

Design Settings

Rainfall Methodology	FEH-22	Time of Entry (mins)	5.00	Connection Type	Level Soffits	Enforce best practice design rules	x
Return Period (years)	100	Maximum Time of Concentration (mins)	30.00	Minimum Backdrop Height (m)	0.200		
Additional Flow (%)	0	Maximum Rainfall (mm/hr)	50.0	Preferred Cover Depth (m)	1.200		
CV	0.750	Minimum Velocity (m/s)	1.00	Include Intermediate Ground	✓		

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	499	1350	749	1500	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Shape	Circular	Barrels	1	Auto Increment (mm)	75	Follow Ground	x
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Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
Roof1.1	0.009	5.00	25.100	400		563246.959	174055.970	0.400
DW1	0.012	5.00	25.100	600		563257.083	174045.049	
GY1	0.010	5.00	25.150	300	300	563225.378	174027.983	0.300
P1b	0.000	5.00	24.750	1200		563238.662	174030.652	0.530
Vent/Dummy Out			25.000	300		563241.401	174042.737	0.350
RG2			24.900	1200		563245.434	174036.300	0.940
RG_1			25.100	1200		563246.629	174048.339	0.733
Roof2.2	0.010	5.00	24.800	600		563246.938	174042.135	0.700
P2b	0.010	5.00	25.000	600		563231.878	174039.659	0.658
G1			25.000	1200		563240.353	174038.048	0.875
Roof2.1	0.010	5.00	24.800	600		563244.866	174029.339	0.800
P1a		5.00	24.900	450		563242.183	174029.400	0.400
P2a		5.00	25.200	450		563232.183	174047.529	0.350
F1a	0.010	5.00	24.775	450		563256.736	174042.088	0.375
F1b	0.010	5.00	25.000	900		563245.223	174043.720	1.000
Roof1.2	0.009	5.00	25.000	300		563256.960	174045.847	0.500
Dummy			25.200	100		563228.206	174038.593	0.400

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.001	RG_1	F1b	6.421	0.600	24.400	24.320	0.080	80.3	150	5.30	50.0
8.000	GY1	P2b	13.364	0.600	24.850	24.683	0.167	80.0	100	5.26	50.0
6.001	P1b	G1	7.587	0.600	24.220	24.125	0.095	80.0	100	5.18	50.0
1.003	G1	Vent/Dummy Out	4.805	0.600	24.700	24.650	0.050	96.1	150	5.54	50.0
4.001	RG2	G1	5.374	0.600	24.400	24.346	0.054	100.0	150	5.29	50.0
2.000	Roof1.1	RG_1	7.637	0.600	24.700	24.450	0.250	30.5	100	5.09	50.0
5.000	Roof2.2	RG2	6.026	0.600	24.100	24.025	0.075	80.0	100	5.12	50.0
4.000	Roof2.1	RG2	6.984	0.600	24.000	23.960	0.040	174.6	100	5.20	50.0
6.000	P1a	P1b	3.737	0.600	24.500	24.220	0.280	13.3	100	5.03	50.0
9.000	P2a	P2b	7.876	0.600	24.850	24.716	0.134	58.8	100	5.13	50.0
3.000	F1a	F1b	11.629	0.600	24.400	24.322	0.078	150.0	100	5.31	50.0
1.002	F1b	G1	7.476	0.600	24.300	24.250	0.050	150.0	150	5.46	50.0
1.000	Roof1.2	RG_1	10.628	0.600	24.500	24.367	0.133	80.0	100	5.21	50.0
7.000	P1b	G1	7.587	0.600	24.550	24.335	0.215	35.3	100	5.10	50.0
8.001	P2b	Dummy	3.825	0.600	24.850	24.800	0.050	76.5	100	5.33	50.0
Overflow	G1	P2b	8.626	0.600	24.400	24.342	0.058	150.0	100	5.23	50.0

