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Date 14/07/2021 00:24
File 210706 FW-SW Net.MDX
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XP Solutions

Network 2020.1

Network Design Table for SW Net 01

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
S6.000	13.799	1.592	8.7	0.136	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.007	67.552	0.270	250.0	0.048	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.008	13.618	0.054	250.0	0.072	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	21.612	0.043	500.0	0.024	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.000	12.129	0.097	125.0	0.015	4.00	0.0	0.600	o	150	Pipe/Conduit	
S7.001	21.923	0.175	125.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	
S7.002	56.508	0.377	150.0	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
S8.000	4.172	0.599	7.0	0.000	4.00	5.0	0.600	o	150	Pipe/Conduit	
S7.003	20.355	0.136	150.0	0.020	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.000	4.316	0.500	8.6	0.080	4.00	0.0	0.600	o	150	Pipe/Conduit	
S9.001	5.880	0.485	12.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S7.004	22.224	0.148	150.0	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit	
S10.000	4.429	0.500	8.9	0.080	4.00	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
S6.000	64.80	4.07	59.600	0.136	0.0	0.0	0.0	3.44	60.9	23.9
S1.007	48.44	8.00	57.783	0.884	5.0	0.0	0.0	1.14	126.1	121.0
S1.008	47.93	8.18	57.438	0.956	5.0	0.0	0.0	1.28	203.8	129.1
S1.009	46.81	8.58	57.383	0.980	5.0	0.0	0.0	0.90	143.5	129.2
S7.000	63.88	4.23	60.300	0.015	0.0	0.0	0.0	0.90	15.9	2.6
S7.001	61.66	4.63	60.203	0.021	0.0	0.0	0.0	0.90	15.9	3.5
S7.002	57.41	5.52	59.953	0.061	0.0	0.0	0.0	1.07	42.4	9.5
S8.000	65.09	4.02	60.250	0.000	5.0	0.0	0.0	3.84	67.9	5.0
S7.003	56.04	5.84	59.576	0.081	5.0	0.0	0.0	1.07	42.4	17.3
S9.000	65.07	4.02	60.500	0.080	0.0	0.0	0.0	3.45	61.0	14.1
S9.001	64.99	4.03	60.000	0.000	5.0	0.0	0.0	2.91	51.4	5.0
S7.004	54.87	6.12	59.365	0.099	10.0	0.0	0.0	1.28	90.6	24.7
S10.000	65.06	4.02	60.400	0.080	0.0	0.0	0.0	3.41	60.2	14.1

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Network Design Table for SW Net 01

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
S10.001	5.657	0.533	10.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S7.005	9.917	0.066	150.0	0.007	0.00	0.0	0.600	o	300	Pipe/Conduit		
S11.000	4.196	0.500	8.4	0.080	4.00	0.0	0.600	o	150	Pipe/Conduit		
S11.001	5.643	0.499	11.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
S7.006	17.830	0.119	150.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
S7.007	43.558	0.290	150.0	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit		
S12.000	15.467	0.709	21.8	0.000	4.00	5.0	0.600	o	150	Pipe/Conduit		
S7.008	11.806	1.251	9.4	0.132	0.00	0.0	0.600	o	300	Pipe/Conduit		
S13.000	21.583	0.216	100.0	0.065	4.00	0.0	0.600	o	150	Pipe/Conduit		
S13.001	16.488	1.119	14.7	0.024	0.00	0.0	0.600	o	150	Pipe/Conduit		
S1.010	76.815	0.307	250.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		
S14.000	40.712	0.550	74.0	0.000	4.00	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)
S10.001	65.01	4.03	59.900	0.000	5.0	0.0	0.0	3.11	55.0	5.0
S7.005	54.36	6.25	59.217	0.106	15.0	0.0	0.0	1.28	90.6	30.6
S11.000	65.07	4.02	60.300	0.080	0.0	0.0	0.0	3.50	61.8	14.1
S11.001	65.01	4.03	59.800	0.000	5.0	0.0	0.0	3.01	53.2	5.0
S7.006	53.48	6.48	59.151	0.106	20.0	0.0	0.0	1.28	90.6	35.4
S7.007	51.46	7.05	59.032	0.157	20.0	0.0	0.0	1.28	90.6	41.9
S12.000	64.49	4.12	59.600	0.000	5.0	0.0	0.0	2.17	38.3	5.0
S7.008	51.33	7.09	58.741	0.289	25.0	0.0	0.0	5.15	363.8	65.2
S13.000	63.14	4.36	59.600	0.065	0.0	0.0	0.0	1.00	17.8	11.1
S13.001	62.57	4.46	59.384	0.089	0.0	0.0	0.0	2.64	46.6	15.1
S1.010	59.81	5.00	57.340	0.000	105.0	0.0	0.0	1.28	203.8	105.0
S14.000	62.65	4.45	59.750	0.000	0.0	0.0	0.0	1.52	60.5	0.0

