

H2OK Systems Limited		Page 1
Nanjerrick Court Allet, Truro TR4 9DJ		
Date 11/04/2017 10:24 File	Designed by awoolley Checked by	
Micro Drainage Source Control 2015.1		

Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.000
Ratio R	0.350
Areal Reduction Factor	1.00
Area (ha)	0.372
SAAR (mm)	708
CWI	106.032
Urban	0.000
SPR	37.000

Results

Percentage Runoff (%)	36.30
Greenfield Runoff Volume (m³)	85.113

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H2OK Systems Limited		Page 1
Nanjerrick Court Allet, Truro TR4 9DJ		
Date 11/04/2017 10:22 File	Designed by awoolley Checked by	
Micro Drainage Source Control 2015.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	0.372	Urban	0.000
SAAR (mm)	708	Region Number	Region 7

Results 1/s

QBAR Rural	1.3
QBAR Urban	1.3
Q100 years	4.1
Q1 year	1.1
Q30 years	2.9
Q100 years	4.1

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H2OK Systems Limited						Page 1	
Nanjerrick Court Allet, Truro TR4 9DJ							
Date 20/04/2017 09:38 File Permeable Pavement 385m...			Designed by awoolley Checked by				
Micro Drainage			Source Control 2015.1				
<u>Summary of Results for 100 year Return Period (+30%)</u> Half Drain Time : 404 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	3.339	0.154	0.0	1.9	1.9	37.1	O K
30 min Summer	3.385	0.200	0.0	1.9	1.9	49.6	O K
60 min Summer	3.432	0.247	0.0	1.9	1.9	62.1	O K
120 min Summer	3.472	0.287	0.0	1.9	1.9	72.5	O K
180 min Summer	3.486	0.301	0.0	1.9	1.9	76.3	O K
240 min Summer	3.489	0.304	0.0	1.9	1.9	77.2	O K
360 min Summer	3.482	0.297	0.0	1.9	1.9	75.2	O K
480 min Summer	3.473	0.288	0.0	1.9	1.9	72.9	O K
600 min Summer	3.465	0.280	0.0	1.9	1.9	70.9	O K
720 min Summer	3.458	0.273	0.0	1.9	1.9	69.0	O K
960 min Summer	3.444	0.259	0.0	1.9	1.9	65.3	O K
1440 min Summer	3.414	0.229	0.0	1.9	1.9	57.2	O K
2160 min Summer	3.366	0.181	0.0	1.9	1.9	44.5	O K
2880 min Summer	3.325	0.140	0.0	1.9	1.9	33.4	O K
4320 min Summer	3.260	0.075	0.0	1.9	1.9	16.1	O K
5760 min Summer	3.221	0.036	0.0	1.9	1.9	5.7	O K
7200 min Summer	3.198	0.013	0.0	1.9	1.9	0.8	O K
8640 min Summer	3.185	0.000	0.0	1.7	1.7	0.0	O K
10080 min Summer	3.185	0.000	0.0	1.5	1.5	0.0	O K
15 min Winter	3.357	0.172	0.0	1.9	1.9	42.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
15 min Summer	115.731	0.0	39.2	22			
30 min Summer	77.804	0.0	53.1	37			
60 min Summer	49.937	0.0	68.6	66			
120 min Summer	30.956	0.0	85.3	124			
180 min Summer	23.058	0.0	95.5	184			
240 min Summer	18.577	0.0	102.6	242			
360 min Summer	13.656	0.0	113.3	352			
480 min Summer	10.974	0.0	121.4	408			
600 min Summer	9.254	0.0	128.1	470			
720 min Summer	8.046	0.0	133.5	534			
960 min Summer	6.447	0.0	142.7	670			
1440 min Summer	4.709	0.0	156.3	944			
2160 min Summer	3.432	0.0	170.6	1328			
