0	0.3	19.9	O K	
2160 min Summer	99.620	0.620	0.3	0.0	0.3	19.6	O K	
2880 min Summer	99.611	0.611	0.3	0.0	0.3	19.0	O K	
4320 min Summer	99.588	0.588	0.3	0.0	0.3	17.8	O K	
5760 min Summer	99.567	0.567	0.3	0.0	0.3	16.6	O K	
7200 min Summer	99.549	0.549	0.3	0.0	0.3	15.6	O K	
8640 min Summer	99.531	0.531	0.3	0.0	0.3	14.7	O K	
10080 min Summer	99.515	0.515	0.3	0.0	0.3	13.9	O K	
15 min Winter	99.311	0.311	0.2	0.0	0.2	5.9	O K	
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
15 min Summer		102.890	0.0	0.0	19			
30 min Summer		75.214	0.0	0.0	33			
60 min Summer		52.662	0.0	0.0	64			
120 min Summer		35.159	0.0	0.0	122			
180 min Summer		27.099	0.0	0.0	182			
240 min Summer		22.505	0.0	0.0	242			
360 min Summer		17.247	0.0	0.0	360			
480 min Summer		14.238	0.0	0.0	430			
600 min Summer		12.250	0.0	0.0	492			
720 min Summer		10.821	0.0	0.0	556			
960 min Summer		8.881	0.0	0.0	684			
1440 min Summer		6.697	0.0	0.0	966			
2160 min Summer		5.062	0.0	0.0	1380			
2880 min Summer		4.154	0.0	0.0	1788			
4320 min Summer		3.157	0.0	0.0	2592			
5760 min Summer		2.613	0.0	0.0	3352			
7200 min Summer		2.267	0.0	0.0	4112			
8640 min Summer		2.023	0.0	0.0	4848			
10080 min Summer		1.837	0.0	0.0	5648			
15 min Winter		102.890	0.0	0.0	19			
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Caversham Bridge House Waterman Place Reading, RG1 8DN			Arrival Building Basin				
Date 26/08/2022 16:25 File Arrival building basin....			Designed by dahayes Checked by				
Innovyze			Source Control 2020.1				
<u>Summary of Results for 100 year Return Period (+30%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	99.391	0.391	0.2	0.0	0.2	8.6	O K
60 min Winter	99.471	0.471	0.2	0.0	0.2	11.9	O K
120 min Winter	99.544	0.544	0.3	0.0	0.3	15.3	O K
180 min Winter	99.578	0.578	0.3	0.0	0.3	17.2	O K
240 min Winter	99.601	0.601	0.3	0.0	0.3	18.5	O K
360 min Winter	99.628	0.628	0.3	0.0	0.3	20.1	O K
480 min Winter	99.642	0.642	0.3	0.0	0.3	21.0	O K
600 min Winter	99.650	0.650	0.3	0.0	0.3	21.4	O K
720 min Winter	99.655	0.655	0.3	0.0	0.3	21.8	O K
960 min Winter	99.662	0.662	0.3	0.0	0.3	22.2	O K
1440 min Winter	99.661	0.661	0.3	0.0	0.3	22.2	O K
2160 min Winter	99.649	0.649	0.3	0.0	0.3	21.4	O K
2880 min Winter	99.631	0.631	0.3	0.0	0.3	20.3	O K
4320 min Winter	99.595	0.595	0.3	0.0	0.3	18.1	O K
5760 min Winter	99.561	0.561	0.3	0.0	0.3	16.2	O K
7200 min Winter	99.532	0.532	0.3	0.0	0.3	14.7	O K
8640 min Winter	99.506	0.506	0.3	0.0	0.3	13.4	O K
10080 min Winter	99.481	0.481	0.2	0.0	0.2	12.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
30 min Winter	75.214	0.0	0.0	33			
60 min Winter	52.662	0.0	0.0	62			
120 min Winter	35.159	0.0	0.0	120			
180 min Winter	27.099	0.0	0.0	178			
240 min Winter	22.505	0.0	0.0	236			
360 min Winter	17.247	0.0	0.0	348			
480 min Winter	14.238	0.0	0.0	456			
600 min Winter	12.250	0.0	0.0	554			
720 min Winter	10.821	0.0	0.0	578			
960 min Winter	8.881	0.0	0.0	730			
1440 min Winter	6.697	0.0	0.0	1038			
2160 min Winter	5.062	0.0	0.0	1488			
2880 min Winter	4.154	0.0	0.0	1908			
4320 min Winter	3.157	0.0	0.0	2728			
5760 min Winter	2.613	0.0	0.0	3528			
7200 min Winter	2.267	0.0	0.0	4320			
8640 min Winter	2.023	0.0	0.0	5096			
10080 min Winter	1.837	0.0	0.0	5848			
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Caversham Bridge House Waterman Place Reading, RG1 8DN	Arrival Building Basin	
Date 26/08/2022 16:25 File Arrival building basin....	Designed by dahayes Checked by	
Innovyze Source Control 2020.1		