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Network Design Table for SW Net 01

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
S14.001	40.139	0.460	87.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
S14.002	42.151	0.280	150.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
S14.003	96.324	1.202	80.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
S1.011	11.227	0.458	24.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		
S15.000	16.421	0.066	250.0	0.000	4.00	0.0	0.600	o	450	Pipe/Conduit		
S15.001	69.229	0.277	250.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		
S15.002	14.622	0.058	252.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		
S1.012	25.187	0.325	77.5	0.000	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
S14.001	60.18	4.92	59.200	0.000	0.0	0.0	0.0	1.40	55.7	0.0
S14.002	57.11	5.58	58.740	0.000	0.0	0.0	0.0	1.06	42.3	0.0
S14.003	52.75	6.68	58.460	0.000	0.0	0.0	0.0	1.46	58.1	0.0
S1.011	52.59	6.73	57.033	0.000	105.0	0.0	0.0	4.12	655.2	105.0
S15.000	63.95	4.21	57.050	0.000	0.0	0.0	0.0	1.28	203.8	0.0
S15.001	59.26	5.11	56.984	0.000	0.0	0.0	0.0	1.28	203.8	0.0
S15.002	58.36	5.31	56.707	0.000	0.0	0.0	0.0	1.28	202.9	0.0
S1.012	51.95	6.91	56.575	0.000	105.0	0.0	0.0	2.31	367.6	105.0

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Area Summary for SW Net 01

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.027	0.027	0.027
1.001	-	-	100	0.048	0.048	0.048
1.002	-	-	100	0.024	0.024	0.024
1.003	-	-	100	0.048	0.048	0.048
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.048	0.048	0.048
1.006	-	-	100	0.024	0.024	0.024
2.000	-	-	100	0.081	0.081	0.081
2.001	-	-	100	0.017	0.017	0.017
2.002	-	-	100	0.042	0.042	0.042
2.003	-	-	100	0.008	0.008	0.008
2.004	-	-	100	0.058	0.058	0.058
3.000	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.053	0.053	0.053
3.001	-	-	100	0.039	0.039	0.039
5.000	-	-	100	0.165	0.165	0.165
2.005	-	-	100	0.018	0.018	0.018
6.000	-	-	100	0.136	0.136	0.136
1.007	-	-	100	0.048	0.048	0.048
1.008	-	-	100	0.072	0.072	0.072
1.009	-	-	100	0.024	0.024	0.024
7.000	-	-	100	0.015	0.015	0.015
7.001	-	-	100	0.006	0.006	0.006
7.002	-	-	100	0.040	0.040	0.040
8.000	-	-	100	0.000	0.000	0.000
7.003	-	-	100	0.020	0.020	0.020
9.000	-	-	100	0.080	0.080	0.080
9.001	-	-	100	0.000	0.000	0.000
7.004	-	-	100	0.018	0.018	0.018
10.000	-	-	100	0.080	0.080	0.080
10.001	-	-	100	0.000	0.000	0.000
7.005	-	-	100	0.007	0.007	0.007
11.000	-	-	100	0.080	0.080	0.080
11.001	-	-	100	0.000	0.000	0.000
7.006	-	-	100	0.000	0.000	0.000
7.007	-	-	100	0.051	0.051	0.051
12.000	-	-	100	0.000	0.000	0.000
7.008	-	-	100	0.132	0.132	0.132
13.000	-	-	100	0.065	0.065	0.065
13.001	-	-	100	0.024	0.024	0.024
1.010	-	-	100	0.000	0.000	0.000
14.000	-	-	100	0.000	0.000	0.000
14.001	-	-	100	0.000	0.000	0.000
14.002	-	-	100	0.000	0.000	0.000
14.003	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000

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Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
15.000	-	-	100	0.000	0.000	0.000
15.001	-	-	100	0.000	0.000	0.000
15.002	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.598	1.598	1.598

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
------------------------	-----------------	-----------------	-----------------	------------------------	--------------	-----------

S1.012	S	61.100	56.250	0.000	1500	0
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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	13
Number of Online Controls	4	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.359		

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Micro Drainage

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Online Controls for SW Net 01

