



Design Settings

Rainfall Methodology	FSR
Return Period (years)	2
Additional Flow (%)	0
FSR Region	England and Wales
M5-60 (mm)	17.000
Ratio-R	0.400
CV	0.750
Time of Entry (mins)	5.00
Maximum Time of Concentration (mins)	5.00
Maximum Rainfall (mm/hr)	50.0
Minimum Velocity (m/s)	1.00
Connection Type	Level Soffits
Minimum Backdrop Height (m)	1.000
Preferred Cover Depth (m)	0.900
Include Intermediate Ground	✓
Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.014	5.00	50.624	600	385634.056	398189.968	1.785
2	0.014	5.00	50.226	600	385643.228	398177.677	1.540
3	0.013	5.00	49.464	600	385651.630	398166.177	1.348
4			48.700	600	385658.692	398156.322	1.190
5	0.015	5.00	50.507	1200	385620.029	398179.267	1.290
6	0.013	5.00	49.897	1200	385628.572	398167.518	2.608
7	0.012	5.00	49.189	1500	385637.445	398155.413	2.000
8			48.650	1800	385643.730	398146.611	1.915
8_OUT			48.500	1500	385641.903	398141.405	1.790

Links (Results)

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.307	52.0	1.9	1.560	1.315	0.014	0.0
1.001	2.627	104.5	3.8	1.315	1.123	0.028	0.0
1.002	2.939	116.8	5.6	1.123	0.965	0.041	0.0
1.003	1.307	52.0	5.6	0.965	1.076	0.041	0.0
2.000	1.786	31.6	2.0	1.140	0.997	0.015	0.0
2.001	2.005	567.0	3.8	2.008	1.400	0.028	0.0
2.002	4.811	1360.1	5.4	1.400	1.315	0.040	0.0
1.004	0.611	10.8	11.0	1.765	1.640	0.081	0.0

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)
1.000	15.336	100.0	225	Circular	50.624	48.839	1.560	50.226	48.686	1.315
1.001	14.242	25.0	225	Circular	50.226	48.686	1.315	49.464	48.116	1.123
1.002	12.124	20.0	225	Circular	49.464	48.116	1.123	48.700	47.510	0.965
1.003	16.141	100.0	225	Circular	48.700	47.510	0.965	48.650	47.349	1.076
2.000	14.942	32.0	150	Circular	50.507	49.217	1.140	49.897	48.750	0.997
2.001	14.712	147.1	600	Circular	49.897	47.289	2.008	49.189	47.189	1.400
2.002	11.693	25.8	600	Circular	49.189	47.189	1.400	48.650	46.735	1.315
1.004	6.666	266.6	150	Circular	48.650	46.735	1.765	48.500	46.710	1.640

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	600	Manhole	Adoptable	2	600	Manhole	Adoptable
1.001	2	600	Manhole	Adoptable	3	600	Manhole	Adoptable
1.002	3	600	Manhole	Adoptable	4	600	Manhole	Adoptable
1.003	4	600	Manhole	Adoptable	8	1800	Manhole	Adoptable
2.000	5	1200	Manhole	Adoptable	6	1200	Manhole	Adoptable
2.001	6	1200	Manhole	Adoptable	7	1500	Manhole	Adoptable
2.002	7	1500	Manhole	Adoptable	8	1800	Manhole	Adoptable
1.004	8	1800	Manhole	Adoptable	8_OUT	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	385634.056	398189.968	50.624	1.785	600				
2	385643.228	398177.677	50.226	1.540	600		1.000 48.839 225 1.000 48.686 225		
3	385651.630	398166.177	49.464	1.348	600		1.001 48.686 225 1.001 48.116 225		
4	385658.692	398156.322	48.700	1.190	600		1.002 48.116 225 1.002 47.510 225		
5	385620.029	398179.267	50.507	1.290	1200				
6	385628.572	398167.518	49.897	2.608	1200		2.000 49.217 150 2.000 48.750 150		
7	385637.445	398155.413	49.189	2.000	1500		2.001 47.289 600 2.001 47.189 600		
8	385643.730	398146.611	48.650	1.915	1800		2.002 47.189 600 2.002 46.735 600 1.003 47.349 225 1.004 46.735 150		



