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Dewey House 55 High Street Ringwood BH24 1AE		
Date 01/01/0001 File Net4.MDX	Designed by pnicklen Checked by	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NET4.SWS

Pipe Sizes NET3 Manhole Sizes NET3

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	550	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)	150

Designed with Level Soffits

Network Design Table for NET4.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	14.841	0.572	25.9	0.010	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	12.653	0.406	31.2	0.153	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	47.408	0.316	150.0	0.060	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	13.014	0.087	149.6	0.010	0.00	0.0	0.600	o	300	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	150.15	5.10	17.141	0.010	0.0	0.0	0.0	2.58	102.5	4.1
2.000	150.22	5.09	16.975	0.153	0.0	0.0	0.0	2.35	93.5	62.2
3.000	143.85	5.74	16.885	0.060	0.0	0.0	0.0	1.07	42.4	23.4
1.001	142.32	5.91	16.494	0.233	0.0	0.0	0.0	1.28	90.7	89.8

Free Flowing Outfall Details for NET4.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.001	25	17.696	16.407	0.000	2000	0

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Simulation Criteria for NET4.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
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	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Storm Duration (mins)	30
Ratio R	0.350		

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Design Criteria for NET4.SWS

Pipe Sizes NET3 Manhole Sizes NET3

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	550	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)	150

Designed with Level Soffits

Free Flowing Outfall Details for NET4.SWS

Outfall Pipe Number	Outfall C. Name	Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.001	25	17.696	16.407	0.000	2000	0

Simulation Criteria for NET4.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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 0 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

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M5-60 (mm)		19.700		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)				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, 30																																																																			
Climate Change (%)		0, 30																																																																			
<table><tr><th></th><th>US/MH</th><th></th><th>Return</th><th>Climate</th><th>First (X)</th><th>First (Y)</th><th>First (Z)</th><th>Overflow</th><th>Water</th></tr><tr><th>PN</th><th>Name</th><th>Storm</th><th>Period</th><th>Change</th><th>Surcharge</th><th>Flood</th><th>Overflow</th><th>Act.</th><th>Level</th></tr><tr><td>1.000</td><td>23</td><td>15</td><td>Winter</td><td>30</td><td>+30%</td><td></td><td></td><td></td><td>17.172</td></tr><tr><td>2.000</td><td>ST10</td><td>15</td><td>Winter</td><td>30</td><td>+30%</td><td></td><td></td><td></td><td>17.128</td></tr><tr><td>3.000</td><td>S21</td><td>15</td><td>Winter</td><td>30</td><td>+30%</td><td></td><td></td><td></td><td>17.014</td></tr><tr><td>1.001</td><td>24</td><td>15</td><td>Winter</td><td>30</td><td>+30%</td><td>30/15</td><td>Summer</td><td></td><td>16.841</td></tr></table>											US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water	PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level	1.000	23	15	Winter	30	+30%				17.172	2.000	ST10	15	Winter	30	+30%				17.128	3.000	S21	15	Winter	30	+30%				17.014	1.001	24	15	Winter	30	+30%	30/15	Summer		16.841
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water																																																												
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<table><tr><th></th><th>US/MH</th><th>Depth</th><th>Volume</th><th>Flow /</th><th>Half Drain</th><th>Pipe</th><th></th><th>Level</th></tr><tr><th>PN</th><th>Name</th><th>(m)</th><th>(m³)</th><th>Cap.</th><th>Time</th><th>Flow</th><th>Status</th><th>Exceeded</th></tr><tr><td>1.000</td><td>23</td><td>-0.194</td><td>0.000</td><td>0.05</td><td></td><td>4.2</td><td>OK</td><td></td></tr><tr><td>2.000</td><td>ST10</td><td>-0.072</td><td>0.000</td><td>0.79</td><td></td><td>63.8</td><td>OK</td><td></td></tr><tr><td>3.000</td><td>S21</td><td>-0.096</td><td>0.000</td><td>0.60</td><td></td><td>24.4</td><td>OK</td><td></td></tr><tr><td>1.001</td><td>24</td><td>0.047</td><td>0.000</td><td>1.30</td><td></td><td>95.9</td><td>SURCHARGED</td><td></td></tr></table>											US/MH	Depth	Volume	Flow /	Half Drain	Pipe		Level	PN	Name	(m)	(m³)	Cap.	Time	Flow	Status	Exceeded	1.000	23	-0.194	0.000	0.05		4.2	OK		2.000	ST10	-0.072	0.000	0.79		63.8	OK		3.000	S21	-0.096	0.000	0.60		24.4	OK		1.001	24	0.047	0.000	1.30		95.9	SURCHARGED							
	US/MH	Depth	Volume	Flow /	Half Drain	Pipe		Level																																																													
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Date 01/01/0001 File Net5.MDX	Designed by pnicklen Checked by	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NET5.SWS

