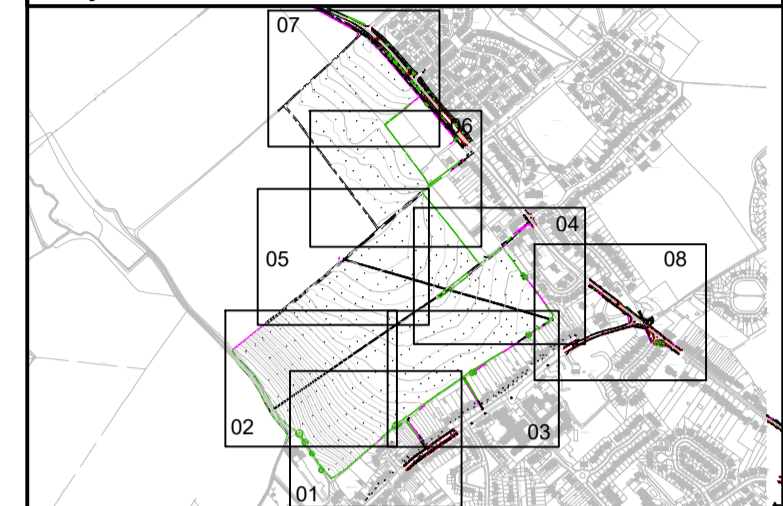




Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. No scale factor has been applied to this survey, therefore the OS coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
8. OS license number: 100022432

Key Plan



Legend

OS Buildings	Contour Lines
Surveyed Buildings	Inspection Chamber
Building	Flow direction and pipe diameter
Wall	Station and Name
Kerb Channel Line	Monitoring Borehole
Top of Kerb	Tree / Bush / Sapling
Top of Surface	Area of Vegetation/ Extent of Tree Canopy
Top of Bank	Hedge
Bottom of Bank	Body of Water
Canopy / Overhang	Body of Water from OS
Line Marking	Spot Level
Centre Line	Assumed Surface
Watercourse	Water Drainage Line
Centre Line	Surface Water Drainage Line
Barrier	
Fence	
Gate	
Overhead Powerline	
Overhead Utilities	

AP Anchor Point	FBW Fence Barbed Wire	LB Litter Bin
BG Back Gully	FCB Fence Closed Board	LP Lamp Post
BO Bollard	FCL Fence Chain Link	MH Manhole
BS Bus Stop	FEL Fence Electric	Mkr Service Marker
BT British Telecom	FMP Fence Metal Panel	PB Post Box
C Crest	FMR Fence Metal Railing	PT Post
CL Cover Level	FOB Fence Open Board	RE Rodding Eye
CMP Cable Marker	FPW Fence Post & Wire	SP Sign Post
Post	FSP Fence Steel Palisade	ST Stop Tap
CCTV Security Camera	FWM Fence Wire Mesh	SV Stop Valve
CITY Cable TV	FFL Finished Floor Level	TCB Telephone Call Box
DC Drainage	FP Flagpole	THL Threshold Level
Channel	Gas	TL Traffic Light
DK Drop Kerb	GV Gas Valve	TP Telegraph Post
DP Down Pipe	GY Gully	TS Traffic Signal
Elec Electric	Ht Height	UTS Unable to Survey
EP Electricity Post	IC Inspection Chamber	WL Water Level
ER Earth Rod	IFL Internal Floor Level	WM Water Meter
FH Fire Hydrant	IL Invert Level	WVO Wash Out
FL Floodlight	(as a reduced level)	

P1	05.08.19	First Issue	IR	DG
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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www.bwbconsulting.com

Client
Richborough Estates

Project Title
Sandwich Road, Sholden


Drawing Title
**Existing Site Plan
Sheet 10 of 10**

Drawn:	I.Riley	Reviewed:	D.Gibbons
BWB Ref:	BMW2914	Date:	18.07.19
Scale@A1:	1:500		

INFORMATION

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
SRS-BWB-00-01-DR-G-0001	S2	P1

Appendix 3: Existing Runoff Rates

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		
Date 19/10/2020 12:26 File	Designed by Heather.Griffiths Checked by	
XP Solutions		Source Control 2018.1

ICP SUDS Mean Annual Flood


Input

Return Period (years)	2	Soil	0.150
Area (ha)	1.000	Urban	0.000
SAAR (mm)	732	Region Number	Region 7

Results 1/s

QBAR Rural	0.4
QBAR Urban	0.4
Q2 years	0.4
Q1 year	0.4
Q30 years	1.0
Q100 years	1.4

Appendix 4: Attenuated Storage Calculations


BWB Consulting Ltd		Page 1
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 20% FEH	
Date 03/02/2021 16:33 File Catchment 1.srcx	Designed by Catherine.Thorpe Checked by	
XP Solutions		Source Control 2018.1

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1572 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.172	1.172	2.9	176.3	O K
30 min Summer	99.232	1.232	3.1	232.8	O K
60 min Summer	99.290	1.290	3.3	289.2	O K
120 min Summer	99.347	1.347	3.4	347.4	O K
180 min Summer	99.385	1.385	3.5	386.6	O K
240 min Summer	99.415	1.415	3.6	417.6	O K
360 min Summer	99.462	1.462	3.7	468.5	O K
480 min Summer	99.499	1.499	3.8	508.5	O K
600 min Summer	99.527	1.527	3.9	540.1	O K
720 min Summer	99.549	1.549	4.0	565.3	O K
960 min Summer	99.580	1.580	4.1	600.5	O K
1440 min Summer	99.608	1.608	4.2	632.4	O K
2160 min Summer	99.614	1.614	4.2	640.1	O K
2880 min Summer	99.604	1.604	4.1	628.8	O K
4320 min Summer	99.568	1.568	4.0	586.8	O K
5760 min Summer	99.529	1.529	3.9	542.7	O K
7200 min Summer	99.492	1.492	3.8	500.6	O K
8640 min Summer	99.456	1.456	3.7	462.0	O K
10080 min Summer	99.423	1.423	3.6	426.6	O K
15 min Winter	99.195	1.195	3.0	197.8	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.520	0.0	26
30 min Summer	79.200	0.0	41
60 min Summer	49.680	0.0	70
120 min Summer	30.420	0.0	130
180 min Summer	22.974	0.0	188
240 min Summer	18.930	0.0	248
360 min Summer	14.600	0.0	366
480 min Summer	12.231	0.0	484
600 min Summer	10.678	0.0	604
720 min Summer	9.560	0.0	722
960 min Summer	8.012	0.0	960
1440 min Summer	6.155	0.0	1230
2160 min Summer	4.620	0.0	1608
2880 min Summer	3.725	0.0	2020
4320 min Summer	2.708	0.0	2852
5760 min Summer	2.149	0.0	3680
7200 min Summer	1.792	0.0	4472
8640 min Summer	1.544	0.0	5280
10080 min Summer	1.362	0.0	6056
15 min Winter	119.520	0.0	26

BWB Consulting Ltd		Page 2
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 20% FEH	
Date 03/02/2021 16:33 File Catchment 1.srcx	Designed by Catherine.Thorpe Checked by	
XP Solutions		Source Control 2018.1

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.261	1.261	3.2	261.1	O K
60 min Winter	99.325	1.325	3.4	324.7	O K
120 min Winter	99.389	1.389	3.5	390.7	O K
180 min Winter	99.431	1.431	3.7	435.4	O K
240 min Winter	99.465	1.465	3.7	471.2	O K
360 min Winter	99.518	1.518	3.9	530.0	O K
480 min Winter	99.560	1.560	4.0	577.0	O K
600 min Winter	99.592	1.592	4.1	614.5	O K
720 min Winter	99.618	1.618	4.2	644.9	O K
960 min Winter	99.655	1.655	4.3	689.1	O K
1440 min Winter	99.689	1.689	4.4	729.0	O K
2160 min Winter	99.693	1.693	4.4	734.1	O K
2880 min Winter	99.680	1.680	4.4	718.6	O K
4320 min Winter	99.631	1.631	4.2	659.4	O K
5760 min Winter	99.575	1.575	4.1	595.2	O K
7200 min Winter	99.522	1.522	3.9	534.0	O K
8640 min Winter	99.471	1.471	3.8	478.1	O K
10080 min Winter	99.424	1.424	3.6	427.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	79.200	0.0	41
60 min Winter	49.680	0.0	70
120 min Winter	30.420	0.0	128
180 min Winter	22.974	0.0	186
240 min Winter	18.930	0.0	244
360 min Winter	14.600	0.0	360
480 min Winter	12.231	0.0	476
600 min Winter	10.678	0.0	590
720 min Winter	9.560	0.0	706
960 min Winter	8.012	0.0	930
1440 min Winter	6.155	0.0	1358
2160 min Winter	4.620	0.0	1696
2880 min Winter	3.725	0.0	2164
4320 min Winter	2.708	0.0	3076
5760 min Winter	2.149	0.0	3976
7200 min Winter	1.792	0.0	4832
8640 min Winter	1.544	0.0	5632
10080 min Winter	1.362	0.0	6456

BWB Consulting Ltd		Page 3
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 20% FEH	
Date 03/02/2021 16:33 File Catchment 1.srcx	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	


Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.800

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.267	4 8	0.267	8 12	0.266

BWB Consulting Ltd		Page 4
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 20% FEH	
Date 03/02/2021 16:33 File Catchment 1.srcx	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.01800	Trench Width (m)	0.5
Infiltration Coefficient Side (m/hr)	0.01800	Trench Length (m)	50.0
Safety Factor	1.5	Slope (1:X)	0.0
Porosity	0.95	Cap Volume Depth (m)	0.000
Invert Level (m)	98.000	Cap Infiltration Depth (m)	1.000

Infiltration Basin

Invert Level (m)	99.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.01800	Porosity	1.00
Infiltration Coefficient Side (m/hr)	0.01800		

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	820.0	1.000	1384.0


BWB Consulting Ltd		Page 1
Waterfront House Nottingham NG2 3DQ	Catchment 1 100 yr + 20% FSR	
Date 03/02/2021 16:40 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1215 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.184	1.184	3.0	187.3	O K
30 min Summer	99.244	1.244	3.1	244.6	O K
60 min Summer	99.302	1.302	3.3	302.0	O K
120 min Summer	99.355	1.355	3.4	355.7	O K
180 min Summer	99.382	1.382	3.5	382.8	O K
240 min Summer	99.397	1.397	3.6	399.4	O K
360 min Summer	99.417	1.417	3.6	420.2	O K
480 min Summer	99.427	1.427	3.6	430.6	O K
600 min Summer	99.431	1.431	3.7	435.3	O K
720 min Summer	99.432	1.432	3.7	436.3	O K
960 min Summer	99.428	1.428	3.6	432.1	O K
1440 min Summer	99.418	1.418	3.6	420.7	O K
2160 min Summer	99.399	1.399	3.6	400.5	O K
2880 min Summer	99.378	1.378	3.5	379.0	O K
4320 min Summer	99.338	1.338	3.4	337.5	O K
5760 min Summer	99.300	1.300	3.3	299.7	O K
7200 min Summer	99.266	1.266	3.2	265.8	O K
8640 min Summer	99.234	1.234	3.1	235.4	O K
10080 min Summer	99.206	1.206	3.0	208.6	O K
15 min Winter	99.208	1.208	3.0	210.1	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	126.866	0.0	26
30 min Summer	83.165	0.0	41
60 min Summer	51.831	0.0	70
120 min Summer	31.128	0.0	130
180 min Summer	22.756	0.0	188
240 min Summer	18.145	0.0	248
360 min Summer	13.193	0.0	366
480 min Summer	10.507	0.0	484
600 min Summer	8.800	0.0	602
720 min Summer	7.610	0.0	722
960 min Summer	6.046	0.0	884
1440 min Summer	4.364	0.0	1116
2160 min Summer	3.145	0.0	1512
2880 min Summer	2.490	0.0	1912
4320 min Summer	1.790	0.0	2732
5760 min Summer	1.414	0.0	3528
7200 min Summer	1.178	0.0	4328
8640 min Summer	1.013	0.0	5096
10080 min Summer	0.893	0.0	5848
15 min Winter	126.866	0.0	26

BWB Consulting Ltd		Page 2
Waterfront House Nottingham NG2 3DQ	Catchment 1 100 yr + 20% FSR	
Date 03/02/2021 16:40 File	Designed by Catherine.Thorpe Checked by	
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Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.275	1.275	3.2	274.4	O K
60 min Winter	99.339	1.339	3.4	339.0	O K
120 min Winter	99.398	1.398	3.6	400.0	O K
180 min Winter	99.427	1.427	3.6	431.2	O K
240 min Winter	99.446	1.446	3.7	450.7	O K
360 min Winter	99.469	1.469	3.8	475.6	O K
480 min Winter	99.481	1.481	3.8	489.2	O K
600 min Winter	99.488	1.488	3.8	496.3	O K
720 min Winter	99.490	1.490	3.8	499.3	O K
960 min Winter	99.489	1.489	3.8	497.8	O K
1440 min Winter	99.474	1.474	3.8	481.2	O K
2160 min Winter	99.450	1.450	3.7	455.4	O K
2880 min Winter	99.422	1.422	3.6	425.5	O K
4320 min Winter	99.365	1.365	3.5	365.4	O K
5760 min Winter	99.311	1.311	3.3	310.6	O K
7200 min Winter	99.262	1.262	3.2	261.8	O K
8640 min Winter	99.217	1.217	3.1	219.0	O K
10080 min Winter	99.178	1.178	3.0	181.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	83.165	0.0	41
60 min Winter	51.831	0.0	70
120 min Winter	31.128	0.0	128
180 min Winter	22.756	0.0	186
240 min Winter	18.145	0.0	244
360 min Winter	13.193	0.0	360
480 min Winter	10.507	0.0	474
600 min Winter	8.800	0.0	588
720 min Winter	7.610	0.0	700
960 min Winter	6.046	0.0	920
1440 min Winter	4.364	0.0	1176
2160 min Winter	3.145	0.0	1624
2880 min Winter	2.490	0.0	2080
4320 min Winter	1.790	0.0	2948
5760 min Winter	1.414	0.0	3808
7200 min Winter	1.178	0.0	4616
8640 min Winter	1.013	0.0	5368
10080 min Winter	0.893	0.0	6144

BWB Consulting Ltd		Page 3
Waterfront House Nottingham NG2 3DQ	Catchment 1 100 yr + 20% FSR	
Date 03/02/2021 16:40 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	


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)	21.300	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.800

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.267		0.267		0.266

BWB Consulting Ltd		Page 4
Waterfront House Nottingham NG2 3DQ	Catchment 1 100 yr + 20% FSR	
Date 03/02/2021 16:40 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.01800	Trench Width (m)	0.5
Infiltration Coefficient Side (m/hr)	0.01800	Trench Length (m)	50.0
Safety Factor	1.5	Slope (1:X)	0.0
Porosity	0.95	Cap Volume Depth (m)	0.000
Invert Level (m)	98.000	Cap Infiltration Depth (m)	1.000

Infiltration Basin

Invert Level (m)	99.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.01800	Porosity	1.00
Infiltration Coefficient Side (m/hr)	0.01800		

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	820.0	1.000	1384.0


BWB Consulting Ltd		Page 1
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 40% FEH	
Date 03/02/2021 16:34 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	

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

Half Drain Time : 1755 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.204	1.204	3.0	206.1	O K
30 min Summer	99.272	1.272	3.2	272.1	O K
60 min Summer	99.338	1.338	3.4	338.3	O K
120 min Summer	99.405	1.405	3.6	407.1	O K
180 min Summer	99.449	1.449	3.7	453.7	O K
240 min Summer	99.483	1.483	3.8	491.0	O K
360 min Summer	99.538	1.538	4.0	552.3	O K
480 min Summer	99.581	1.581	4.1	601.1	O K
600 min Summer	99.614	1.614	4.2	640.1	O K
720 min Summer	99.641	1.641	4.3	671.6	O K
960 min Summer	99.679	1.679	4.4	716.9	O K
1440 min Summer	99.712	1.712	4.5	758.1	Flood Risk
2160 min Summer	99.723	1.723	4.5	770.8	Flood Risk
2880 min Summer	99.714	1.714	4.5	760.7	Flood Risk
4320 min Summer	99.678	1.678	4.4	716.1	O K
5760 min Summer	99.638	1.638	4.2	668.1	O K
7200 min Summer	99.599	1.599	4.1	622.2	O K
8640 min Summer	99.562	1.562	4.0	579.7	O K
10080 min Summer	99.528	1.528	3.9	540.9	O K
15 min Winter	99.230	1.230	3.1	231.1	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	139.440	0.0	27
30 min Summer	92.400	0.0	41
60 min Summer	57.960	0.0	70
120 min Summer	35.490	0.0	130
180 min Summer	26.804	0.0	188
240 min Summer	22.085	0.0	248
360 min Summer	17.033	0.0	366
480 min Summer	14.269	0.0	486
600 min Summer	12.458	0.0	604
720 min Summer	11.153	0.0	724
960 min Summer	9.347	0.0	962
1440 min Summer	7.181	0.0	1290
2160 min Summer	5.390	0.0	1668
2880 min Summer	4.346	0.0	2056
4320 min Summer	3.160	0.0	2896
5760 min Summer	2.507	0.0	3696
7200 min Summer	2.090	0.0	4544
8640 min Summer	1.801	0.0	5360
10080 min Summer	1.589	0.0	6152
15 min Winter	139.440	0.0	26

BWB Consulting Ltd		Page 2
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 40% FEH	
Date 03/02/2021 16:34 File	Designed by Catherine.Thorpe Checked by	
XP Solutions		Source Control 2018.1

