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Innovyze Network 2018.1		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 497526 102719 SU 97526 02719
Data Type	Point
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)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.653	4-8	2.378	8-12	2.246	12-16	0.193

Total Area Contributing (ha) = 5.470

Total Pipe Volume (m³) = 343.616

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.021	4.829	2.384	0.000	0	0

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Simulation Criteria for Storm

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	6
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
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 497050 103400 SU 97050 03400
C (1km)	-0.025
D1 (1km)	0.395
D2 (1km)	0.244
D3 (1km)	0.395
E (1km)	0.309
F (1km)	2.339
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: BASIN 1, DS/PN: 1.007, Volume (m³): 42.0

Unit Reference	MD-SHE-0091-4200-1400-4200
Design Head (m)	1.400
Design Flow (l/s)	4.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	91
Invert Level (m)	4.201
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	4.2
Flush-Flo™	0.398	4.1
Kick-Flo®	0.814	3.3
Mean Flow over Head Range	-	3.6

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	2.9	1.200	3.9	3.000	6.0	7.000	8.9
0.200	3.8	1.400	4.2	3.500	6.4	7.500	9.2
0.300	4.0	1.600	4.5	4.000	6.9	8.000	9.5
0.400	4.1	1.800	4.7	4.500	7.2	8.500	9.8
0.500	4.0	2.000	5.0	5.000	7.6	9.000	10.1
0.600	3.9	2.200	5.2	5.500	8.0	9.500	10.3
0.800	3.3	2.400	5.4	6.000	8.3		
1.000	3.6	2.600	5.6	6.500	8.6		

Hydro-Brake® Optimum Manhole: BASIN 2, DS/PN: 12.007, Volume (m³): 14.0

Unit Reference	MD-SHE-0319-6000-0920-6000
Design Head (m)	0.920
Design Flow (l/s)	60.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	319
Invert Level (m)	4.795
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

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Hydro-Brake® Optimum Manhole: BASIN 2, DS/PN: 12.007, Volume (m³): 14.0

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.920	60.0
Flush-Flo™	0.462	60.0
Kick-Flo®	0.754	54.5
Mean Flow over Head Range	-	46.8

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	9.6	1.200	68.2	3.000	106.4	7.000	161.0
0.200	32.7	1.400	73.5	3.500	114.7	7.500	166.5
0.300	57.3	1.600	78.4	4.000	122.4	8.000	171.9
0.400	59.7	1.800	83.0	4.500	129.7	8.500	177.1
0.500	59.9	2.000	87.4	5.000	136.5	9.000	182.1
0.600	58.8	2.200	91.5	5.500	143.1	9.500	185.5
0.800	56.1	2.400	95.5	6.000	149.3		
1.000	62.4	2.600	99.2	6.500	155.2		

Hydro-Brake® Optimum Manhole: BASIN 3, DS/PN: 12.011, Volume (m³): 5.8

Unit Reference	MD-SHE-0187-1800-1200-1800
Design Head (m)	1.200
Design Flow (l/s)	18.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	187
Invert Level (m)	4.164
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	18.0
Flush-Flo™	0.374	17.9
Kick-Flo®	0.818	15.0
Mean Flow over Head Range	-	15.4

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	6.5	0.300	17.8	0.500	17.7	0.800	15.4
0.200	16.8	0.400	17.9	0.600	17.3	1.000	16.5

