STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SOUTHERN NETWORK

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 611050 137750 TR 11050 37750
C (1km)	-0.023
D1 (1km)	0.346
D2 (1km)	0.375
D3 (1km)	0.302
E (1km)	0.311
F (1km)	2.491
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	0.75
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for SOUTHERN NETWORK

« - 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
20.008	21.472	0.650	33.0	0.028	0.00	0.0	0.600	o	450	Pipe/Conduit	
20.009	21.055	0.850	24.8	0.066	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.000	10.703	0.050	214.1	0.028	5.00	0.0	0.600	o	225	Pipe/Conduit	
20.010	24.384	0.100	243.8	0.059	0.00	0.0	0.600	o	450	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)
20.008	50.00	6.80	67.300	0.501	0.0	0.0	0.0	3.55	564.1	67.8
20.009	50.00	6.89	66.650	0.567	0.0	0.0	0.0	4.10	651.8	76.8
25.000	50.00	5.20	66.075	0.028	0.0	0.0	0.0	0.89	35.4	3.8
20.010	50.00	7.20	65.800	0.654	0.0	0.0	0.0	1.30	206.4	88.6

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Network Design Table for SOUTHERN NETWORK

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
20.011	31.671	0.500	63.3	0.075	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
~~26.000~~	~~7.804~~	~~1.050~~	~~7.4~~	~~0.028~~	~~5.00~~	~~0.0~~	~~0.600~~	~~o~~	~~150~~	~~Pipe/Conduit~~	🔒
20.012	30.353	0.540	56.2	0.044	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
20.013	26.317	0.460	57.2	0.017	0.00	0.0	0.600	oo	450	Double Pipe	🔒
27.000	27.070	0.086	314.8	0.104	5.00	0.0	0.600	o	300	Pipe/Conduit	🔒
27.001	62.149	0.218	285.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
27.002	84.614	0.100	846.1	0.229	0.00	0.0	0.600	\/	-1	Pipe/Conduit	🔒
20.014	16.216	0.300	54.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
20.015	69.525	0.500	139.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
20.016	65.090	1.375	47.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
28.000	88.363	0.250	353.5	0.236	5.00	0.0	0.600	o	450	Pipe/Conduit	🔒
28.001	16.417	0.250	65.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
20.017	56.830	0.050	1136.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
29.000	14.165	0.450	31.5	0.032	5.00	0.0	0.600	o	225	Pipe/Conduit	🔒
30.000	23.163	0.400	57.9	0.065	5.00	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)
20.011	50.00	7.41	65.700	0.729	0.0	0.0	0.0	2.56	406.8	98.7
~~26.000~~	~~50.00~~	~~5.03~~	~~66.550~~	~~0.028~~	~~0.0~~	~~0.0~~	~~0.0~~	~~3.72~~	~~65.7~~	~~3.8~~
20.012	50.00	7.60	65.200	0.801	0.0	0.0	0.0	2.72	432.0	108.5
20.013	50.00	7.76	64.660	0.818	0.0	0.0	0.0	2.69	856.3	110.8
27.000	50.00	5.51	65.300	0.104	0.0	0.0	0.0	0.88	62.3	14.1
27.001	50.00	6.63	65.214	0.104	0.0	0.0	0.0	0.93	65.5	14.1
27.002	50.00	8.14	64.300	0.333	0.0	0.0	0.0	0.94	1497.2	45.1
20.014	50.00	8.29	64.200	1.151	0.0	0.0	0.0	1.78	70.9«	155.9
20.015	50.00	9.34	63.900	1.151	0.0	0.0	0.0	1.11	44.0«	155.9
20.016	50.00	9.91	63.400	1.151	0.0	0.0	0.0	1.91	75.8«	155.9
28.000	50.00	6.37	62.300	0.236	0.0	0.0	0.0	1.08	171.1	32.0
28.001	50.00	6.48	62.050	0.236	0.0	0.0	0.0	2.51	399.5	32.0
20.017	45.30	11.50	61.800	1.387	0.0	0.0	0.0	0.59	94.6«	170.2
29.000	50.00	5.10	64.275	0.032	0.0	0.0	0.0	2.34	93.1	4.3
30.000	50.00	5.29	64.300	0.065	0.0	0.0	0.0	1.32	23.4	8.8

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Network Design Table for SOUTHERN NETWORK