Orifice Manhole: S9.0, DS/PN: S9.001, Volume (m³): 0.3

Diameter (m) 0.075

Discharge Coefficient 0.600

Invert Level (m) 60.000

Orifice Manhole: S10.0, DS/PN: S10.001, Volume (m³): 0.3

Diameter (m) 0.075

Discharge Coefficient 0.600

Invert Level (m) 59.900

Orifice Manhole: S11.0, DS/PN: S11.001, Volume (m³): 0.3

Diameter (m) 0.075

Discharge Coefficient 0.600

Invert Level (m) 59.800

Hydro-Brake® Optimum Manhole: S1.11, DS/PN: S1.010, Volume (m³): 12.5

Unit Reference

Design Head (m)

Design Flow (l/s)

Flush-Flo™

Objective

Application

Sump Available

Diameter (mm)

Invert Level (m)

Minimum Outlet Pipe Diameter (mm)

Suggested Manhole Diameter (mm)

MD-SHE-0378-1050-2900-1050

2.900

105.0

Calculated

Minimise upstream storage

Surface

Yes

378

57.340

450

Site Specific Design (Contact Hydro International)

Control Points

Head (m)

Flow (l/s)

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)

2.900

104.9

Kick-Flo®

1.882

85.1

Flush-Flo™

0.860

104.9

Mean Flow over Head Range

-

90.5

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

10.6

1.200

103.1

3.000

106.6

7.000

161.2

0.200

37.6

1.400

100.7

3.500

114.9

7.500

166.7

0.300

71.4

1.600

96.8

4.000

122.7

8.000

172.0

0.400

95.3

1.800

89.6

4.500

129.9

8.500

177.2

0.500

99.8

2.000

87.6

5.000

136.7

9.000

182.3

0.600

102.6

2.200

91.7

5.500

143.3

9.500

187.1

0.800

104.8

2.400

95.7

6.000

149.5

1.000

104.5

2.600

99.5

6.500

155.4

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Storage Structures for SW Net 01

Filter Drain Manhole: S1.2, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.150
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.30	Slope (1:X)	1000.0
Invert Level (m)	59.850	Cap Volume Depth (m)	0.550
Trench Width (m)	0.5	Cap Infiltration Depth (m)	0.000
Trench Length (m)	85.0		

Filter Drain Manhole: S2.0, DS/PN: S2.000

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.150
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.30	Slope (1:X)	70.0
Invert Level (m)	59.150	Cap Volume Depth (m)	0.550
Trench Width (m)	0.5	Cap Infiltration Depth (m)	0.000
Trench Length (m)	49.0		

Cellular Storage Manhole: S2.2, DS/PN: S2.002

Invert Level (m)	58.488	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	55.0	55.0	0.801	0.0	80.6
0.800	55.0	80.6			

Porous Car Park Manhole: S3.1, DS/PN: S3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	37.5
Max Percolation (l/s)	104.2	Slope (1:X)	150.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	60.155	Cap Volume Depth (m)	0.400

Porous Car Park Manhole: S5.0, DS/PN: S5.000

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1000	Porosity	0.30
Max Percolation (l/s)	100.8	Invert Level (m)	59.900

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<u>Porous Car Park Manhole: S5.0, DS/PN: S5.000</u> Width (m) 11.0 Depression Storage (mm) 5 Length (m) 33.0 Evaporation (mm/day) 3 Slope (1:X) 165.0 Cap Volume Depth (m) 0.400 <u>Porous Car Park Manhole: S2.5, DS/PN: S2.005</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 11.0 Membrane Percolation (mm/hr) 1000 Length (m) 30.0 Max Percolation (l/s) 91.7 Slope (1:X) 300.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 60.100 Cap Volume Depth (m) 0.400 <u>Filter Drain Manhole: S6.0, DS/PN: S6.000</u> Infiltration Coefficient Base (m/hr) 0.00000 Pipe Diameter (m) 0.150 Infiltration Coefficient Side (m/hr) 0.00000 Pipe Depth above Invert (m) 0.000 Safety Factor 2.0 Number of Pipes 1 Porosity 0.30 Slope (1:X) 1000.0 Invert Level (m) 59.850 Cap Volume Depth (m) 0.550 Trench Width (m) 0.5 Cap Infiltration Depth (m) 0.000 Trench Length (m) 47.0 <u>Porous Car Park Manhole: SPP1, DS/PN: S9.000</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 22.0 Membrane Percolation (mm/hr) 1000 Length (m) 36.0 Max Percolation (l/s) 220.0 Slope (1:X) 360.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 60.500 Cap Volume Depth (m) 0.350 <u>Porous Car Park Manhole: SPP2, DS/PN: S10.000</u> Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 22.0 Membrane Percolation (mm/hr) 1000 Length (m) 36.0 Max Percolation (l/s) 220.0 Slope (1:X) 360.0 Safety Factor 2.0 Depression Storage (mm) 5 Porosity 0.30 Evaporation (mm/day) 3 Invert Level (m) 60.400 Cap Volume Depth (m) 0.350 <u>Porous Car Park Manhole: SPP3, DS/PN: S11.000</u> Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0 Membrane Percolation (mm/hr) 1000 Porosity 0.30 Max Percolation (l/s) 220.0 Invert Level (m) 60.300		
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Width (m)	22.0	Depression Storage (mm)	5
Length (m)	36.0	Evaporation (mm/day)	3
Slope (1:X)	360.0	Cap Volume Depth (m)	0.350