Pipe Sizes NET5 Manhole Sizes NET5

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	550	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)	150

Designed with Level Soffits

Free Flowing Outfall Details for NET5.SWS

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.001	Swale	17.442	16.815	0.000	2000	0
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Simulation Criteria for NET5.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
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 0 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Storm Duration (mins)	30
Ratio R	0.350		

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Simulation Criteria for NET5.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
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	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Storm Duration (mins)	30
Ratio R	0.350		

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NET6.SWS

Pipe Sizes NET9+PFA Manhole Sizes NET9+PFA

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	550	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)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for NET6.SWS

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

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)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NET6.SWS

Pipe Sizes NET9+PFA Manhole Sizes NET9+PFA

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	550	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)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for NET6.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
1.001	20.221	0.405	49.9	0.107	0.00	0.0	0.600	o	225	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)
1.001	53.72	5.21	17.675	0.107	0.0	0.0	0.0	1.86	73.8	20.8

Free Flowing Outfall Details for NET6.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.001	Swale	18.482	17.270	0.000	2000	0

Simulation Criteria for NET6.SWS

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

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Simulation Criteria for NET6.SWS

Synthetic Rainfall Details

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)	20.000	Storm Duration (mins) 30
Ratio R	0.400	

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Reuby & Stagg Ltd		Page 1
Dewey House 55 High Street Ringwood BH24 1AE		
Date 01/01/0001 File Net7.MDX	Designed by pnicklen Checked by	
Innovyze Network 2020.1		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NET7.SWS

Pipe Sizes NET5 Manhole Sizes NET5

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	550	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)	150

Designed with Level Soffits

Free Flowing Outfall Details for NET7.SWS

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	Swale	18.068	16.456	16.435	2000 0

Simulation Criteria for NET7.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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 0 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Storm Duration (mins)	30
Ratio R	0.350		

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Reuby & Stagg Ltd							Page 2																																																																																
Dewey House 55 High Street Ringwood BH24 1AE																																																																																							
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STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes NET5 Manhole Sizes NET5

Designed with Level Soffits

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	8.900	0.114	78.1	0.141	5.00	0.0	0.600	o	225	Pipe/Conduit		
1.001	15.710	0.499	31.5	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit		
2.000	18.798	0.125	150.4	0.028	5.00	0.0	0.600	o	225	Pipe/Conduit		
3.000	18.257	0.122	150.0	0.014	5.00	0.0	0.600	o	225	Pipe/Conduit		
1.002	29.186	0.170	172.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		

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	150.11	5.10	17.314	0.141	0.0	0.0	0.0	1.48	58.9	57.3
1.001	148.97	5.21	17.200	0.156	0.0	0.0	0.0	2.34	93.0	62.9
2.000	148.14	5.29	16.826	0.028	0.0	0.0	0.0	1.06	42.3	11.2
3.000	148.23	5.29	16.823	0.014	0.0	0.0	0.0	1.07	42.4	5.6
1.002	144.23	5.70	16.626	0.198	0.0	0.0	0.0	1.20	84.5	77.3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.002	Swale	18.068	16.456	16.435	2000	0

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Simulation Criteria for NET7.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
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 0		Number of Time/Area Diagrams 0	
Number of Offline Controls 0		Number of Real Time Controls 0	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Storm Duration (mins)	30
Ratio R	0.350		

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for NETWORK 8.SWS

Pipe Sizes NETWORK 7 Manhole Sizes NETWORK 7

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	19.900	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	550	Maximum Backdrop Height (m)	20.000
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)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Free Flowing Outfall Details for NETWORK 8.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	Suds feature E	17.157	14.800	0.000	2000	0