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
29.001	23.906	0.450	53.1	0.036	0.00	0.0	0.600	o	225	Pipe/Conduit	
29.002	18.423	0.400	46.1	0.024	0.00	0.0	0.600	o	225	Pipe/Conduit	
29.003	13.524	0.855	15.8	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit	
31.000	21.643	0.505	42.9	0.036	5.00	0.0	0.600	o	150	Pipe/Conduit	
29.004	10.698	0.037	290.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
32.000	16.342	0.082	200.0	0.063	5.00	0.0	0.600	o	225	Pipe/Conduit	
32.001	17.532	0.088	200.0	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
32.002	14.987	0.097	154.5	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
29.005	20.932	0.073	286.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
33.000	17.701	0.220	80.5	0.084	5.00	0.0	0.600	o	225	Pipe/Conduit	
33.001	19.935	0.680	29.3	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
33.002	14.941	0.700	21.3	0.013	0.00	0.0	0.600	o	225	Pipe/Conduit	
33.003	53.224	0.763	69.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
34.000	12.850	0.450	28.6	0.071	5.00	0.0	0.600	o	225	Pipe/Conduit	
34.001	41.372	1.438	28.8	0.100	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)
29.001	50.00	5.51	63.825	0.133	0.0	0.0	0.0	1.80	71.5	18.0
29.002	50.00	5.67	63.375	0.157	0.0	0.0	0.0	1.93	76.8	21.3
29.003	50.00	5.74	62.975	0.171	0.0	0.0	0.0	3.31	131.5	23.2
31.000	50.00	5.23	62.700	0.036	0.0	0.0	0.0	1.54	27.2	4.9
29.004	50.00	5.93	62.045	0.207	0.0	0.0	0.0	0.92	64.9	28.0
32.000	50.00	5.30	62.350	0.063	0.0	0.0	0.0	0.92	36.6	8.5
32.001	50.00	5.61	62.268	0.092	0.0	0.0	0.0	0.92	36.6	12.5
32.002	50.00	5.85	62.180	0.109	0.0	0.0	0.0	1.05	41.7	14.8
29.005	50.00	6.23	62.008	0.316	0.0	0.0	0.0	1.20	190.1	42.8
33.000	50.00	5.20	66.375	0.084	0.0	0.0	0.0	1.46	58.0	11.4
33.001	50.00	5.34	66.155	0.101	0.0	0.0	0.0	2.43	96.4	13.7
33.002	50.00	5.43	65.475	0.114	0.0	0.0	0.0	2.84	113.1	15.4
33.003	50.00	5.99	64.775	0.114	0.0	0.0	0.0	1.57	62.3	15.4
34.000	50.00	5.09	66.075	0.071	0.0	0.0	0.0	2.46	97.7	9.6
34.001	50.00	5.37	65.625	0.171	0.0	0.0	0.0	2.45	97.4	23.2

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Network Design Table for SOUTHERN NETWORK

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
35.000	18.492	0.800	23.1	0.038	5.00	0.0	0.600	o	150	Pipe/Conduit	🔒
35.001	27.799	0.350	79.4	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
35.002	6.867	0.088	78.0	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
34.002	5.260	0.175	30.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
33.004	126.153	1.862	67.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
29.006	34.833	0.135	258.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	🔒
20.018	6.018	0.125	48.1	0.000	0.00	0.0	0.600	\/	-1	Pipe/Conduit	🔒
20.019	14.451	0.194	74.5	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)
35.000	50.00	5.15	65.500	0.038	0.0	0.0	0.0	2.10	37.2	5.1
35.001	50.00	5.46	64.625	0.079	0.0	0.0	0.0	1.47	58.4	10.7
35.002	50.00	5.54	64.275	0.090	0.0	0.0	0.0	1.48	58.9	12.2
34.002	50.00	5.58	64.187	0.261	0.0	0.0	0.0	2.40	95.2	35.3
33.004	50.00	6.84	63.787	0.375	0.0	0.0	0.0	2.47	393.3	50.8
29.006	50.00	7.30	61.935	0.691	0.0	0.0	0.0	1.26	200.5	93.6
20.018	45.24	11.52	61.750	2.078	0.0	0.0	0.0	3.96	6340.6	254.6
20.019	44.82	11.68	61.625	2.078	0.0	0.0	0.0	1.52	60.3«	254.6

Free Flowing Outfall Details for SOUTHERN NETWORK

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
20.019	Outfall 03	62.200	61.431	60.400	0	0

Simulation Criteria for SOUTHERN NETWORK

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	7
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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Simulation Criteria for SOUTHERN NETWORK

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 611050 137750 TR 11050 37750
C (1km)	-0.023
D1 (1km)	0.346
D2 (1km)	0.375
D3 (1km)	0.302
E (1km)	0.311
F (1km)	2.491
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for SOUTHERN NETWORK