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.150
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.30	Slope (1:X)	1000.0
Invert Level (m)	59.750	Cap Volume Depth (m)	0.550
Trench Width (m)	0.5	Cap Infiltration Depth (m)	0.000
Trench Length (m)	52.5		

Infiltration Coefficient Base (m/hr)	0.00000	Pipe Diameter (m)	0.150
Infiltration Coefficient Side (m/hr)	0.00000	Pipe Depth above Invert (m)	0.000
Safety Factor	2.0	Number of Pipes	1
Porosity	0.30	Slope (1:X)	1000.0
Invert Level (m)	59.850	Cap Volume Depth (m)	0.550
Trench Width (m)	0.5	Cap Infiltration Depth (m)	0.000
Trench Length (m)	46.5		

Invert Level (m)	57.415	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	170.0	170.0	1.801	0.0	251.0
1.800	170.0	251.0			

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for <u>SW Net 01</u>									
PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1.1	-0.059	0.000	0.68			9.5	OK	
S1.001	S1.2	-0.132	0.000	0.35			15.6	OK	
S1.002	S1.3	-0.121	0.000	0.43			18.8	OK	
S1.003	S1.4	-0.102	0.000	0.58			24.7	OK	
S1.004	S1.5	-0.104	0.000	0.56			24.6	OK	
S1.005	S1.6	-0.076	0.000	0.76			29.9	OK	
S1.006	S1.7	-0.077	0.000	0.75			32.5	OK	
S2.000	S2.0	-0.138	0.000	0.32		6	13.5	OK	
S2.001	S2.1	-0.127	0.000	0.39			15.7	OK	
S2.002	S2.2	-0.149	0.000	0.25			10.2	OK	
S2.003	S2.3	-0.145	0.000	0.27			10.8	OK	
S2.004	S2.4	-0.133	0.000	0.35			15.3	OK	
S3.000	S3.0	-0.150	0.000	0.00			0.0	OK	
S4.000	S4.0	-0.066	0.000	0.60			8.8	OK	
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US/MH				Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	
S3.001	S3.1	30 Summer	2	+0%	100/15 Summer				
S5.000	S5.0	15 Winter	2	+0%	100/15 Summer				
S2.005	S2.5	15 Winter	2	+0%	30/15 Summer				
S6.000	S6.0	15 Winter	2	+0%	100/15 Summer				
S1.007	S1.8	15 Winter	2	+0%	30/15 Summer				
S1.008	S1.9	30 Winter	2	+0%	30/15 Summer				
S1.009	S1.10	30 Winter	2	+0%	30/15 Summer				
S7.000	S7.0	15 Winter	2	+0%					
S7.001	S7.1	15 Winter	2	+0%					
S7.002	S7.2	15 Winter	2	+0%					
S8.000	S8.0	15 Summer	2	+0%					
S7.003	S7.3	15 Winter	2	+0%	100/15 Summer				
S9.000	SPP1	60 Winter	2	+0%					
S9.001	S9.0	60 Winter	2	+0%	2/30 Winter	100/120 Summer			
S7.004	S7.4	15 Winter	2	+0%	100/60 Winter				
S10.000	SPP2	60 Winter	2	+0%					
S10.001	S10.0	60 Winter	2	+0%	2/30 Winter	100/120 Summer			
S7.005	SJ1	30 Winter	2	+0%					
S11.000	SPP3	60 Winter	2	+0%					
S11.001	S11.0	60 Winter	2	+0%	2/30 Winter	100/120 Summer			
S7.006	SJ2	30 Winter	2	+0%					
S7.007	S7.5	30 Winter	2	+0%	100/15 Summer				
S12.000	S12.0	60 Summer	2	+0%					
S7.008	S7.6	30 Winter	2	+0%	100/60 Summer				
S13.000	S13.0	15 Winter	2	+0%	30/15 Summer				
S13.001	S13.1	15 Winter	2	+0%	100/60 Winter				
S1.010	S1.11	30 Winter	2	+0%	30/15 Summer				
S14.000	SEXS9	15 Summer	2	+0%					
S14.001	SDSW1	15 Summer	2	+0%					
S14.002	SDSW2	15 Summer	2	+0%					
S14.003	SDSW3	15 Summer	2	+0%					
S1.011	S1.12	30 Winter	2	+0%					
S15.000	SEXS12	15 Summer	2	+0%					
S15.001	S15.0	15 Summer	2	+0%					
S15.002	S15.1	60 Winter	2	+0%					
S1.012	S1.13	30 Winter	2	+0%					

