

**Roger Casey Associates**

Consulting Civil & Structural Engineers

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Job No.	:	20936
Sheet	:	S1
Made by	:	BWE
Date	:	16.12.2020
Checked	:	PWJL
Revision	:	-

Ref:	CALCULATIONS		Output.
RESIDENTIAL DEVELOPMENT AT CIMLA COMMON, NEATH.			
Client: KWIC Construction			
RCA Brief: Surface water drainage design.			
Design Data:			
1 Percolation Test Results.			
2 BRE 365.			
3 Building Regulations Approved Document Part H.			
4 Sewers for Adoption 7th Edition.			
5 Site Location Co-Ordinates:			
E 276159			
N 196164			
6 Site Grid Reference: SS 76159 96164			
7 Time of Entry = 4 minutes.			
8 Welsh Ministers Standards.			
Information			
Provided: Architectural Site Plan.			
Percolation Test Result.			
Drainage			
Design By: Micro Drainage Source Control - Version 2020.1			
Revisions:			
Revision Version:		Description:	Date:
Calculations Prepared By:		Calculations Checked By:	
Ben Edwards		Philip Lawrence	
Signed:		Date:	Signed: Date:
		16.12.2020	16.12.2020
		Template Issue Date:	
		21/03/2016	

Roger Casey Associates		Page 1																																																																																																																																																																																																																																																																																		
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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 57 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 Control (l/s)</th><th>Max Σ Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>100.662</td><td>0.162</td><td>0.1</td><td>0.8</td><td>0.9</td><td>2.7</td><td>O K</td></tr><tr><td>30 min Summer</td><td>100.711</td><td>0.211</td><td>0.1</td><td>0.8</td><td>0.9</td><td>3.9</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>100.748</td><td>0.248</td><td>0.1</td><td>0.8</td><td>1.0</td><td>4.7</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>100.765</td><td>0.265</td><td>0.1</td><td>0.8</td><td>1.0</td><td>5.2</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>100.762</td><td>0.262</td><td>0.1</td><td>0.8</td><td>1.0</td><td>5.1</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>100.753</td><td>0.253</td><td>0.1</td><td>0.8</td><td>1.0</td><td>4.9</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>100.732</td><td>0.232</td><td>0.1</td><td>0.8</td><td>0.9</td><td>4.4</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>100.709</td><td>0.209</td><td>0.1</td><td>0.8</td><td>0.9</td><td>3.8</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>100.686</td><td>0.186</td><td>0.1</td><td>0.8</td><td>0.9</td><td>3.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>100.664</td><td>0.164</td><td>0.1</td><td>0.8</td><td>0.9</td><td>2.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>100.628</td><td>0.128</td><td>0.1</td><td>0.8</td><td>0.9</td><td>1.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>100.578</td><td>0.078</td><td>0.1</td><td>0.8</td><td>0.9</td><td>0.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>100.525</td><td>0.025</td><td>0.0</td><td>0.7</td><td>0.7</td><td>0.1</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>100.500</td><td>0.000</td><td>0.0</td><td>0.6</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>100.500</td><td>0.000</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>100.500</td><td>0.000</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>100.500</td><td>0.000</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>100.500</td><td>0.000</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>100.500</td><td>0.000</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>100.681</td><td>0.181</td><td>0.1</td><td>0.8</td><td>0.9</td><td>3.1</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak 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Summer</td><td>6.358</td><td>0.0</td><td>22.2</td><td>766</td></tr><tr><td>2160 min Summer</td><td>4.751</td><td>0.0</td><td>24.9</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>3.869</td><td>0.0</td><td>27.0</td><td>0</td></tr><tr><td>4320 min Summer</td><td>2.900</td><td>0.0</td><td>30.2</td><td>0</td></tr><tr><td>5760 min