Orifice Manhole: 115, DS/PN: 20.008, Volume (m³): 4.4

Diameter (m) 0.340 Discharge Coefficient 0.600 Invert Level (m) 67.300

Hydro-Brake® Optimum Manhole: 127, DS/PN: 20.014, Volume (m³): 142.6

Unit Reference	MD-SFP-0152-1200-1000-1200
Design Head (m)	1.000
Design Flow (l/s)	12.0
Flush-Flo™	Calculated
Objective	Future Proof
Application	Surface
Sump Available	Yes
Diameter (mm)	152
Invert Level (m)	64.200
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	**Head (m)**	**Flow (l/s)**
Design Point (Calculated)	1.000	12.0
Flush-Flo™	0.264	12.0
Kick-Flo®	0.635	9.7
Mean Flow over Head Range	-	10.1

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)**
0.100	5.8	1.200	13.1	3.000	20.2	7.000	30.3
0.200	11.8	1.400	14.1	3.500	21.7	7.500	31.4
0.300	12.0	1.600	15.0	4.000	23.2	8.000	32.3
0.400	11.6	1.800	15.8	4.500	24.5	8.500	33.3
0.500	11.2	2.000	16.6	5.000	25.8	9.000	34.2
0.600	10.3	2.200	17.4	5.500	27.0	9.500	35.1
0.800	10.8	2.400	18.2	6.000	28.2		
1.000	12.0	2.600	18.9	6.500	29.3		

Hydro-Brake® Optimum Manhole: 156, DS/PN: 20.018, Volume (m³): 16.3

Unit Reference	MD-SHE-0199-2090-1250-2090
Design Head (m)	1.250
Design Flow (l/s)	20.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	199
Invert Level (m)	61.750
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

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Hydro-Brake® Optimum Manhole: 156, DS/PN: 20.018, Volume (m³): 16.3

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.250	20.9
Flush-Flo™	0.393	20.8
Kick-Flo®	0.858	17.5
Mean Flow over Head Range	-	17.8

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)
0.100	6.9	1.200	20.5	3.000	31.8	7.000	47.8
0.200	18.8	1.400	22.0	3.500	34.2	7.500	49.4
0.300	20.6	1.600	23.5	4.000	36.5	8.000	51.0
0.400	20.8	1.800	24.9	4.500	38.6	8.500	52.5
0.500	20.6	2.000	26.1	5.000	40.6	9.000	54.0
0.600	20.3	2.200	27.4	5.500	42.5	9.500	55.5
0.800	18.6	2.400	28.5	6.000	44.4		
1.000	18.8	2.600	29.7	6.500	46.1		

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Storage Structures for SOUTHERN NETWORK

Porous Car Park Manhole: 123, DS/PN: 20.013

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.6
Membrane Percolation (mm/hr)	1000	Length (m)	29.0
Max Percolation (l/s)	69.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	66.200	Membrane Depth (mm)	0

Tank or Pond Manhole: 127, DS/PN: 20.014

Invert Level (m) 64.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	625.0	0.500	976.0	1.000	1351.0
0.250	798.0	0.750	1160.0		

Porous Car Park Manhole: 136, DS/PN: 29.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.7
Membrane Percolation (mm/hr)	1000	Length (m)	20.7
Max Percolation (l/s)	90.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	63.825	Membrane Depth (mm)	0

Porous Car Park Manhole: 143, DS/PN: 29.004

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.7
Membrane Percolation (mm/hr)	1000	Length (m)	18.6
Max Percolation (l/s)	55.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	63.500	Membrane Depth (mm)	0

Porous Car Park Manhole: 151, DS/PN: 35.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	13.0
Membrane Percolation (mm/hr)	1000	Length (m)	13.7
Max Percolation (l/s)	49.5	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	65.350	Membrane Depth (mm)	0

Tank or Pond Manhole: 156, DS/PN: 20.018

Invert Level (m) 61.750

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	159.0	0.500	400.0	1.000	670.0
0.250	274.0	0.750	532.0	1.250	814.0

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Summary of Critical Results by Maximum Level (Rank 1) for SOUTHERN NETWORK

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 7
Number of Online Controls 5 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location GB 611050 137750 TR 11050 37750	
C (1km)	-0.023
D1 (1km)	0.346
D2 (1km)	0.375
D3 (1km)	0.302
E (1km)	0.311
F (1km)	2.491
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2
Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
20.008	115	15 Winter	2	+0%					67.618
20.009	116	15 Winter	2	+0%					66.768
25.000	117	15 Winter	2	+0%					66.135
20.010	118	15 Winter	2	+0%					66.033
20.011	119	15 Winter	2	+0%					65.864
~~26.000~~	~~121~~	~~15 Winter~~	~~2~~	~~+0%~~					~~66.579~~
20.012	122	15 Winter	2	+0%					65.367
20.013	123	15 Winter	2	+0%					64.772
27.000	124	15 Winter	2	+0%					65.416
27.001	125	15 Winter	2	+0%					65.321
27.002	126	360 Winter	2	+0%					64.372
20.014	127	360 Winter	2	+0%					64.372
20.015	128	360 Winter	2	+0%					63.978
20.016	130	360 Winter	2	+0%					63.459