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for
SW Net 01

PN	US/MH Name	Water	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status
		Level (m)	Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)	
S5.000	S5.0	58.977	-0.223	0.000	0.15		5	27.5	OK
S2.005	S2.5	58.096	-0.100	0.000	0.77		7	44.1	OK
S6.000	S6.0	59.666	-0.084	0.000	0.41		5	22.7	OK
S1.007	S1.8	58.046	-0.112	0.000	0.80			94.7	OK
S1.008	S1.9	57.780	-0.108	0.000	0.58			88.3	OK
S1.009	S1.10	57.761	-0.073	0.000	0.81			88.8	OK
S7.000	S7.0	60.342	-0.108	0.000	0.17			2.5	OK
S7.001	S7.1	60.250	-0.103	0.000	0.22			3.3	OK
S7.002	S7.2	60.023	-0.155	0.000	0.20			8.3	OK
S8.000	S8.0	60.282	-0.118	0.000	0.10			5.0	OK
S7.003	S7.3	59.676	-0.124	0.000	0.41			15.7	OK
S9.000	SPP1	60.533	-0.117	0.000	0.11		14	4.9	OK
S9.001	S9.0	60.211	0.061	0.000	0.11			4.8	SURCHARGED
S7.004	S7.4	59.465	-0.200	0.000	0.24			19.4	OK
S10.000	SPP2	60.433	-0.117	0.000	0.11		14	4.9	OK
S10.001	S10.0	60.111	0.061	0.000	0.11			4.8	SURCHARGED
S7.005	SJ1	59.345	-0.172	0.000	0.38			24.4	OK*
S11.000	SPP3	60.333	-0.117	0.000	0.11		14	4.9	OK
S11.001	S11.0	60.011	0.061	0.000	0.11			4.8	SURCHARGED
S7.006	SJ2	59.271	-0.180	0.000	0.34			29.1	OK*
S7.007	S7.5	59.162	-0.170	0.000	0.39			33.0	OK
S12.000	S12.0	59.637	-0.113	0.000	0.14			5.0	OK
S7.008	S7.6	58.825	-0.216	0.000	0.17		16	48.6	OK
S13.000	S13.0	59.688	-0.062	0.000	0.64		5	10.8	OK
S13.001	S13.1	59.443	-0.091	0.000	0.32			13.9	OK
S1.010	S1.11	57.738	-0.052	0.000	0.50		16	95.1	OK
S14.000	SEXS9	59.750	-0.225	0.000	0.00			0.0	OK
S14.001	SDSW1	59.200	-0.225	0.000	0.00			0.0	OK
S14.002	SDSW2	58.740	-0.225	0.000	0.00			0.0	OK
S14.003	SDSW3	58.460	-0.225	0.000	0.00			0.0	OK
S1.011	S1.12	57.184	-0.298	0.000	0.25			95.1	OK
S15.000	SEXS12	57.050	-0.450	0.000	0.00			0.0	OK
S15.001	S15.0	56.984	-0.450	0.000	0.00			0.0	OK
S15.002	S15.1	56.743	-0.414	0.000	0.00			0.2	OK
S1.012	S1.13	56.745	-0.280	0.000	0.31			94.9	OK

PN	US/MH Name	Level Exceeded
S3.001	S3.1	
S5.000	S5.0	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for
SW Net 01

PN	US/MH Name	Level Exceeded
S2.005	S2.5	
S6.000	S6.0	
S1.007	S1.8	
S1.008	S1.9	
S1.009	S1.10	
S7.000	S7.0	
S7.001	S7.1	
S7.002	S7.2	
S8.000	S8.0	
S7.003	S7.3	
S9.000	SPP1	
S9.001	S9.0	2
S7.004	S7.4	
S10.000	SPP2	
S10.001	S10.0	1
S7.005	SJ1	
S11.000	SPP3	
S11.001	S11.0	2
S7.006	SJ2	
S7.007	S7.5	
S12.000	S12.0	
S7.008	S7.6	
S13.000	S13.0	
S13.001	S13.1	
S1.010	S1.11	
S14.000	SEXS9	
S14.001	SDSW1	
S14.002	SDSW2	
S14.003	SDSW3	
S1.011	S1.12	
S15.000	SEXS12	
S15.001	S15.0	
S15.002	S15.1	
S1.012	S1.13	

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for SW Net 01

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	13
Number of Online Controls	4	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FSR	Ratio R	0.358
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