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.306	1.306	3.3	305.2	O K
60 min Winter	99.379	1.379	3.5	379.8	O K
120 min Winter	99.452	1.452	3.7	457.7	O K
180 min Winter	99.501	1.501	3.9	510.9	O K
240 min Winter	99.539	1.539	4.0	553.6	O K
360 min Winter	99.601	1.601	4.1	624.3	O K
480 min Winter	99.649	1.649	4.3	681.2	O K
600 min Winter	99.687	1.687	4.4	727.1	O K
720 min Winter	99.718	1.718	4.5	764.8	Flood Risk
960 min Winter	99.762	1.762	4.6	820.5	Flood Risk
1440 min Winter	99.805	1.805	4.7	874.7	Flood Risk
2160 min Winter	99.813	1.813	4.8	884.4	Flood Risk
2880 min Winter	99.803	1.803	4.7	871.6	Flood Risk
4320 min Winter	99.755	1.755	4.6	810.6	Flood Risk
5760 min Winter	99.699	1.699	4.4	741.7	O K
7200 min Winter	99.644	1.644	4.3	675.2	O K
8640 min Winter	99.592	1.592	4.1	613.9	O K
10080 min Winter	99.543	1.543	4.0	558.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.400	0.0	41
60 min Winter	57.960	0.0	70
120 min Winter	35.490	0.0	128
180 min Winter	26.804	0.0	186
240 min Winter	22.085	0.0	244
360 min Winter	17.033	0.0	360
480 min Winter	14.269	0.0	476
600 min Winter	12.458	0.0	592
720 min Winter	11.153	0.0	708
960 min Winter	9.347	0.0	934
1440 min Winter	7.181	0.0	1370
2160 min Winter	5.390	0.0	1740
2880 min Winter	4.346	0.0	2196
4320 min Winter	3.160	0.0	3116
5760 min Winter	2.507	0.0	4032
7200 min Winter	2.090	0.0	4896
8640 min Winter	1.801	0.0	5712
10080 min Winter	1.589	0.0	6560

BWB Consulting Ltd		Page 3
Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 40% FEH	
Date 03/02/2021 16:34 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	


Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.800

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.267	4 8	0.267	8 12	0.266

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Waterfront House Nottingham NG2 3DQ	Catchment 1 100yr plus 40% FEH	
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XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 50.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	820.0	1.000	1384.0


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Waterfront House Nottingham NG2 3DQ	Catchment 1 30 yr FEH	
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XP Solutions		Source Control 2018.1

Summary of Results for 30 year Return Period

Half Drain Time : 980 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.104	1.104	2.7	114.2	O K
30 min Summer	99.142	1.142	2.9	148.9	O K
60 min Summer	99.180	1.180	3.0	184.1	O K
120 min Summer	99.223	1.223	3.1	223.9	O K
180 min Summer	99.247	1.247	3.1	247.9	O K
240 min Summer	99.265	1.265	3.2	264.7	O K
360 min Summer	99.288	1.288	3.3	287.4	O K
480 min Summer	99.302	1.302	3.3	301.7	O K
600 min Summer	99.311	1.311	3.3	310.9	O K
720 min Summer	99.317	1.317	3.3	316.9	O K
960 min Summer	99.326	1.326	3.4	325.6	O K
1440 min Summer	99.335	1.335	3.4	334.5	O K
2160 min Summer	99.333	1.333	3.4	332.9	O K
2880 min Summer	99.323	1.323	3.3	322.7	O K
4320 min Summer	99.293	1.293	3.3	293.1	O K
5760 min Summer	99.264	1.264	3.2	263.9	O K
7200 min Summer	99.236	1.236	3.1	237.3	O K
8640 min Summer	99.212	1.212	3.0	213.9	O K
10080 min Summer	99.190	1.190	3.0	193.3	O K
15 min Winter	99.120	1.120	2.8	128.1	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	77.807	0.0	26
30 min Summer	51.020	0.0	41
60 min Summer	31.954	0.0	70
120 min Summer	19.912	0.0	128
180 min Summer	15.040	0.0	188
240 min Summer	12.317	0.0	246
360 min Summer	9.302	0.0	364
480 min Summer	7.630	0.0	482
600 min Summer	6.546	0.0	600
720 min Summer	5.778	0.0	688
960 min Summer	4.748	0.0	804
1440 min Summer	3.601	0.0	1062
2160 min Summer	2.708	0.0	1476
2880 min Summer	2.197	0.0	1884
4320 min Summer	1.617	0.0	2724
5760 min Summer	1.299	0.0	3520
7200 min Summer	1.097	0.0	4264
8640 min Summer	0.958	0.0	5024
10080 min Summer	0.857	0.0	5760
15 min Winter	77.807	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 1 30 yr FEH	
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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.162	1.162	2.9	167.1	O K
60 min Winter	99.205	1.205	3.0	206.8	O K
120 min Winter	99.252	1.252	3.2	252.1	O K
180 min Winter	99.280	1.280	3.2	279.6	O K
240 min Winter	99.300	1.300	3.3	299.2	O K
360 min Winter	99.326	1.326	3.4	326.0	O K
480 min Winter	99.344	1.344	3.4	343.6	O K
600 min Winter	99.355	1.355	3.4	355.7	O K
720 min Winter	99.363	1.363	3.5	364.0	O K
960 min Winter	99.373	1.373	3.5	373.5	O K
1440 min Winter	99.380	1.380	3.5	381.1	O K
2160 min Winter	99.375	1.375	3.5	375.7	O K
2880 min Winter	99.358	1.358	3.4	358.8	O K
4320 min Winter	99.313	1.313	3.3	313.0	O K
5760 min Winter	99.269	1.269	3.2	268.7	O K
7200 min Winter	99.228	1.228	3.1	229.1	O K
8640 min Winter	99.192	1.192	3.0	194.7	O K
10080 min Winter	99.160	1.160	2.9	165.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	51.020	0.0	40
60 min Winter	31.954	0.0	70
120 min Winter	19.912	0.0	126
180 min Winter	15.040	0.0	184
240 min Winter	12.317	0.0	242
360 min Winter	9.302	0.0	358
480 min Winter	7.630	0.0	472
600 min Winter	6.546	0.0	584
720 min Winter	5.778	0.0	694
960 min Winter	4.748	0.0	904
1440 min Winter	3.601	0.0	1130
2160 min Winter	2.708	0.0	1600
2880 min Winter	2.197	0.0	2052
4320 min Winter	1.617	0.0	2940
5760 min Winter	1.299	0.0	3752
7200 min Winter	1.097	0.0	4544
8640 min Winter	0.958	0.0	5352
10080 min Winter	0.857	0.0	6056

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Waterfront House Nottingham NG2 3DQ	Catchment 1 30 yr FEH	
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.800

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.267		0.267		0.266

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Waterfront House Nottingham NG2 3DQ	Catchment 1 30 yr FEH	
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Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 50.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	820.0	1.000	1384.0


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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FEH	
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Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1531 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.171	1.171	3.3	198.4	O K
30 min Summer	99.231	1.231	3.5	261.9	O K
60 min Summer	99.290	1.290	3.7	325.3	O K
120 min Summer	99.348	1.348	3.9	390.8	O K
180 min Summer	99.386	1.386	4.0	434.8	O K
240 min Summer	99.416	1.416	4.1	469.7	O K
360 min Summer	99.463	1.463	4.3	526.7	O K
480 min Summer	99.500	1.500	4.4	571.5	O K
600 min Summer	99.528	1.528	4.5	606.8	O K
720 min Summer	99.550	1.550	4.6	634.8	O K
960 min Summer	99.581	1.581	4.7	673.9	O K
1440 min Summer	99.608	1.608	4.8	709.6	O K
2160 min Summer	99.615	1.615	4.8	718.4	O K
2880 min Summer	99.605	1.605	4.8	705.7	O K
4320 min Summer	99.569	1.569	4.6	658.2	O K
5760 min Summer	99.529	1.529	4.5	608.2	O K
7200 min Summer	99.491	1.491	4.4	560.7	O K
8640 min Summer	99.455	1.455	4.3	517.0	O K
10080 min Summer	99.422	1.422	4.1	477.1	O K
15 min Winter	99.194	1.194	3.4	222.5	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.520	0.0	26
30 min Summer	79.200	0.0	41
60 min Summer	49.680	0.0	70
120 min Summer	30.420	0.0	130
180 min Summer	22.974	0.0	188
240 min Summer	18.930	0.0	248
360 min Summer	14.600	0.0	366
480 min Summer	12.231	0.0	484
600 min Summer	10.678	0.0	604
720 min Summer	9.560	0.0	722
960 min Summer	8.012	0.0	960
1440 min Summer	6.155	0.0	1218
2160 min Summer	4.620	0.0	1604
2880 min Summer	3.725	0.0	2000
4320 min Summer	2.708	0.0	2820
5760 min Summer	2.149	0.0	3640
7200 min Summer	1.792	0.0	4472
8640 min Summer	1.544	0.0	5272
10080 min Summer	1.362	0.0	6056
15 min Winter	119.520	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FEH	
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XP Solutions		Source Control 2018.1

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.261	1.261	3.6	293.8	O K
60 min Winter	99.325	1.325	3.8	365.2	O K
120 min Winter	99.390	1.390	4.0	439.4	O K
180 min Winter	99.433	1.433	4.2	489.7	O K
240 min Winter	99.466	1.466	4.3	529.8	O K
360 min Winter	99.519	1.519	4.5	595.8	O K
480 min Winter	99.561	1.561	4.6	648.3	O K
600 min Winter	99.593	1.593	4.7	690.2	O K
720 min Winter	99.619	1.619	4.8	724.2	O K
960 min Winter	99.656	1.656	4.9	773.3	O K
1440 min Winter	99.688	1.688	5.0	817.1	O K
2160 min Winter	99.693	1.693	5.1	822.9	O K
2880 min Winter	99.680	1.680	5.0	805.0	O K
4320 min Winter	99.629	1.629	4.8	737.7	O K
5760 min Winter	99.574	1.574	4.6	664.9	O K
7200 min Winter	99.519	1.519	4.5	595.9	O K
8640 min Winter	99.469	1.469	4.3	533.1	O K
10080 min Winter	99.421	1.421	4.1	476.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	79.200	0.0	41
60 min Winter	49.680	0.0	70
120 min Winter	30.420	0.0	128
180 min Winter	22.974	0.0	186
240 min Winter	18.930	0.0	244
360 min Winter	14.600	0.0	360
480 min Winter	12.231	0.0	476
600 min Winter	10.678	0.0	590
720 min Winter	9.560	0.0	704
960 min Winter	8.012	0.0	928
1440 min Winter	6.155	0.0	1354
2160 min Winter	4.620	0.0	1692
2880 min Winter	3.725	0.0	2164
4320 min Winter	2.708	0.0	3072
5760 min Winter	2.149	0.0	3968
7200 min Winter	1.792	0.0	4824
8640 min Winter	1.544	0.0	5624
10080 min Winter	1.362	0.0	6456