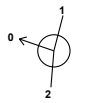
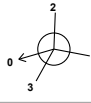
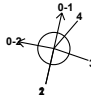
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	1.123	19.8	2.4	0.550	0.530	0.018	0.0	35	0.764
8.000	0.861	6.8	1.4	0.200	0.217	0.010	0.0	30	0.668
6.001	0.861	6.8	0.0	0.430	0.775	0.000	0.0	0	0.000
1.003	1.025	18.1	7.9	0.150	0.200	0.058	0.0	69	0.988
4.001	1.005	17.8	2.7	0.350	0.504	0.020	0.0	40	0.727
2.000	1.401	11.0	1.2	0.300	0.550	0.009	0.0	22	0.915
5.000	0.861	6.8	1.4	0.600	0.775	0.010	0.0	30	0.668
4.000	0.579	4.5	1.4	0.700	0.840	0.010	0.0	37	0.502
6.000	2.126	16.7	0.0	0.300	0.430	0.000	0.0	0	0.000
9.000	1.006	7.9	0.0	0.250	0.184	0.000	0.0	0	0.000
3.000	0.625	4.9	1.4	0.275	0.578	0.010	0.0	36	0.531
1.002	0.818	14.5	5.1	0.550	0.600	0.038	0.0	62	0.750
1.000	0.861	6.8	1.2	0.400	0.633	0.009	0.0	29	0.648
7.000	1.302	10.2	0.0	0.100	0.565	0.000	0.0	0	0.000
8.001	0.881	6.9	2.7	0.050	0.300	0.020	0.0	43	0.826
Overflow	0.625	4.9	0.0	0.500	0.558	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.001	6.421	80.3	150	Circular	25.100	24.400	0.550	25.000	24.320	0.530
8.000	13.364	80.0	100	Circular	25.150	24.850	0.200	25.000	24.683	0.217
6.001	7.587	80.0	100	Circular	24.750	24.220	0.430	25.000	24.125	0.775
1.003	4.805	96.1	150	Circular	25.000	24.700	0.150	25.000	24.650	0.200
4.001	5.374	100.0	150	Circular	24.900	24.400	0.350	25.000	24.346	0.504
2.000	7.637	30.5	100	Circular	25.100	24.700	0.300	25.100	24.450	0.550
5.000	6.026	80.0	100	Circular	24.800	24.100	0.600	24.900	24.025	0.775
4.000	6.984	174.6	100	Circular	24.800	24.000	0.700	24.900	23.960	0.840
6.000	3.737	13.3	100	Circular	24.900	24.500	0.300	24.750	24.220	0.430
9.000	7.876	58.8	100	Circular	25.200	24.850	0.250	25.000	24.716	0.184
3.000	11.629	150.0	100	Circular	24.775	24.400	0.275	25.000	24.322	0.578
1.002	7.476	150.0	150	Circular	25.000	24.300	0.550	25.000	24.250	0.600
1.000	10.628	80.0	100	Circular	25.000	24.500	0.400	25.100	24.367	0.633
7.000	7.587	35.3	100	Circular	24.750	24.550	0.100	25.000	24.335	0.565
8.001	3.825	76.5	100	Circular	25.000	24.850	0.050	25.200	24.800	0.300
Overflow	8.626	150.0	100	Circular	25.000	24.400	0.500	25.000	24.342	0.558

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	RG_1	1200		Manhole	Adoptable	F1b	900	Manhole	Adoptable
8.000	GY1	300	300	Manhole	Adoptable	P2b	600	Manhole	Adoptable
6.001	P1b	1200		Manhole	Adoptable	G1	1200	Manhole	Adoptable
1.003	G1	1200		Manhole	Adoptable	Vent/Dummy Out	300	Manhole	Adoptable
4.001	RG2	1200		Manhole	Adoptable	G1	1200	Manhole	Adoptable
2.000	Roof1.1	400		Manhole	Adoptable	RG_1	1200	Manhole	Adoptable
5.000	Roof2.2	600		Manhole	Adoptable	RG2	1200	Manhole	Adoptable
4.000	Roof2.1	600		Manhole	Adoptable	RG2	1200	Manhole	Adoptable
6.000	P1a	450		Manhole	Adoptable	P1b	1200	Manhole	Adoptable
9.000	P2a	450		Manhole	Adoptable	P2b	600	Manhole	Adoptable
3.000	F1a	450		Manhole	Adoptable	F1b	900	Manhole	Adoptable
1.002	F1b	900		Manhole	Adoptable	G1	1200	Manhole	Adoptable
1.000	Roof1.2	300		Manhole	Adoptable	RG_1	1200	Manhole	Adoptable
7.000	P1b	1200		Manhole	Adoptable	G1	1200	Manhole	Adoptable
8.001	P2b	600		Manhole	Adoptable	Dummy	100	Manhole	Adoptable
Overflow	G1	1200		Manhole	Adoptable	P2b	600	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
Roof1.1	563246.959	174055.970	25.100	0.400	400		 0	2.000	24.700	100
DW1	563257.083	174045.049	25.100		600					
GY1	563225.378	174027.983	25.150	0.300	300	300	 0	8.000	24.850	100
P1b	563238.662	174030.652	24.750	0.530	1200		 1 0-1 0-2	6.000 6.001 7.000	24.220 24.220 24.550	100 100 100
Vent/Dummy Out	563241.401	174042.737	25.000	0.350	300		 1	1.003	24.650	150
RG2	563245.434	174036.300	24.900	0.940	1200		 1 2 0	5.000 4.000	24.025 23.960	100 100
RG_1	563246.629	174048.339	25.100	0.733	1200		 1 2 0	4.001 2.000 1.000	24.400 24.450 24.367	150 100 100
Roof2.2	563246.938	174042.135	24.800	0.700	600		 0	5.000	24.100	100
P2b	563231.878	174039.659	25.000	0.658	600		 1 2 3 0	Overflow 9.000 8.000 8.001	24.342 24.716 24.683 24.850	100 100 100 100
G1	563240.353	174038.048	25.000	0.875	1200		 1 2 3 4 0-1 0-2	7.000 6.001 4.001 1.002 1.003 Overflow	24.335 24.125 24.346 24.250 24.700 24.400	100 100 150 150 150 100
Roof2.1	563244.866	174029.339	24.800	0.800	600		 0	4.000	24.000	100
P1a	563242.183	174029.400	24.900	0.400	450		 0	6.000	24.500	100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)	
P2a	563232.183	174047.529	25.200	0.350	450			0	9.000	24.850	100
F1a	563256.736	174042.088	24.775	0.375	450			0	3.000	24.400	100
F1b	563245.223	174043.720	25.000	1.000	900			1 2 0	3.000 1.001 1.002	24.322 24.320 24.300	100 150 150
Roof1.2	563256.960	174045.847	25.000	0.500	300			0	1.000	24.500	100
Dummy	563228.206	174038.593	25.200	0.400	100			1	8.001	24.800	100