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
8_OUT	385641.903	398141.405	48.500	1.790	1500		1	1.004	46.710	150

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	1440
FSR Region	England and Wales	Additional Storage (m³/ha)	0.0
M5-60 (mm)	17.000	Check Discharge Rate(s)	✓
Ratio-R	0.400	1 year (l/s)	5.0
Summer CV	0.750	30 year (l/s)	5.0
Winter CV	0.840	100 year (l/s)	5.0
Analysis Speed	Normal	Check Discharge Volume	✓
Skip Steady State	x	100 year 360 minute (m³)	

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

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

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

Node 8 Online Hydro-Brake® Control

Flap Valve	✓
Replaces Downstream Link	✓
Invert Level (m)	46.735
Design Depth (m)	1.785
Design Flow (l/s)	5.0
Objective	(HE) Minimise upstream storage
Sump Available	✓
Product Number	CTL-SHE-0094-5000-1785-5000
Min Outlet Diameter (m)	0.150
Min Node Diameter (mm)	1200



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File: SW scheme.pfd
Network: Surface Water
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10/05/2022

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Snell Street
Manchester

Other (defaults)

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



Results for 30 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	48.883	0.044	4.1	0.0123	0.0000	OK
15 minute winter	2	10	48.728	0.042	8.1	0.0120	0.0000	OK
15 minute winter	3	10	48.164	0.048	11.8	0.0136	0.0000	OK
15 minute winter	4	11	47.585	0.075	11.8	0.0214	0.0000	OK
15 minute winter	5	10	49.256	0.039	4.4	0.0437	0.0000	OK
30 minute winter	6	29	47.540	0.251	7.4	0.2844	0.0000	OK
30 minute winter	7	28	47.538	0.349	12.3	0.6168	0.0000	OK
30 minute winter	8	28	47.540	0.805	16.2	2.0481	0.0000	SURCHARGED
15 minute summer	8_OUT	1	46.710	0.000	4.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	4.0	0.765	0.078	0.0809	
15 minute winter	2	1.001	3	8.0	1.416	0.077	0.0810	
15 minute winter	3	1.002	4	11.8	1.334	0.101	0.1080	
15 minute winter	4	1.003	8	11.7	1.034	0.225	0.2617	
15 minute winter	5	2.000	6	4.3	1.233	0.137	0.0525	
30 minute winter	6	2.001	7	7.9	0.759	0.014	2.0635	
30 minute winter	7	2.002	8	8.1	0.645	0.006	2.6411	
30 minute winter	8	Hydro-Brake®	8_OUT	4.4				14.2

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	48.898	0.059	7.4	0.0167	0.0000	OK
15 minute winter	2	10	48.744	0.058	14.7	0.0164	0.0000	OK
60 minute winter	3	49	48.489	0.373	11.2	0.1056	0.0000	SURCHARGED
60 minute winter	4	49	48.489	0.979	11.2	0.2770	0.0000	FLOOD RISK
15 minute winter	5	10	49.270	0.053	7.9	0.0598	0.0000	OK
60 minute winter	6	48	48.487	1.198	9.3	1.3547	0.0000	SURCHARGED
60 minute winter	7	49	48.488	1.299	12.1	2.2951	0.0000	SURCHARGED
60 minute winter	8	49	48.487	1.752	12.0	4.4586	0.0000	FLOOD RISK
15 minute summer	8_OUT	1	46.710	0.000	4.4	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	1	1.000	2	7.3	0.895	0.141	0.1253	
15 minute winter	2	1.001	3	14.6	1.668	0.140	0.1245	
60 minute winter	3	1.002	4	11.2	1.363	0.096	0.4822	
60 minute winter	4	1.003	8	11.2	0.960	0.215	0.6419	
15 minute winter	5	2.000	6	7.8	1.447	0.247	0.0806	
60 minute winter	6	2.001	7	9.0	0.685	0.016	4.1440	
60 minute winter	7	2.002	8	6.0	0.627	0.004	3.2937	
60 minute winter	8	Hydro-Brake®	8_OUT	5.0				32.6