2880 min Summer	2.739	0.0	181.4	1704			
4320 min Summer	1.989	0.0	197.0	2416			
5760 min Summer	1.583	0.0	208.5	3056			
7200 min Summer	1.325	0.0	217.4	3680			
8640 min Summer	1.147	0.0	225.2	0			
10080 min Summer	1.015	0.0	231.9	0			
15 min Winter	115.731	0.0	44.1	22			
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H2OK Systems Limited							Page 2
Nanjerrick Court Allet, Truro TR4 9DJ							
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Micro Drainage			Source Control 2015.1				
<u>Summary of Results for 100 year Return Period (+30%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	3.410	0.225	0.0	1.9	1.9	56.2	O K
60 min Winter	3.464	0.279	0.0	1.9	1.9	70.5	O K
120 min Winter	3.512	0.327	0.0	1.9	1.9	83.2	Flood Risk
180 min Winter	3.531	0.346	0.0	1.9	1.9	88.3	Flood Risk
240 min Winter	3.538	0.353	0.0	1.9	1.9	90.1	Flood Risk
360 min Winter	3.536	0.351	0.0	1.9	1.9	89.7	Flood Risk
480 min Winter	3.525	0.340	0.0	1.9	1.9	86.8	Flood Risk
600 min Winter	3.513	0.328	0.0	1.9	1.9	83.5	Flood Risk
720 min Winter	3.504	0.319	0.0	1.9	1.9	81.1	Flood Risk
960 min Winter	3.484	0.299	0.0	1.9	1.9	75.9	O K
1440 min Winter	3.440	0.255	0.0	1.9	1.9	64.2	O K
2160 min Winter	3.365	0.180	0.0	1.9	1.9	44.2	O K
2880 min Winter	3.301	0.116	0.0	1.9	1.9	27.2	O K
4320 min Winter	3.216	0.031	0.0	1.9	1.9	4.7	O K
5760 min Winter	3.185	0.000	0.0	1.7	1.7	0.0	O K
7200 min Winter	3.185	0.000	0.0	1.5	1.5	0.0	O K
8640 min Winter	3.185	0.000	0.0	1.3	1.3	0.0	O K
10080 min Winter	3.185	0.000	0.0	1.1	1.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	77.804	0.0	59.7	36			
60 min Winter	49.937	0.0	77.0	64			
120 min Winter	30.956	0.0	95.8	122			
180 min Winter	23.058	0.0	107.1	180			
240 min Winter	18.577	0.0	115.2	236			
360 min Winter	13.656	0.0	127.1	348			
480 min Winter	10.974	0.0	136.3	452			
600 min Winter	9.254	0.0	143.6	494			
720 min Winter	8.046	0.0	149.9	566			
960 min Winter	6.447	0.0	160.0	722			
1440 min Winter	4.709	0.0	175.4	1028			
2160 min Winter	3.432	0.0	191.6	1432			
2880 min Winter	2.739	0.0	203.4	1792			
4320 min Winter	1.989	0.0	221.0	2384			
5760 min Winter	1.583	0.0	233.9	0			
7200 min Winter	1.325	0.0	244.2	0			
8640 min Winter	1.147	0.0	253.0	0			
10080 min Winter	1.015	0.0	260.6	0			
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H2OK Systems Limited		Page 4
Nanjerrick Court Allet, Truro TR4 9DJ		
Date 20/04/2017 09:38 File Permeable Pavement 385m...	Designed by awoolley Checked by	
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Model Details

Storage is Online Cover Level (m) 3.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	28.0
Max Percolation (l/s)	77.8	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	3.185	Cap Volume Depth (m)	0.385