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FEH	
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.900

Time (mins)		Area	Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)	From:	To:	(ha)
0	4	0.300	4	8	0.300	8	12	0.300

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FEH	
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XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 65.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	901.0	1.000	1560.0


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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FSR	
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Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1195 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.184	1.184	3.4	211.8	O K
30 min Summer	99.245	1.245	3.6	276.6	O K
60 min Summer	99.304	1.304	3.8	341.3	O K
120 min Summer	99.358	1.358	3.9	401.9	O K
180 min Summer	99.384	1.384	4.0	432.2	O K
240 min Summer	99.400	1.400	4.1	451.1	O K
360 min Summer	99.420	1.420	4.1	474.4	O K
480 min Summer	99.430	1.430	4.2	486.2	O K
600 min Summer	99.434	1.434	4.2	491.4	O K
720 min Summer	99.435	1.435	4.2	492.4	O K
960 min Summer	99.431	1.431	4.2	487.6	O K
1440 min Summer	99.420	1.420	4.1	475.1	O K
2160 min Summer	99.401	1.401	4.1	452.7	O K
2880 min Summer	99.381	1.381	4.0	428.5	O K
4320 min Summer	99.340	1.340	3.9	381.6	O K
5760 min Summer	99.302	1.302	3.8	338.8	O K
7200 min Summer	99.267	1.267	3.6	300.6	O K
8640 min Summer	99.235	1.235	3.5	266.3	O K
10080 min Summer	99.207	1.207	3.4	236.2	O K
15 min Winter	99.208	1.208	3.5	237.5	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	127.517	0.0	26
30 min Summer	83.580	0.0	41
60 min Summer	52.076	0.0	70
120 min Summer	31.261	0.0	130
180 min Summer	22.845	0.0	188
240 min Summer	18.218	0.0	248
360 min Summer	13.246	0.0	366
480 min Summer	10.549	0.0	484
600 min Summer	8.835	0.0	602
720 min Summer	7.639	0.0	722
960 min Summer	6.069	0.0	878
1440 min Summer	4.381	0.0	1112
2160 min Summer	3.157	0.0	1500
2880 min Summer	2.499	0.0	1912
4320 min Summer	1.796	0.0	2728
5760 min Summer	1.419	0.0	3520
7200 min Summer	1.182	0.0	4320
8640 min Summer	1.017	0.0	5096
10080 min Summer	0.896	0.0	5848
15 min Winter	127.517	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FSR	
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Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.276	1.276	3.7	310.2	O K
60 min Winter	99.341	1.341	3.9	383.1	O K
120 min Winter	99.401	1.401	4.1	451.9	O K
180 min Winter	99.430	1.430	4.2	486.8	O K
240 min Winter	99.449	1.449	4.2	508.9	O K
360 min Winter	99.472	1.472	4.3	537.0	O K
480 min Winter	99.484	1.484	4.3	552.1	O K
600 min Winter	99.491	1.491	4.4	560.0	O K
720 min Winter	99.493	1.493	4.4	563.3	O K
960 min Winter	99.492	1.492	4.4	561.4	O K
1440 min Winter	99.477	1.477	4.3	542.8	O K
2160 min Winter	99.453	1.453	4.2	513.7	O K
2880 min Winter	99.424	1.424	4.2	480.0	O K
4320 min Winter	99.366	1.366	4.0	412.1	O K
5760 min Winter	99.312	1.312	3.8	350.1	O K
7200 min Winter	99.262	1.262	3.6	295.3	O K
8640 min Winter	99.217	1.217	3.5	247.3	O K
10080 min Winter	99.178	1.178	3.4	205.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	83.580	0.0	41
60 min Winter	52.076	0.0	70
120 min Winter	31.261	0.0	128
180 min Winter	22.845	0.0	186
240 min Winter	18.218	0.0	244
360 min Winter	13.246	0.0	360
480 min Winter	10.549	0.0	474
600 min Winter	8.835	0.0	588
720 min Winter	7.639	0.0	700
960 min Winter	6.069	0.0	918
1440 min Winter	4.381	0.0	1168
2160 min Winter	3.157	0.0	1624
2880 min Winter	2.499	0.0	2080
4320 min Winter	1.796	0.0	2948
5760 min Winter	1.419	0.0	3800
7200 min Winter	1.182	0.0	4608
8640 min Winter	1.017	0.0	5360
10080 min Winter	0.896	0.0	6064

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FSR	
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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)	21.400	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.900

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4 0.300	4	8 0.300	8	12 0.300

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 20% FSR	
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Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 65.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	901.0	1.000	1560.0


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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 40% FEH	
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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1730 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.203	1.203	3.4	231.8	O K
30 min Summer	99.272	1.272	3.7	306.1	O K
60 min Summer	99.339	1.339	3.9	380.6	O K
120 min Summer	99.406	1.406	4.1	457.9	O K
180 min Summer	99.450	1.450	4.2	510.3	O K
240 min Summer	99.484	1.484	4.3	552.1	O K
360 min Summer	99.539	1.539	4.5	620.8	O K
480 min Summer	99.582	1.582	4.7	675.4	O K
600 min Summer	99.615	1.615	4.8	719.0	O K
720 min Summer	99.642	1.642	4.9	754.1	O K
960 min Summer	99.679	1.679	5.0	804.4	O K
1440 min Summer	99.712	1.712	5.1	850.1	Flood Risk
2160 min Summer	99.723	1.723	5.2	864.3	Flood Risk
2880 min Summer	99.715	1.715	5.1	853.0	Flood Risk
4320 min Summer	99.678	1.678	5.0	802.5	O K
5760 min Summer	99.637	1.637	4.9	748.2	O K
7200 min Summer	99.598	1.598	4.7	696.1	O K
8640 min Summer	99.561	1.561	4.6	648.1	O K
10080 min Summer	99.526	1.526	4.5	604.2	O K
15 min Winter	99.229	1.229	3.5	260.0	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	139.440	0.0	27
30 min Summer	92.400	0.0	41
60 min Summer	57.960	0.0	70
120 min Summer	35.490	0.0	130
180 min Summer	26.804	0.0	188
240 min Summer	22.085	0.0	248
360 min Summer	17.033	0.0	366
480 min Summer	14.269	0.0	486
600 min Summer	12.458	0.0	604
720 min Summer	11.153	0.0	724
960 min Summer	9.347	0.0	962
1440 min Summer	7.181	0.0	1266
2160 min Summer	5.390	0.0	1660
2880 min Summer	4.346	0.0	2048
4320 min Summer	3.160	0.0	2864
5760 min Summer	2.507	0.0	3696
7200 min Summer	2.090	0.0	4536
8640 min Summer	1.801	0.0	5288
10080 min Summer	1.589	0.0	6144
15 min Winter	139.440	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 40% FEH	
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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.306	1.306	3.8	343.4	O K
60 min Winter	99.380	1.380	4.0	427.2	O K
120 min Winter	99.453	1.453	4.2	514.8	O K
180 min Winter	99.502	1.502	4.4	574.5	O K
240 min Winter	99.541	1.541	4.5	622.4	O K
360 min Winter	99.602	1.602	4.7	701.7	O K
480 min Winter	99.650	1.650	4.9	765.4	O K
600 min Winter	99.688	1.688	5.0	816.6	O K
720 min Winter	99.719	1.719	5.1	858.6	Flood Risk
960 min Winter	99.763	1.763	5.3	920.6	Flood Risk
1440 min Winter	99.804	1.804	5.4	980.1	Flood Risk
2160 min Winter	99.812	1.812	5.5	990.8	Flood Risk
2880 min Winter	99.801	1.801	5.4	975.9	Flood Risk
4320 min Winter	99.753	1.753	5.3	906.4	Flood Risk
5760 min Winter	99.697	1.697	5.1	828.1	O K
7200 min Winter	99.641	1.641	4.9	752.8	O K
8640 min Winter	99.588	1.588	4.7	683.8	O K
10080 min Winter	99.539	1.539	4.5	620.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.400	0.0	41
60 min Winter	57.960	0.0	70
120 min Winter	35.490	0.0	128
180 min Winter	26.804	0.0	186
240 min Winter	22.085	0.0	244
360 min Winter	17.033	0.0	360
480 min Winter	14.269	0.0	476
600 min Winter	12.458	0.0	592
720 min Winter	11.153	0.0	706
960 min Winter	9.347	0.0	932
1440 min Winter	7.181	0.0	1368
2160 min Winter	5.390	0.0	1732
2880 min Winter	4.346	0.0	2192
4320 min Winter	3.160	0.0	3116
5760 min Winter	2.507	0.0	3992
7200 min Winter	2.090	0.0	4896
8640 min Winter	1.801	0.0	5712
10080 min Winter	1.589	0.0	6552