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.213	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.028

Time (mins)		Area
From:	To:	(ha)
0	4	0.028

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Caversham Bridge House Waterman Place Reading, RG1 8DN	Arrival Building Basin									
Date 26/08/2022 16:25 File Arrival building basin....	Designed by dahayes Checked by									
Innovyze Source Control 2020.1										
Model Details Storage is Online Cover Level (m) 100.000 Infiltration Basin Structure Invert Level (m) 99.000 Safety Factor 3.0 Infiltration Coefficient Base (m/hr) 0.02772 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.02772 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>10.0</td><td>1.000</td><td>112.0</td></tr></tbody></table> Weir Overflow Control Discharge Coef 0.544 Width (m) 0.500 Invert Level (m) 99.900			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	10.0	1.000	112.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	10.0	1.000	112.0							
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APPENDIX M STAFF AREA CALCULATIONS

Stantec UK Ltd		Page 1																																																																																																																																																																																																																																																																																		
Caversham Bridge House Waterman Place Reading, RG1 8DN		Staff Building and Car Park Permeable pavement																																																																																																																																																																																																																																																																																		
Date 26/08/2022 15:47 File STAFF BUILDING & CAR PA...		Designed by dahayes Checked by																																																																																																																																																																																																																																																																																		
Innovyze		Source Control 2020.1																																																																																																																																																																																																																																																																																		
Summary of Results for 100 year Return Period (+30%) Half Drain Time : 1154 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 Overflow (l/s)</th><th>Max Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>99.128</td><td>0.348</td><td>2.0</td><td>0.0</td><td>2.0</td><td>95.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.218</td><td>0.438</td><td>2.5</td><td>0.0</td><td>2.5</td><td>151.1</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.308</td><td>0.528</td><td>3.1</td><td>0.0</td><td>3.1</td><td>219.9</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.393</td><td>0.613</td><td>3.5</td><td>0.0</td><td>3.5</td><td>296.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.436</td><td>0.656</td><td>3.8</td><td>0.0</td><td>3.8</td><td>339.4</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.467</td><td>0.687</td><td>4.0</td><td>0.0</td><td>4.0</td><td>371.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.506</td><td>0.726</td><td>4.2</td><td>0.0</td><td>4.2</td><td>414.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.530</td><td>0.750</td><td>4.3</td><td>0.0</td><td>4.3</td><td>442.6</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.545</td><td>0.765</td><td>4.4</td><td>0.0</td><td>4.4</td><td>461.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.556</td><td>0.776</td><td>4.5</td><td>0.0</td><td>4.5</td><td>473.