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11 Tungsten Building George Street Fishersgate BN41 1RA	Manor Nursery Angmering West Sussex	
Date 28/06/2019 File Planning Network File.MDX	Designed by S Burgess Checked by SRD	
Innovyze Network 2017.1.2		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NETWORK 4.SWS

Pipe Sizes NETWORK 9 Manhole Sizes NETWORK 9

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.600	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.500
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.000
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.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for NETWORK 4.SWS

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	16.046	0.156	103.0	0.015	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	1.123	0.011	103.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	9.993	0.308	32.4	0.011	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	7.272	0.375	19.4	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	2.431	0.375	6.5	0.004	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.004	10.932	0.106	102.9	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.005	5.058	0.049	103.0	0.000	0.00	0.0	0.600	o	100	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	50.00	5.35	16.050	0.015	0.0	0.0	0.0	0.76	5.9	2.0
1.001	50.00	5.38	15.894	0.015	0.0	0.0	0.0	0.76	5.9	2.0
1.002	50.00	5.50	15.883	0.026	0.0	0.0	0.0	1.36	10.7	3.5
1.003	50.00	5.57	15.575	0.026	0.0	0.0	0.0	1.76	13.8	3.5
2.000	50.00	5.01	15.575	0.004	0.0	0.0	0.0	3.06	24.0	0.5
1.004	50.00	5.81	15.200	0.030	0.0	0.0	0.0	0.76	6.0	4.1
1.005	50.00	5.92	15.094	0.030	0.0	0.0	0.0	0.76	5.9	4.1

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<u>PIPELINE SCHEDULES for NETWORK 4.SWS</u> <u>Upstream Manhole</u> <table><tr><th>PN</th><th>Hyd Sect</th><th>Diam (mm)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>1.000</td><td>o</td><td>100</td><td>1</td><td>16.650</td><td>16.050</td><td>0.500</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.001</td><td>o</td><td>100</td><td>2</td><td>16.650</td><td>15.894</td><td>0.656</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.002</td><td>o</td><td>100</td><td>3</td><td>16.675</td><td>15.883</td><td>0.692</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.003</td><td>o</td><td>100</td><td>4</td><td>16.675</td><td>15.575</td><td>1.000</td><td>Open Manhole</td><td>1200</td></tr><tr><td>2.000</td><td>o</td><td>100</td><td>8</td><td>16.675</td><td>15.575</td><td>1.000</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.004</td><td>o</td><td>100</td><td>5</td><td>16.500</td><td>15.200</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.005</td><td>o</td><td>100</td><td>6</td><td>16.450</td><td>15.094</td><td>1.256</td><td>Open Manhole</td><td>1200</td></tr></table> <u>Downstream Manhole</u> <table><tr><th>PN</th><th>Length (m)</th><th>Slope (1:X)</th><th>MH Name</th><th>C.Level (m)</th><th>I.Level (m)</th><th>D.Depth (m)</th><th>MH Connection</th><th>MH DIAM., L*W (mm)</th></tr><tr><td>1.000</td><td>16.046</td><td>103.0</td><td>2</td><td>16.650</td><td>15.894</td><td>0.656</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.001</td><td>1.123</td><td>103.0</td><td>3</td><td>16.675</td><td>15.883</td><td>0.692</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.002</td><td>9.993</td><td>32.4</td><td>4</td><td>16.675</td><td>15.575</td><td>1.000</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.003</td><td>7.272</td><td>19.4</td><td>5</td><td>16.500</td><td>15.200</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>2.000</td><td>2.431</td><td>6.5</td><td>5</td><td>16.500</td><td>15.200</td><td>1.200</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.004</td><td>10.932</td><td>102.9</td><td>6</td><td>16.450</td><td>15.094</td><td>1.256</td><td>Open Manhole</td><td>1200</td></tr><tr><td>1.005</td><td>5.058</td><td>103.0</td><td>7</td><td>16.800</td><td>15.045</td><td>1.655</td><td>Open Manhole</td><td>0</td></tr></table>									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	100	1	16.650	16.050	0.500	Open Manhole	1200	1.001	o	100	2	16.650	15.894	0.656	Open Manhole	1200	1.002	o	100	3	16.675	15.883	0.692	Open Manhole	1200	1.003	o	100	4	16.675	15.575	1.000	Open Manhole	1200	2.000	o	100	8	16.675	15.575	1.000	Open Manhole	1200	1.004	o	100	5	16.500	15.200	1.200	Open Manhole	1200	1.005	o	100	6	16.450	15.094	1.256	Open Manhole	1200	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	16.046	103.0	2	16.650	15.894	0.656	Open Manhole	1200	1.001	1.123	103.0	3	16.675	15.883	0.692	Open Manhole	1200	1.002	9.993	32.4	4	16.675	15.575	1.000	Open Manhole	1200	1.003	7.272	19.4	5	16.500	15.200	1.200	Open Manhole	1200	2.000	2.431	6.5	5	16.500	15.200	1.200	Open Manhole	1200	1.004	10.932	102.9	6	16.450	15.094	1.256	Open Manhole	1200	1.005	5.058	103.0	7	16.800	15.045	1.655	Open Manhole	0
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Summary of Critical Results by Maximum Level (Rank 1) for NETWORK 4.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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	0.350
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	19.500	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1 15	Winter	100	+40%	100/15	Summer			16.397
1.001	2 15	Winter	100	+40%	100/15	Summer			16.200
1.002	3 15	Winter	100	+40%	100/15	Summer			16.154
1.003	4 15	Winter	100	+40%	100/15	Summer			15.877
2.000	8 15	Winter	100	+40%	100/15	Winter			15.679
1.004	5 15	Winter	100	+40%	100/15	Summer			15.676
1.005	6 15	Winter	100	+40%	100/15	Summer			15.325

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.247	0.000	1.14		6.5	FLOOD RISK	
1.001	2	0.206	0.000	1.62		6.4	SURCHARGED	
1.002	3	0.171	0.000	1.00		10.0	SURCHARGED	
1.003	4	0.202	0.000	0.73		9.2	SURCHARGED	
2.000	8	0.004	0.000	0.12		2.1	SURCHARGED	
1.004	5	0.377	0.000	1.82		10.1	SURCHARGED	
1.005	6	0.132	0.000	1.94		10.1	SURCHARGED	

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