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 40% FEH	
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.900

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.300		0.300		0.300

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Waterfront House Nottingham NG2 3DQ	Catchment 2 100 yr + 40% FEH	
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Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 65.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	901.0	1.000	1560.0


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Waterfront House Nottingham NG2 3DQ	Catchment 2 30 yr FEH	
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Summary of Results for 30 year Return Period

Half Drain Time : 970 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.102	1.102	3.1	128.5	O K
30 min Summer	99.140	1.140	3.2	167.5	O K
60 min Summer	99.179	1.179	3.4	207.1	O K
120 min Summer	99.222	1.222	3.5	251.9	O K
180 min Summer	99.247	1.247	3.6	278.9	O K
240 min Summer	99.264	1.264	3.6	297.8	O K
360 min Summer	99.288	1.288	3.7	323.2	O K
480 min Summer	99.302	1.302	3.8	339.2	O K
600 min Summer	99.311	1.311	3.8	349.5	O K
720 min Summer	99.317	1.317	3.8	356.3	O K
960 min Summer	99.326	1.326	3.8	366.3	O K
1440 min Summer	99.335	1.335	3.9	376.6	O K
2160 min Summer	99.334	1.334	3.9	374.9	O K
2880 min Summer	99.324	1.324	3.8	363.5	O K
4320 min Summer	99.294	1.294	3.7	330.1	O K
5760 min Summer	99.264	1.264	3.6	297.2	O K
7200 min Summer	99.236	1.236	3.5	267.2	O K
8640 min Summer	99.211	1.211	3.5	240.9	O K
10080 min Summer	99.189	1.189	3.4	217.9	O K
15 min Winter	99.117	1.117	3.2	144.2	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	77.807	0.0	26
30 min Summer	51.020	0.0	41
60 min Summer	31.954	0.0	70
120 min Summer	19.912	0.0	128
180 min Summer	15.040	0.0	188
240 min Summer	12.317	0.0	246
360 min Summer	9.302	0.0	364
480 min Summer	7.630	0.0	482
600 min Summer	6.546	0.0	600
720 min Summer	5.778	0.0	680
960 min Summer	4.748	0.0	798
1440 min Summer	3.601	0.0	1056
2160 min Summer	2.708	0.0	1472
2880 min Summer	2.197	0.0	1880
4320 min Summer	1.617	0.0	2720
5760 min Summer	1.299	0.0	3512
7200 min Summer	1.097	0.0	4264
8640 min Summer	0.958	0.0	5024
10080 min Summer	0.857	0.0	5760
15 min Winter	77.807	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 2 30 yr FEH	
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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.161	1.161	3.3	188.0	O K
60 min Winter	99.204	1.204	3.4	232.7	O K
120 min Winter	99.251	1.251	3.6	283.6	O K
180 min Winter	99.280	1.280	3.7	314.5	O K
240 min Winter	99.300	1.300	3.7	336.5	O K
360 min Winter	99.327	1.327	3.8	366.6	O K
480 min Winter	99.344	1.344	3.9	386.3	O K
600 min Winter	99.356	1.356	3.9	399.7	O K
720 min Winter	99.364	1.364	4.0	409.0	O K
960 min Winter	99.373	1.373	4.0	419.5	O K
1440 min Winter	99.381	1.381	4.0	428.4	O K
2160 min Winter	99.375	1.375	4.0	422.2	O K
2880 min Winter	99.359	1.359	3.9	403.1	O K
4320 min Winter	99.313	1.313	3.8	351.4	O K
5760 min Winter	99.268	1.268	3.6	301.6	O K
7200 min Winter	99.227	1.227	3.5	257.2	O K
8640 min Winter	99.190	1.190	3.4	218.6	O K
10080 min Winter	99.158	1.158	3.3	185.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	51.020	0.0	40
60 min Winter	31.954	0.0	68
120 min Winter	19.912	0.0	126
180 min Winter	15.040	0.0	184
240 min Winter	12.317	0.0	242
360 min Winter	9.302	0.0	358
480 min Winter	7.630	0.0	472
600 min Winter	6.546	0.0	584
720 min Winter	5.778	0.0	692
960 min Winter	4.748	0.0	900
1440 min Winter	3.601	0.0	1126
2160 min Winter	2.708	0.0	1588
2880 min Winter	2.197	0.0	2048
4320 min Winter	1.617	0.0	2908
5760 min Winter	1.299	0.0	3752
7200 min Winter	1.097	0.0	4544
8640 min Winter	0.958	0.0	5288
10080 min Winter	0.857	0.0	6056

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Waterfront House Nottingham NG2 3DQ	Catchment 2 30 yr FEH	
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.900

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.300		0.300		0.300

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Waterfront House Nottingham NG2 3DQ	Catchment 2 30 yr FEH	
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Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.01800	Trench Width (m)	0.5
Infiltration Coefficient Side (m/hr)	0.01800	Trench Length (m)	65.0
Safety Factor	1.5	Slope (1:X)	0.0
Porosity	0.95	Cap Volume Depth (m)	0.000
Invert Level (m)	98.000	Cap Infiltration Depth (m)	1.000

Infiltration Basin

Invert Level (m)	99.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.01800	Porosity	1.00
Infiltration Coefficient Side (m/hr)	0.01800		

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	901.0	1.000	1560.0


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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FEH	
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Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1505 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.182	1.182	2.2	132.3	O K
30 min Summer	99.243	1.243	2.3	174.6	O K
60 min Summer	99.302	1.302	2.5	216.9	O K
120 min Summer	99.361	1.361	2.6	260.4	O K
180 min Summer	99.399	1.399	2.7	289.7	O K
240 min Summer	99.428	1.428	2.8	312.8	O K
360 min Summer	99.475	1.475	2.9	350.6	O K
480 min Summer	99.511	1.511	3.0	380.2	O K
600 min Summer	99.539	1.539	3.1	403.5	O K
720 min Summer	99.560	1.560	3.1	421.9	O K
960 min Summer	99.590	1.590	3.2	447.3	O K
1440 min Summer	99.617	1.617	3.3	470.9	O K
2160 min Summer	99.623	1.623	3.3	476.7	O K
2880 min Summer	99.614	1.614	3.2	468.2	O K
4320 min Summer	99.577	1.577	3.2	436.6	O K
5760 min Summer	99.539	1.539	3.1	403.6	O K
7200 min Summer	99.502	1.502	3.0	372.4	O K
8640 min Summer	99.467	1.467	2.9	343.9	O K
10080 min Summer	99.435	1.435	2.8	318.0	O K
15 min Winter	99.205	1.205	2.2	148.4	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.520	0.0	26
30 min Summer	79.200	0.0	41
60 min Summer	49.680	0.0	70
120 min Summer	30.420	0.0	130
180 min Summer	22.974	0.0	188
240 min Summer	18.930	0.0	248
360 min Summer	14.600	0.0	366
480 min Summer	12.231	0.0	484
600 min Summer	10.678	0.0	604
720 min Summer	9.560	0.0	722
960 min Summer	8.012	0.0	960
1440 min Summer	6.155	0.0	1204
2160 min Summer	4.620	0.0	1584
2880 min Summer	3.725	0.0	1992
4320 min Summer	2.708	0.0	2816
5760 min Summer	2.149	0.0	3640
7200 min Summer	1.792	0.0	4464
8640 min Summer	1.544	0.0	5272
10080 min Summer	1.362	0.0	6048
15 min Winter	119.520	0.0	26

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Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.273	1.273	2.4	195.9	O K
60 min Winter	99.338	1.338	2.6	243.5	O K
120 min Winter	99.403	1.403	2.7	292.9	O K
180 min Winter	99.445	1.445	2.8	326.3	O K
240 min Winter	99.478	1.478	2.9	352.9	O K
360 min Winter	99.531	1.531	3.0	396.7	O K
480 min Winter	99.571	1.571	3.1	431.4	O K
600 min Winter	99.603	1.603	3.2	459.0	O K
720 min Winter	99.628	1.628	3.3	481.3	O K
960 min Winter	99.664	1.664	3.4	513.4	O K
1440 min Winter	99.694	1.694	3.5	541.4	O K
2160 min Winter	99.699	1.699	3.5	545.6	O K
2880 min Winter	99.686	1.686	3.4	533.4	O K
4320 min Winter	99.636	1.636	3.3	488.4	O K
5760 min Winter	99.582	1.582	3.2	440.6	O K
7200 min Winter	99.529	1.529	3.0	395.4	O K
8640 min Winter	99.480	1.480	2.9	354.7	O K
10080 min Winter	99.435	1.435	2.8	318.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	79.200	0.0	41
60 min Winter	49.680	0.0	70
120 min Winter	30.420	0.0	128
180 min Winter	22.974	0.0	186
240 min Winter	18.930	0.0	244
360 min Winter	14.600	0.0	360
480 min Winter	12.231	0.0	476
600 min Winter	10.678	0.0	590
720 min Winter	9.560	0.0	704
960 min Winter	8.012	0.0	926
1440 min Winter	6.155	0.0	1346
2160 min Winter	4.620	0.0	1676
2880 min Winter	3.725	0.0	2140
4320 min Winter	2.708	0.0	3068
5760 min Winter	2.149	0.0	3928
7200 min Winter	1.792	0.0	4768
8640 min Winter	1.544	0.0	5624
10080 min Winter	1.362	0.0	6448