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Rate(s)	✓	100 year (l/s)	3.1
Rainfall Events	Singular	Analysis Speed	Detailed	Additional Storage (m³/ha)	20.0	2 year (l/s)	1.0	Check Discharge Volume	✓
Summer CV	0.750	Skip Steady State	x	Starting Level (m)		30 year (l/s)	2.5	100 year +40% 360 minute (m³)	55

Storm Durations

60 | 360

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	0	0	0	100	40	0	0

Pre-development Discharge Rate

Site Makeup	Brownfield	PIMP (%)	100	Betterment (%)	0	Q 100 year (l/s)	3.1
Brownfield Method	MRM	CV	0.750	Q 2 year (l/s)	1.0		
Contributing Area (ha)	0.080	Time of Concentration (mins)	5.00	Q 30 year (l/s)	2.5		

Pre-development Discharge Volume

Site Makeup	Brownfield	PIMP (%)	100	Climate Change (%)	40	PR	0.750
Brownfield Method	MRM	CV	0.750	Storm Duration (mins)	360	Runoff Volume (m³)	55
Contributing Area (ha)	0.080	Return Period (years)	100	Betterment (%)	0		

Node P1b Online Orifice Control

Flap Valve	x	Invert Level (m)	24.220	Design Flow (l/s)	1.0	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	0.700	Diameter (m)	0.024		

Node P1b Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	4.800	Depth (m)	0.350
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	24.220	Length (m)	12.500	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	15	Slope (1:X)	250.0		

Node P2b Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.01800	Porosity	0.30	Width (m)	4.800	Depth (m)	0.350
Side Inf Coefficient (m/hr)	0.02400	Invert Level (m)	24.400	Length (m)	22.000	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	9	Slope (1:X)	350.0		

Node G1 Lined Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.02000	Porosity	0.95	Ring Diameter (m)	1.200	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.10000	Invert Level (m)	23.500	Pit Width (m)	2.500	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	510	Pit Length (m)	7.500	Number Required	2

Node RG 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	24.600
Side Inf Coefficient (m/hr)	0.02400	Porosity	0.15	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	0.400	15.0	0.0

Node RG 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	24.400
Side Inf Coefficient (m/hr)	0.02400	Porosity	0.30	Time to half empty (mins)	6

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	0.200	15.0	0.0
			0.201	0.0	0.0

Node RG2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	24.150
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.15	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	5.0	0.0	0.400	5.0	0.0

Node RG2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.02000	Safety Factor	2.0	Invert Level (m)	23.950
Side Inf Coefficient (m/hr)	0.02400	Porosity	0.30	Time to half empty (mins)	



Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	5.0	0.0	0.200	5.0	0.0	0.201	0.0	0.0

Node F1a Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.02000	Safety Factor	2.0	Invert Level (m)	24.400
Side Inf Coefficient (m/hr)	0.02400	Porosity	0.15	Time to half empty (mins)	5

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	10.0	0.0	0.300	10.0	0.0	0.301	0.0	0.0

Node F1b Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	24.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.15	Time to half empty (mins)	5

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	10.0	0.0	0.300	10.0	0.0	0.301	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Cover Depth	✓	Proportional Velocity	✓	Time to Half Empty	✓
Node Losses	✓	Minimum Cover Depth (m)	1.200	Return Period (years)	100	Return Period (years)	30
Link Size	✓	Maximum Cover Depth (m)	3.000	Minimum Proportional Velocity (m/s)	0.750	Discharge Rates	✓
Minimum Diameter (mm)	150	Backdrops	✓	Maximum Proportional Velocity (m/s)	3.000	2 year (l/s)	1.0
Link Length	✓	Minimum Backdrop Height (m)	0.200	Surcharged Depth	✓	30 year (l/s)	2.5
Maximum Length (m)	100.000	Maximum Backdrop Height (m)	1.500	Return Period (years)	100	100 year (l/s)	3.1
Coordinates	✓	Full Bore Velocity	✓	Maximum Surcharged Depth (m)	0.100	Discharge Volume	✓
Accuracy (m)	1.000	Minimum Full Bore Velocity (m/s)	1.000	Flooding	✓	100 year 360 minute (m³)	100
Crossings	✓	Maximum Full Bore Velocity (m/s)	3.000	Return Period (years)	30		