Simulation Criteria for NETWORK 8.SWS

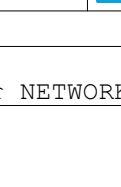
Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Storage Structures 1
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	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
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Summary of Critical Results by Maximum Level (Rank 1) for NETWORK 8.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	1
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	FEH	Data Type	Point
FEH Rainfall Version	2013 Cv (Summer)		0.750
Site Location	GB 448927 117350	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160
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.
1.000	pfa6	15 Winter	100	+40%	100/15 Summer			
2.000	30	15 Winter	100	+40%	100/15 Summer			
1.001	31	15 Winter	100	+40%	100/15 Summer			
1.002	32	15 Winter	100	+40%	100/15 Summer			
3.000	pfa14	15 Winter	100	+40%	100/15 Summer			
1.003	33	15 Winter	100	+40%	100/15 Summer			
1.004	34	15 Winter	100	+40%	100/15 Summer			
1.005	35	15 Winter	100	+40%	100/15 Summer			
1.006	36	15 Winter	100	+40%	100/15 Summer			
4.000	37	15 Winter	100	+40%	100/15 Summer			
4.001	38	15 Winter	100	+40%	100/15 Summer			
4.002	39	15 Winter	100	+40%	100/15 Summer			
1.007	40	15 Winter	100	+40%	100/15 Summer			
1.008	Basin Outlet	120 Winter	100	+40%	100/30 Winter			
1.009	Flow Control	120 Winter	100	+40%	100/15 Summer			

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Summary of Critical Results by Maximum Level (Rank 1) for NETWORK 8.SWS

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	pfa6	17.959	1.218	0.000	1.05			132.4	FLOOD RISK
2.000	30	17.723	1.075	0.000	0.44			20.6	FLOOD RISK
1.001	31	17.685	1.224	0.000	0.86			174.8	SURCHARGED
1.002	32	17.595	1.259	0.000	0.99			186.4	SURCHARGED
3.000	pfa14	18.700	0.776	0.000	2.94			528.5	SURCHARGED
1.003	33	17.534	1.260	0.000	2.33			700.1	SURCHARGED
1.004	34	17.258	1.042	0.000	2.49			710.6	SURCHARGED
1.005	35	16.946	0.776	0.000	2.30			714.9	SURCHARGED
1.006	36	16.626	0.519	0.000	2.50			714.1	SURCHARGED
4.000	37	16.560	0.057	0.000	0.37			14.5	SURCHARGED
4.001	38	16.535	0.175	0.000	0.94			36.7	SURCHARGED
4.002	39	16.451	0.253	0.000	1.47			56.5	SURCHARGED
1.007	40	16.301	0.241	0.000	1.76			756.0	SURCHARGED
1.008	Basin Outlet	15.609	0.109	0.000	0.42			33.0	SURCHARGED
1.009	Flow Control	15.658	0.258	0.000	0.28			31.9	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	pfa6	
2.000	30	
1.001	31	
1.002	32	
3.000	pfa14	
1.003	33	
1.004	34	
1.005	35	
1.006	36	
4.000	37	
4.001	38	
4.002	39	
1.007	40	
1.008	Basin Outlet	
1.009	Flow Control	

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Synthetic Rainfall Details <table><tr><td>Rainfall Model</td><td>FSR</td><td>Profile Type</td><td>Summer</td></tr><tr><td>Return Period (years)</td><td>100</td><td>Cv (Summer)</td><td>0.750</td></tr><tr><td>Region</td><td>England and Wales</td><td>Cv (Winter)</td><td>0.840</td></tr><tr><td>M5-60 (mm)</td><td>19.900</td><td>Storm Duration (mins)</td><td>30</td></tr><tr><td>Ratio R</td><td>0.350</td><td></td><td></td></tr></table>			Rainfall Model	FSR	Profile Type	Summer	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.900	Storm Duration (mins)	30	Ratio R	0.350		
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Summary of Critical Results by Maximum Level (Rank 1) for NETWORK 8.SWS

