Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	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)
Outfall			39.160	1200	583.219	364.058	0.840
EX-01-S	0.020	5.00	39.160	1200	584.527	367.632	0.820
EX-02-S	0.088	5.00	39.560	1200	592.146	405.102	1.020
EX-03-S	0.046	5.00	39.630	1200	608.071	403.875	0.980
EX-04-S		5.00	39.760	1200	609.908	419.466	1.000

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)
Outfall PN	EX-01-S	Outfall	3.806	0.600	38.340	38.320	0.020	190.3	225	6.38	50.0
EX-01 PN	EX-02-S	EX-01-S	38.237	0.600	38.540	38.340	0.200	191.2	225	6.31	50.0
EX-02 PN	EX-03-S	EX-02-S	15.972	0.600	38.650	38.540	0.110	145.2	150	5.63	50.0
EX-03 PN	EX-04-S	EX-03-S	15.699	0.600	38.760	38.650	0.110	142.7	150	5.31	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)
Outfall PN	0.944	37.5	29.2	0.595	0.615	0.154	0.0	150	1.041
EX-01 PN	0.942	37.5	25.4	0.795	0.595	0.134	0.0	136	1.010
EX-02 PN	0.832	14.7	8.7	0.830	0.870	0.046	0.0	83	0.868
EX-03 PN	0.839	14.8	0.0	0.850	0.830	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)
Outfall PN	3.806	190.3	225	Circular	39.160	38.340	0.595	39.160	38.320	0.615
EX-01 PN	38.237	191.2	225	Circular	39.560	38.540	0.795	39.160	38.340	0.595
EX-02 PN	15.972	145.2	150	Circular	39.630	38.650	0.830	39.560	38.540	0.870
EX-03 PN	15.699	142.7	150	Circular	39.760	38.760	0.850	39.630	38.650	0.830

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
Outfall PN	EX-01-S	1200	Manhole	Adoptable	Outfall	1200	Manhole	Adoptable
EX-01 PN	EX-02-S	1200	Manhole	Adoptable	EX-01-S	1200	Manhole	Adoptable
EX-02 PN	EX-03-S	1200	Manhole	Adoptable	EX-02-S	1200	Manhole	Adoptable
EX-03 PN	EX-04-S	1200	Manhole	Adoptable	EX-03-S	1200	Manhole	Adoptable

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
Outfall	583.219	364.058	39.160	0.840	1200		1	Outfall PN	38.320	225
EX-01-S	584.527	367.632	39.160	0.820	1200		1	EX-01 PN	38.340	225
							0	Outfall PN	38.340	225
EX-02-S	592.146	405.102	39.560	1.020	1200		1	EX-02 PN	38.540	150
							0	EX-01 PN	38.540	225
EX-03-S	608.071	403.875	39.630	0.980	1200		1	EX-03 PN	38.650	150
							0	EX-02 PN	38.650	150
EX-04-S	609.908	419.466	39.760	1.000	1200		0	EX-03 PN	38.760	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
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 %)
1	0	0	0
2	0	0	0
5	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.439	0.119	21.1	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.476	0.136	21.1	0.2209	0.0000	OK
15 minute winter	EX-02-S	10	38.651	0.111	18.7	0.3158	0.0000	OK
15 minute winter	EX-03-S	10	38.718	0.068	6.5	0.1414	0.0000	OK
15 minute summer	EX-04-S	1	38.760	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	EX-01-S	Outfall PN	Outfall	21.1	0.907	0.563	0.0886	10.0
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	18.4	0.832	0.490	0.8499	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	6.3	0.575	0.428	0.1735	
15 minute summer	EX-04-S	EX-03 PN	EX-03-S	0.0	0.000	0.000	0.0593	

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.458	0.138	27.3	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.501	0.161	27.2	0.2604	0.0000	OK
15 minute winter	EX-02-S	10	38.670	0.130	24.1	0.3709	0.0000	OK
15 minute winter	EX-03-S	10	38.729	0.079	8.4	0.1645	0.0000	OK
15 minute summer	EX-04-S	1	38.760	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	EX-01-S	Outfall PN	Outfall	27.3	0.975	0.727	0.1063	12.9
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	23.8	0.880	0.635	1.0309	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	8.2	0.621	0.555	0.2050	
15 minute summer	EX-04-S	EX-03 PN	EX-03-S	0.0	0.000	0.000	0.0718	