Approval Results

The network has been designed using IDF rainfall
It contains 17 nodes (3 outfalls) and 16 links
The total impermeable area is 0.090 ha
1 online control has been defined
9 structures have been defined, providing 43m³ of storage below the flood risk level
Infiltration based on BRE 365 has been applied at 6 of the structures
Simulations have been completed using FEH-22 summer and winter storms from 15 to 1440 minute duration

12 manholes are smaller than that required by the library

Node	Required Dia (mm)	Actual Dia (mm)	Actual Width (mm)
Roof1.1	1200	400	
GY1	1200	300	300
Vent/Dummy Out	1200	300	
Roof2.2	1200	600	
P2b	1200	600	
Roof2.1	1200	600	
P1a	1200	450	
P2a	1200	450	
F1a	1200	450	
F1b	1200	900	
Roof1.2	1200	300	
Dummy	1200	100	

8 connections have combined exit and entry losses less than the recommended total

Node	US Link	DS Link	US Exit Loss	DS Entry Loss	Angle (degrees)	Recommended Node Losses
P1b	6.000	6.001	0.250	0.250	83	0.900
RG2	5.000	4.001	0.250	0.250	95	1.200
RG2	4.000	4.001	0.250	0.250	76	0.900
RG_1	1.000	1.001	0.250	0.250	87	0.900
P2b	9.000	8.001	0.250	0.250	72	0.900
P2b	8.000	8.001	0.250	0.250	135	1.200
G1	4.001	1.003	0.250	0.250	84	0.900
G1	1.002	1.003	0.250	0.250	152	1.200

12 circular links have diameters < 150mm

US Node	DS Node	Link	Dia (mm)
GY1	P2b	8.000	100
P1b	G1	6.001	100
Roof1.1	RG_1	2.000	100
Roof2.2	RG2	5.000	100
Roof2.1	RG2	4.000	100
P1a	P1b	6.000	100
P2a	P2b	9.000	100
F1a	F1b	3.000	100
Roof1.2	RG_1	1.000	100
P1b	G1	7.000	100
P2b	Dummy	8.001	100
G1	P2b	Overflow	100

No links have lengths > 100.000m

1 link has a length that differs from its coordinated length by more than 1.000m

US Node	DS Node	Link	Length (m)	Coordinate Length (m)
RG_1	F1b	1.001	6.421	4.829

No links cross one or more other links

16 links have cover depth outside the range 1.200-3.000m

US Node	DS Node	Link	Minimum Depth (m)	Maximum Depth (m)
RG_1	F1b	1.001	0.530	0.550
GY1	P2b	8.000	0.200	0.217
P1b	G1	6.001	0.430	0.775
G1	Vent/Dummy Out	1.003	0.150	0.200
RG2	G1	4.001	0.350	0.504
Roof1.1	RG_1	2.000	0.300	0.550
Roof2.2	RG2	5.000	0.600	0.775
Roof2.1	RG2	4.000	0.700	0.840
P1a	P1b	6.000	0.300	0.430
P2a	P2b	9.000	0.184	0.250
F1a	F1b	3.000	0.275	0.578
F1b	G1	1.002	0.550	0.600
Roof1.2	RG_1	1.000	0.400	0.633
P1b	G1	7.000	0.100	0.565
P2b	Dummy	8.001	0.050	0.300
G1	P2b	Overflow	0.500	0.558

1 node has backdrops outside the range 0.200-1.500m

Node	US Link	DS Link	Backdrop (m)
F1b	1.001	1.002	0.020

9 links have full bore velocity outside the range 1.000-3.000m/s

US Node	DS Node	Link	Velocity (m/s)
GY1	P2b	8.000	0.861
P1b	G1	6.001	0.861
Roof2.2	RG2	5.000	0.861
Roof2.1	RG2	4.000	0.579
F1a	F1b	3.000	0.625
F1b	G1	1.002	0.818
Roof1.2	RG_1	1.000	0.861
P2b	Dummy	8.001	0.881
G1	P2b	Overflow	0.625

8 links have peak proportional velocity outside the range 0.750-3.000m/s during the 100 year return period

US Node	DS Node	Link	Velocity (m/s)	Event
RG_1	F1b	1.001	0.660	100 year 15 minute summer
Roof2.2	RG2	5.000	0.635	100 year 15 minute winter
Roof2.1	RG2	4.000	0.534	100 year 15 minute winter
P1a	P1b	6.000	0.042	100 year +40% CC 480 minute winter
F1a	F1b	3.000	0.561	100 year 15 minute summer
Roof1.2	RG_1	1.000	0.621	100 year 15 minute winter
P1b	G1	7.000	0.329	100 year +40% CC 360 minute summer
G1	P2b	Overflow	0.492	100 year 480 minute winter

