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Clarke Hall Farm Aberford Road, Wakefield WF1 4AL	124.008 Westfield Lane, Wyke	
Date 06/07/2023 File 124.008 - V5.MDX	Designed by A.Bottomley Checked by A.Bottomley	
Innovyze	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SWS.SWS

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.321	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
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)	0.75
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for SWS.SWS

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.173	4-8	0.128

Total Area Contributing (ha) = 0.301

Total Pipe Volume (m³) = 209.828

Network Design Table for SWS.SWS

- Indicates pipe length does not match coordinates

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	10.416	0.494	21.1	0.032	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	13.376	0.892	15.0	0.017	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	18.586	0.449	41.4	0.017	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	46.28	5.08	171.569	0.032	0.0	0.0	0.0	2.20	38.9	5.3
1.001	45.97	5.16	171.075	0.049	0.0	0.0	0.0	2.61	46.2	8.1
1.002	45.26	5.36	170.183	0.066	0.0	0.0	0.0	1.57	27.7	10.8

Clarke Hall Farm
Aberford Road, Wakefield
WF1 4AL

124.008
Westfield Lane,
Wyke



Date	06/07/2023
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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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PIPELINE SCHEDULES for SWS.SWS

Upstream Manhole

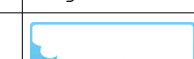
- Indicates pipe length does not match coordinates

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	1	173.114	171.569	1.395	Open Manhole	1200
1.001	o	150	2	172.617	171.075	1.392	Open Manhole	1200
1.002	o	150	3	171.976	170.183	1.643	Open Manhole	1200
2.000	o	225	4	170.271	168.846	1.200	Open Manhole	1200
1.003	o	225	5	171.106	168.609	2.272	Open Manhole	1200
3.000	[]	-1	6	169.600	166.600	0.900	Open Manhole	1
3.001	o	580	7	170.345	166.507	3.258	Open Manhole	1
1.004	o	150	8	170.500	166.409	3.941	Open Manhole	2100
1.005	o	150	9	170.368	166.373	3.845	Open Manhole	1200
1.006	o	150	10	167.800	165.974	1.676	Open Manhole	1200
1.007	o	150	C1	165.750	164.320	1.280	Open Manhole	1200

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	10.416	21.1	2	172.617	171.075	1.392	Open Manhole	1200
1.001	13.376	15.0	3	171.976	170.183	1.643	Open Manhole	1200
1.002	18.586	41.4	5	171.106	169.734	1.222	Open Manhole	1200
2.000	16.702	70.5	5	171.106	168.609	2.272	Open Manhole	1200
1.003	27.462	82.2	8	170.500	168.275	2.000	Open Manhole	2100
3.000	19.500#	209.7	7	170.345	166.507	1.738	Open Manhole	1
3.001	2.874#	59.9	8	170.500	166.459	3.461	Open Manhole	2100
1.004	3.512	97.6	9	170.368	166.373	3.845	Open Manhole	1200
1.005	39.840#	99.8	10	167.800	165.974	1.676	Open Manhole	1200
1.006	23.776#	14.4	C1	165.750	164.320	1.280	Open Manhole	1200
1.007	5.360#	94.0	C2	165.750	164.263	1.337	Open Manhole	0

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<u>Online Controls for SWS.SWS</u> <u>Depth/Flow Relationship Manhole: 8, DS/PN: 1.004, Volume (m³): 15.7</u> Invert Level (m) 166.409 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.130</td><td>1.9900</td><td>1.170</td><td>2.3500</td><td>2.210</td><td>3.0600</td><td>3.250</td><td>3.5400</td></tr><tr><td>0.260</td><td>2.3800</td><td>1.300</td><td>2.4600</td><td>2.340</td><td>3.1300</td><td>3.390</td><td>3.5900</td></tr><tr><td>0.390</td><td>2.3500</td><td>1.430</td><td>2.5600</td><td>2.470</td><td>3.2000</td><td>3.520</td><td>3.6400</td></tr><tr><td>0.520</td><td>2.1400</td><td>1.560</td><td>2.6600</td><td>2.600</td><td>3.2600</td><td>3.650</td><td>3.6900</td></tr><tr><td>0.650</td><td>1.8000</td><td>1.690</td><td>2.7500</td><td>2.730</td><td>3.3200</td><td>3.780</td><td>3.7300</td></tr><tr><td>0.780</td><td>1.9600</td><td>1.820</td><td>2.8300</td><td>2.860</td><td>3.3800</td><td></td><td></td></tr><tr><td>0.910</td><td>2.1000</td><td>1.950</td><td>2.9100</td><td>2.990</td><td>3.4400</td><td></td><td></td></tr><tr><td>1.040</td><td>2.2300</td><td>2.080</td><td>2.9900</td><td>3.120</td><td>3.4900</td><td></td><td></td></tr></table> <u>Manhole Headloss for SWS.SWS</u> <table><tr><td>PN</td><td>US/MH Name</td><td>US/MH Headloss</td></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)	0.130	1.9900	1.170	2.3500	2.210	3.0600	3.250	3.5400	0.260	2.3800	1.300	2.4600	2.340	3.1300	3.390	3.5900	0.390	2.3500	1.430	2.5600	2.470	3.2000	3.520	3.6400	0.520	2.1400	1.560	2.6600	2.600	3.2600	3.650	3.6900	0.650	1.8000	1.690	2.7500	2.730	3.3200	3.780	3.7300	0.780	1.9600	1.820	2.8300	2.860	3.3800			0.910	2.1000	1.950	2.9100	2.990	3.4400			1.040	2.2300	2.080	2.9900	3.120	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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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)			
1.002	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	-1.654	0.000	0.00		7.6	OK	
3.001	7	-0.041	0.000	0.01		2.8	OK	
1.004	8	0.490	0.000	0.20		2.4	SURCHARGED	
1.005	9	-0.113	0.000	0.14		2.4	OK	
1.006	10	-0.128	0.000	0.05		2.4	OK	
1.007	C1	-0.110	0.000	0.16		2.4	OK	