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Hydro-Brake® Optimum Manhole: BASIN 3, DS/PN: 12.011, Volume (m³): 5.8 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>1.200</td><td>18.0</td><td>2.400</td><td>25.1</td><td>5.000</td><td>35.7</td><td>8.000</td><td>44.8</td></tr><tr><td>1.400</td><td>19.4</td><td>2.600</td><td>26.0</td><td>5.500</td><td>37.3</td><td>8.500</td><td>46.1</td></tr><tr><td>1.600</td><td>20.6</td><td>3.000</td><td>27.9</td><td>6.000</td><td>38.9</td><td>9.000</td><td>47.4</td></tr><tr><td>1.800</td><td>21.8</td><td>3.500</td><td>30.0</td><td>6.500</td><td>40.5</td><td>9.500</td><td>48.6</td></tr><tr><td>2.000</td><td>23.0</td><td>4.000</td><td>32.0</td><td>7.000</td><td>42.0</td><td></td><td></td></tr><tr><td>2.200</td><td>24.0</td><td>4.500</td><td>33.9</td><td>7.500</td><td>43.4</td><td></td><td></td></tr></table> Hydro-Brake® Optimum Manhole: BASIN 4, DS/PN: 1.019, Volume (m³): 7.9 <table><tr><td>Unit Reference</td><td>MD-SHE-0190-1980-1520-1980</td></tr><tr><td>Design Head (m)</td><td>1.520</td></tr><tr><td>Design Flow (l/s)</td><td>19.8</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>190</td></tr><tr><td>Invert Level (m)</td><td>3.249</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>225</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1500</td></tr></table> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.520</td><td>19.8</td></tr><tr><td>Flush-Flo™</td><td>0.455</td><td>19.8</td></tr><tr><td>Kick-Flo®</td><td>0.991</td><td>16.2</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>17.1</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>6.6</td><td>1.200</td><td>17.7</td><td>3.000</td><td>27.4</td><td>7.000</td><td>41.2</td></tr><tr><td>0.200</td><td>17.5</td><td>1.400</td><td>19.0</td><td>3.500</td><td>29.5</td><td>7.500</td><td>42.6</td></tr><tr><td>0.300</td><td>19.2</td><td>1.600</td><td>20.3</td><td>4.000</td><td>31.5</td><td>8.000</td><td>44.0</td></tr><tr><td>0.400</td><td>19.7</td><td>1.800</td><td>21.5</td><td>4.500</td><td>33.3</td><td>8.500</td><td>45.3</td></tr><tr><td>0.500</td><td>19.8</td><td>2.000</td><td>22.6</td><td>5.000</td><td>35.0</td><td>9.000</td><td>46.5</td></tr><tr><td>0.600</td><td>19.5</td><td>2.200</td><td>23.6</td><td>5.500</td><td>36.7</td><td>9.500</td><td>47.8</td></tr><tr><td>0.800</td><td>18.7</td><td>2.400</td><td>24.6</td><td>6.000</td><td>38.2</td><td></td><td></td></tr><tr><td>1.000</td><td>16.2</td><td>2.600</td><td>25.6</td><td>6.500</td><td>39.8</td><td></td><td></td></tr></table> Hydro-Brake® Optimum Manhole: BASIN 5, DS/PN: 19.008, Volume (m³): 7.3 <table><tr><td>Unit Reference</td><td>MD-SHE-0058-1900-1700-1900</td></tr><tr><td>Design Head (m)</td><td>1.700</td></tr><tr><td>Design Flow (l/s)</td><td>1.9</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr></table>				Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	1.200	18.0	2.400	25.1	5.000	35.7	8.000	44.8	1.400	19.4	2.600	26.0	5.500	37.3	8.500	46.1	1.600	20.6	3.000	27.9	6.000	38.9	9.000	47.4	1.800	21.8	3.500	30.0	6.500	40.5	9.500	48.6	2.000	23.0	4.000	32.0	7.000	42.0			2.200	24.0	4.500	33.9	7.500	43.4			Unit Reference	MD-SHE-0190-1980-1520-1980	Design Head (m)	1.520	Design Flow (l/s)	19.8	Flush-Flo™	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	190	Invert Level (m)	3.249	Minimum Outlet Pipe Diameter (mm)	225	Suggested Manhole Diameter (mm)	1500	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.520	19.8	Flush-Flo™	0.455	19.8	Kick-Flo®	0.991	16.2	Mean Flow over Head Range	-	17.1	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	6.6	1.200	17.7	3.000	27.4	7.000	41.2	0.200	17.5	1.400	19.0	3.500	29.5	7.500	42.6	0.300	19.2	1.600	20.3	4.000	31.5	8.000	44.0	0.400	19.7	1.800	21.5	4.500	33.3	8.500	45.3	0.500	19.8	2.000	22.6	5.000	35.0	9.000	46.5	0.600	19.5	2.200	23.6	5.500	36.7	9.500	47.8	0.800	18.7	2.400	24.6	6.000	38.2			1.000	16.2	2.600	25.6	6.500	39.8			Unit Reference	MD-SHE-0058-1900-1700-1900	Design Head (m)	1.700	Design Flow (l/s)	1.9	Flush-Flo™	Calculated