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)	2, 30, 100
Climate Change (%)	0, 0, 40

									Water
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)
S1.000	S1.1	15 Winter	30	+0%	100/15 Summer				59.717
S1.001	S1.2	15 Summer	30	+0%	100/15 Summer				59.586
S1.002	S1.3	15 Winter	30	+0%	30/15 Summer				59.475
S1.003	S1.4	15 Winter	30	+0%	30/15 Summer				59.394
S1.004	S1.5	15 Winter	30	+0%	30/15 Summer				59.272
S1.005	S1.6	15 Winter	30	+0%	30/15 Summer				59.104
S1.006	S1.7	15 Winter	30	+0%	30/15 Summer				58.891
S2.000	S2.0	15 Winter	30	+0%	100/15 Summer				58.953
S2.001	S2.1	15 Winter	30	+0%	100/15 Summer				58.815
S2.002	S2.2	15 Winter	30	+0%	100/15 Summer				58.740
S2.003	S2.3	15 Winter	30	+0%	30/15 Summer				58.712
S2.004	S2.4	15 Winter	30	+0%	30/15 Summer				58.712
S3.000	S3.0	15 Summer	30	+0%	100/15 Summer				59.800
S4.000	S4.0	15 Winter	30	+0%	30/15 Summer				59.479

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SW Net 01

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
S1.000	S1.1	-0.033	0.000	0.97			13.5		OK
S1.001	S1.2	-0.093	0.000	0.64			28.1		OK
S1.002	S1.3	0.112	0.000	0.78			33.9	SURCHARGED	
S1.003	S1.4	0.257	0.000	0.99			42.4	SURCHARGED	
S1.004	S1.5	0.339	0.000	0.83			36.7	SURCHARGED	
S1.005	S1.6	0.472	0.000	1.09			42.5	SURCHARGED	
S1.006	S1.7	0.430	0.000	1.11			47.8	SURCHARGED	
S2.000	S2.0	-0.098	0.000	0.61			25.5		OK
S2.001	S2.1	-0.076	0.000	0.77			30.7		OK
S2.002	S2.2	-0.048	0.000	0.69			28.6		OK
S2.003	S2.3	0.065	0.000	0.79			31.3	SURCHARGED	
S2.004	S2.4	0.160	0.000	0.79			35.2	SURCHARGED	
S3.000	S3.0	-0.150	0.000	0.00			0.0		OK
S4.000	S4.0	0.029	0.000	1.13			16.6	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SW Net 01

US/MH			Return	Climate	First (X)		First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge		Flood	Overflow	Act.
S3.001	S3.1	15 Summer	30	+0%	100/15	Summer			
S5.000	S5.0	15 Winter	30	+0%	100/15	Summer			
S2.005	S2.5	15 Winter	30	+0%	30/15	Summer			
S6.000	S6.0	15 Winter	30	+0%	100/15	Summer			
S1.007	S1.8	15 Winter	30	+0%	30/15	Summer			
S1.008	S1.9	60 Winter	30	+0%	30/15	Summer			
S1.009	S1.10	60 Winter	30	+0%	30/15	Summer			
S7.000	S7.0	15 Winter	30	+0%					
S7.001	S7.1	15 Winter	30	+0%					
S7.002	S7.2	15 Winter	30	+0%					
S8.000	S8.0	15 Summer	30	+0%					
S7.003	S7.3	15 Winter	30	+0%	100/15	Summer			
S9.000	SPP1	30 Winter	30	+0%					
S9.001	S9.0	30 Winter	30	+0%	2/30	Winter	100/120	Summer	
S7.004	S7.4	15 Winter	30	+0%	100/60	Winter			
S10.000	SPP2	30 Winter	30	+0%					
S10.001	S10.0	60 Summer	30	+0%	2/30	Winter	100/120	Summer	
S7.005	SJ1	15 Winter	30	+0%					
S11.000	SPP3	30 Winter	30	+0%					
S11.001	S11.0	60 Summer	30	+0%	2/30	Winter	100/120	Summer	
S7.006	SJ2	15 Winter	30	+0%					
S7.007	S7.5	15 Winter	30	+0%	100/15	Summer			
S12.000	S12.0	60 Summer	30	+0%					
S7.008	S7.6	15 Winter	30	+0%	100/60	Summer			
S13.000	S13.0	15 Winter	30	+0%	30/15	Summer			
S13.001	S13.1	15 Winter	30	+0%	100/60	Winter			
S1.010	S1.11	60 Winter	30	+0%	30/15	Summer			
S14.000	SEXS9	15 Summer	30	+0%					
S14.001	SDSW1	15 Summer	30	+0%					
S14.002	SDSW2	15 Summer	30	+0%					
S14.003	SDSW3	15 Summer	30	+0%					
S1.011	S1.12	60 Winter	30	+0%					
S15.000	SEXS12	15 Summer	30	+0%					
S15.001	S15.0	15 Summer	30	+0%					
S15.002	S15.1	60 Winter	30	+0%					
S1.012	S1.13	60 Winter	30	+0%					