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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FEH	
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.600

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0	4 0.200	4	8 0.200	8	12 0.200

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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FEH	
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Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.01800	Trench Width (m)	0.5
Infiltration Coefficient Side (m/hr)	0.01800	Trench Length (m)	35.0
Safety Factor	1.5	Slope (1:X)	0.0
Porosity	0.95	Cap Volume Depth (m)	0.000
Invert Level (m)	98.000	Cap Infiltration Depth (m)	1.000

Infiltration Basin

Invert Level (m)	99.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.01800	Porosity	1.00
Infiltration Coefficient Side (m/hr)	0.01800		

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	580.0	1.000	1080.0


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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FSR	
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Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 1184 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.195	1.195	2.2	141.2	O K
30 min Summer	99.257	1.257	2.4	184.4	O K
60 min Summer	99.317	1.317	2.5	227.5	O K
120 min Summer	99.370	1.370	2.6	267.9	O K
180 min Summer	99.396	1.396	2.7	288.0	O K
240 min Summer	99.412	1.412	2.7	300.5	O K
360 min Summer	99.432	1.432	2.8	315.9	O K
480 min Summer	99.442	1.442	2.8	323.6	O K
600 min Summer	99.446	1.446	2.8	326.9	O K
720 min Summer	99.446	1.446	2.8	327.4	O K
960 min Summer	99.442	1.442	2.8	324.1	O K
1440 min Summer	99.432	1.432	2.8	315.7	O K
2160 min Summer	99.413	1.413	2.7	300.8	O K
2880 min Summer	99.392	1.392	2.7	284.7	O K
4320 min Summer	99.352	1.352	2.6	254.0	O K
5760 min Summer	99.315	1.315	2.5	226.1	O K
7200 min Summer	99.281	1.281	2.4	201.4	O K
8640 min Summer	99.250	1.250	2.3	179.1	O K
10080 min Summer	99.222	1.222	2.3	159.6	O K
15 min Winter	99.220	1.220	2.3	158.4	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	127.517	0.0	27
30 min Summer	83.580	0.0	41
60 min Summer	52.076	0.0	70
120 min Summer	31.261	0.0	130
180 min Summer	22.845	0.0	188
240 min Summer	18.218	0.0	248
360 min Summer	13.246	0.0	366
480 min Summer	10.549	0.0	484
600 min Summer	8.835	0.0	602
720 min Summer	7.639	0.0	722
960 min Summer	6.069	0.0	866
1440 min Summer	4.381	0.0	1110
2160 min Summer	3.157	0.0	1500
2880 min Summer	2.499	0.0	1908
4320 min Summer	1.796	0.0	2728
5760 min Summer	1.419	0.0	3520
7200 min Summer	1.182	0.0	4328
8640 min Summer	1.017	0.0	5096
10080 min Summer	0.896	0.0	5848
15 min Winter	127.517	0.0	26

BWB Consulting Ltd		Page 2
Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FSR	
Date 03/02/2021 16:53 File	Designed by Catherine.Thorpe Checked by	
XP Solutions		Source Control 2018.1

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.288	1.288	2.4	206.8	O K
60 min Winter	99.354	1.354	2.6	255.4	O K
120 min Winter	99.413	1.413	2.7	301.2	O K
180 min Winter	99.443	1.443	2.8	324.4	O K
240 min Winter	99.461	1.461	2.9	339.0	O K
360 min Winter	99.484	1.484	2.9	357.6	O K
480 min Winter	99.496	1.496	2.9	367.5	O K
600 min Winter	99.502	1.502	3.0	372.6	O K
720 min Winter	99.504	1.504	3.0	374.6	O K
960 min Winter	99.502	1.502	3.0	373.1	O K
1440 min Winter	99.488	1.488	2.9	360.8	O K
2160 min Winter	99.464	1.464	2.9	341.5	O K
2880 min Winter	99.436	1.436	2.8	319.2	O K
4320 min Winter	99.379	1.379	2.7	274.9	O K
5760 min Winter	99.326	1.326	2.5	234.7	O K
7200 min Winter	99.278	1.278	2.4	199.3	O K
8640 min Winter	99.234	1.234	2.3	168.3	O K
10080 min Winter	99.195	1.195	2.2	141.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	83.580	0.0	41
60 min Winter	52.076	0.0	70
120 min Winter	31.261	0.0	128
180 min Winter	22.845	0.0	186
240 min Winter	18.218	0.0	244
360 min Winter	13.246	0.0	360
480 min Winter	10.549	0.0	474
600 min Winter	8.835	0.0	588
720 min Winter	7.639	0.0	700
960 min Winter	6.069	0.0	916
1440 min Winter	4.381	0.0	1160
2160 min Winter	3.157	0.0	1612
2880 min Winter	2.499	0.0	2076
4320 min Winter	1.796	0.0	2944
5760 min Winter	1.419	0.0	3800
7200 min Winter	1.182	0.0	4608
8640 min Winter	1.017	0.0	5368
10080 min Winter	0.896	0.0	6152

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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FSR	
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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)	21.400	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.600

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4 0.200	4	8 0.200	8	12 0.200

BWB Consulting Ltd		Page 4
Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 20% FSR	
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Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 35.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	580.0	1.000	1080.0


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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 40% FEH	
Date 03/02/2021 16:50 File	Designed by Catherine.Thorpe Checked by	
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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1664 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.214	1.214	2.3	154.6	O K
30 min Summer	99.285	1.285	2.4	204.1	O K
60 min Summer	99.352	1.352	2.6	253.7	O K
120 min Summer	99.418	1.418	2.8	305.2	O K
180 min Summer	99.462	1.462	2.9	340.0	O K
240 min Summer	99.496	1.496	2.9	367.7	O K
360 min Summer	99.550	1.550	3.1	413.2	O K
480 min Summer	99.592	1.592	3.2	449.3	O K
600 min Summer	99.625	1.625	3.3	477.9	O K
720 min Summer	99.650	1.650	3.3	501.0	O K
960 min Summer	99.686	1.686	3.4	533.7	O K
1440 min Summer	99.718	1.718	3.5	563.7	Flood Risk
2160 min Summer	99.728	1.728	3.5	573.2	Flood Risk
2880 min Summer	99.720	1.720	3.5	565.6	Flood Risk
4320 min Summer	99.684	1.684	3.4	531.8	O K
5760 min Summer	99.644	1.644	3.3	495.7	O K
7200 min Summer	99.606	1.606	3.2	461.2	O K
8640 min Summer	99.570	1.570	3.1	429.8	O K
10080 min Summer	99.536	1.536	3.0	401.1	O K
15 min Winter	99.241	1.241	2.3	173.3	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	139.440	0.0	27
30 min Summer	92.400	0.0	41
60 min Summer	57.960	0.0	70
120 min Summer	35.490	0.0	130
180 min Summer	26.804	0.0	188
240 min Summer	22.085	0.0	248
360 min Summer	17.033	0.0	366
480 min Summer	14.269	0.0	486
600 min Summer	12.458	0.0	604
720 min Summer	11.153	0.0	724
960 min Summer	9.347	0.0	962
1440 min Summer	7.181	0.0	1248
2160 min Summer	5.390	0.0	1628
2880 min Summer	4.346	0.0	2024
4320 min Summer	3.160	0.0	2860
5760 min Summer	2.507	0.0	3688
7200 min Summer	2.090	0.0	4480
8640 min Summer	1.801	0.0	5280
10080 min Summer	1.589	0.0	6064
15 min Winter	139.440	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 40% FEH	
Date 03/02/2021 16:50 File	Designed by Catherine.Thorpe Checked by	
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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.318	1.318	2.5	228.9	O K
60 min Winter	99.392	1.392	2.7	284.8	O K
120 min Winter	99.466	1.466	2.9	343.1	O K
180 min Winter	99.514	1.514	3.0	382.8	O K
240 min Winter	99.552	1.552	3.1	414.6	O K
360 min Winter	99.612	1.612	3.2	467.1	O K
480 min Winter	99.659	1.659	3.4	509.1	O K
600 min Winter	99.696	1.696	3.5	542.9	O K
720 min Winter	99.725	1.725	3.5	570.5	Flood Risk
960 min Winter	99.768	1.768	3.6	610.9	Flood Risk
1440 min Winter	99.807	1.807	3.8	649.0	Flood Risk
2160 min Winter	99.814	1.814	3.8	656.4	Flood Risk
2880 min Winter	99.804	1.804	3.7	646.0	Flood Risk
4320 min Winter	99.755	1.755	3.6	599.0	Flood Risk
5760 min Winter	99.700	1.700	3.5	547.1	Flood Risk
7200 min Winter	99.646	1.646	3.3	497.6	O K
8640 min Winter	99.596	1.596	3.2	452.5	O K
10080 min Winter	99.548	1.548	3.1	411.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	92.400	0.0	41
60 min Winter	57.960	0.0	70
120 min Winter	35.490	0.0	128
180 min Winter	26.804	0.0	186
240 min Winter	22.085	0.0	244
360 min Winter	17.033	0.0	360
480 min Winter	14.269	0.0	476
600 min Winter	12.458	0.0	592
720 min Winter	11.153	0.0	706
960 min Winter	9.347	0.0	932
1440 min Winter	7.181	0.0	1362
2160 min Winter	5.390	0.0	1712
2880 min Winter	4.346	0.0	2168
4320 min Winter	3.160	0.0	3080
5760 min Winter	2.507	0.0	3984
7200 min Winter	2.090	0.0	4832
8640 min Winter	1.801	0.0	5704
10080 min Winter	1.589	0.0	6552

