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Clarke Hall Farm Aberford Road, Wakefield WF1 4AL	124.008 Westfield Lane, Wyke	
Date 06/04/2023 File 124.008 - V3.MDX	Designed by A.Bottomley Checked by A.Bottomley	
Innovyze	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes STANDARD Manhole Sizes STANDARD

Designed with Level Soffits

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.172	4-8	0.129

Network Design Table for SWS.SWS

Network Results Table

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Innovyze		Network 2019.1

Manhole Schedules for SWS.SWS

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)
1	173.119	1.550	Open Manhole	1200	1.000	171.569	150				
2	172.629	1.554	Open Manhole	1200	1.001	171.075	150	1.000	171.075	150	
3	171.987	1.804	Open Manhole	1200	1.002	170.183	150	1.001	170.183	150	
4	170.271	1.425	Open Manhole	1200	2.000	168.846	225				
5	171.106	2.497	Open Manhole	1200	1.003	168.609	225	1.002	169.734	150	1050
								2.000	168.609	225	
6	169.600	2.655	Open Manhole	1	3.000	166.945	-1				
7	170.345	3.510	Open Manhole	1	3.001	166.835	375	3.000	166.835	-1	
8	170.500	3.750	Open Manhole	2100	1.004	166.750	150	1.003	168.275	225	1600
								3.001	166.800	375	275
9	170.368	3.654	Open Manhole	1200	1.005	166.714	150	1.004	166.714	150	
10	167.800	1.485	Open Manhole	1200	1.006	166.315	150	1.005	166.315	150	
C1	165.750	1.416	Open Manhole	1200	1.007	164.334	150	1.006	164.334	150	
C2	165.750	1.473	Open Manhole	0		OUTFALL		1.007	164.277	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	106177.217	74525.738	106177.217	74525.738	Required	
2	106177.224	74515.321	106177.224	74515.321	Required	
3	106168.432	74505.240	106168.432	74505.240	Required	
4	106133.279	74502.217	106133.279	74502.217	Required	
5	106149.919	74503.648	106149.919	74503.648	Required	
6	106155.215	74454.430	106155.215	74454.430	Required	
7	106153.412	74472.454	106153.412	74472.454	Required	
8	106152.857	74476.344	106152.857	74476.344	Required	

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Westfield Lane,
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Date	06/04/2023
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Designed by A.Bottomley

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Checked by A.Bottomley

Innovyze

Network 2019.1

Manhole Schedules for SWS.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
9	106149.363	74475.987	106149.363	74475.987	Required	
10	106150.803	74443.552	106150.803	74443.552	Required	
C1	106128.698	74441.651	106128.698	74441.651	Required	
C2	106123.874	74442.833			No Entry	

