

T J Booth Associates		Page 1
104 Yorkshire St Rochdale Lancashire OL16 1JY	attenuation system CRH chestnut way lboro	
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 100 year Return Period (+45%)

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	165.8142	0.5542	37.0	O K
30 Summer	6.5	6.5	165.9157	0.6558	45.5	O K
60 Summer	6.5	6.5	166.0293	0.7693	54.7	O K
120 Summer	6.5	6.5	166.1173	0.8573	61.4	O K
180 Summer	6.5	6.5	166.0983	0.8383	60.1	O K
240 Summer	6.5	6.5	166.0742	0.8143	58.3	O K
360 Summer	6.5	6.5	166.0222	0.7623	54.2	O K
480 Summer	6.5	6.5	165.9622	0.7023	49.3	O K
600 Summer	6.5	6.5	165.8922	0.6323	43.6	O K
720 Summer	6.5	6.5	165.8217	0.5617	37.7	O K
960 Summer	6.5	6.5	165.7212	0.4612	27.0	O K
1440 Summer	6.5	6.5	165.5242	0.2642	12.3	O K
2160 Summer	6.1	6.1	165.3307	0.0708	3.1	O K
2880 Summer	5.2	5.2	165.2757	0.0158	0.7	O K
4320 Summer	3.9	3.9	165.2600	0.0000	0.0	O K
5760 Summer	3.1	3.1	165.2600	0.0000	0.0	O K
7200 Summer	2.7	2.7	165.2600	0.0000	0.0	O K
8640 Summer	2.3	2.3	165.2600	0.0000	0.0	O K
10080 Summer	2.1	2.1	165.2600	0.0000	0.0	O K
15 Winter	6.5	6.5	165.8257	0.5657	38.0	O K
30 Winter	6.5	6.5	166.0052	0.7453	52.8	O K
60 Winter	6.5	6.5	166.2388	0.9788	68.2	FLOOD RISK
120 Winter	6.5	6.5	166.3483	1.0883	72.4	FLOOD RISK
180 Winter	6.5	6.5	166.2788	1.0188	70.3	FLOOD RISK
240 Winter	6.5	6.5	166.2258	0.9658	67.5	FLOOD RISK

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
15 Summer	89.23	20
30 Summer	61.54	32
60 Summer	40.51	60
120 Summer	25.63	104
180 Summer	19.23	136
240 Summer	15.63	172
360 Summer	11.65	242
480 Summer	9.44	312
600 Summer	8.01	378
720 Summer	7.00	442
960 Summer	5.65	560
1440 Summer	4.17	784
2160 Summer	3.07	1108
2880 Summer	2.46	1468
4320 Summer	1.81	0
5760 Summer	1.45	0
7200 Summer	1.23	0
8640 Summer	1.07	0
10080 Summer	0.95	0
15 Winter	89.23	18
30 Winter	61.54	32
60 Winter	40.51	62
120 Winter	25.63	114
180 Winter	19.23	144
240 Winter	15.63	184

T J Booth Associates		Page 2
104 Yorkshire St Rochdale Lancashire OL16 1JY	attenuation system CRH chestnut way lboro	
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 100 year Return Period (+45%)

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	166.1098	0.8498	60.9	O K
480 Winter	6.5	6.5	166.0103	0.7503	53.2	O K
600 Winter	6.5	6.5	165.8983	0.6383	44.1	O K
720 Winter	6.5	6.5	165.7877	0.5277	34.2	O K
960 Winter	6.5	6.5	165.6137	0.3537	18.5	O K
1440 Winter	6.2	6.2	165.3398	0.0798	3.5	O K
2160 Winter	4.8	4.8	165.2600	0.0000	0.0	O K
2880 Winter	3.8	3.8	165.2600	0.0000	0.0	O K
4320 Winter	2.8	2.8	165.2600	0.0000	0.0	O K
5760 Winter	2.3	2.3	165.2600	0.0000	0.0	O K
7200 Winter	2.0	2.0	165.2600	0.0000	0.0	O K
8640 Winter	1.7	1.7	165.2600	0.0000	0.0	O K
10080 Winter	1.5	1.5	165.2600	0.0000	0.0	O K

Storm Duration (mins)	Rain (mm/hr)	Time-Peak (mins)
360 Winter	11.65	262
480 Winter	9.44	338
600 Winter	8.01	412
720 Winter	7.00	470
960 Winter	5.65	580
1440 Winter	4.17	768
2160 Winter	3.07	0
2880 Winter	2.46	0
4320 Winter	1.81	0
5760 Winter	1.45	0
7200 Winter	1.23	0
8640 Winter	1.07	0
10080 Winter	0.95	0

T J Booth Associates		Page 3
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	

Rainfall Details

Region	ENG+WAL	Shortest Storm (mins)	15
Return Period (years)	100	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 %	+45
Cv (Winter)	0.840		

Pipe Network

Volume in Pipe Network (m ³)	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

T J Booth Associates		Page 4
104 Yorkshire St Rochdale Lancashire OL16 1JY	attenuation system CRH chestnut way lboro	
Date may 2023 File calc-tjba-CRH-chestnut way-atenua...	Designed By ds Checked By	
Micro Drainage	Source Control W.10.4	

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