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Summary of Critical Results by Maximum Level (Rank 1) for SOUTHERN NETWORK

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
20.008	115	-0.132	0.000	0.16		71.5	OK	
20.009	116	-0.332	0.000	0.15		79.9	OK	
25.000	117	-0.165	0.000	0.16		4.7	OK	
20.010	118	-0.217	0.000	0.53		90.9	OK	
20.011	119	-0.286	0.000	0.28		99.9	OK	
~~26.000~~	~~121~~	~~-0.121~~	~~0.000~~	~~0.08~~		~~4.8~~	~~OK~~	
20.012	122	-0.283	0.000	0.29		108.9	OK	
20.013	123	-0.338	0.000	0.15		109.2	OK	
27.000	124	-0.184	0.000	0.31		17.4	OK	
27.001	125	-0.193	0.000	0.28		17.3	OK	
27.002	126	-0.328	0.000	0.01		8.8	OK	
20.014	127	-0.053	0.000	0.18		11.3	OK	
20.015	128	-0.147	0.000	0.26		11.3	OK	
20.016	130	-0.166	0.000	0.15		11.3	OK	

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Summary of Critical Results by Maximum Level (Rank 1) for SOUTHERN NETWORK

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
28.000	131	15 Winter	2	+0%					62.452
28.001	132	15 Winter	2	+0%					62.158
20.017	133	240 Winter	2	+0%					62.091
29.000	134	15 Winter	2	+0%					64.313
30.000	135	15 Winter	2	+0%					64.375
29.001	136	15 Winter	2	+0%					63.887
29.002	137	15 Winter	2	+0%					63.443
29.003	138	15 Winter	2	+0%					63.029
31.000	142	15 Winter	2	+0%					62.750
29.004	143	15 Winter	2	+0%					62.208
32.000	139	15 Winter	2	+0%					62.439
32.001	140	15 Winter	2	+0%					62.374
32.002	141	15 Winter	2	+0%					62.288
29.005	45	15 Winter	2	+0%					62.193
33.000	144	15 Winter	2	+0%					66.456
33.001	145	15 Winter	2	+0%					66.222
33.002	146	15 Winter	2	+0%					65.541
33.003	147	15 Winter	2	+0%					64.861
34.000	148	15 Winter	2	+0%					66.132
34.001	149	15 Winter	2	+0%					65.707
35.000	150	15 Winter	2	+0%					65.544
35.001	151	15 Winter	2	+0%					64.698
35.002	152	15 Winter	2	+0%					64.365
34.002	153	15 Winter	2	+0%					64.325
33.004	154	15 Winter	2	+0%					63.905
29.006	155	15 Winter	2	+0%					62.165
20.018	156	240 Winter	2	+0%					62.084
20.019	157	240 Winter	2	+0%					61.723

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
28.000	131	-0.298	0.000	0.23		36.7	OK	
28.001	132	-0.342	0.000	0.13		36.8	OK	
20.017	133	-0.159	0.000	0.17		15.8	OK	
29.000	134	-0.187	0.000	0.07		5.4	OK	
30.000	135	-0.075	0.000	0.49		10.9	OK	
29.001	136	-0.163	0.000	0.17		11.3	OK	
29.002	137	-0.157	0.000	0.20		13.6	OK	
29.003	138	-0.171	0.000	0.13		15.0	OK	
31.000	142	-0.100	0.000	0.24		6.1	OK	
29.004	143	-0.137	0.000	0.36		18.7	OK	
32.000	139	-0.136	0.000	0.32		10.5	OK	
32.001	140	-0.119	0.000	0.45		14.7	OK	
32.002	141	-0.117	0.000	0.46		17.0	OK	
29.005	45	-0.265	0.000	0.22		34.5	OK	
33.000	144	-0.144	0.000	0.27		14.3	OK	
33.001	145	-0.158	0.000	0.19		16.5	OK	
33.002	146	-0.159	0.000	0.19		18.6	OK	

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Summary of Critical Results by Maximum Level (Rank 1) for SOUTHERN NETWORK

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
33.003	147	-0.139	0.000	0.31		18.6	OK	
34.000	148	-0.168	0.000	0.14		12.1	OK	
34.001	149	-0.143	0.000	0.28		26.3	OK	
35.000	150	-0.106	0.000	0.19		6.5	OK	
35.001	151	-0.152	0.000	0.23		12.3	OK	
35.002	152	-0.135	0.000	0.33		14.0	OK	
34.002	153	-0.087	0.000	0.69		40.5	OK	
33.004	154	-0.332	0.000	0.15		57.0	OK	
29.006	155	-0.220	0.000	0.51		90.0	OK	
20.018	156	-0.066	0.000	0.01		20.7	OK	
20.019	157	-0.127	0.000	0.39		20.7	OK	

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