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0074-2000-0485-2000
Design Head (m)	0.485
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	74
Invert Level (m)	3.085
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.485	1.9
Flush-Flo™	0.143	1.9
Kick-Flo®	0.332	1.6
Mean Flow over Head Range	-	1.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9	1.200	2.9	3.000	4.5	7.000	6.8
0.200	1.9	1.400	3.2	3.500	4.8	7.500	7.0
0.300	1.8	1.600	3.4	4.000	5.2	8.000	7.2
0.400	1.8	1.800	3.5	4.500	5.4	8.500	7.5
0.500	2.0	2.000	3.7	5.000	5.7	9.000	7.7
0.600	2.1	2.200	3.9	5.500	6.0	9.500	7.9
0.800	2.4	2.400	4.1	6.000	6.3		
1.000	2.7	2.600	4.2	6.500	6.5		

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H2OK Systems Limited						Page 1																																																																																																																																																																																																																																																																																		
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<u>Summary of Results for 30 year Return Period</u> Half Drain Time : 140 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (1/s)</th><th>Max Control (1/s)</th><th>Max Σ Outflow (1/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>2.907</td><td>0.077</td><td>0.0</td><td>2.3</td><td>2.3</td><td>20.2</td><td>O K</td></tr><tr><td>30 min Summer</td><td>2.926</td><td>0.096</td><td>0.0</td><td>2.6</td><td>2.6</td><td>26.5</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>2.941</td><td>0.111</td><td>0.0</td><td>2.8</td><td>2.8</td><td>31.8</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>2.955</td><td>0.125</td><td>0.0</td><td>2.9</td><td>2.9</td><td>36.5</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>2.957</td><td>0.127</td><td>0.0</td><td>2.9</td><td>2.9</td><td>37.3</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>2.956</td><td>0.126</td><td>0.0</td><td>2.9</td><td>2.9</td><td>36.8</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>2.946</td><td>0.116</td><td>0.0</td><td>2.9</td><td>2.9</td><td>33.5</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>2.941</td><td>0.111</td><td>0.0</td><td>2.8</td><td>2.8</td><td>31.9</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>2.936</td><td>0.106</td><td>0.0</td><td>2.7</td><td>2.7</td><td>30.2</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>2.931</td><td>0.101</td><td>0.0</td><td>2.7</td><td>2.7</td><td>28.5</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>2.923</td><td>0.093</td><td>0.0</td><td>2.6</td><td>2.6</td><td>25.5</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>2.908</td><td>0.078</td><td>0.0</td><td>2.3</td><td>2.3</td><td>20.4</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>2.891</td><td>0.061</td><td>0.0</td><td>2.1</td><td>2.1</td><td>14.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>2.880</td><td>0.050</td><td>0.0</td><td>1.9</td><td>1.9</td><td>10.9</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>2.866</td><td>0.036</td><td>0.0</td><td>1.6</td><td>1.6</td><td>6.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>2.857</td><td>0.027</td><td>0.0</td><td>1.4</td><td>1.4</td><td>3.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>2.851</td><td>0.021</td><td>0.0</td><td>1.2</td><td>1.2</td><td>2.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>2.846</td><td>0.016</td><td>0.0</td><td>1.1</td><td>1.1</td><td>1.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>2.843</td><td>0.013</td><td>0.0</td><td>1.0</td><td>1.0</td><td>0.8</td><td>O K</td></tr><tr><td>15 min Winter</td><td>2.915</td><td>0.085</td><td>0.0</td><td>2.5</td><td>2.5</td><td>23.0</td><td>Flood Risk</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge 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>22.1</td><td>21</td></tr><tr><td>30 min Summer</td><td>45.828</td><td>0.0</td><td>30.0</td><td>35</td></tr><tr><td>60 min Summer</td><td>29.238</td><td>0.0</td><td>38.7</td><td>62</td></tr><tr><td>120 min Summer</td><td>18.112</td><td>0.0</td><td>48.4</td><td>122</td></tr><tr><td>180 min Summer</td><td>13.534</td><td>0.0</td><td>54.4</td><td>170</td></tr><tr><td>240 min Summer</td><td>10.952</td><td>0.0</td><td>58.8</td><td>200</td></tr><tr><td>360 min Summer</td><td>8.106</td><td>0.0</td><td>65.4</td><td>240</td></tr><tr><td>480 min Summer</td><td>6.544</td><td>0.0</td><td>70.5</td><td>308</td></tr><tr><td>600 min Summer</td><td>5.539</td><td>0.0</td><td>74.6</td><td>376</td></tr><tr><td>720 min Summer</td><td>4.832</td><td>0.0</td><td>78.1</td><td>442</td></tr><tr><td>960 min Summer</td><td>3.892</td><td>0.0</td><td>83.9</td><td>574</td></tr><tr><td>1440 min Summer</td><td>2.866</td><td>0.0</td><td>92.6</td><td>826</td></tr><tr><td>2160 min Summer</td><td>2.108</td><td>0.0</td><td>101.9</td><td>1192</td></tr><tr><td>2880 min Summer</td><td>1.693</td><td>0.0</td><td>108.8</td><td>1560</td></tr><tr><td>4320 min