5 links have a surcharged depth greater than 0.100m during the 100 year return period

US Node	DS Node	Link	Surcharged Depth (m)	Event
RG_1	F1b	1.001	0.133	100 year +40% CC 960 minute winter
RG2	G1	4.001	0.133	100 year +40% CC 960 minute winter
Roof2.2	RG2	5.000	0.318	100 year 15 minute winter
Roof2.1	RG2	4.000	0.422	100 year 15 minute winter
G1	P2b	Overflow	0.183	100 year +40% CC 960 minute winter

No nodes flood during the 30 year return period

2 infiltrating structures failed to half empty in 1440 minutes during the 30 year return period

Node	Structure	Time to Half Empty (mins)
RG2	Depth/Area	Not identified
RG_1	Depth/Area	Not identified

No outfalls have a discharge rate greater than 1.0l/s during the 2 year return period

No outfalls have a discharge rate greater than 2.5l/s during the 30 year return period

No outfalls have a discharge rate greater than 3.1l/s during the 100 year return period

No outfalls have a discharge volume greater than 100m³ during the 100 year 360 minute storm

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	106.020	30.000	2 year 960 minute summer	6.917	1.821	30 year 600 minute summer	20.605	5.636
2 year 15 minute winter	74.400	30.000	2 year 960 minute winter	4.582	1.821	30 year 600 minute winter	14.078	5.636
2 year 30 minute summer	67.904	19.214	2 year 1440 minute summer	4.925	1.320	30 year 720 minute summer	18.271	4.897
2 year 30 minute winter	47.652	19.214	2 year 1440 minute winter	3.310	1.320	30 year 720 minute winter	12.279	4.897
2 year 60 minute summer	44.370	11.726	30 year 15 minute summer	280.222	79.293	30 year 960 minute summer	14.907	3.925
2 year 60 minute winter	29.478	11.726	30 year 15 minute winter	196.647	79.293	30 year 960 minute winter	9.875	3.925
2 year 120 minute summer	30.355	8.022	30 year 30 minute summer	180.714	51.136	30 year 1440 minute summer	10.714	2.872
2 year 120 minute winter	20.167	8.022	30 year 30 minute winter	126.817	51.136	30 year 1440 minute winter	7.201	2.872
2 year 180 minute summer	24.203	6.228	30 year 60 minute summer	119.627	31.614	100 year 15 minute summer	360.347	101.966
2 year 180 minute winter	15.733	6.228	30 year 60 minute winter	79.477	31.614	100 year 15 minute winter	252.875	101.966
2 year 240 minute summer	19.459	5.142	30 year 120 minute summer	72.173	19.073	100 year 30 minute summer	234.778	66.434
2 year 240 minute winter	12.928	5.142	30 year 120 minute winter	47.950	19.073	100 year 30 minute winter	164.757	66.434
2 year 360 minute summer	15.006	3.862	30 year 180 minute summer	54.790	14.099	100 year 60 minute summer	155.949	41.213
2 year 360 minute winter	9.754	3.862	30 year 180 minute winter	35.615	14.099	100 year 60 minute winter	103.609	41.213
2 year 480 minute summer	11.811	3.121	30 year 240 minute summer	42.960	11.353	100 year 120 minute summer	93.124	24.610
2 year 480 minute winter	7.847	3.121	30 year 240 minute winter	28.542	11.353	100 year 120 minute winter	61.870	24.610
2 year 600 minute summer	9.630	2.634	30 year 360 minute summer	32.430	8.345	100 year 180 minute summer	70.834	18.228
2 year 600 minute winter	6.580	2.634	30 year 360 minute winter	21.080	8.345	100 year 180 minute winter	46.044	18.228
2 year 720 minute summer	8.533	2.287	30 year 480 minute summer	25.324	6.692	100 year 240 minute summer	55.829	14.754
2 year 720 minute winter	5.735	2.287	30 year 480 minute winter	16.825	6.692	100 year 240 minute winter	37.091	14.754