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>99.569</td><td>0.789</td><td>4.6</td><td>0.0</td><td>4.6</td><td>490.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>99.583</td><td>0.803</td><td>4.6</td><td>0.0</td><td>4.6</td><td>508.4</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>99.593</td><td>0.813</td><td>4.7</td><td>0.0</td><td>4.7</td><td>520.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>99.594</td><td>0.814</td><td>4.7</td><td>0.0</td><td>4.7</td><td>522.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>99.587</td><td>0.807</td><td>4.7</td><td>0.0</td><td>4.7</td><td>512.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>99.575</td><td>0.795</td><td>4.6</td><td>0.0</td><td>4.6</td><td>497.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>99.562</td><td>0.782</td><td>4.5</td><td>0.0</td><td>4.5</td><td>482.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>99.550</td><td>0.770</td><td>4.4</td><td>0.0</td><td>4.4</td><td>466.7</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>99.536</td><td>0.756</td><td>4.4</td><td>0.0</td><td>4.4</td><td>450.6</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.154</td><td>0.374</td><td>2.2</td><td>0.0</td><td>2.2</td><td>110.2</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>Overflow Volume (m³)</th><th>Time-Peak 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Summer</td><td>6.697</td><td>0.0</td><td>0.0</td><td>1080</td></tr><tr><td>2160 min Summer</td><td>5.062</td><td>0.0</td><td>0.0</td><td>1488</td></tr><tr><td>2880 min Summer</td><td>4.154</td><td>0.0</td><td>0.0</td><td>1904</td></tr><tr><td>4320 min Summer</td><td>3.157</td><td>0.0</td><td>0.0</td><td>2724</td></tr><tr><td>5760 min Summer</td><td>2.613</td><td>0.0</td><td>0.0</td><td>3528</td></tr><tr><td>7200 min Summer</td><td>2.267</td><td>0.0</td><td>0.0</td><td>4328</td></tr><tr><td>8640 min Summer</td><td>2.023</td><td>0.0</td><td>0.0</td><td>5112</td></tr><tr><td>10080 min Summer</td><td>1.837</td><td>0.0</td><td>0.0</td><td>5944</td></tr><tr><td>15 min Winter</td><td>102.890</td><td>0.0</td><td>0.0</td><td>19</td></tr></tbody></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Overflow (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	99.128	0.348	2.0	0.0	2.0	95.4	O K	30 min Summer	99.218	0.438	2.5	0.0	2.5	151.1	O K	60 min Summer	99.308	0.528	3.1	0.0	3.1	219.9	O K	120 min Summer	99.393	0.613	3.5	0.0	3.5	296.0	O K	180 min Summer	99.436	0.656	3.8	0.0	3.8	339.4	O K	240 min Summer	99.467	0.687	4.0	0.0	4.0	371.3	O K	360 min Summer	99.506	0.726	4.2	0.0	4.2	414.7	O K	480 min Summer	99.530	0.750	4.3	0.0	4.3	442.6	O K	600 min Summer	99.545	0.765	4.4	0.0	4.4	461.3	O K	720 min Summer	99.556	0.776	4.5	0.0	4.5	473.7	O K	960 min Summer	99.569	0.789	4.6	0.0	4.6	490.0	O K	1440 min Summer	99.583	0.803	4.6	0.0	4.6	508.4	O K	2160 min Summer	99.593	0.813	4.7	0.0	4.7	520.7	O K	2880 min Summer	99.594	0.814	4.7	0.0	4.7	522.2	O K	4320 min Summer	99.587	0.807	4.7	0.0	4.7	512.5	O K	5760 min Summer	99.575	0.795	4.6	0.0	4.6	497.2	O K	7200 min Summer	99.562	0.782	4.5	0.0	4.5	482.1	O K	8640 min Summer	99.550	0.770	4.4	0.0	4.4	466.7	O K	10080 min Summer	99.536	0.756	4.4	0.0	4.4	450.6	O K	15 min Winter	99.154	0.374	2.2	0.0	2.2	110.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)	15 min Summer	102.890	0.0	0.0	19	30 min Summer	75.214	0.0	0.0	34	60 min Summer	52.662	0.0	0.0	64	120 min Summer	35.159	0.0	0.0	124	180 min Summer	27.099	0.0	0.0	182	240 min Summer	22.505	0.0	0.0	242	360 min Summer	17.247	0.0	0.0	362	480 min Summer	14.238	0.0	0.0	482	600 min Summer	12.250	0.0	0.0	600	720 min Summer	10.821	0.0	0.0	716	960 min Summer	8.881	0.0	0.0	826	1440 min Summer	6.697	0.0	0.0	1080	2160 min Summer	5.062	0.0	0.0	1488	2880 min Summer	4.154	0.0	0.0	1904	4320 min Summer	3.157	0.0	0.0	2724	5760 min Summer	2.613	0.0	0.0	3528	7200 min Summer	2.267	0.0	0.0	4328	8640 min Summer	2.023	0.0	0.0	5112	10080 min Summer	1.837	0.0	0.0	5944	15 min Winter	102.890	0.0	0.0	19