Summer</td><td>1.242</td><td>0.0</td><td>118.7</td><td>2252</td></tr><tr><td>5760 min Summer</td><td>0.996</td><td>0.0</td><td>125.8</td><td>2944</td></tr><tr><td>7200 min Summer</td><td>0.839</td><td>0.0</td><td>131.9</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>0.730</td><td>0.0</td><td>137.2</td><td>4408</td></tr><tr><td>10080 min Summer</td><td>0.648</td><td>0.0</td><td>141.5</td><td>5088</td></tr><tr><td>15 min Winter</td><td>68.836</td><td>0.0</td><td>24.9</td><td>21</td></tr></tbody></table>								Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status	15 min Summer	2.907	0.077	0.0	2.3	2.3	20.2	O K	30 min Summer	2.926	0.096	0.0	2.6	2.6	26.5	Flood Risk	60 min Summer	2.941	0.111	0.0	2.8	2.8	31.8	Flood Risk	120 min Summer	2.955	0.125	0.0	2.9	2.9	36.5	Flood Risk	180 min Summer	2.957	0.127	0.0	2.9	2.9	37.3	Flood Risk	240 min Summer	2.956	0.126	0.0	2.9	2.9	36.8	Flood Risk	360 min Summer	2.946	0.116	0.0	2.9	2.9	33.5	Flood Risk	480 min Summer	2.941	0.111	0.0	2.8	2.8	31.9	Flood Risk	600 min Summer	2.936	0.106	0.0	2.7	2.7	30.2	Flood Risk	720 min Summer	2.931	0.101	0.0	2.7	2.7	28.5	Flood Risk	960 min Summer	2.923	0.093	0.0	2.6	2.6	25.5	Flood Risk	1440 min Summer	2.908	0.078	0.0	2.3	2.3	20.4	O K	2160 min Summer	2.891	0.061	0.0	2.1	2.1	14.9	O K	2880 min Summer	2.880	0.050	0.0	1.9	1.9	10.9	O K	4320 min Summer	2.866	0.036	0.0	1.6	1.6	6.0	O K	5760 min Summer	2.857	0.027	0.0	1.4	1.4	3.4	O K	7200 min Summer	2.851	0.021	0.0	1.2	1.2	2.0	O K	8640 min Summer	2.846	0.016	0.0	1.1	1.1	1.3	O K	10080 min Summer	2.843	0.013	0.0	1.0	1.0	0.8	O K	15 min Winter	2.915	0.085	0.0	2.5	2.5	23.0	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	68.836	0.0	22.1	21	30 min Summer	45.828	0.0	30.0	35	60 min Summer	29.238	0.0	38.7	62	120 min Summer	18.112	0.0	48.4	122	180 min Summer	13.534	0.0	54.4	170	240 min Summer	10.952	0.0	58.8	200	360 min Summer	8.106	0.0	65.4	240	480 min Summer	6.544	0.0	70.5	308	600 min Summer	5.539	0.0	74.6	376	720 min Summer	4.832	0.0	78.1	442	960 min Summer	3.892	0.0	83.9	574	1440 min Summer	2.866	0.0	92.6	826	2160 min Summer	2.108	0.0	101.9	1192	2880 min Summer	1.693	0.0	108.8	1560	4320 min Summer	1.242	0.0	118.7	2252	5760 min Summer	0.996	0.0	125.8	2944	7200 min Summer	0.839	0.0	131.9	3672	8640 min Summer	0.730	0.0	137.2	4408	10080 min Summer	0.648	0.0	141.5	5088	15 min Winter	68.836	0.0	24.9	21
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480 min Summer	2.941	0.111	0.0	2.8	2.8	31.9	Flood Risk																																																																																																																																																																																																																																																																																	
600 min Summer	2.936	0.106	0.0	2.7	2.7	30.2	Flood Risk																																																																																																																																																																																																																																																																																	
720 min Summer	2.931	0.101	0.0	2.7	2.7	28.5	Flood Risk																																																																																																																																																																																																																																																																																	
960 min Summer	2.923	0.093	0.0	2.6	2.6	25.5	Flood Risk																																																																																																																																																																																																																																																																																	
1440 min Summer	2.908	0.078	0.0	2.3	2.3	20.4	O K																																																																																																																																																																																																																																																																																	
2160 min Summer	2.891	0.061	0.0	2.1	2.1	14.9	O K																																																																																																																																																																																																																																																																																	
2880 min Summer	2.880	0.050	0.0	1.9	1.9	10.9	O K																																																																																																																																																																																																																																																																																	
4320 min Summer	2.866	0.036	0.0	1.6	1.6	6.0	O K																																																																																																																																																																																																																																																																																	
