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1 Dale Street Liverpool L2 2ET	PALGRAVE AVENUE - REV B MANCHESTER 223-150	
Date 01/01/0001 File 223-150 NETWORK REV B-A...	Designed by JPR Checked by	
Innovyze	Network 2020.1.3	

Online Controls for 223-150 SW REV B-A.SWS

Hydro-Brake® Optimum Manhole: S10, DS/PN: 1.009, Volume (m³): 1.9

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)	62.022
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 223-150 SW REV B-A.SWS

Tank or Pond Manhole: Outlet, DS/PN: 1.008

Invert Level (m) 62.063

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	0.400	30.0	0.800	30.0	0.801	0.0

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 223-150 SW REV B-A.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	FSR	Ratio R	0.353
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	18.300	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, 2, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S1	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
1.001	S2	15 Winter	1	+0%	100/15 Summer			
2.000	S12	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
2.001	S13	15 Winter	1	+0%	100/15 Summer			
1.002	S3	15 Winter	1	+0%	30/15 Summer			
3.000	S14	15 Winter	1	+0%	100/15 Summer	100/15 Summer		
3.001	S15	15 Winter	1	+0%	30/15 Summer			
1.003	S4	15 Winter	1	+0%	30/15 Summer			
4.000	S16	15 Winter	1	+0%	100/15 Summer			
1.004	S5	15 Winter	1	+0%	30/15 Summer			
1.005	S6	15 Winter	1	+0%	30/15 Summer			
1.006	S7	15 Winter	1	+0%	2/15 Winter			
1.007	Inlet	15 Winter	1	+0%				
1.008	Outlet	30 Winter	1	+0%	30/15 Summer			
1.009	S10	30 Winter	1	+0%	2/30 Winter			

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Innovyze					Network 2020.1.3						
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for 223-150 SW REV B-A.SWS</u>											
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	Level Exceeded	
1.000	S1	63.424	-0.126	0.000	0.06			1.2	OK	4	
1.001	S2	63.270	-0.113	0.000	0.14			2.2	OK		
2.000	S12	63.420	-0.130	0.000	0.04			0.9	OK	2	
2.001	S13	63.237	-0.122	0.000	0.08			1.5	OK		
1.002	S3	63.114	-0.097	0.000	0.27			4.3	OK		
3.000	S14	63.434	-0.116	0.000	0.12			2.5	OK	2	
3.001	S15	63.135	-0.110	0.000	0.16			2.5	OK		
1.003	S4	63.054	-0.078	0.000	0.46			6.9	OK		
4.000	S16	63.419	-0.131	0.000	0.04			1.2	OK		
1.004	S5	62.993	-0.075	0.000	0.50			8.1	OK		
1.005	S6	62.862	-0.071	0.000	0.53			9.0	OK		
1.006	S7	62.650	-0.044	0.000	0.84			9.1	OK		
1.007	Inlet	62.604	-0.066	0.000	0.60			9.1	OK*		
1.008	Outlet	62.151	-0.062	0.000	0.32			4.0	OK		
1.009	S10	62.144	-0.028	0.000	0.25			4.0	OK		
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Liverpool

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Date 01/01/0001

File 223-150 NETWORK REV B-A...

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PALGRAVE AVENUE - REV B

MANCHESTER

223-150

Designed by JPR

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Network 2020.1.3

Micro Drainage

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)

for 223-150 SW REV B-A.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 Coeffiecient 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

Region England and Wales Cv (Summer)

M5-60 (mm)

FSR

18.300 Cv (Winter)

Ratio R 0.353

0.750

0.840

Margin for Flood Risk Warning (mm)

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status

DVD Status

Inertia Status

300.0

ON

ON

ON

Profile(s)

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

Return Period(s) (years)

Climate Change (%)

Summer and Winter

1, 2, 30, 100

0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S1	15 Winter	2	+0%	100/15 Summer	100/15 Summer		
1.001	S2	15 Winter	2	+0%	100/15 Summer			
2.000	S12	15 Winter	2	+0%	100/15 Summer	100/15 Summer		
2.001	S13	15 Winter	2	+0%	100/15 Summer			
1.002	S3	15 Winter	2	+0%	30/15 Summer			
3.000	S14	15 Winter	2	+0%	100/15 Summer	100/15 Summer		
3.001	S15	15 Winter	2	+0%	30/15 Summer			
1.003	S4	15 Winter	2	+0%	30/15 Summer			
4.000	S16	15 Winter	2	+0%	100/15 Summer			
1.004	S5	15 Winter	2	+0%	30/15 Summer			
1.005	S6	15 Winter	2	+0%	30/15 Summer			
1.006	S7	15 Winter	2	+0%	2/15 Winter			
1.007	Inlet	15 Winter	2	+0%				
1.008	Outlet	30 Winter	2	+0%	30/15 Summer			
1.009	S10	30 Winter	2	+0%	2/30 Winter			

