


Paul Waite Associates		Page 1
Summit House Riparian Way Keighley BD20 7BW	21256-PWA-01-XX-CA-C-3000 P04 HAINSWORTH ROAD DAVRIC SITE SURFACE WATER CALCULATIONS	
Date 11/09/2023 File 21256-PWA-01-XX-CA-C-30...	Designed by AC Checked by LS	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	10	PIMP (%)	100
M5-60 (mm)	17.000	Add Flow / Climate Change (%)	0
Ratio R	0.300	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.065	4-8	0.025

Total Area Contributing (ha) = 0.090

Total Pipe Volume (m³) = 2.086

Network Design Table for Storm

< - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	12.900	0.129	100.0	0.007	4.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.001	13.400	0.134	100.0	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.002	4.500	0.095	47.4	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
2.000	17.000	0.638	26.6	0.011	4.00	0.0	0.600	o	100	Pipe/Conduit	🔴
3.000	8.500	0.133	63.9	0.023	4.00	0.0	0.600	o	150	Pipe/Conduit	🔴
2.001	13.900	0.139	100.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
2.002	4.800	0.098	49.0	0.016	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.003	2.000	0.020	100.0	0.008	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.004	5.500	0.055	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	80.58	4.21	98.633	0.007	0.0	0.0	0.0	1.00	17.8	1.5
1.001	79.16	4.44	98.504	0.011	0.0	0.0	0.0	1.00	17.8	2.4
1.002	78.84	4.49	98.370	0.029	0.0	0.0	0.0	1.47	25.9	6.2
2.000	80.75	4.19	99.200	0.011	0.0	0.0	0.0	1.50	11.8	2.4
3.000	81.25	4.11	98.645	0.023	0.0	0.0	0.0	1.26	22.3	5.1
2.001	79.27	4.42	98.512	0.037	0.0	0.0	0.0	1.00	17.8	7.9
2.002	78.92	4.47	98.373	0.053	0.0	0.0	0.0	1.44	25.5	11.3
1.003	78.64	4.52	98.275	0.090	0.0	0.0	0.0	1.00	17.8<<	19.2
1.004	78.08	4.61	98.255	0.090	0.0	0.0	0.0	1.00	17.8<<	19.2

Summit House
 Riparian Way
 Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
 HAINSWORTH ROAD DAVRIC SITE
 SURFACE WATER CALCULATIONS



Date 11/09/2023
 File 21256-PWA-01-XX-CA-C-30...

Designed by AC
 Checked by LS

Innovyze

Network 2020.1.3

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	33.900	0.339	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.006	11.100	0.111	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	74.87	5.17	98.200	0.090	0.0	0.0	0.0	1.00	17.8«	19.2
1.006	73.88	5.36	97.861	0.090	0.0	0.0	0.0	1.00	17.8«	19.2

Summit House
Riparian Way
Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
HAINSWORTH ROAD DAVRIC SITE
SURFACE WATER CALCULATIONS



Date 11/09/2023

Designed by AC

File 21256-PWA-01-XX-CA-C-30...

Checked by LS

Innovyze

Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SWMH5a	99.242	0.609	Open Manhole	450	1.000	98.633	150				
SWMH4a	99.250	0.746	Open Manhole	450	1.001	98.504	150	1.000	98.504	150	
SWMH01	99.512	1.142	Open Manhole	450	1.002	98.370	150	1.001	98.370	150	
SWMH3a	99.850	0.650	Open Manhole	450	2.000	99.200	100				
SWMH1a	99.947	1.302	Open Manhole	450	3.000	98.645	150				
SWMH2a	99.850	1.338	Open Manhole	450	2.001	98.512	150	2.000	98.562	100	
SWMH2b	99.860	1.487	Open Manhole	450	2.002	98.373	150	3.000	98.512	150	
ATTENUATION	99.730	1.455	Junction		1.003	98.275	150	2.001	98.373	150	
								1.002	98.275	150	
SWMH02FC	99.961	1.706	Open Manhole	1500	1.004	98.255	150	2.002	98.275	150	
SWMH03	99.978	1.778	Open Manhole	450	1.005	98.200	150	1.003	98.255	150	
SWMH04	99.844	1.983	Open Manhole	450	1.006	97.861	150	1.004	98.200	150	
	99.956	2.206	Open Manhole	0		OUTFALL		1.005	97.861	150	
								1.006	97.750	150	

No coordinates have been specified, layout information cannot be produced.