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 360 minute summer	42.711	10.991	100 year +40% CC 15 minute summer	504.486	142.752	100 year +40% CC 360 minute summer	59.795	15.387
100 year 360 minute winter	27.763	10.991	100 year +40% CC 15 minute winter	354.025	142.752	100 year +40% CC 360 minute winter	38.868	15.387
100 year 480 minute summer	33.834	8.941	100 year +40% CC 30 minute summer	328.689	93.008	100 year +40% CC 480 minute summer	47.368	12.518
100 year 480 minute winter	22.479	8.941	100 year +40% CC 30 minute winter	230.659	93.008	100 year +40% CC 480 minute winter	31.470	12.518
100 year 600 minute summer	27.853	7.618	100 year +40% CC 60 minute summer	218.329	57.698	100 year +40% CC 600 minute summer	38.994	10.666
100 year 600 minute winter	19.031	7.618	100 year +40% CC 60 minute winter	145.053	57.698	100 year +40% CC 600 minute winter	26.643	10.666
100 year 720 minute summer	24.928	6.681	100 year +40% CC 120 minute summer	130.374	34.454	100 year +40% CC 720 minute summer	34.899	9.353
100 year 720 minute winter	16.753	6.681	100 year +40% CC 120 minute winter	86.617	34.454	100 year +40% CC 720 minute winter	23.455	9.353
100 year 960 minute summer	20.578	5.419	100 year +40% CC 180 minute summer	99.168	25.519	100 year +40% CC 960 minute summer	28.809	7.586
100 year 960 minute winter	13.631	5.419	100 year +40% CC 180 minute winter	64.462	25.519	100 year +40% CC 960 minute winter	19.084	7.586
100 year 1440 minute summer	14.892	3.991	100 year +40% CC 240 minute summer	78.160	20.655	100 year +40% CC 1440 minute summer	20.848	5.588
100 year 1440 minute winter	10.008	3.991	100 year +40% CC 240 minute winter	51.928	20.655	100 year +40% CC 1440 minute winter	14.011	5.588

Results for 2 year Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Roof1.1 DW1	11	24.723	0.023	1.2	0.0132	0.0000	OK
15 minute winter	GY1	10	24.881	0.031	1.4	0.0235	0.0000	OK
15 minute summer	P1b	1	24.220	0.000	0.0	0.0000	0.0000	OK
15 minute summer	Vent/Dummy Out	1	24.650	0.000	0.0	0.0000	0.0000	OK
120 minute winter	RG2	74	24.421	0.461	0.8	1.0268	0.0000	OK
15 minute winter	RG_1	11	24.436	0.069	2.4	0.2408	0.0000	OK
120 minute winter	Roof2.2	74	24.422	0.322	0.5	0.1827	0.0000	SURCHARGED
15 minute winter	P2b	14	24.446	0.104	2.8	0.5866	0.0000	OK
1440 minute winter	G1	930	23.771	-0.354	0.7	9.6775	0.0000	OK
120 minute winter	Roof2.1	74	24.422	0.422	0.5	0.2247	0.0000	SURCHARGED
15 minute summer	P1a	1	24.500	0.000	0.0	0.0000	0.0000	OK
15 minute summer	P2a	1	24.850	0.000	0.0	0.0000	0.0000	OK
15 minute winter	F1a	11	24.436	0.036	1.4	0.0786	0.0000	OK
15 minute winter	F1b	11	24.364	0.064	5.0	0.1543	0.0000	OK
15 minute winter	Roof1.2	11	24.529	0.029	1.2	0.0123	0.0000	OK
15 minute summer	Dummy	1	24.800	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Roof1.1	2.000	RG_1	1.2	0.903	0.109	0.0101	
15 minute winter	GY1	8.000	P2b	1.3	0.664	0.200	0.0272	
15 minute summer	P1b	Orifice	G1	0.0				
15 minute summer	P1b	7.000	G1	0.0	0.000	0.000	0.0000	
120 minute winter	RG2	4.001	G1	0.7	0.485	0.041	0.0080	
120 minute winter	RG2	Infiltration		0.0				
15 minute winter	RG_1	1.001	F1b	2.3	0.626	0.116	0.0240	
15 minute winter	RG_1	Infiltration		0.0				
15 minute winter	RG_1	Infiltration		0.0				
120 minute winter	Roof2.2	5.000	RG2	0.4	0.310	0.056	0.0471	
15 minute winter	P2b	8.001	Dummy	0.0	0.000	0.000	0.0000	0.0
15 minute winter	P2b	Infiltration		0.2				
1440 minute winter	G1	1.003	Vent/Dummy Out	0.0	0.000	0.000	0.0000	0.0
1440 minute winter	G1	Overflow	P2b	-0.7	-0.150	-0.144	0.0388	
1440 minute winter	G1	Infiltration		0.3				
120 minute winter	Roof2.1	4.000	RG2	0.4	0.241	0.084	0.0546	
15 minute summer	P1a	6.000	P1b	0.0	0.000	0.000	0.0000	
15 minute summer	P2a	9.000	P2b	0.0	0.000	0.000	0.0000	
15 minute winter	F1a	3.000	F1b	1.4	0.496	0.276	0.0326	
15 minute winter	F1a	Infiltration		0.0				
15 minute winter	F1b	1.002	G1	4.9	0.714	0.337	0.0510	
15 minute winter	Roof1.2	1.000	RG_1	1.2	0.332	0.177	0.0402	