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Caversham Bridge House Waterman Place Reading, RG1 8DN	Staff Building and Car Park Permeable pavement						
Date 26/08/2022 15:47 File STAFF BUILDING & CAR PA...	Designed by dahayes Checked by						
Innovyze Source Control 2020.1							
<u>Summary of Results for 100 year Return Period (+30%)</u>							
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	99.248	0.468	2.7	0.0	2.7	172.7	O K
60 min Winter	99.343	0.563	3.3	0.0	3.3	249.9	O K
120 min Winter	99.433	0.653	3.8	0.0	3.8	335.9	O K
180 min Winter	99.479	0.699	4.0	0.0	4.0	385.1	O K
240 min Winter	99.512	0.732	4.2	0.0	4.2	421.5	O K
360 min Winter	99.554	0.774	4.5	0.0	4.5	471.7	O K
480 min Winter	99.581	0.801	4.6	0.0	4.6	504.8	O K
600 min Winter	99.599	0.819	4.7	0.0	4.7	527.6	O K
720 min Winter	99.611	0.831	4.8	0.0	4.8	543.7	O K
960 min Winter	99.625	0.845	4.9	0.0	4.9	562.8	O K
1440 min Winter	99.637	0.857	5.0	0.0	5.0	579.0	O K
2160 min Winter	99.644	0.864	5.0	0.0	5.0	587.9	O K
2880 min Winter	99.640	0.860	5.0	0.0	5.0	582.7	O K
4320 min Winter	99.621	0.841	4.9	0.0	4.9	557.2	O K
5760 min Winter	99.598	0.818	4.7	0.0	4.7	526.8	O K
7200 min Winter	99.575	0.795	4.6	0.0	4.6	497.6	O K
8640 min Winter	99.553	0.773	4.5	0.0	4.5	470.0	O K
10080 min Winter	99.530	0.750	4.3	0.0	4.3	442.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)			
30 min Winter	75.214	0.0	0.0	33			
60 min Winter	52.662	0.0	0.0	62			
120 min Winter	35.159	0.0	0.0	122			
180 min Winter	27.099	0.0	0.0	180			
240 min Winter	22.505	0.0	0.0	238			
360 min Winter	17.247	0.0	0.0	354			
480 min Winter	14.238	0.0	0.0	468			
600 min Winter	12.250	0.0	0.0	582			
720 min Winter	10.821	0.0	0.0	692			
960 min Winter	8.881	0.0	0.0	904			
1440 min Winter	6.697	0.0	0.0	1128			
2160 min Winter	5.062	0.0	0.0	1600			
2880 min Winter	4.154	0.0	0.0	2048			
4320 min Winter	3.157	0.0	0.0	2940			
5760 min Winter	2.613	0.0	0.0	3808			
7200 min Winter	2.267	0.0	0.0	4616			
8640 min Winter	2.023	0.0	0.0	5448			
10080 min Winter	1.837	0.0	0.0	6256			
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Innovyze Source Control 2020.1		

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)	20.000	Shortest Storm (mins)	15
Ratio R	0.213	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.644

Time (mins)		Area
From:	To:	(ha)
0	4	0.644

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Caversham Bridge House Waterman Place Reading, RG1 8DN	Staff Building and Car Park Permeable pavement																									
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Model Details Storage is Online Cover Level (m) 100.000 Porous Car Park Structure <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.01188</td><td>Width (m)</td><td>35.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>157.0</td></tr><tr><td>Max Percolation (l/s)</td><td>1526.4</td><td>Slope (1:X)</td><td>150.0</td></tr><tr><td>Safety Factor</td><td>3.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>98.780</td><td>Cap Volume Depth (m)</td><td>1.000</td></tr></table> Weir Overflow Control Discharge Coef 0.544 Width (m) 4.000 Invert Level (m) 99.780			Infiltration Coefficient Base (m/hr)	0.01188	Width (m)	35.0	Membrane Percolation (mm/hr)	1000	Length (m)	157.0	Max Percolation (l/s)	1526.4	Slope (1:X)	150.0	Safety Factor	3.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	98.780	Cap Volume Depth (m)	1.000
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Condition 27 - Proposed Drainage Strategy

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