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Date 01/05/2024 File 223-151 Network Rev C.MDX	Designed by JPR Checked by JCM	
Innovyze	Network 2020.1.3	

Existing Network Details for 223-151 S.W NETWORK REV C.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	31.434	0.524	60.0	0.027	5.00	0.600	o	150	Pipe/Conduit
1.001	17.325	0.173	100.0	0.015	0.00	0.600	o	150	Pipe/Conduit
1.002	11.577	0.207	56.0	0.000	0.00	0.600	o	150	Pipe/Conduit
2.000	31.842	0.531	60.0	0.027	5.00	0.600	o	150	Pipe/Conduit
2.001	16.908	0.323	52.3	0.015	0.00	0.600	o	150	Pipe/Conduit
1.003	3.394	0.034	99.8	0.000	0.00	0.600	o	150	Pipe/Conduit
1.004	6.268	0.175	35.8	0.045	0.00	0.600	o	150	Pipe/Conduit
1.005	6.330	0.063	100.5	0.000	0.00	0.600	o	225	Pipe/Conduit
1.006	4.743	0.047	100.0	0.000	0.00	0.600	o	225	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	1	62.150	61.550	0.450	62.000	61.026	0.824		1200
1.001	2	62.000	61.026	0.824	61.950	60.853	0.947		1200
1.002	3	61.950	60.853	0.947	61.900	60.646	1.104		1200
2.000	9	62.150	61.550	0.450	61.950	61.019	0.781		1200
2.001	10	61.950	61.019	0.781	61.900	60.696	1.054		1200
1.003	4	61.900	60.646	1.104	62.550	60.612	1.788		1200
1.004	5	62.550	60.612	1.788	62.968	60.437	2.381		1200
1.005	6	62.968	60.362	2.381	62.228	60.299	1.704		1200
1.006	7	62.228	60.299	1.704	61.598	60.252	1.121	Hydro-Brake®	1200

Free Flowing Outfall Details for 223-151 S.W NETWORK REV C.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.006	8	61.598	60.252	59.768	1200	0

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Simulation Criteria for 223-151 S.W NETWORK REV C.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	10.000
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

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)	18.100	Storm Duration (mins)	30
Ratio R	0.354		

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Online Controls for 223-151 S.W NETWORK REV C.SWS

Hydro-Brake® Optimum Manhole: 7, DS/PN: 1.006, Volume (m³): 2.4

Unit Reference	MD-SHE-0100-5000-1350-5000
Design Head (m)	1.350
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	100
Invert Level (m)	60.299
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.350	5.0
Flush-Flo™	0.400	5.0
Kick-Flo®	0.829	4.0
Mean Flow over Head Range	-	4.4

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	3.3	1.200	4.7	3.000	7.3	7.000	10.9
0.200	4.6	1.400	5.1	3.500	7.8	7.500	11.2
0.300	4.9	1.600	5.4	4.000	8.3	8.000	11.6
0.400	5.0	1.800	5.7	4.500	8.8	8.500	11.9
0.500	5.0	2.000	6.0	5.000	9.2	9.000	12.2
0.600	4.8	2.200	6.3	5.500	9.7	9.500	12.6
0.800	4.2	2.400	6.5	6.000	10.1		
1.000	4.4	2.600	6.8	6.500	10.5		

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Storage Structures for 223-151 S.W NETWORK REV C.SWS

Tank or Pond Manhole: 6, DS/PN: 1.005

Invert Level (m) 60.362

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	105.0	0.400	105.0	0.401	0.0

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<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for 223-151 S.W NETWORK REV C.SWS</u>									
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 223-151 S.W NETWORK REV C.SWS

PN	US/MH Name	Surcharged		Flooded		Flow / Overflow (l/s)	Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow	Cap.					
2.001	10	-0.018	0.000	0.57				13.1	OK	
1.003	4	0.264	0.000	2.14				24.7	SURCHARGED	
1.004	5	0.169	0.000	1.40				35.0	SURCHARGED	
1.005	6	-0.019	0.000	0.17				6.0	OK	
1.006	7	0.072	0.000	0.16				4.8	SURCHARGED	

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Liverpool

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223-151

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Micro

Drainage

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 223-151 S.W NETWORK REV C.SWS

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 10.000

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 FSR

Ratio R 0.354

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.200 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 45

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water
	PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Level
								Act.	(m)
1.000	1	15 Winter	100	+45%	100/15 Summer				62.022
1.001	2	15 Winter	100	+45%	30/15 Summer				61.884
1.002	3	15 Winter	100	+45%	30/15 Summer				61.708
2.000	9	15 Winter	100	+45%	100/15 Summer				61.946
2.001	10	15 Winter	100	+45%	100/15 Summer				61.785
1.003	4	15 Winter	100	+45%	30/15 Summer				61.590
1.004	5	120 Winter	100	+45%	30/15 Summer				61.554
1.005	6	120 Winter	100	+45%	100/15 Summer				61.542
1.006	7	120 Winter	100	+45%	30/30 Summer				61.538

Surcharged Flooded

Half Drain Pipe

US/MH

Depth

Volume

Flow / Overflow

Time

Flow

Level

PN

Name

(m)

(m³)

Cap.

(l/s)

(mins)

(l/s)

Status

Exceeded

1.000

1

0.322

0.000

0.63

13.9 FLOOD RISK

1.001

2

0.708

0.000

0.98

16.2 FLOOD RISK

1.002

3

0.705

0.000

0.81

17.4 FLOOD RISK

2.000

9

0.246

0.000

0.64

14.1 FLOOD RISK

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