Results for 30 year Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Roof1.1 DW1	10	24.739	0.039	3.2	0.0223	0.0000	OK
15 minute winter	GY1	10	24.903	0.053	3.6	0.0403	0.0000	OK
600 minute winter	P1b	585	24.228	0.008	0.0	0.0230	0.0000	OK
15 minute summer	Vent/Dummy Out	1	24.650	0.000	0.0	0.0000	0.0000	OK
15 minute winter	RG2	12	24.463	0.503	5.7	1.1059	0.0000	OK
15 minute winter	RG_1	11	24.460	0.093	6.4	0.3777	0.0000	OK
15 minute winter	Roof2.2	12	24.481	0.381	3.6	0.2163	0.0000	SURCHARGED
15 minute winter	P2b	14	24.485	0.143	7.1	1.7778	0.0000	OK
600 minute winter	G1	570	24.230	0.105	2.3	26.1919	0.0000	OK
15 minute winter	Roof2.1	12	24.483	0.483	3.6	0.2575	0.0000	SURCHARGED
15 minute summer	P1a	1	24.500	0.000	0.0	0.0000	0.0000	OK
15 minute summer	P2a	1	24.850	0.000	0.0	0.0000	0.0000	OK
15 minute winter	F1a	11	24.462	0.062	3.6	0.1351	0.0000	OK
15 minute winter	F1b	11	24.424	0.124	13.2	0.3013	0.0000	OK
15 minute winter	Roof1.2	10	24.548	0.048	3.2	0.0208	0.0000	OK
15 minute summer	Dummy	1	24.800	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Roof1.1	2.000	RG_1	3.2	1.175	0.289	0.0207	
15 minute winter	GY1	8.000	P2b	3.5	0.852	0.521	0.0553	
600 minute winter	P1b	Orifice	G1	0.0				
600 minute winter	P1b	7.000	G1	0.0	0.000	0.000	0.0000	
15 minute winter	RG2	4.001	G1	5.7	0.849	0.319	0.0358	
15 minute winter	RG2	Infiltration		0.0				
15 minute winter	RG_1	1.001	F1b	6.4	0.652	0.320	0.0631	
15 minute winter	RG_1	Infiltration		0.0				
15 minute winter	RG_1	Infiltration		0.0				
15 minute winter	Roof2.2	5.000	RG2	2.8	0.639	0.421	0.0471	
15 minute winter	P2b	8.001	Dummy	0.0	0.000	0.000	0.0000	0.0
15 minute winter	P2b	Infiltration		0.3				
600 minute winter	G1	1.003	Vent/Dummy Out	0.0	0.000	0.000	0.0000	0.0
600 minute winter	G1	Overflow	P2b	2.8	0.491	0.570	0.0509	
600 minute winter	G1	Infiltration		0.5				
15 minute winter	Roof2.1	4.000	RG2	2.9	0.365	0.627	0.0546	
15 minute summer	P1a	6.000	P1b	0.0	0.000	0.000	0.0000	
15 minute summer	P2a	9.000	P2b	0.0	0.000	0.000	0.0000	
15 minute winter	F1a	3.000	F1b	3.5	0.543	0.707	0.0749	
15 minute winter	F1a	Infiltration		0.0				
15 minute winter	F1b	1.002	G1	13.2	0.907	0.913	0.1085	
15 minute winter	Roof1.2	1.000	RG_1	3.2	0.538	0.470	0.0601	