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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 40% FEH	
Date 03/02/2021 16:50 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	


Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.600

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.200		0.200		0.200

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Waterfront House Nottingham NG2 3DQ	Catchment 3 100 yr + 40% FEH	
Date 03/02/2021 16:50 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure


Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 35.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	580.0	1.000	1080.0


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Waterfront House Nottingham NG2 3DQ	Catchment 3 30 yr FEH	
Date 03/02/2021 16:51 File	Designed by Catherine.Thorpe Checked by	
XP Solutions		Source Control 2018.1

Summary of Results for 30 year Return Period

Half Drain Time : 975 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	99.111	1.111	2.0	85.7	O K
30 min Summer	99.151	1.151	2.1	111.7	O K
60 min Summer	99.191	1.191	2.2	138.1	O K
120 min Summer	99.234	1.234	2.3	168.0	O K
180 min Summer	99.259	1.259	2.4	185.9	O K
240 min Summer	99.277	1.277	2.4	198.5	O K
360 min Summer	99.300	1.300	2.5	215.4	O K
480 min Summer	99.315	1.315	2.5	226.0	O K
600 min Summer	99.324	1.324	2.5	232.8	O K
720 min Summer	99.330	1.330	2.5	237.2	O K
960 min Summer	99.338	1.338	2.6	243.7	O K
1440 min Summer	99.347	1.347	2.6	250.4	O K
2160 min Summer	99.346	1.346	2.6	249.2	O K
2880 min Summer	99.336	1.336	2.5	241.7	O K
4320 min Summer	99.306	1.306	2.5	219.9	O K
5760 min Summer	99.277	1.277	2.4	198.6	O K
7200 min Summer	99.250	1.250	2.3	179.2	O K
8640 min Summer	99.225	1.225	2.3	162.2	O K
10080 min Summer	99.204	1.204	2.2	147.2	O K
15 min Winter	99.127	1.127	2.0	96.1	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	77.807	0.0	26
30 min Summer	51.020	0.0	41
60 min Summer	31.954	0.0	70
120 min Summer	19.912	0.0	128
180 min Summer	15.040	0.0	188
240 min Summer	12.317	0.0	246
360 min Summer	9.302	0.0	364
480 min Summer	7.630	0.0	482
600 min Summer	6.546	0.0	600
720 min Summer	5.778	0.0	680
960 min Summer	4.748	0.0	798
1440 min Summer	3.601	0.0	1056
2160 min Summer	2.708	0.0	1472
2880 min Summer	2.197	0.0	1880
4320 min Summer	1.617	0.0	2720
5760 min Summer	1.299	0.0	3512
7200 min Summer	1.097	0.0	4264
8640 min Summer	0.958	0.0	5024
10080 min Summer	0.857	0.0	5840
15 min Winter	77.807	0.0	26

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Waterfront House Nottingham NG2 3DQ	Catchment 3 30 yr FEH	
Date 03/02/2021 16:51 File	Designed by Catherine.Thorpe Checked by	
XP Solutions		Source Control 2018.1

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	99.172	1.172	2.2	125.4	O K
60 min Winter	99.215	1.215	2.3	155.2	O K
120 min Winter	99.264	1.264	2.4	189.1	O K
180 min Winter	99.292	1.292	2.4	209.7	O K
240 min Winter	99.312	1.312	2.5	224.3	O K
360 min Winter	99.339	1.339	2.6	244.3	O K
480 min Winter	99.357	1.357	2.6	257.4	O K
600 min Winter	99.368	1.368	2.6	266.3	O K
720 min Winter	99.376	1.376	2.6	272.4	O K
960 min Winter	99.385	1.385	2.7	279.2	O K
1440 min Winter	99.393	1.393	2.7	285.1	O K
2160 min Winter	99.387	1.387	2.7	281.0	O K
2880 min Winter	99.371	1.371	2.6	268.5	O K
4320 min Winter	99.327	1.327	2.5	234.9	O K
5760 min Winter	99.283	1.283	2.4	202.8	O K
7200 min Winter	99.243	1.243	2.3	174.2	O K
8640 min Winter	99.207	1.207	2.2	149.4	O K
10080 min Winter	99.176	1.176	2.2	128.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	51.020	0.0	40
60 min Winter	31.954	0.0	70
120 min Winter	19.912	0.0	126
180 min Winter	15.040	0.0	184
240 min Winter	12.317	0.0	242
360 min Winter	9.302	0.0	358
480 min Winter	7.630	0.0	472
600 min Winter	6.546	0.0	584
720 min Winter	5.778	0.0	692
960 min Winter	4.748	0.0	900
1440 min Winter	3.601	0.0	1124
2160 min Winter	2.708	0.0	1588
2880 min Winter	2.197	0.0	2048
4320 min Winter	1.617	0.0	2908
5760 min Winter	1.299	0.0	3752
7200 min Winter	1.097	0.0	4544
8640 min Winter	0.958	0.0	5360
10080 min Winter	0.857	0.0	6056

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Waterfront House Nottingham NG2 3DQ	Catchment 3 30 yr FEH	
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 635100 152000 TR 35100 52000
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.600

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.200		0.200		0.200

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Waterfront House Nottingham NG2 3DQ	Catchment 3 30 yr FEH	
Date 03/02/2021 16:51 File	Designed by Catherine.Thorpe Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 100.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr) 0.01800	Trench Width (m) 0.5
Infiltration Coefficient Side (m/hr) 0.01800	Trench Length (m) 35.0
Safety Factor 1.5	Slope (1:X) 0.0
Porosity 0.95	Cap Volume Depth (m) 0.000
Invert Level (m) 98.000	Cap Infiltration Depth (m) 1.000

Infiltration Basin

Invert Level (m) 99.000	Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01800	Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01800	

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	580.0	1.000	1080.0

Appendix 5: Illustrative Surface Water Drainage Strategy

Catchment 1
 Developable Area = 1.0ha
 Impermeable Area @ 65% = 0.7ha
 Impermeable Area + 10% Urban Creep = 0.8ha

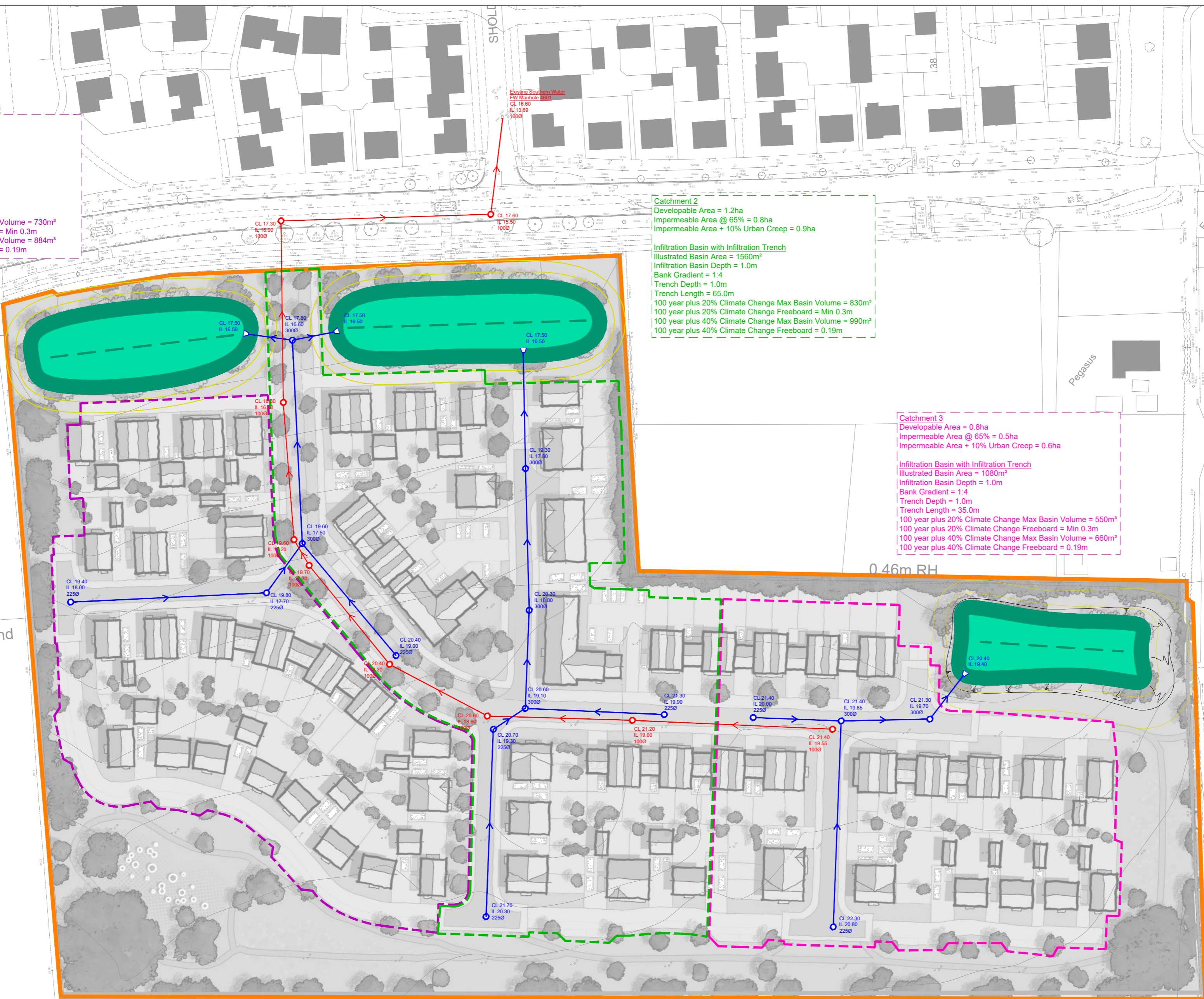
Infiltration Basin with Infiltration Trench
 Illustrated Basin Area = 1390m²
 Infiltration Basin Depth = 1.0m
 Bank Gradient = 1:4
 Trench Length = 50.0m
 Trench Depth = 1.0m
 100 year plus 20% Climate Change Max Basin Volume = 730m³
 100 year plus 20% Climate Change Freeboard = Min 0.3m
 100 year plus 40% Climate Change Max Basin Volume = 884m³
 100 year plus 40% Climate Change Freeboard = 0.19m