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Innovyze	Network 2019.1	
<u>Simulation Criteria for SWS.SWS</u> Volumetric Runoff Coeff 1.000 Additional Flow - % of Total Flow 0.000 Areal Reduction Factor 1.000 MADD Factor * 10m³/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 Storage Structures 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR Profile Type Summer Return Period (years) 1 Cv (Summer) 1.000 Region England and Wales Cv (Winter) 0.840 M5-60 (mm) 19.000 Storm Duration (mins) 30 Ratio R 0.321		
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<u>Online Controls for SWS.SWS</u> <u>Depth/Flow Relationship Manhole: 8, DS/PN: 1.004, Volume (m³): 14.2</u> Invert Level (m) 166.750 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.090</td><td>1.8800</td><td>0.800</td><td>2.2900</td><td>1.510</td><td>3.0300</td><td>2.220</td><td>3.5400</td></tr><tr><td>0.180</td><td>2.6200</td><td>0.890</td><td>2.4000</td><td>1.600</td><td>3.1000</td><td>2.310</td><td>3.6000</td></tr><tr><td>0.270</td><td>2.8600</td><td>0.980</td><td>2.5100</td><td>1.690</td><td>3.1700</td><td>2.400</td><td>3.6500</td></tr><tr><td>0.360</td><td>2.8600</td><td>1.070</td><td>2.6000</td><td>1.780</td><td>3.2400</td><td>2.490</td><td>3.7000</td></tr><tr><td>0.440</td><td>2.8000</td><td>1.160</td><td>2.7000</td><td>1.870</td><td>3.3100</td><td>2.580</td><td>3.7500</td></tr><tr><td>0.530</td><td>2.6600</td><td>1.240</td><td>2.7900</td><td>1.950</td><td>3.3700</td><td></td><td></td></tr><tr><td>0.620</td><td>2.3600</td><td>1.330</td><td>2.8700</td><td>2.040</td><td>3.4300</td><td></td><td></td></tr><tr><td>0.710</td><td>2.1700</td><td>1.420</td><td>2.9500</td><td>2.130</td><td>3.4900</td><td></td><td></td></tr></table> <u>Manhole Headloss for SWS.SWS</u> <table><tr><th>PN</th><th>US/MH Name</th><th>US/MH Headloss</th></tr><tr><td>1.000</td><td>1</td><td>0.500</td></tr><tr><td>1.001</td><td>2</td><td>0.500</td></tr><tr><td>1.002</td><td>3</td><td>0.500</td></tr><tr><td>2.000</td><td>4</td><td>0.500</td></tr><tr><td>1.003</td><td>5</td><td>0.500</td></tr><tr><td>3.000</td><td>6</td><td>0.500</td></tr><tr><td>3.001</td><td>7</td><td>0.500</td></tr><tr><td>1.004</td><td>8</td><td>0.500</td></tr><tr><td>1.005</td><td>9</td><td>0.500</td></tr><tr><td>1.006</td><td>10</td><td>0.500</td></tr><tr><td>1.007</td><td>C1</td><td>0.500</td></tr></table>						Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.090	1.8800	0.800	2.2900	1.510	3.0300	2.220	3.5400	0.180	2.6200	0.890	2.4000	1.600	3.1000	2.310	3.6000	0.270	2.8600	0.980	2.5100	1.690	3.1700	2.400	3.6500	0.360	2.8600	1.070	2.6000	1.780	3.2400	2.490	3.7000	0.440	2.8000	1.160	2.7000	1.870	3.3100	2.580	3.7500	0.530	2.6600	1.240	2.7900	1.950	3.3700			0.620	2.3600	1.330	2.8700	2.040	3.4300			0.710	2.1700	1.420	2.9500	2.130	3.4900			PN	US/MH Name	US/MH Headloss	1.000	1	0.500	1.001	2	0.500	1.002	3	0.500	2.000	4	0.500	1.003	5	0.500	3.000	6	0.500	3.001	7	0.500	1.004	8	0.500	1.005	9	0.500	1.006	10	0.500	1.007	C1	0.500
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WF1 4AL

124.008

Westfield Lane,

Wyke

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File 124.008 - V3.MDX

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Innovyze

Network 2019.1

Micro Drainage

Summary of Critical Results by Maximum Level (Rank 1) for SWS.SWS

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 Coeffiecient 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 Storage Structures 0

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model

FSR

Ratio R 0.325

Region England and Wales Cv (Summer) 1.000

M5-60 (mm)

19.000 Cv (Winter) 1.000

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, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years)

1

Climate Change (%)

0

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level

(m)