5760 min Summer	2.857	0.027	0.0	1.4	1.4	3.4	O K																																																																																																																																																																																																																																																																																	
7200 min Summer	2.851	0.021	0.0	1.2	1.2	2.0	O K																																																																																																																																																																																																																																																																																	
8640 min Summer	2.846	0.016	0.0	1.1	1.1	1.3	O K																																																																																																																																																																																																																																																																																	
10080 min Summer	2.843	0.013	0.0	1.0	1.0	0.8	O K																																																																																																																																																																																																																																																																																	
15 min Winter	2.915	0.085	0.0	2.5	2.5	23.0	Flood Risk																																																																																																																																																																																																																																																																																	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																																				
15 min Summer	68.836	0.0	22.1	21																																																																																																																																																																																																																																																																																				
30 min Summer	45.828	0.0	30.0	35																																																																																																																																																																																																																																																																																				
60 min Summer	29.238	0.0	38.7	62																																																																																																																																																																																																																																																																																				
120 min Summer	18.112	0.0	48.4	122																																																																																																																																																																																																																																																																																				
180 min Summer	13.534	0.0	54.4	170																																																																																																																																																																																																																																																																																				
240 min Summer	10.952	0.0	58.8	200																																																																																																																																																																																																																																																																																				
360 min Summer	8.106	0.0	65.4	240																																																																																																																																																																																																																																																																																				
480 min Summer	6.544	0.0	70.5	308																																																																																																																																																																																																																																																																																				
600 min Summer	5.539	0.0	74.6	376																																																																																																																																																																																																																																																																																				
720 min Summer	4.832	0.0	78.1	442																																																																																																																																																																																																																																																																																				
960 min Summer	3.892	0.0	83.9	574																																																																																																																																																																																																																																																																																				