Simulation Criteria

Areal Reduction Factor 1.000

Hot Start (mins) 0

Hot Start Level (mm) 0

Manhole Headloss Coeff (Global) 0.500

Foul Sewage per hectare (l/s) 0.000

Additional Flow - % of Total Flow 0.000

MADD Factor * 10m³/ha Storage 2.000

Inlet Coefficient 0.800

Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0

Number of Online Controls 1

Number of Offline Controls 0

Number of Storage Structures 1

Number of Time/Area Diagrams 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH

FEH Rainfall Version 2013 Cv

Site Location GB 448927 117350

Data Type Point

(Summer) 0.750

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status OFF

Inertia Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160

Return Period(s) (years) 30

Climate Change (%) 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	pfa6	15 Winter	30	+30%	30/15 Summer			
2.000	30	15 Winter	30	+30%	30/15 Summer			
1.001	31	15 Winter	30	+30%	30/15 Summer			
1.002	32	15 Winter	30	+30%	30/15 Summer			
3.000	pfa14	15 Winter	30	+30%	30/15 Summer			
1.003	33	15 Winter	30	+30%	30/15 Summer			
1.004	34	15 Winter	30	+30%	30/15 Summer			
1.005	35	15 Winter	30	+30%	30/15 Summer			
1.006	36	15 Winter	30	+30%	30/15 Summer			
4.000	37	15 Winter	30	+30%				
4.001	38	15 Winter	30	+30%				
4.002	39	15 Winter	30	+30%	30/15 Summer			
1.007	40	15 Winter	30	+30%	30/15 Summer			
1.008	Basin Outlet	120 Winter	30	+30%				
1.009	Flow Control	180 Winter	30	+30%	30/30 Summer			

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Horton Heath Networ 9

Designed by PN R&S

Checked by MD

Network 2020.1

Micro Drainage

Summary of Critical Results by Maximum Level (Rank 1) for Norther SuDA feature A

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 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 1

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 FEH

Data Type Point

FEH Rainfall Version 2013 Cv (Summer) 0.750

Site Location GB 448927 117350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status OFF

Inertia Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160

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.

S1.000

SPfa12

15 Winter

100

+40%

100/15 Summer

S2.000

S44

15 Winter

100

+40%

100/15 Summer

S1.001

S45

15 Winter

100

+40%

100/15 Summer

S3.000

S46

15 Winter

100

+40%

100/15 Summer

S1.002

S47

15 Winter

100

+40%

100/15 Summer

S4.000

SPfa18

15 Winter

100

+40%

100/15 Summer

S5.000

S41

15 Winter

100

+40%

100/15 Summer

S4.001

S42

15 Winter

100

+40%

100/15 Summer

S4.002

S43

15 Winter

100

+40%

100/15 Summer

S1.003

SSuds feat A

240 Winter

100

+40%

100/15 Summer

S1.004

SFlow Control

240 Winter

100

+40%

100/15 Summer

PN

US/MH Name

Water Level (m)

Surcharged Depth (m)

Flooded Volume (m³)

Flow / Cap. (l/s)

Half Drain Time (mins)

Pipe Flow (l/s)

S1.000

SPfa12

17.408

0.873

0.000

1.10

431.9

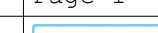
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Date 25/05/2022 File Net8+PFAreduced.MDX	Designed by PN R&S Checked by MD	
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Summary of Critical Results by Maximum Level (Rank 1) for Norther SuDA
feature A

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S2.000	S44	17.653	1.090	0.000	1.29			52.7
S1.001	S45	16.923	0.780	0.000	4.22			483.7
S3.000	S46	16.616	0.537	0.000	0.73			52.9
S1.002	S47	16.510	0.390	0.000	2.17			539.6
S4.000	SPfa18	17.919	0.764	0.000	1.11			286.7
S5.000	S41	16.801	0.403	0.000	0.63			30.8
S4.001	S42	16.726	0.510	0.000	1.94			328.8
S4.002	S43	16.382	0.251	0.000	1.61			329.7
S1.003	SSuds feat A	16.229	0.594	0.000	0.39			18.2
S1.004	SFlow Control	16.235	0.710	0.000	0.23			17.7