1.000

1

15 Summer

1

+0%

171.607

1.001

2

15 Summer

1

+0%

171.117

1.002

3

15 Summer

1

+0%

170.246

2.000

4

15 Summer

1

+0%

168.911

1.003

5

15 Summer

1

+0%

168.714

3.000

6

240 Summer

1

+0%

167.129

3.001

7

240 Summer

1

+0%

167.129

1.004

8

240 Summer

1

+0%

1/15 Summer

167.130

1.005

9

720 Winter

1

+0%

166.755

1.006

10

720 Winter

1

+0%

166.338

1.007

C1

720 Winter

1

+0%

164.378

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Innovyze	Network 2019.1	

Summary of Critical Results by Maximum Level (Rank 1) for SWS.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Pipe Flow	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Cap.	(l/s)	(l/s)		
1.000	1	-0.112	0.000	0.14		5.0	OK	
1.001	2	-0.108	0.000	0.17		7.2	OK	
1.002	3	-0.087	0.000	0.36		9.4	OK	
2.000	4	-0.160	0.000	0.18		10.2	OK	
1.003	5	-0.120	0.000	0.44		23.4	OK	
3.000	6	-1.016	0.000	0.00		7.6	OK	
3.001	7	-0.081	0.000	0.03		2.9	OK	
1.004	8	0.230	0.000	0.24		2.9	SURCHARGED	
1.005	9	-0.109	0.000	0.17		2.9	OK	
1.006	10	-0.127	0.000	0.06		2.9	OK	
1.007	C1	-0.106	0.000	0.19		2.9	OK	

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Summary of Critical Results by Maximum Level (Rank 1) for SWS.SWS

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)			
1.000	1	-0.088	0.000	0.35		12.3	OK	
1.001	2	-0.078	0.000	0.46		19.5	OK	
1.002	3	0.018	0.000	1.00		26.0	SURCHARGED	
2.000	4	-0.085	0.000	0.44		24.3	OK	
1.003	5	0.103	0.000	1.15		61.4	SURCHARGED	
3.000	6	-0.616	0.000	0.00		11.1	OK	
3.001	7	0.319	0.000	0.03		2.7	SURCHARGED	
1.004	8	0.630	0.000	0.24		2.9	SURCHARGED	
1.005	9	-0.109	0.000	0.17		2.9	OK	
1.006	10	-0.127	0.000	0.06		2.9	OK	
1.007	C1	-0.106	0.000	0.19		2.9	OK	

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Network 2019.1

Micro Drainage

Summary of Critical Results by Maximum Level (Rank 1) for SWS.SWS

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 Storage Structures 0

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.325

Region England and Wales Cv (Summer) 1.000

M5-60 (mm) 19.000 Cv (Winter) 1.000

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, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 100

Climate Change (%) 40

PN

US/MH

Storm

Return Period

Climate Change

First (X) Surchage

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level (m)

1.000

1

15 Summer

100

+40%

100/15 Summer

171.727

1.001

2

15 Summer

100

+40%

100/15 Summer

171.546

1.002

3

15 Summer

100

+40%

100/15 Summer

171.055

2.000

4

15 Summer

100

+40%

100/15 Summer

169.883

1.003

5

15 Summer

100

+40%

100/15 Summer

169.741

3.000

6

480 Winter

100

+40%

100/240 Summer

168.962

3.001

7

480 Winter

100

+40%

100/15 Summer

168.962

1.004

8

480 Winter

100

+40%

100/15 Summer

168.962

1.005

9

480 Winter

100

+40%

166.760

1.006

10

480 Winter

100

+40%

166.341

1.007

C1

480 Winter

100

+40%

164.383

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Summary of Critical Results by Maximum Level (Rank 1) for SWS.SWS

PN	US/MH Name	Surcharged		Flooded		Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)			
1.000	1	0.008	0.000	0.63		21.8	SURCHARGED	
1.001	2	0.321	0.000	0.74		31.2	SURCHARGED	
1.002	3	0.722	0.000	1.61		41.7	SURCHARGED	
2.000	4	0.812	0.000	0.77		42.6	SURCHARGED	
1.003	5	0.907	0.000	1.91		101.7	SURCHARGED	
3.000	6	0.817	0.000	0.00		12.1	SURCHARGED	
3.001	7	1.752	0.000	0.03		3.0	SURCHARGED	
1.004	8	2.062	0.000	0.30		3.5	SURCHARGED	
1.005	9	-0.104	0.000	0.20		3.5	OK	
1.006	10	-0.124	0.000	0.07		3.5	OK	
1.007	C1	-0.101	0.000	0.24		3.5	OK	