Summit House
 Riparian Way
 Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
 HAINSWORTH ROAD DAVRIC SITE
 SURFACE WATER CALCULATIONS



Date 11/09/2023
 File 21256-PWA-01-XX-CA-C-30...

Designed by AC
 Checked by LS

Innovyze

Network 2020.1.3

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	SWMH5a	99.242	98.633	0.459	Open Manhole	450
1.001	o	150	SWMH4a	99.250	98.504	0.596	Open Manhole	450
1.002	o	150	SWMH01	99.512	98.370	0.992	Open Manhole	450
2.000	o	100	SWMH3a	99.850	99.200	0.550	Open Manhole	450
3.000	o	150	SWMH1a	99.947	98.645	1.152	Open Manhole	450
2.001	o	150	SWMH2a	99.850	98.512	1.188	Open Manhole	450
2.002	o	150	SWMH2b	99.860	98.373	1.337	Open Manhole	450
1.003	o	150	ATTENUATION	99.730	98.275	1.305	Junction	
1.004	o	150	SWMH02FC	99.961	98.255	1.556	Open Manhole	1500
1.005	o	150	SWMH03	99.978	98.200	1.628	Open Manhole	450
1.006	o	150	SWMH04	99.844	97.861	1.833	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	12.900	100.0	SWMH4a	99.250	98.504	0.596	Open Manhole	450
1.001	13.400	100.0	SWMH01	99.512	98.370	0.992	Open Manhole	450
1.002	4.500	47.4	ATTENUATION	99.730	98.275	1.305	Junction	
2.000	17.000	26.6	SWMH2a	99.850	98.562	1.188	Open Manhole	450
3.000	8.500	63.9	SWMH2a	99.850	98.512	1.188	Open Manhole	450
2.001	13.900	100.0	SWMH2b	99.860	98.373	1.337	Open Manhole	450
2.002	4.800	49.0	ATTENUATION	99.730	98.275	1.305	Junction	
1.003	2.000	100.0	SWMH02FC	99.961	98.255	1.556	Open Manhole	1500
1.004	5.500	100.0	SWMH03	99.978	98.200	1.628	Open Manhole	450
1.005	33.900	100.0	SWMH04	99.844	97.861	1.833	Open Manhole	450
1.006	11.100	100.0		99.956	97.750	2.056	Open Manhole	0

Summit House
 Riparian Way
 Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
 HAINSWORTH ROAD DAVRIC SITE
 SURFACE WATER CALCULATIONS



Date 11/09/2023
 File 21256-PWA-01-XX-CA-C-30...

Designed by AC
 Checked by LS

Innovyze

Network 2020.1.3

Setting Out Information - Site Coordinates (Storm)

PN	USMH Name	Dia/Len (mm)	Width (mm)	US Easting (m)	US Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Layout (North)
1.000	SWMH5a	450						●
1.001	SWMH4a	450						●
1.002	SWMH01	450						●
2.000	SWMH3a	450						●
3.000	SWMH1a	450						●
2.001	SWMH2a	450						●
2.002	SWMH2b	450						●
1.003	ATTENUATION							○
1.004	SWMH02FC	1500						●
1.005	SWMH03	450						●
1.006	SWMH04	450						●

PN	DSMH Name	Dia/Len (mm)	Width (mm)	DS Easting (m)	DS Northing (m)	Layout (North)
1.006			0			●

Summit House
Riparian Way
Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
HAINSWORTH ROAD DAVRIC SITE
SURFACE WATER CALCULATIONS



Date 11/09/2023
File 21256-PWA-01-XX-CA-C-30...

Designed by AC
Checked by LS

Innovyze

Network 2020.1.3

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
1.000	SWMH5a	150	0.459	0.596	Unclassified	450	0	0.459	Unclassified
1.001	SWMH4a	150	0.596	0.992	Unclassified	450	0	0.596	Unclassified
1.002	SWMH01	150	0.992	1.305	Unclassified	450	0	0.992	Unclassified
2.000	SWMH3a	100	0.550	1.188	Unclassified	450	0	0.550	Unclassified
3.000	SWMH1a	150	1.152	1.188	Unclassified	450	0	1.152	Unclassified
2.001	SWMH2a	150	1.188	1.337	Unclassified	450	0	1.188	Unclassified
2.002	SWMH2b	150	1.305	1.337	Unclassified	450	0	1.337	Unclassified
1.003	ATTENUATION	150	1.305	1.556	Unclassified				Junction
1.004	SWMH02FC	150	1.556	1.628	Unclassified	1500	0	1.556	Unclassified
1.005	SWMH03	150	1.628	1.833	Unclassified	450	0	1.628	Unclassified
1.006	SWMH04	150	1.833	2.056	Unclassified	450	0	1.833	Unclassified

