

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	150.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S5			39.184	1800	-177254.168	478521.833	1.901
S4			39.158	1350	-177258.176	478521.883	1.925
S3	0.035	5.00	39.190	1350	-177229.807	478519.442	1.601
S2	0.006	5.00	39.173	1350	-177217.552	478519.376	1.430
S1	0.003	5.00	39.261	1350	-177204.092	478519.310	1.350

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)
S1-S2	S1	S2	13.460	0.600	37.911	37.743	0.168	80.1	150	5.20	89.7
S2-S3	S2	S3	12.255	0.600	37.743	37.589	0.154	79.6	150	5.38	88.4
S3-S5	S3	S5	24.478	0.600	37.589	37.283	0.306	80.0	150	5.74	85.9
S5-S4	S5	S4	4.008	0.600	37.283	37.233	0.050	80.2	150	5.80	85.5

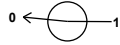
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
S1-S2	1.124	19.9	0.7	1.200	1.280	0.003	0.0	20	0.531
S2-S3	1.128	19.9	2.2	1.280	1.451	0.009	0.0	33	0.737
S3-S5	1.125	19.9	10.2	1.451	1.751	0.044	0.0	76	1.134
S5-S4	1.124	19.9	10.2	1.751	1.775	0.044	0.0	76	1.133

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)
S1-S2	13.460	80.1	150	Circular	39.261	37.911	1.200	39.173	37.743	1.280
S2-S3	12.255	79.6	150	Circular	39.173	37.743	1.280	39.190	37.589	1.451
S3-S5	24.478	80.0	150	Circular	39.190	37.589	1.451	39.184	37.283	1.751
S5-S4	4.008	80.2	150	Circular	39.184	37.283	1.751	39.158	37.233	1.775

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1-S2	S1	1350	Manhole	Adoptable	S2	1350	Manhole	Adoptable
S2-S3	S2	1350	Manhole	Adoptable	S3	1350	Manhole	Adoptable
S3-S5	S3	1350	Manhole	Adoptable	S5	1800	Manhole	Adoptable
S5-S4	S5	1800	Manhole	Adoptable	S4	1350	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S5	-177254.168	478521.833	39.184	1.901	1800		1 S3-S5	37.283	150
							0 S5-S4	37.283	150
S4	-177258.176	478521.883	39.158	1.925	1350		1 S5-S4	37.233	150
							0 S2-S3	37.589	150
S3	-177229.807	478519.442	39.190	1.601	1350		0 S3-S5	37.589	150
							1 S1-S2	37.743	150
S2	-177217.552	478519.376	39.173	1.430	1350		0 S2-S3	37.743	150
							0 S1-S2	37.911	150
S1	-177204.092	478519.310	39.261	1.350	1350				

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	1440
Ratio-R	0.400	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

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 %)
2	0	0	0
30	0	0	0
100	40	0	0

Node S5 Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	37.283	Design Flow (l/s)	1.0
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)
2.000	0.000

Node S5 Lined Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.35290	Invert Level (m)	36.500	Pit Length (m)	2.200
Side Inf Coefficient (m/hr)	0.35290	Time to half empty (mins)	688	Depth (m)	
Safety Factor	5.0	Ring Diameter (m)	1.800	Inf Depth (m)	
Porosity	0.30	Pit Width (m)	2.200	Number Required	1

Node S3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.700	Slope (1:X)	350.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	5.0	Width (m)	18.700	Inf Depth (m)	
Porosity	0.30	Length (m)	18.700		

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	S5	118	37.707	0.424	2.5	4.9839	0.0000	SURCHARGED
15 minute summer	S4	1	37.233	0.000	0.0	0.0000	0.0000	OK
120 minute winter	S3	118	37.707	0.118	2.5	0.1691	0.0000	OK
15 minute winter	S2	10	37.771	0.028	1.6	0.0403	0.0000	OK
15 minute summer	S1	11	37.927	0.016	0.5	0.0236	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)
120 minute winter	S5	Depth/Flow	S4	0.0				0.0
120 minute winter	S5	Infiltration		0.3				
120 minute winter	S3	S3-S5	S5	2.5	0.762	0.126	0.3977	
15 minute winter	S2	S2-S3	S3	1.5	0.323	0.077	0.0601	
15 minute summer	S1	S1-S2	S2	0.5	0.310	0.025	0.0221	

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S5	232	38.336	1.053	2.4	8.6165	0.0000	SURCHARGED
15 minute summer	S4	1	37.233	0.000	0.0	0.0000	0.0000	OK
240 minute winter	S3	232	38.336	0.747	2.8	1.0690	0.0000	SURCHARGED
240 minute winter	S2	232	38.336	0.593	0.9	0.8487	0.0000	SURCHARGED
240 minute winter	S1	232	38.336	0.425	0.6	0.6082	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	S5	Depth/Flow	S4	0.0				0.0
240 minute winter	S5	Infiltration		0.4				
240 minute winter	S3	S3-S5	S5	2.4	0.671	0.120	0.4309	
240 minute winter	S2	S2-S3	S3	0.6	0.261	0.030	0.2157	
240 minute winter	S1	S1-S2	S2	-0.4	0.255	-0.021	0.2370	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	S5	344	38.801	1.518	2.4	11.3037	0.0000	SURCHARGED
15 minute summer	S4	1	37.233	0.000	0.0	0.0000	0.0000	OK
360 minute winter	S3	344	38.801	1.212	3.5	9.5160	0.0000	SURCHARGED
360 minute winter	S2	344	38.801	1.058	0.8	1.5143	0.0000	SURCHARGED
360 minute winter	S1	344	38.801	0.890	0.5	1.2739	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	S5	Depth/Flow	S4	0.0				0.0
360 minute winter	S5	Infiltration		0.5				
360 minute winter	S3	S3-S5	S5	2.4	0.586	0.119	0.4309	
360 minute winter	S2	S2-S3	S3	0.7	0.232	0.034	0.2157	
360 minute winter	S1	S1-S2	S2	-0.3	0.250	-0.017	0.2370	