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S3.001	S3.1	59.273	-0.058	0.000	0.68	5	28.8	OK

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	<table> <tr> <th>PN</th><th>US/MH Name</th><th>Level Exceeded</th></tr> <tr><td>S2.005</td><td>S2.5</td><td></td></tr> <tr><td>S6.000</td><td>S6.0</td><td></td></tr> <tr><td>S1.007</td><td>S1.8</td><td></td></tr> <tr><td>S1.008</td><td>S1.9</td><td></td></tr> <tr><td>S1.009</td><td>S1.10</td><td></td></tr> <tr><td>S7.000</td><td>S7.0</td><td></td></tr> <tr><td>S7.001</td><td>S7.1</td><td></td></tr> <tr><td>S7.002</td><td>S7.2</td><td></td></tr> <tr><td>S8.000</td><td>S8.0</td><td></td></tr> <tr><td>S7.003</td><td>S7.3</td><td></td></tr> <tr><td>S9.000</td><td>SPP1</td><td></td></tr> <tr><td>S9.001</td><td>S9.0</td><td>2</td></tr> <tr><td>S7.004</td><td>S7.4</td><td></td></tr> <tr><td>S10.000</td><td>SPP2</td><td></td></tr> <tr><td>S10.001</td><td>S10.0</td><td>1</td></tr> <tr><td>S7.005</td><td>SJ1</td><td></td></tr> <tr><td>S11.000</td><td>SPP3</td><td></td></tr> <tr><td>S11.001</td><td>S11.0</td><td>2</td></tr> <tr><td>S7.006</td><td>SJ2</td><td></td></tr> <tr><td>S7.007</td><td>S7.5</td><td></td></tr> <tr><td>S12.000</td><td>S12.0</td><td></td></tr> <tr><td>S7.008</td><td>S7.6</td><td></td></tr> <tr><td>S13.000</td><td>S13.0</td><td></td></tr> <tr><td>S13.001</td><td>S13.1</td><td></td></tr> <tr><td>S1.010</td><td>S1.11</td><td></td></tr> <tr><td>S14.000</td><td>SEXS9</td><td></td></tr> <tr><td>S14.001</td><td>SDSW1</td><td></td></tr> <tr><td>S14.002</td><td>SDSW2</td><td></td></tr> <tr><td>S14.003</td><td>SDSW3</td><td></td></tr> <tr><td>S1.011</td><td>S1.12</td><td></td></tr> <tr><td>S15.000</td><td>SEXS12</td><td></td></tr> <tr><td>S15.001</td><td>S15.0</td><td></td></tr> <tr><td>S15.002</td><td>S15.1</td><td></td></tr> <tr><td>S1.012</td><td>S1.13</td><td></td></tr> </table>	PN	US/MH Name	Level Exceeded	S2.005	S2.5		S6.000	S6.0		S1.007	S1.8		S1.008	S1.9		S1.009	S1.10		S7.000	S7.0		S7.001	S7.1		S7.002	S7.2		S8.000	S8.0		S7.003	S7.3		S9.000	SPP1		S9.001	S9.0	2	S7.004	S7.4		S10.000	SPP2		S10.001	S10.0	1	S7.005	SJ1		S11.000	SPP3		S11.001	S11.0	2	S7.006	SJ2		S7.007	S7.5		S12.000	S12.0		S7.008	S7.6		S13.000	S13.0		S13.001	S13.1		S1.010	S1.11		S14.000	SEXS9		S14.001	SDSW1		S14.002	SDSW2		S14.003	SDSW3		S1.011	S1.12		S15.000	SEXS12		S15.001	S15.0		S15.002	S15.1		S1.012	S1.13		
PN	US/MH Name	Level Exceeded																																																																																																									
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for SW Net 01

Number of Input Hydrographs	0	Number of Storage Structures	13
Number of Online Controls	4	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