1440 min Summer	2.866	0.0	92.6	826																																																																																																																																																																																																																																																																																				
2160 min Summer	2.108	0.0	101.9	1192																																																																																																																																																																																																																																																																																				
2880 min Summer	1.693	0.0	108.8	1560																																																																																																																																																																																																																																																																																				
4320 min Summer	1.242	0.0	118.7	2252																																																																																																																																																																																																																																																																																				
5760 min Summer	0.996	0.0	125.8	2944																																																																																																																																																																																																																																																																																				
7200 min Summer	0.839	0.0	131.9	3672																																																																																																																																																																																																																																																																																				
8640 min Summer	0.730	0.0	137.2	4408																																																																																																																																																																																																																																																																																				
10080 min Summer	0.648	0.0	141.5	5088																																																																																																																																																																																																																																																																																				
15 min Winter	68.836	0.0	24.9	21																																																																																																																																																																																																																																																																																				
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Nanjerrick Court Allet, Truro TR4 9DJ							
Date 20/04/2017 09:50 File				Designed by awoolley Checked by			
Micro Drainage				Source Control 2015.1			
<u>Summary of Results for 30 year Return Period</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	2.936	0.106		0.0	2.7	2.7	30.2 Flood Risk
60 min Winter	2.958	0.128		0.0	2.9	2.9	37.5 Flood Risk
120 min Winter	2.973	0.143		0.0	2.9	2.9	42.7 Flood Risk
180 min Winter	2.976	0.146		0.0	2.9	2.9	43.7 Flood Risk
240 min Winter	2.974	0.144		0.0	2.9	2.9	43.1 Flood Risk
360 min Winter	2.968	0.138		0.0	2.9	2.9	40.9 Flood Risk
480 min Winter	2.958	0.128		0.0	2.9	2.9	37.6 Flood Risk
600 min Winter	2.943	0.113		0.0	2.8	2.8	32.4 Flood Risk
720 min Winter	2.935	0.105		0.0	2.7	2.7	29.9 Flood Risk
960 min Winter	2.922	0.092		0.0	2.6	2.6	25.5 Flood Risk
1440 min Winter	2.902	0.072		0.0	2.3	2.3	18.5 O K
2160 min Winter	2.882	0.052		0.0	1.9	1.9	11.5 O K
2880 min Winter	2.869	0.039		0.0	1.7	1.7	7.1 O K
4320 min Winter	2.854	0.024		0.0	1.3	1.3	2.7 O K
5760 min Winter	2.846	0.016		0.0	1.1	1.1	1.2 O K
7200 min Winter	2.842	0.012		0.0	0.9	0.9	0.6 O K
8640 min Winter	2.839	0.009		0.0	0.8	0.8	0.3 O K
10080 min Winter	2.837	0.007		0.0	0.7	0.7	0.2 O K
Storm Event			Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
30 min Winter			45.828	0.0	33.8	35	
60 min Winter			29.238	0.0	43.6	64	
120 min Winter			18.112	0.0	54.4	120	
180 min Winter			13.534	0.0	61.2	174	
240 min Winter			10.952	0.0	66.1	224	
360 min Winter			8.106	0.0	73.5	280	
480 min Winter			6.544	0.0	79.2	360	
600 min Winter			5.539	0.0	83.8	404	
720 min Winter			4.832	0.0	87.8	474	
960 min Winter			3.892	0.0	94.3	608	
1440 min Winter			2.866	0.0	104.0	868	
2160 min Winter			2.108	0.0	114.5	1236	
2880 min Winter			1.693	0.0	122.3	1588	
4320 min Winter			1.242	0.0	134.0	2252	
5760 min Winter			0.996	0.0	142.4	2992	
7200 min Winter			0.839	0.0	148.2	3648	
8640 min Winter			0.730	0.0	154.9	4296	
10080 min Winter			0.648	0.0	159.7	5112	
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Rainfall Details