Results for 100 year Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Roof1.1 DW1	10	24.745	0.045	4.2	0.0260	0.0000	OK
15 minute winter	GY1	10	24.913	0.063	4.6	0.0474	0.0000	OK
960 minute winter	P1b	870	24.450	0.230	0.5	3.9498	0.0000	SURCHARGED
15 minute summer	Vent/Dummy Out	1	24.650	0.000	0.0	0.0000	0.0000	OK
15 minute winter	RG2	11	24.478	0.518	8.4	1.1343	0.0000	OK
15 minute winter	RG_1	11	24.471	0.104	8.3	0.4391	0.0000	OK
15 minute winter	Roof2.2	11	24.518	0.418	4.6	0.2372	0.0000	FLOOD RISK
30 minute winter	P2b	23	24.504	0.162	7.2	2.4026	0.0000	OK
720 minute winter	G1	495	24.469	0.343	3.1	28.9973	0.0000	OK
15 minute winter	Roof2.1	11	24.522	0.522	4.6	0.2784	0.0000	FLOOD RISK
15 minute summer	P1a	1	24.500	0.000	0.0	0.0000	0.0000	OK
15 minute summer	P2a	1	24.850	0.000	0.0	0.0000	0.0000	OK
15 minute winter	F1a	12	24.514	0.114	4.6	0.2489	0.0000	FLOOD RISK
720 minute winter	F1b	495	24.469	0.169	1.6	0.4085	0.0000	SURCHARGED
15 minute winter	Roof1.2	10	24.556	0.056	4.2	0.0243	0.0000	OK
15 minute summer	Dummy	1	24.800	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Roof1.1	2.000	RG_1	4.1	1.255	0.377	0.0252	
15 minute winter	GY1	8.000	P2b	4.5	0.900	0.669	0.0671	
960 minute winter	P1b	Orifice	G1	0.4				
960 minute winter	P1b	7.000	G1	0.0	0.000	0.000	0.0297	
15 minute winter	RG2	4.001	G1	8.1	0.930	0.455	0.0469	
15 minute winter	RG2	Infiltration		0.0				
15 minute winter	RG_1	1.001	F1b	8.0	0.658	0.404	0.0801	
15 minute winter	RG_1	Infiltration		0.0				
15 minute winter	RG_1	Infiltration		0.0				
15 minute winter	Roof2.2	5.000	RG2	4.2	0.635	0.621	0.0471	
30 minute winter	P2b	8.001	Dummy	0.0	0.000	0.000	0.0000	0.0
30 minute winter	P2b	Infiltration		0.3				
720 minute winter	G1	1.003	Vent/Dummy Out	0.0	0.000	0.000	0.0000	0.0
720 minute winter	G1	Overflow	P2b	-1.0	-0.186	-0.200	0.0584	
720 minute winter	G1	Infiltration		0.5				
15 minute winter	Roof2.1	4.000	RG2	4.2	0.534	0.919	0.0546	
15 minute summer	P1a	6.000	P1b	0.0	0.000	0.000	0.0000	
15 minute summer	P2a	9.000	P2b	0.0	0.000	0.000	0.0000	
15 minute winter	F1a	3.000	F1b	4.0	0.555	0.812	0.0910	
15 minute winter	F1a	Infiltration		0.0				
720 minute winter	F1b	1.002	G1	1.6	0.530	0.111	0.1316	
15 minute winter	Roof1.2	1.000	RG_1	4.1	0.621	0.612	0.0658	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 95.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Roof1.1 DW1	10	24.755	0.055	5.8	0.0317	0.0000	OK
15 minute winter	GY1	10	24.932	0.082	6.5	0.0622	0.0000	OK
960 minute winter	P1b	690	24.683	0.463	1.5	6.3852	0.0000	FLOOD RISK
15 minute summer	Vent/Dummy Out	1	24.650	0.000	0.0	0.0000	0.0000	OK
960 minute winter	RG2	690	24.683	0.723	0.9	1.5192	0.0000	FLOOD RISK
960 minute winter	RG_1	690	24.683	0.316	0.8	1.4500	0.0000	SURCHARGED
960 minute winter	Roof2.2	690	24.683	0.583	0.4	0.3312	0.0000	FLOOD RISK
960 minute winter	P2b	690	24.683	0.341	1.5	8.1723	0.0000	OK
960 minute winter	G1	690	24.683	0.558	3.1	29.2400	0.0000	OK
960 minute winter	Roof2.1	690	24.683	0.683	0.4	0.3641	0.0000	FLOOD RISK
960 minute winter	P1a	690	24.683	0.183	0.1	0.0291	0.0000	FLOOD RISK
15 minute summer	P2a	1	24.850	0.000	0.0	0.0000	0.0000	OK
960 minute winter	F1a	690	24.683	0.283	0.4	0.6205	0.0000	FLOOD RISK
960 minute winter	F1b	690	24.683	0.383	1.6	0.8039	0.0000	SURCHARGED
960 minute winter	Roof1.2	690	24.683	0.183	0.4	0.0789	0.0000	SURCHARGED
15 minute summer	Dummy	1	24.800	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Roof1.1	2.000	RG_1	5.8	1.331	0.527	0.0405	
15 minute winter	GY1	8.000	P2b	6.3	0.951	0.933	0.0889	
960 minute winter	P1b	Orifice	G1	0.2				
960 minute winter	P1b	7.000	G1	-1.1	-0.199	-0.107	0.0594	
960 minute winter	RG2	4.001	G1	0.9	0.501	0.049	0.0946	
960 minute winter	RG2	Infiltration		0.0				
960 minute winter	RG_1	1.001	F1b	0.8	0.542	0.040	0.1130	
960 minute winter	RG_1	Infiltration		0.0				
960 minute winter	RG_1	Infiltration		0.0				
960 minute winter	Roof2.2	5.000	RG2	0.4	0.310	0.061	0.0471	
960 minute winter	P2b	8.001	Dummy	0.0	0.000	0.000	0.0000	0.0
960 minute winter	P2b	Infiltration		0.3				
960 minute winter	G1	1.003	Vent/Dummy Out	0.0	0.000	0.000	0.0000	0.0
960 minute winter	G1	Overflow	P2b	0.7	-0.145	0.140	0.0675	
960 minute winter	G1	Infiltration		0.5				
960 minute winter	Roof2.1	4.000	RG2	0.5	0.135	0.103	0.0546	
960 minute winter	P1a	6.000	P1b	-0.1	-0.017	-0.008	0.0292	
15 minute summer	P2a	9.000	P2b	0.0	0.000	0.000	0.0000	
960 minute winter	F1a	3.000	F1b	0.4	0.377	0.081	0.0910	
960 minute winter	F1a	Infiltration		0.0				
960 minute winter	F1b	1.002	G1	1.6	0.530	0.111	0.1316	
960 minute winter	Roof1.2	1.000	RG_1	0.4	0.162	0.059	0.0832	