Catchment 2
 Developable Area = 1.2ha
 Impermeable Area @ 65% = 0.8ha
 Impermeable Area + 10% Urban Creep = 0.9ha

Infiltration Basin with Infiltration Trench
 Illustrated Basin Area = 1560m²
 Infiltration Basin Depth = 1.0m
 Bank Gradient = 1:4
 Trench Length = 65.0m
 Trench Depth = 1.0m
 100 year plus 20% Climate Change Max Basin Volume = 830m³
 100 year plus 20% Climate Change Freeboard = Min 0.3m
 100 year plus 40% Climate Change Max Basin Volume = 990m³
 100 year plus 40% Climate Change Freeboard = 0.19m

Catchment 3
 Developable Area = 0.8ha
 Impermeable Area @ 65% = 0.5ha
 Impermeable Area + 10% Urban Creep = 0.6ha

Infiltration Basin with Infiltration Trench
 Illustrated Basin Area = 1080m²
 Infiltration Basin Depth = 1.0m
 Bank Gradient = 1:4
 Trench Length = 35.0m
 Trench Depth = 1.0m
 100 year plus 20% Climate Change Max Basin Volume = 550m³
 100 year plus 20% Climate Change Freeboard = Min 0.3m
 100 year plus 40% Climate Change Max Basin Volume = 660m³
 100 year plus 40% Climate Change Freeboard = 0.19m



- Notes**
- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
 - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
 - Infiltration basins have been designed to accommodate the 1 in 100 year plus 20% climate change event, with a minimum 300mm freeboard. Sensitivity tests have been run to ensure the 1 in 100 year plus 40% climate change scenario is accommodated within the freeboard and ensure the half drain down time is less than 24 hours in the 30 year event.
 - Infiltration basins enhanced with use of infiltration trenches to reduce the risk of chalk dissolution and enable the depth to reach the infiltrating layer. Depth of trench to be confirmed following ground investigation.
 - All infiltration basins are 1m depth with 1:4 bank gradients and a 0.5m wide infiltration grate trenches along their center.
 - All infiltration systems should have silt traps installed upstream to provide a multi stage treatment train.
 - Infiltration rate assumed to be 5×10^{-4} m/s based upon nearby ground investigation. Site specific infiltration testing to BRE 365 standard required.
 - Separation distances are required between the drainage measure and other drainage measures (including public sewers or permeable paving), building foundations and property boundaries. For shallow infiltration measures the minimum separation or setback distance between any two infiltration measures less than 5m deep shall be equal to the maximum depth of the deepest - in this case 2m (inner easement). A 5m access easement should also be applied for maintenance purposes, but this can include footways, private drives, public sewers etc (outer easement).
 - To be read in conjunction with Sustainable Drainage Statement document reference SRS-BWB-ZZ-XX-RP-CD-0002_SDS.
 - Subject to detailed design and infiltration testing. Do not construct from this drawing.

- Legend**
- Illustrative Site Boundary
 - Catchment 1
 - Catchment 2
 - Catchment 3
 - Infiltration Basin and Trench
 - Proposed Surface Water Sewer
 - Earthworks Batter
 - 2m Separation Distance and 5m Access Easement
 - Proposed Foul Water Sewer

P03	05.03.21	UPDATED TO LATEST MASTERPLAN	CT	RJ
P02	10.02.21	UPDATED TO LATEST MASTERPLAN	CT	RJ
P01	03.02.21	PRELIMINARY ISSUE	CT	RJ
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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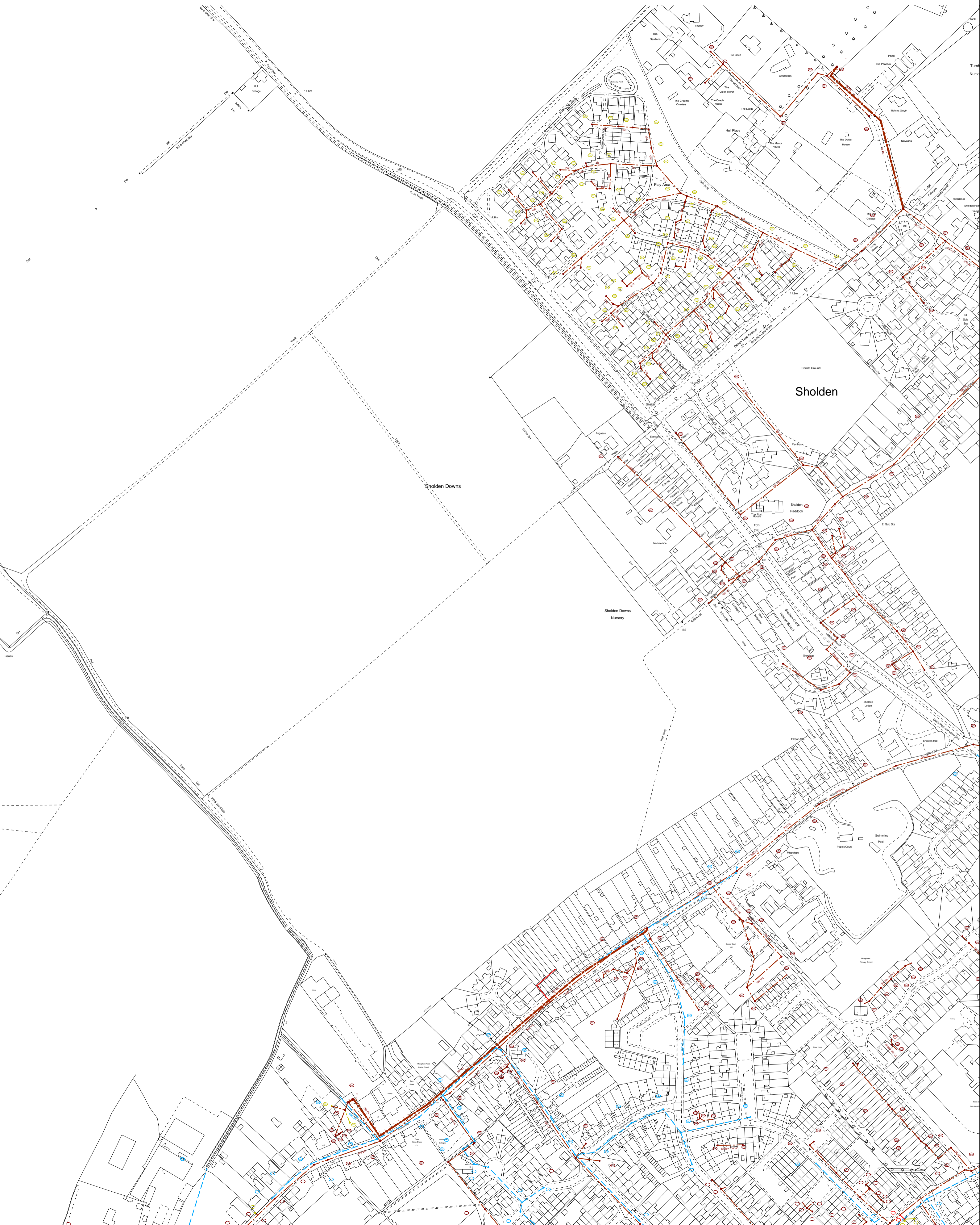
Project Title
 Sandwich Road, Sholden

Drawing Title
 Illustrative Drainage Strategy

Drawn:	C Thorpe	Reviewed:	R Jobling
BWB Ref:	BMW 2914	Date:	03.02.21
		Scale@A2:	1:500
DRAWING STATUS			
PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
SRS-BWB-ZZ-XX-DR-CD-0003	S2	P03	

Appendix 6: Southern Water Asset Records

SOUTHERN WATER





BETTER SOLUTIONS, INTELLIGENTLY ENGINEERED