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 Area Diagram

Total Area (ha) 0.185

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 4	0.092	4 8	0.093

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Nanjerrick Court Allet, Truro TR4 9DJ		
Date 20/04/2017 09:50 File	Designed by awoolley Checked by	
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Model Details

Storage is Online Cover Level (m) 3.210

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	36.0
Max Percolation (l/s)	100.0	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	2.830	Cap Volume Depth (m)	0.150

ACO Q-Brake Outflow Control

Design Head (m)	0.150	Diameter (mm)	87
Design Flow (l/s)	2.0	Invert Level (m)	2.830

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.7	1.200	5.7	3.000	9.0	7.000	13.7
0.200	2.3	1.400	6.1	3.500	9.7	7.500	14.2
0.300	2.8	1.600	6.6	4.000	10.4	8.000	14.7
0.400	3.3	1.800	7.0	4.500	11.0	8.500	15.1
0.500	3.7	2.000	7.3	5.000	11.6	9.000	15.6
0.600	4.0	2.200	7.7	5.500	12.2	9.500	16.0
0.800	4.6	2.400	8.0	6.000	12.7		
1.000	5.2	2.600	8.4	6.500	13.2		

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Nanjerrick Court Allet, Truro TR4 9DJ							
Date 20/04/2017 09:49				Designed by awoolley			
File PERMEABLE PAVING ATTENU...				Checked by			
Micro Drainage				Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+30%)</u> Half Drain Time : 271 minutes.							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	2.954	0.124	0.0	2.9	2.9	36.3	Flood Risk
30 min Summer	2.992	0.162	0.0	2.9	2.9	48.7	Flood Risk
60 min Summer	3.218	0.388	0.0	3.2	3.2	59.3	FLOOD
120 min Summer	3.226	0.396	0.0	3.3	3.3	67.4	FLOOD
180 min Summer	3.228	0.398	0.0	3.3	3.3	69.4	FLOOD
240 min Summer	3.228	0.398	0.0	3.3	3.3	69.3	FLOOD
360 min Summer	3.227	0.397	0.0	3.3	3.3	68.3	FLOOD
480 min Summer	3.225	0.395	0.0	3.3	3.3	66.4	FLOOD
600 min Summer	3.223	0.393	0.0	3.3	3.3	64.2	FLOOD
720 min Summer	3.220	0.390	0.0	3.2	3.2	62.0	FLOOD
960 min Summer	3.216	0.386	0.0	3.2	3.2	57.7	FLOOD
1440 min Summer	3.210	0.380	0.0	3.2	3.2	51.8	FLOOD
2160 min Summer	2.972	0.142	0.0	2.9	2.9	42.5	Flood Risk
2880 min Summer	2.931	0.101	0.0	2.7	2.7	28.5	Flood Risk
4320 min Summer	2.903	0.073	0.0	2.3	2.3	18.8	O K
5760 min Summer	2.885	0.055	0.0	2.0	2.0	12.7	O K
7200 min Summer	2.874	0.044	0.0	1.8	1.8	8.7	O K
8640 min Summer	2.865	0.035	0.0	1.6	1.6	6.0	O K
10080 min Summer	2.860	0.030	0.0	1.5	1.5	4.2	O K
15 min Winter	2.968	0.138	0.0	2.9	2.9	41.1	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
15 min Summer	115.731	0.0	38.3	22			
30 min Summer	77.804	0.0	52.2	36			
60 min Summer	49.937	8.0	67.4	64			
120 min Summer	30.956	16.1	84.0	122			
180 min Summer	23.058	18.1	94.0	166			
240 min Summer	18.577	18.0	101.1	196			
360 min Summer	13.656	17.0	111.6	260			
480 min Summer	10.974	15.1	119.6	328			
600 min Summer	9.254	12.9	126.1	396			
720 min Summer	8.046	10.7	131.6	464			
960 min Summer	6.447	6.4	140.6	598			
1440 min Summer	4.709	0.5	153.9	854			
2160 min Summer	3.432	0.0	168.0	1320			
2880 min Summer	2.739	0.0	178.4	1592			
4320 min Summer	1.989	0.0	193.7	2332			
5760 min Summer	1.583	0.0	204.7	3048			