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

									Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.000	S1.1	15 Winter	100	+40%	100/15 Summer				60.570
S1.001	S1.2	15 Winter	100	+40%	100/15 Summer				60.526
S1.002	S1.3	15 Winter	100	+40%	30/15 Summer				60.421
S1.003	S1.4	15 Winter	100	+40%	30/15 Summer				60.355
S1.004	S1.5	15 Winter	100	+40%	30/15 Summer				60.292
S1.005	S1.6	15 Winter	100	+40%	30/15 Summer				60.193
S1.006	S1.7	15 Winter	100	+40%	30/15 Summer				59.940
S2.000	S2.0	60 Winter	100	+40%	100/15 Summer				59.697
S2.001	S2.1	60 Winter	100	+40%	100/15 Summer				59.693
S2.002	S2.2	60 Winter	100	+40%	100/15 Summer				59.689
S2.003	S2.3	60 Winter	100	+40%	30/15 Summer				59.680
S2.004	S2.4	60 Winter	100	+40%	30/15 Summer				59.673
S3.000	S3.0	15 Winter	100	+40%	100/15 Summer				60.206
S4.000	S4.0	15 Winter	100	+40%	30/15 Summer				60.552

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Micro Drainage

XP Solutions

Network 2020.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SW Net 01

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1.1	0.820	0.000	1.21			16.9	FLOOD RISK	
S1.001	S1.2	0.848	0.000	0.82		7	36.0	FLOOD RISK	
S1.002	S1.3	1.058	0.000	0.85			36.9	FLOOD RISK	
S1.003	S1.4	1.218	0.000	1.03			44.0	SURCHARGED	
S1.004	S1.5	1.359	0.000	0.88			38.8	SURCHARGED	
S1.005	S1.6	1.560	0.000	1.37			53.5	SURCHARGED	
S1.006	S1.7	1.480	0.000	1.41			60.6	SURCHARGED	
S2.000	S2.0	0.646	0.000	0.53		10	22.4	FLOOD RISK	
S2.001	S2.1	0.802	0.000	0.62			24.8	SURCHARGED	
S2.002	S2.2	0.901	0.000	0.49		44	20.3	SURCHARGED	
S2.003	S2.3	1.033	0.000	0.52			20.5	SURCHARGED	
S2.004	S2.4	1.121	0.000	0.64			28.2	SURCHARGED	
S3.000	S3.0	0.256	0.000	0.03			0.9	SURCHARGED	
S4.000	S4.0	1.102	0.000	1.66			24.3	FLOOD RISK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SW Net 01

US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.
S3.001	S3.1	15 Winter	100	+40%	100/15	Summer		
S5.000	S5.0	60 Winter	100	+40%	100/15	Summer		
S2.005	S2.5	60 Winter	100	+40%	30/15	Summer		
S6.000	S6.0	15 Winter	100	+40%	100/15	Summer		
S1.007	S1.8	60 Winter	100	+40%	30/15	Summer		
S1.008	S1.9	60 Winter	100	+40%	30/15	Summer		
S1.009	S1.10	60 Winter	100	+40%	30/15	Summer		
S7.000	S7.0	15 Winter	100	+40%				
S7.001	S7.1	15 Winter	100	+40%				
S7.002	S7.2	15 Winter	100	+40%				
S8.000	S8.0	15 Summer	100	+40%				
S7.003	S7.3	15 Winter	100	+40%	100/15	Summer		
S9.000	SPP1	60 Winter	100	+40%				
S9.001	S9.0	120 Summer	100	+40%	2/30	Winter	100/120	Summer
S7.004	S7.4	60 Winter	100	+40%	100/60	Winter		
S10.000	SPP2	60 Winter	100	+40%				
S10.001	S10.0	120 Winter	100	+40%	2/30	Winter	100/120	Summer
S7.005	SJ1	15 Summer	100	+40%				
S11.000	SPP3	60 Winter	100	+40%				
S11.001	S11.0	120 Winter	100	+40%	2/30	Winter	100/120	Summer
S7.006	SJ2	15 Summer	100	+40%				
S7.007	S7.5	60 Winter	100	+40%	100/15	Summer		
S12.000	S12.0	60 Winter	100	+40%				
S7.008	S7.6	60 Winter	100	+40%	100/60	Summer		
S13.000	S13.0	15 Winter	100	+40%	30/15	Summer		
S13.001	S13.1	60 Winter	100	+40%	100/60	Winter		
S1.010	S1.11	60 Winter	100	+40%	30/15	Summer		
S14.000	SEXS9	15 Summer	100	+40%				
S14.001	SDSW1	15 Summer	100	+40%				
S14.002	SDSW2	15 Summer	100	+40%				
S14.003	SDSW3	15 Summer	100	+40%				
S1.011	S1.12	360 Summer	100	+40%				
S15.000	SEXS12	15 Summer	100	+40%				
S15.001	S15.0	15 Summer	100	+40%				
S15.002	S15.1	480 Summer	100	+40%				
S1.012	S1.13	480 Summer	100	+40%				

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
S3.001	S3.1	60.206	0.875	0.000	0.86		4	36.3	SURCHARGED

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