Free Flowing Outfall Details for Storm


Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006		99.956	97.750	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
		Number of Storage Structures	1
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	17.000	Cv (Summer)	0.750
Return Period (years)	10	Ratio R	0.300	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Summer	Storm Duration (mins)	30

Paul Waite Associates		Page 7
Summit House Riparian Way Keighley BD20 7BW	21256-PWA-01-XX-CA-C-3000 P04 HAINSWORTH ROAD DAVRIC SITE SURFACE WATER CALCULATIONS	
Date 11/09/2023 File 21256-PWA-01-XX-CA-C-30...	Designed by AC Checked by LS	
Innovyze	Network 2020.1.3	

Online Controls for Storm


Hydro-Brake® Optimum Manhole: SWMH02FC, DS/PN: 1.004, Volume (m³): 3.0

Unit Reference	MD-SHE-0048-1000-0900-1000	Sump Available	Yes
Design Head (m)	0.900	Diameter (mm)	48
Design Flow (l/s)	1.0	Invert Level (m)	98.255
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	75
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	1.0	Kick-Flo®	0.428	0.7
Flush-Flo™	0.212	0.9	Mean Flow over Head Range	-	0.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	2.0	7.000	2.5
0.200	0.9	1.000	1.0	2.200	1.5	4.500	2.1	7.500	2.6
0.300	0.9	1.200	1.1	2.400	1.6	5.000	2.2	8.000	2.7
0.400	0.8	1.400	1.2	2.600	1.6	5.500	2.3	8.500	2.8
0.500	0.8	1.600	1.3	3.000	1.7	6.000	2.4	9.000	2.9
0.600	0.8	1.800	1.4	3.500	1.8	6.500	2.5	9.500	2.9

Paul Waite Associates		Page 8
Summit House Riparian Way Keighley BD20 7BW	21256-PWA-01-XX-CA-C-3000 P04 HAINSWORTH ROAD DAVRIC SITE SURFACE WATER CALCULATIONS	
Date 11/09/2023 File 21256-PWA-01-XX-CA-C-30...	Designed by AC Checked by LS	
Innovyze	Network 2020.1.3	

Storage Structures for Storm

Cellular Storage Manhole: ATTENUATION, DS/PN: 1.003

Invert Level (m) 98.275 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

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	60.0	0.0	0.799	60.0	0.0	0.800	0.0	0.0

Manhole Headloss for Storm

PN	US/MH Name	US/MH Headloss
1.000	SWMH5a	0.500
1.001	SWMH4a	0.500
1.002	SWMH01	0.500
2.000	SWMH3a	0.500
3.000	SWMH1a	0.500
2.001	SWMH2a	0.500
2.002	SWMH2b	0.500
1.003	ATTENUATION	0.000
1.004	SWMH02FC	0.500
1.005	SWMH03	0.500
1.006	SWMH04	0.500

Summit House
Riparian Way
Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
HAINSWORTH ROAD DAVRIC SITE
SURFACE WATER CALCULATIONS



Date 11/09/2023
File 21256-PWA-01-XX-CA-C-30...

Designed by AC
Checked by LS

Innovyze

Network 2020.1.3

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.300 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 40, 45

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SWMH5a	15 minute 1 year Winter I+0%	99.242	98.654	-0.129	0.000	0.05	0.8	0.8	OK
1.001	SWMH4a	15 minute 1 year Winter I+0%	99.250	98.530	-0.124	0.000	0.07	1.2	1.2	OK
1.002	SWMH01	15 minute 1 year Winter I+0%	99.512	98.408	-0.112	0.000	0.15	2.8	2.8	OK
2.000	SWMH3a	15 minute 1 year Winter I+0%	99.850	99.222	-0.078	0.000	0.11	1.3	1.3	OK
3.000	SWMH1a	15 minute 1 year Winter I+0%	99.947	98.682	-0.113	0.000	0.14	2.6	2.6	OK
2.001	SWMH2a	15 minute 1 year Winter I+0%	99.850	98.563	-0.099	0.000	0.26	4.2	4.2	OK
2.002	SWMH2b	15 minute 1 year Winter I+0%	99.860	98.428	-0.095	0.000	0.29	5.6	5.6	OK
1.003	ATTENUATION	240 minute 1 year Winter I+0%	99.730	98.392	-0.033	0.000	0.08	0.8	0.8	OK*
1.004	SWMH02FC	240 minute 1 year Winter I+0%	99.961	98.392	-0.013	0.000	0.06	0.8	0.8	OK
1.005	SWMH03	240 minute 1 year Winter I+0%	99.978	98.221	-0.129	0.000	0.05	0.8	0.8	OK
1.006	SWMH04	240 minute 1 year Winter I+0%	99.844	97.883	-0.128	0.000	0.05	0.8	0.8	OK