7200 min Summer	1.325	0.0	213.3	3744			
8640 min Summer	1.147	0.0	219.6	4416			
10080 min Summer	1.015	0.0	226.4	5144			
15 min Winter	115.731	0.0	43.1	22			
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Nanjerrick Court Allet, Truro TR4 9DJ							
Date 20/04/2017 09:49 File PERMEABLE PAVING ATTENU...			Designed by awoolley Checked by				
Micro Drainage			Source Control 2015.1				
<u>Summary of Results for 100 year Return Period (+30%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	3.213	0.383	0.0	3.2	3.2	54.6	FLOOD
60 min Winter	3.226	0.396	0.0	3.3	3.3	67.5	FLOOD
120 min Winter	3.236	0.406	0.0	3.3	3.3	77.6	FLOOD
180 min Winter	3.239	0.409	0.0	3.3	3.3	80.6	FLOOD
240 min Winter	3.239	0.409	0.0	3.3	3.3	80.6	FLOOD
360 min Winter	3.237	0.407	0.0	3.3	3.3	78.8	FLOOD
480 min Winter	3.235	0.405	0.0	3.3	3.3	76.1	FLOOD
600 min Winter	3.231	0.401	0.0	3.3	3.3	72.7	FLOOD
720 min Winter	3.228	0.398	0.0	3.3	3.3	69.2	FLOOD
960 min Winter	3.221	0.391	0.0	3.2	3.2	62.4	FLOOD
1440 min Winter	3.211	0.381	0.0	3.2	3.2	52.3	FLOOD
2160 min Winter	2.941	0.111	0.0	2.8	2.8	31.9	Flood Risk
2880 min Winter	2.916	0.086	0.0	2.5	2.5	23.2	Flood Risk
4320 min Winter	2.885	0.055	0.0	2.0	2.0	12.5	O K
5760 min Winter	2.868	0.038	0.0	1.6	1.6	6.8	O K
7200 min Winter	2.858	0.028	0.0	1.4	1.4	3.7	O K
8640 min Winter	2.851	0.021	0.0	1.2	1.2	2.2	O K
10080 min Winter	2.847	0.017	0.0	1.1	1.1	1.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	77.804	3.3	58.6	35			
60 min Winter	49.937	16.2	75.8	64			
120 min Winter	30.956	26.3	94.3	120			
180 min Winter	23.058	29.3	105.6	174			
240 min Winter	18.577	29.3	113.5	226			
360 min Winter	13.656	27.5	125.3	280			
480 min Winter	10.974	24.8	134.3	356			
600 min Winter	9.254	21.4	141.5	432			
720 min Winter	8.046	17.9	147.7	506			
960 min Winter	6.447	11.1	157.8	646			
1440 min Winter	4.709	1.0	172.8	902			
2160 min Winter	3.432	0.0	188.6	1280			
2880 min Winter	2.739	0.0	200.3	1648			
4320 min Winter	1.989	0.0	217.4	2376			
5760 min Winter	1.583	0.0	230.0	3056			
7200 min Winter	1.325	0.0	239.7	3744			
8640 min Winter	1.147	0.0	248.4	4416			
10080 min Winter	1.015	0.0	254.8	5144			
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Nanjerrick Court Allet, Truro TR4 9DJ		
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Micro Drainage Source Control 2015.1		

Model Details

Storage is Online Cover Level (m) 3.210

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	36.0
Max Percolation (l/s)	100.0	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	2.830	Cap Volume Depth (m)	0.150

ACO Q-Brake Outflow Control

Design Head (m)	0.150	Diameter (mm)	87
Design Flow (l/s)	2.0	Invert Level (m)	2.830

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.7	1.200	5.7	3.000	9.0	7.000	13.7
0.200	2.3	1.400	6.1	3.500	9.7	7.500	14.2
0.300	2.8	1.600	6.6	4.000	10.4	8.000	14.7
0.400	3.3	1.800	7.0	4.500	11.0	8.500	15.1
0.500	3.7	2.000	7.3	5.000	11.6	9.000	15.6
0.600	4.0	2.200	7.7	5.500	12.2	9.500	16.0
0.800	4.6	2.400	8.0	6.000	12.7		
1.000	5.2	2.600	8.4	6.500	13.2		

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