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Results for 5 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.477	0.157	35.1	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.530	0.190	35.0	0.3084	0.0000	OK
15 minute winter	EX-02-S	11	38.696	0.156	31.1	0.4465	0.0000	OK
15 minute winter	EX-03-S	11	38.748	0.098	10.9	0.2029	0.0000	OK
15 minute summer	EX-04-S	1	38.760	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	EX-01-S	Outfall PN	Outfall	35.1	1.067	0.935	0.1246	16.7
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	30.6	0.931	0.816	1.2484	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	10.4	0.656	0.711	0.2380	
15 minute summer	EX-04-S	EX-03 PN	EX-03-S	0.0	0.000	0.000	0.0896	

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Results for 10 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.486	0.166	39.4	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.548	0.208	39.2	0.3366	0.0000	OK
15 minute winter	EX-02-S	11	38.715	0.175	34.9	0.4996	0.0000	OK
15 minute winter	EX-03-S	11	38.778	0.128	12.5	0.2649	0.0000	OK
15 minute winter	EX-04-S	11	38.780	0.020	0.5	0.0232	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	EX-01-S	Outfall PN	Outfall	39.4	1.116	1.049	0.1329	19.4
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	34.1	0.950	0.912	1.3667	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	11.7	0.682	0.799	0.2684	
15 minute winter	EX-04-S	EX-03 PN	EX-03-S	-0.5	-0.060	-0.035	0.1369	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.498	0.178	45.4	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.576	0.236	45.6	0.3820	0.0000	SURCHARGED
15 minute winter	EX-02-S	11	38.824	0.284	40.9	0.8124	0.0000	SURCHARGED
15 minute winter	EX-03-S	12	38.932	0.282	15.9	0.5843	0.0000	SURCHARGED
15 minute winter	EX-04-S	12	38.934	0.174	2.3	0.1971	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)
15 minute winter	EX-01-S	Outfall PN	Outfall	45.4	1.187	1.210	0.1399	24.5
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	39.1	0.983	1.044	1.5207	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	14.2	0.805	0.964	0.2812	
15 minute winter	EX-04-S	EX-03 PN	EX-03-S	2.8	0.239	0.186	0.2764	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.518	0.198	58.2	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.633	0.293	58.5	0.4739	0.0000	SURCHARGED
15 minute winter	EX-02-S	11	39.047	0.507	52.0	1.4483	0.0000	SURCHARGED
15 minute winter	EX-03-S	12	39.222	0.572	20.7	1.1835	0.0000	SURCHARGED
15 minute winter	EX-04-S	12	39.224	0.464	5.4	0.5250	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)
15 minute winter	EX-01-S	Outfall PN	Outfall	58.2	1.466	1.551	0.1462	31.9
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	50.1	1.260	1.338	1.5207	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	18.0	1.022	1.224	0.2812	
15 minute winter	EX-04-S	EX-03 PN	EX-03-S	-5.4	-0.312	-0.361	0.2764	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Outfall	11	38.533	0.213	78.1	0.0000	0.0000	OK
15 minute winter	EX-01-S	11	38.726	0.386	78.4	0.6243	0.0000	SURCHARGED
15 minute winter	EX-02-S	11	39.459	0.919	70.4	2.6253	0.0000	FLOOD RISK
15 minute winter	EX-03-S	11	39.630	0.980	28.8	2.0286	0.9151	FLOOD
15 minute winter	EX-04-S	11	39.656	0.896	7.2	1.0134	0.0000	FLOOD RISK

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	EX-01-S	Outfall PN	Outfall	78.1	1.964	2.080	0.1498	43.8
15 minute winter	EX-02-S	EX-01 PN	EX-01-S	66.6	1.674	1.778	1.5207	
15 minute winter	EX-03-S	EX-02 PN	EX-02-S	22.7	1.289	1.544	0.2812	
15 minute winter	EX-04-S	EX-03 PN	EX-03-S	-7.2	-0.411	-0.488	0.2764	

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