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104 Yorkshire St Rochdale Lancashire OL16 1JY	attenuation system CRH chestnut way Iboro	
Date may 2023 File calc-tjba-CRH-chestnut way-atenua...	Designed By ds Checked By	
Micro Drainage	Source Control W.10.4	

Summary of Results for 30 year Return Period (+40%)

Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
15 Summer	6.5	6.5	165.6637	0.4037	22.0	O K
30 Summer	6.5	6.5	165.7452	0.4852	29.5	O K
60 Summer	6.5	6.5	165.7822	0.5222	33.7	O K
120 Summer	6.5	6.5	165.8327	0.5727	38.7	O K
180 Summer	6.5	6.5	165.8167	0.5567	37.2	O K
240 Summer	6.5	6.5	165.7962	0.5362	35.1	O K
360 Summer	6.5	6.5	165.7532	0.4932	30.4	O K
480 Summer	6.5	6.5	165.7052	0.4452	25.5	O K
600 Summer	6.5	6.5	165.6472	0.3872	20.8	O K
720 Summer	6.5	6.5	165.5892	0.3292	16.7	O K
960 Summer	6.5	6.5	165.4883	0.2282	10.2	O K
1440 Summer	6.2	6.2	165.3377	0.0778	3.4	O K
2160 Summer	5.1	5.1	165.2687	0.0088	0.4	O K
2880 Summer	4.2	4.2	165.2600	0.0000	0.0	O K
4320 Summer	3.1	3.1	165.2600	0.0000	0.0	O K
5760 Summer	2.6	2.6	165.2600	0.0000	0.0	O K
7200 Summer	2.2	2.2	165.2600	0.0000	0.0	O K
8640 Summer	1.9	1.9	165.2600	0.0000	0.0	O K
10080 Summer	1.7	1.7	165.2600	0.0000	0.0	O K
15 Winter	6.5	6.5	165.7142	0.4542	26.3	O K
30 Winter	6.5	6.5	165.8353	0.5752	38.9	O K
60 Winter	6.5	6.5	165.9157	0.6558	45.5	O K
120 Winter	6.5	6.5	165.9232	0.6633	46.1	O K
180 Winter	6.5	6.5	165.8913	0.6313	43.5	O K
240 Winter	6.5	6.5	165.8467	0.5868	39.9	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	68.99	17
30 Summer	47.08	31
60 Summer	30.81	56
120 Summer	19.53	94
180 Summer	14.75	128
240 Summer	12.05	162
360 Summer	9.05	228
480 Summer	7.38	292
600 Summer	6.29	354
720 Summer	5.52	414
960 Summer	4.49	530
1440 Summer	3.35	752
2160 Summer	2.49	1104
2880 Summer	2.02	0
4320 Summer	1.50	0
5760 Summer	1.21	0
7200 Summer	1.03	0
8640 Summer	0.90	0
10080 Summer	0.81	0
15 Winter	68.99	17
30 Winter	47.08	33
60 Winter	30.81	60
120 Winter	19.53	104
180 Winter	14.75	140
240 Winter	12.05	176

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Storm Duration (mins)	Maximum Control (l/s)	Maximum Outflow (l/s)	Maximum Water Level (m OD)	Maximum Depth (m)	Maximum Volume (m ³)	Status
360 Winter	6.5	6.5	165.7642	0.5042	31.6	O K
480 Winter	6.5	6.5	165.6822	0.4222	23.5	O K
600 Winter	6.5	6.5	165.5842	0.3242	16.4	O K
720 Winter	6.5	6.5	165.4962	0.2362	10.6	O K
960 Winter	6.2	6.2	165.3487	0.0888	3.9	O K
1440 Winter	5.0	5.0	165.2643	0.0043	0.2	O K
2160 Winter	3.8	3.8	165.2600	0.0000	0.0	O K
2880 Winter	3.1	3.1	165.2600	0.0000	0.0	O K
4320 Winter	2.3	2.3	165.2600	0.0000	0.0	O K
5760 Winter	1.9	1.9	165.2600	0.0000	0.0	O K
7200 Winter	1.6	1.6	165.2600	0.0000	0.0	O K
8640 Winter	1.4	1.4	165.2600	0.0000	0.0	O K
10080 Winter	1.2	1.2	165.2600	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
360 Winter	9.05	248
480 Winter	7.38	312
600 Winter	6.29	370
720 Winter	5.52	426
960 Winter	4.49	526
1440 Winter	3.35	742
2160 Winter	2.49	0
2880 Winter	2.02	0
4320 Winter	1.50	0
5760 Winter	1.21	0
7200 Winter	1.03	0
8640 Winter	0.90	0
10080 Winter	0.81	0

Rainfall Details

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	30	Longest Storm (mins)	10080
M5-60 (mm)	20.000	Summer Storms	Yes
Ratio-R	0.300	Winter Storms	Yes
Cv (Summer)	0.750	Climate Change %	+40
Cv (Winter)	0.840		

Pipe Network

Volume in Pipe Network (m³)	5	Dia of Outfall Pipe (m)	0.200
Slope of Outfall Pipe (1:x)	100.0	Roughness of Outfall Pipe	0.600

Time / Area Diagram

Total Area (ha) = 0.182

Time	(mins)	Area
from:	to:	(ha)
0	4	0.182

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Tank/Pond Details

Invert Level (m) 165.260 Ground Level (m) 166.400

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.00	44.3	0.60	81.0	1.20	2.0	1.80	2.0	2.40	2.0
0.10	44.3	0.70	81.0	1.30	2.0	1.90	2.0	2.50	2.0
0.20	44.3	0.80	81.0	1.40	2.0	2.00	2.0		
0.30	71.3	0.90	54.0	1.50	2.0	2.10	2.0		
0.40	71.3	1.00	54.0	1.60	2.0	2.20	2.0		
0.50	116.3	1.10	9.0	1.70	2.0	2.30	2.0		

Depth / Flow Outflow Control

Invert Level of Control 165.120

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.10	4.1	0.80	5.3	2.00	8.7	4.00	12.2	7.00	16.2
0.20	6.1	1.00	5.9	2.20	9.1	4.50	13.0	7.50	16.8
0.30	6.5	1.20	6.4	2.40	9.5	5.00	13.7	8.00	17.3
0.40	6.5	1.40	6.9	2.60	9.9	5.50	14.4	8.50	17.8
0.50	6.4	1.60	7.7	3.00	10.6	6.00	15.0	9.00	18.4
0.60	6.2	1.80	8.2	3.50	11.5	6.50	15.6	9.50	18.9