Summer</td><td>2.367</td><td>0.0</td><td>32.7</td><td>0</td></tr><tr><td>7200 min Summer</td><td>2.026</td><td>0.0</td><td>34.9</td><td>0</td></tr><tr><td>8640 min Summer</td><td>1.787</td><td>0.0</td><td>36.8</td><td>0</td></tr><tr><td>10080 min Summer</td><td>1.610</td><td>0.0</td><td>38.5</td><td>0</td></tr><tr><td>15 min Winter</td><td>105.672</td><td>0.0</td><td>4.0</td><td>22</td></tr></table>				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	100.662	0.162	0.1	0.8	0.9	2.7	O K	30 min Summer	100.711	0.211	0.1	0.8	0.9	3.9	Flood Risk	60 min Summer	100.748	0.248	0.1	0.8	1.0	4.7	Flood Risk	120 min Summer	100.765	0.265	0.1	0.8	1.0	5.2	Flood Risk	180 min Summer	100.762	0.262	0.1	0.8	1.0	5.1	Flood Risk	240 min Summer	100.753	0.253	0.1	0.8	1.0	4.9	Flood Risk	360 min Summer	100.732	0.232	0.1	0.8	0.9	4.4	Flood Risk	480 min Summer	100.709	0.209	0.1	0.8	0.9	3.8	Flood Risk	600 min Summer	100.686	0.186	0.1	0.8	0.9	3.3	O K	720 min Summer	100.664	0.164	0.1	0.8	0.9	2.7	O K	960 min Summer	100.628	0.128	0.1	0.8	0.9	1.9	O K	1440 min Summer	100.578	0.078	0.1	0.8	0.9	0.7	O K	2160 min Summer	100.525	0.025	0.0	0.7	0.7	0.1	O K	2880 min Summer	100.500	0.000	0.0	0.6	0.6	0.0	O K	4320 min Summer	100.500	0.000	0.0	0.5	0.5	0.0	O K	5760 min Summer	100.500	0.000	0.0	0.4	0.4	0.0	O K	7200 min Summer	100.500	0.000	0.0	0.3	0.3	0.0	O K	8640 min Summer	100.500	0.000	0.0	0.3	0.3	0.0	O K	10080 min Summer	100.500	0.000	0.0	0.3	0.3	0.0	O K	15 min Winter	100.681	0.181	0.1	0.8	0.9	3.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	105.672	0.0	3.5	22	30 min Summer	75.915	0.0	5.3	34	60 min Summer	52.299	0.0	7.4	56	120 min Summer	34.644	0.0	10.0	90	180 min Summer	26.617	0.0	11.6	126	240 min Summer	21.939	0.0	12.8	160	360 min Summer	16.693	0.0	14.5	228	480 min Summer	13.717	0.0	16.0	294	600 min Summer	11.762	0.0	17.1	356	720 min Summer	10.363	0.0	18.1	418	960 min Summer	8.473	0.0	19.8	536	1440 min Summer	6.358	0.0	22.2	766	2160 min Summer	4.751	0.0	24.9	1104	2880 min Summer	3.869	0.0	27.0	0	4320 min Summer	2.900	0.0	30.2	0	5760 min Summer	2.367	0.0	32.7	0	7200 min Summer	2.026	0.0	34.9	0	8640 min Summer	1.787	0.0	36.8	0	10080 min Summer	1.610	0.0	38.5	0	15 min Winter	105.672	0.0	4.0	22
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Innovyze		Source Control 2020.1					
Summary of Results for 100 year Return Period (+40%)							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	100.738	0.238	0.1	0.8	0.9	4.5	Flood Risk
60 min Winter	100.784	0.284	0.1	0.8	1.0	5.6	Flood Risk
120 min Winter	100.801	0.301	0.1	0.9	1.0	6.0	Flood Risk
180 min Winter	100.793	0.293	0.1	0.9	1.0	5.8	Flood Risk
240 min Winter	100.777	0.277	0.1	0.8	1.0	5.4	Flood Risk
360 min Winter	100.739	0.239	0.1	0.8	0.9	4.5	Flood Risk
480 min Winter	100.701	0.201	0.1	0.8	0.9	3.6	Flood Risk
600 min Winter	100.665	0.165	0.1	0.8	0.9	2.8	O K
720 min Winter	100.634	0.134	0.1	0.8	0.9	2.0	O K
960 min Winter	100.587	0.087	0.1	0.8	0.9	0.9	O K
1440 min Winter	100.517	0.017	0.0	0.7	0.7	0.0	O K
2160 min Winter	100.500	0.000	0.0	0.6	0.6	0.0	O K
2880 min Winter	100.500	0.000	0.0	0.5	0.5	0.0	O K
4320 min Winter	100.500	0.000	0.0	0.3	0.3	0.0	O K
5760 min Winter	100.500	0.000	0.0	0.3	0.3	0.0	O K
7200 min Winter	100.500	0.000	0.0	0.2	0.2	0.0	O K
8640 min Winter	100.500	0.000	0.0	0.2	0.2	0.0	O K
10080 min Winter	100.500	0.000	0.0	0.2	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	75.915	0.0	6.0	34			
60 min Winter	52.299	0.0	8.4	60			
120 min Winter	34.644	0.0	11.2	98			
180 min Winter	26.617	0.0	13.0	136			
240 min Winter	21.939	0.0	14.3	174			
360 min Winter	16.693	0.0	16.3	244			
480 min Winter	13.717	0.0	18.0	312			
600 min Winter	11.762	0.0	19.3	376			
720 min Winter	10.363	0.0	20.4	434			
960 min Winter	8.473	0.0	22.2	544			
1440 min Winter	6.358	0.0	25.0	746			
2160 min Winter	4.751	0.0	28.0	0			
2880 min Winter	3.869	0.0	30.3	0			
4320 min Winter	2.900	0.0	34.0	0			
5760 min Winter	2.367	0.0	36.8	0			
7200 min Winter	2.026	0.0	39.2	0			
8640 min Winter	1.787	0.0	41.4	0			
10080 min Winter	1.610	0.0	43.4	0			
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Ty Mansel 6 Mansel Street Carmarthen, SA31 1PX		Cimla Common Neath Plot 2 Porous Car Park	
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Innovyze		Source Control 2020.1	



Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 50 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	100.663	0.163	0.1	0.8	0.9	2.4	O K
30 min Summer	100.711	0.211	0.1	0.8	0.9	3.4	Flood Risk
60 min Summer	100.745	0.245	0.1	0.8	0.9	4.1	Flood Risk
120 min Summer	100.759	0.259	0.1	0.8	0.9	4.4	Flood Risk
180 min Summer	100.755	0.255	0.1	0.8	0.9	4.3	Flood Risk
240 min Summer	100.744	0.244	0.1	0.8	0.9	4.1	Flood Risk
360 min Summer	100.720	0.220	0.1	0.8	0.9	3.6	Flood Risk
480 min Summer	100.694	0.194	0.1	0.8	0.9	3.0	O K
600 min Summer	100.669	0.169	0.1	0.8	0.9	2.5	O K
720 min Summer	100.647	0.147	0.1	0.8	0.9	2.0	O K
960 min Summer	100.610	0.110	0.1	0.8	0.9	1.3	O K
1440 min Summer	100.561	0.061	0.1	0.8	0.8	0.4	O K
2160 min Summer	100.500	0.000	0.0	0.7	0.7	0.0	O K
2880 min Summer	100.500	0.000	0.0	0.6	0.6	0.0	O K
4320 min Summer	100.500	0.000	0.0	0.4	0.4	0.0	O K
5760 min Summer	100.500	0.000	0.0	0.3	0.3	0.0	O K
7200 min Summer	100.500	0.000	0.0	0.3	0.3	0.0	O K
8640 min Summer	100.500	0.000	0.0	0.3	0.3	0.0	O K
10080 min Summer	100.500	0.000	0.0	0.2	0.2	0.0	O K
15 min Winter	100.681	0.181	0.1	0.8	0.9	2.8	O K
30 min Winter	100.738	0.238	0.1	0.8	0.9	4.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	105.672	0.0	3.2	22
30 min Summer	75.915	0.0	4.8	33
60 min Summer	52.299	0.0	6.7	54
120 min Summer	34.644	0.0	9.0	88
180 min Summer	26.617	0.0	10.4	124
240 min Summer	21.939	0.0	11.5	158
360 min Summer	16.693	0.0	13.1	224
480 min Summer	13.717	0.0	14.4	290
600 min Summer	11.762	0.0	15.4	352
720 min Summer	10.363	0.0	16.3	412
960 min Summer	8.473	0.0	17.8	528
1440 min Summer	6.358	0.0	20.0	754
2160 min Summer	4.751	0.0	22.4	0
2880 min Summer	3.869	0.0	24.3	0
4320 min Summer	2.900	0.0	27.2	0
5760 min Summer	2.367	0.0	29.5	0
7200 min Summer	2.026	0.0	31.4	0
8640 min Summer	1.787	0.0	33.1	0
10080 min Summer	1.610	0.0	34.7	0
15 min Winter	105.672	0.0	3.7	22
30 min Winter	75.915	0.0	5.4	34

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Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.500	Shortest Storm (mins)	15
Ratio R	0.238	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.018

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4	0.006	4	8	0.006
				8	12
					0.006

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