PN	US/MH Name	Status	Level Exceeded
S1.000	SPfa12	SURCHARGED	
S2.000	S44	FLOOD RISK	
S1.001	S45	FLOOD RISK	
S3.000	S46	FLOOD RISK	
S1.002	S47	FLOOD RISK	
S4.000	SPfa18	SURCHARGED	
S5.000	S41	SURCHARGED	
S4.001	S42	SURCHARGED	
S4.002	S43	SURCHARGED	
S1.003	SSuds feat A	SURCHARGED	
S1.004	SFlow Control	FLOOD RISK	

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STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes NETWORK 7 Manhole Sizes NETWORK 7

Designed with Level Soffits

```
# - 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
S1.000	46.490	0.389	119.5	0.779	5.00	0.0	0.600	o	525	Pipe/Conduit	
S2.000	62.997	0.420	150.0	0.105	5.00	0.0	0.600	o	225	Pipe/Conduit	
S1.001	11.483	0.023	499.3	0.015	0.00	0.0	0.600	o	525	Pipe/Conduit	
S3.000	36.887	0.184	200.5	0.098	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	18.811#	0.085	221.3	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	

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)
S1.000	52.97	5.38	16.010	0.779	0.0	0.0	0.0	2.05	443.3	149.0
S2.000	50.42	5.99	16.338	0.105	0.0	0.0	0.0	1.07	42.4	19.1
S1.001	49.67	6.18	15.618	0.899	0.0	0.0	0.0	1.00	215.5	161.3
S3.000	52.20	5.56	15.779	0.098	0.0	0.0	0.0	1.11	78.2	18.5
S1.002	48.89	6.39	15.595	0.997	0.0	0.0	0.0	1.50	325.1	176.0

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Network Design Table for Norther SuDA feature A

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
S4.000	47.723	0.939	50.8	0.535	5.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	16.060	0.182	88.2	0.058	5.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	12.755	0.085	150.1	0.026	0.00	0.0	0.600	o	450	Pipe/Conduit	
S4.002	31.720#	0.171	185.5	0.006	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	3.141	0.110	28.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	21.190	0.562	37.7	0.000	0.00	0.0	0.600	o	225	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)
S4.000	53.26	5.31	16.780	0.535	0.0	0.0	0.0	2.55	281.3	102.9
S5.000	53.81	5.19	16.173	0.058	0.0	0.0	0.0	1.39	55.4	11.3
S4.001	52.69	5.44	15.766	0.619	0.0	0.0	0.0	1.66	263.6	117.8
S4.002	51.19	5.80	15.681	0.625	0.0	0.0	0.0	1.49	236.9	117.8
S1.003	48.81	6.41	15.410	1.622	0.0	0.0	0.0	2.46	97.7«	285.9
S1.004	48.21	6.57	15.300	1.622	0.0	0.0	0.0	2.14	85.0«	285.9

Free Flowing Outfall Details for Norther SuDA feature A

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.004	S	15.500	14.738	0.000	0	0

Simulation Criteria for Norther SuDA feature A

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	1
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

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Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type Summer
Return Period (years)	100	Cv (Summer) 0.750
Region England and Wales		Cv (Winter) 0.840
M5-60 (mm)	19.900	Storm Duration (mins) 30
Ratio R	0.350	

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Summary of Critical Results by Maximum Level (Rank 1) for Norther SuDA feature A

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 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 1

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 FEH

Data Type Point

FEH Rainfall Version 2013 Cv (Summer) 0.750

Site Location GB 448927 117350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status OFF

Inertia Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160

Return Period(s) (years) 30

Climate Change (%) 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	SPfa12	15 Winter	30	+30%	30/15 Summer			
S2.000	S44	15 Winter	30	+30%	30/15 Summer			
S1.001	S45	15 Winter	30	+30%	30/15 Summer			
S3.000	S46	15 Winter	30	+30%	30/15 Summer			
S1.002	S47	15 Winter	30	+30%	30/15 Summer			
S4.000	SPfa18	15 Winter	30	+30%	30/15 Winter			
S5.000	S41	15 Winter	30	+30%	30/15 Summer			
S4.001	S42	15 Winter	30	+30%	30/15 Summer			
S4.002	S43	15 Winter	30	+30%	30/15 Summer			
S1.003	SSuds feat A	180 Winter	30	+30%	30/15 Summer			
S1.004	SFlow Control	180 Winter	30	+30%	30/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	SPfa12	16.796	0.261	0.000	0.83			324.1

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