Summit House
Riparian Way
Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
HAINSWORTH ROAD DAVRIC SITE
SURFACE WATER CALCULATIONS



Date 11/09/2023
File 21256-PWA-01-XX-CA-C-30...

Designed by AC
Checked by LS

Innovyze

Network 2020.1.3

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.300 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 40, 45

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SWMH5a	360 minute 30 year Winter I+40%	99.242	98.835	0.052	0.000	0.03		0.5	SURCHARGED
1.001	SWMH4a	360 minute 30 year Winter I+40%	99.250	98.835	0.181	0.000	0.04		0.7	SURCHARGED
1.002	SWMH01	360 minute 30 year Winter I+40%	99.512	98.835	0.315	0.000	0.09		1.8	SURCHARGED
2.000	SWMH3a	15 minute 30 year Winter I+40%	99.850	99.243	-0.057	0.000	0.38		4.3	OK
3.000	SWMH1a	360 minute 30 year Winter I+40%	99.947	98.837	0.042	0.000	0.08		1.5	SURCHARGED
2.001	SWMH2a	360 minute 30 year Winter I+40%	99.850	98.837	0.175	0.000	0.14		2.3	SURCHARGED
2.002	SWMH2b	360 minute 30 year Winter I+40%	99.860	98.835	0.312	0.000	0.17		3.3	SURCHARGED
1.003	ATTENUATION	360 minute 30 year Winter I+40%	99.730	98.834	0.409	0.000	0.09		1.0	SURCHARGED*
1.004	SWMH02FC	360 minute 30 year Winter I+40%	99.961	98.834	0.429	0.000	0.06		0.9	SURCHARGED
1.005	SWMH03	1440 minute 30 year Winter I+40%	99.978	98.222	-0.128	0.000	0.05		0.9	OK
1.006	SWMH04	1440 minute 30 year Summer I+40%	99.844	97.883	-0.128	0.000	0.05		0.9	OK

Summit House
Riparian Way
Keighley BD20 7BW

21256-PWA-01-XX-CA-C-3000 P04
HAINSWORTH ROAD DAVRIC SITE
SURFACE WATER CALCULATIONS



Date 11/09/2023
File 21256-PWA-01-XX-CA-C-30...

Designed by AC
Checked by LS

Innovyze

Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.300 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 40, 45

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap. (l/s)	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	SWMH5a	480 minute 100 year Winter I+45%	99.242	99.215	0.432	0.000	0.03		0.5	FLOOD RISK
1.001	SWMH4a	480 minute 100 year Winter I+45%	99.250	99.215	0.561	0.000	0.04		0.7	FLOOD RISK
1.002	SWMH01	480 minute 100 year Winter I+45%	99.512	99.214	0.694	0.000	0.10		2.0	FLOOD RISK
2.000	SWMH3a	15 minute 100 year Winter I+45%	99.850	99.250	-0.050	0.000	0.51		5.7	OK
3.000	SWMH1a	480 minute 100 year Winter I+45%	99.947	99.217	0.422	0.000	0.08		1.6	SURCHARGED
2.001	SWMH2a	480 minute 100 year Winter I+45%	99.850	99.216	0.554	0.000	0.16		2.5	SURCHARGED
2.002	SWMH2b	480 minute 100 year Winter I+45%	99.860	99.215	0.692	0.000	0.19		3.6	SURCHARGED
1.003	ATTENUATION	480 minute 100 year Winter I+45%	99.730	99.075	0.650	0.000	0.10		1.1	SURCHARGED*
1.004	SWMH02FC	480 minute 100 year Winter I+45%	99.961	99.213	0.808	0.000	0.07		1.0	SURCHARGED
1.005	SWMH03	480 minute 100 year Winter I+45%	99.978	98.224	-0.126	0.000	0.06		1.0	OK
1.006	SWMH04	480 minute 100 year Winter I+45%	99.844	97.886	-0.125	0.000	0.06		1.0	OK