

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Permavoid Storage	0.009	5.00	101.000		-15.477	96.242	0.500
Outfall			101.000	1200	3.208	89.144	0.517

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)
1.000	Permavoid Storage	Outfall	1.000	0.600	100.500	100.483	0.017	59.5	100	5.02	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)
1.000	1.000	7.9	1.2	0.400	0.417	0.009	0.0	27	0.730

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	1.000	59.5	100	Circular	101.000	100.500	0.400	101.000	100.483	0.417

Link	US Node	Node Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Permavoid Storage	Junction	Outfall	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Link	IL (m)	Dia (mm)
Permavoid Storage	-15.477	96.242	101.000	0.500				
						1.000	100.500	100
Outfall	3.208	89.144	101.000	0.517	1200	1.000	100.483	100

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	11.3
Summer CV	0.750	Drain Down Time (mins)	240	30 year (l/s)	33.8
Winter CV	0.840	Additional Storage (m ³ /ha)	20.0	100 year (l/s)	45.7
Analysis Speed	Normal	Check Discharge Rate(s)	✓	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	35	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Betterment (%)	0
Greenfield Method	ReFH2	Q 2 year (l/s)	11.3
Region	England, Wales, NI	Q 30 year (l/s)	33.8
Include Baseflow	x	Q 100 year (l/s)	45.7
Positively Drained Area (ha)	1.000		

Node Permavoid Storage Online Orifice Control

Flap Valve	x	Invert Level (m)	100.450	Diameter (m)	0.031
Downstream Link	1.000	Design Depth (m)	0.350	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.2		

Node Permavoid Storage Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	100.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	40

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	10.1	0.0	0.300	10.1	0.0	0.301	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	108.821	30.793	2 year 360 minute winter	11.131	4.407
2 year 15 minute winter	76.366	30.793	2 year 480 minute summer	13.424	3.548
2 year 30 minute summer	68.547	19.396	2 year 480 minute winter	8.919	3.548
2 year 30 minute winter	48.103	19.396	2 year 600 minute summer	10.901	2.982
2 year 60 minute summer	44.705	11.814	2 year 600 minute winter	7.448	2.982
2 year 60 minute winter	29.701	11.814	2 year 720 minute summer	9.627	2.580
2 year 120 minute summer	33.326	8.807	2 year 720 minute winter	6.470	2.580
2 year 120 minute winter	22.141	8.807	2 year 960 minute summer	7.777	2.048
2 year 180 minute summer	27.247	7.012	2 year 960 minute winter	5.151	2.048
2 year 180 minute winter	17.711	7.012	2 year 1440 minute summer	5.497	1.473
2 year 240 minute summer	22.118	5.845	2 year 1440 minute winter	3.695	1.473
2 year 240 minute winter	14.695	5.845	30 year +35% CC 15 minute summer	461.386	130.556
2 year 360 minute summer	17.124	4.407	30 year +35% CC 15 minute winter	323.779	130.556

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year +35% CC 30 minute summer	294.451	83.319	100 year +40% CC 15 minute winter	440.234	177.514
30 year +35% CC 30 minute winter	206.632	83.319	100 year +40% CC 30 minute summer	403.411	114.151
30 year +35% CC 60 minute summer	192.066	50.757	100 year +40% CC 30 minute winter	283.096	114.151
30 year +35% CC 60 minute winter	127.604	50.757	100 year +40% CC 60 minute summer	263.839	69.725
30 year +35% CC 120 minute summer	122.126	32.274	100 year +40% CC 60 minute winter	175.289	69.725
30 year +35% CC 120 minute winter	81.137	32.274	100 year +40% CC 120 minute summer	167.222	44.192
30 year +35% CC 180 minute summer	94.229	24.248	100 year +40% CC 120 minute winter	111.098	44.192
30 year +35% CC 180 minute winter	61.251	24.248	100 year +40% CC 180 minute summer	130.037	33.463
30 year +35% CC 240 minute summer	74.085	19.579	100 year +40% CC 180 minute winter	84.527	33.463
30 year +35% CC 240 minute winter	49.221	19.579	100 year +40% CC 240 minute summer	103.134	27.255
30 year +35% CC 360 minute summer	55.305	14.232	100 year +40% CC 240 minute winter	68.520	27.255
30 year +35% CC 360 minute winter	35.950	14.232	100 year +40% CC 360 minute summer	78.152	20.111
30 year +35% CC 480 minute summer	42.458	11.220	100 year +40% CC 360 minute winter	50.801	20.111
30 year +35% CC 480 minute winter	28.208	11.220	100 year +40% CC 480 minute summer	60.508	15.991
30 year +35% CC 600 minute summer	33.964	9.290	100 year +40% CC 480 minute winter	40.200	15.991
30 year +35% CC 600 minute winter	23.206	9.290	100 year +40% CC 600 minute summer	48.620	13.299
30 year +35% CC 720 minute summer	29.640	7.944	100 year +40% CC 600 minute winter	33.220	13.299
30 year +35% CC 720 minute winter	19.920	7.944	100 year +40% CC 720 minute summer	42.531	11.399
30 year +35% CC 960 minute summer	23.493	6.186	100 year +40% CC 720 minute winter	28.583	11.399
30 year +35% CC 960 minute winter	15.562	6.186	100 year +40% CC 960 minute summer	33.751	8.888
30 year +35% CC 1440 minute summer	16.166	4.333	100 year +40% CC 960 minute winter	22.358	8.888
30 year +35% CC 1440 minute winter	10.865	4.333	100 year +40% CC 1440 minute summer	23.050	6.178
100 year +40% CC 15 minute summer	627.333	177.514	100 year +40% CC 1440 minute winter	15.491	6.178

Results for 2 year Critical Storm Duration. Lowest mass balance: 93.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	Permavoid Storage	14	100.528	0.028	1.3	0.2866	0.0000	OK
15 minute summer	Outfall	1	100.483	0.000	0.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m ³)
15 minute winter	Permavoid Storage	Orifice	Outfall	0.4	0.5

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 93.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute winter	Permavoid Storage	27	100.702	0.202	4.0	2.0170	0.0000	FLOOD RISK
15 minute summer	Outfall	1	100.483	0.000	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m ³)
30 minute winter	Permavoid Storage	Orifice	Outfall	0.9	3.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 93.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute winter	Permavoid Storage	28	100.798	0.298	5.5	2.9692	0.0000	FLOOD RISK
15 minute summer	Outfall	1	100.483	0.000	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Discharge Vol (m ³)
30 minute winter	Permavoid Storage	Orifice	Outfall	1.1	4.3