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 223-150 SW REV B-A.SWS

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)	
1.000	S1	63.428	-0.122	0.000	0.08			1.6	OK
1.001	S2	63.275	-0.108	0.000	0.17			2.9	OK
2.000	S12	63.422	-0.128	0.000	0.05			1.1	OK
2.001	S13	63.241	-0.118	0.000	0.10			1.9	OK
1.002	S3	63.122	-0.089	0.000	0.34			5.6	OK
3.000	S14	63.439	-0.111	0.000	0.15			3.3	OK
3.001	S15	63.141	-0.104	0.000	0.20			3.3	OK
1.003	S4	63.066	-0.066	0.000	0.60			8.9	OK
4.000	S16	63.421	-0.129	0.000	0.05			1.6	OK
1.004	S5	63.006	-0.062	0.000	0.64			10.5	OK
1.005	S6	62.876	-0.057	0.000	0.69			11.7	OK
1.006	S7	62.698	0.004	0.000	1.03			11.2	SURCHARGED
1.007	Inlet	62.619	-0.052	0.000	0.75			11.4	OK*
1.008	Outlet	62.184	-0.029	0.000	0.35			4.4	OK
1.009	S10	62.176	0.004	0.000	0.28			4.3	SURCHARGED

PN	US/MH		Level Exceeded
	Name		
1.000	S1		4
1.001	S2		
2.000	S12		2
2.001	S13		
1.002	S3		
3.000	S14		2
3.001	S15		
1.003	S4		
4.000	S16		
1.004	S5		
1.005	S6		
1.006	S7		
1.007	Inlet		
1.008	Outlet		
1.009	S10		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 223-150 SW REV B-A.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /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	0.353
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	18.300	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, 2, 30, 100
Climate Change (%)	0, 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S1	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
1.001	S2	15 Winter	30	+0%	100/15 Summer			
2.000	S12	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
2.001	S13	15 Winter	30	+0%	100/15 Summer			
1.002	S3	15 Winter	30	+0%	30/15 Summer			
3.000	S14	15 Winter	30	+0%	100/15 Summer	100/15 Summer		
3.001	S15	15 Winter	30	+0%	30/15 Summer			
1.003	S4	15 Winter	30	+0%	30/15 Summer			
4.000	S16	15 Winter	30	+0%	100/15 Summer			
1.004	S5	15 Winter	30	+0%	30/15 Summer			
1.005	S6	15 Winter	30	+0%	30/15 Summer			
1.006	S7	15 Winter	30	+0%	2/15 Winter			
1.007	Inlet	15 Summer	30	+0%				
1.008	Outlet	30 Winter	30	+0%	30/15 Summer			
1.009	S10	30 Winter	30	+0%	2/30 Winter			

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 223-150 SW REV B-A.SWS

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)	
1.000	S1	63.438	-0.112	0.000	0.15			3.0	OK
1.001	S2	63.299	-0.084	0.000	0.37			6.1	OK
2.000	S12	63.432	-0.118	0.000	0.10			2.1	OK
2.001	S13	63.290	-0.069	0.000	0.21			4.0	OK
1.002	S3	63.279	0.068	0.000	0.63			10.2	SURCHARGED
3.000	S14	63.455	-0.095	0.000	0.29			6.2	OK
3.001	S15	63.274	0.029	0.000	0.34			5.4	SURCHARGED
1.003	S4	63.257	0.125	0.000	0.93			14.0	SURCHARGED
4.000	S16	63.431	-0.119	0.000	0.09			3.0	OK
1.004	S5	63.202	0.134	0.000	1.01			16.4	SURCHARGED
1.005	S6	63.066	0.133	0.000	1.10			18.5	SURCHARGED
1.006	S7	62.778	0.083	0.000	1.70			18.4	SURCHARGED
1.007	Inlet	62.671	0.000	0.000	1.19			18.0	SURCHARGED*
1.008	Outlet	62.349	0.136	0.000	0.42			5.3	SURCHARGED
1.009	S10	62.340	0.168	0.000	0.31			5.0	SURCHARGED

PN	US/MH		Level Exceeded
	Name		
1.000	S1		4
1.001	S2		
2.000	S12		2
2.001	S13		
1.002	S3		
3.000	S14		2
3.001	S15		
1.003	S4		
4.000	S16		
1.004	S5		
1.005	S6		
1.006	S7		
1.007	Inlet		
1.008	Outlet		
1.009	S10		