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<u>Hydro-Brake® Optimum Manhole: BASIN 5, DS/PN: 19.008, Volume (m³): 7.3</u> <table><tr><td>Objective</td><td colspan="2">Minimise upstream storage</td></tr><tr><td>Application</td><td colspan="2">Surface</td></tr><tr><td>Sump Available</td><td colspan="2">Yes</td></tr><tr><td>Diameter (mm)</td><td colspan="2">58</td></tr><tr><td>Invert Level (m)</td><td colspan="2">2.948</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td colspan="2">75</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td colspan="2">1200</td></tr></table> <table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.700</td><td>1.9</td></tr><tr><td>Flush-Flo™</td><td>0.253</td><td>1.4</td></tr><tr><td>Kick-Flo®</td><td>0.515</td><td>1.1</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>1.4</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>1.2</td><td>1.200</td><td>1.6</td><td>3.000</td><td>2.5</td><td>7.000</td><td>3.7</td></tr><tr><td>0.200</td><td>1.3</td><td>1.400</td><td>1.7</td><td>3.500</td><td>2.6</td><td>7.500</td><td>3.8</td></tr><tr><td>0.300</td><td>1.4</td><td>1.600</td><td>1.8</td><td>4.000</td><td>2.8</td><td>8.000</td><td>3.9</td></tr><tr><td>0.400</td><td>1.3</td><td>1.800</td><td>1.9</td><td>4.500</td><td>3.0</td><td>8.500</td><td>4.0</td></tr><tr><td>0.500</td><td>1.2</td><td>2.000</td><td>2.0</td><td>5.000</td><td>3.1</td><td>9.000</td><td>4.1</td></tr><tr><td>0.600</td><td>1.2</td><td>2.200</td><td>2.1</td><td>5.500</td><td>3.3</td><td>9.500</td><td>4.2</td></tr><tr><td>0.800</td><td>1.3</td><td>2.400</td><td>2.2</td><td>6.000</td><td>3.4</td><td></td><td></td></tr><tr><td>1.000</td><td>1.5</td><td>2.600</td><td>2.3</td><td>6.500</td><td>3.5</td><td></td><td></td></tr></table>			Objective	Minimise upstream storage		Application	Surface		Sump Available	Yes		Diameter (mm)	58		Invert Level (m)	2.948		Minimum Outlet Pipe Diameter (mm)	75		Suggested Manhole Diameter (mm)	1200		Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.700	1.9	Flush-Flo™	0.253	1.4	Kick-Flo®	0.515	1.1	Mean Flow over Head Range	-	1.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	1.2	1.200	1.6	3.000	2.5	7.000	3.7	0.200	1.3	1.400	1.7	3.500	2.6	7.500	3.8	0.300	1.4	1.600	1.8	4.000	2.8	8.000	3.9	0.400	1.3	1.800	1.9	4.500	3.0	8.500	4.0	0.500	1.2	2.000	2.0	5.000	3.1	9.000	4.1	0.600	1.2	2.200	2.1	5.500	3.3	9.500	4.2	0.800	1.3	2.400	2.2	6.000	3.4			1.000	1.5	2.600	2.3	6.500	3.5		
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0.500	1.2	2.000	2.0	5.000	3.1	9.000	4.1																																																																																																							
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Storage Structures for Storm Tank or Pond Manhole: BASIN 1, DS/PN: 1.007 Invert Level (m) 4.201 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>952.2</td><td>1.700</td><td>2459.3</td></tr></table> Tank or Pond Manhole: BASIN 2, DS/PN: 12.007 Invert Level (m) 4.795 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>110.1</td><td>1.220</td><td>344.8</td></tr></table> Tank or Pond Manhole: BASIN 3, DS/PN: 12.011 Invert Level (m) 4.164 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>187.2</td><td>1.500</td><td>501.8</td></tr></table> Cellular Storage Manhole: TANK, DS/PN: 18.000 Invert Level (m) 3.301 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>240.0</td><td>240.0</td><td>1.501</td><td>0.0</td><td>333.0</td></tr><tr><td>1.500</td><td>240.0</td><td>333.0</td><td></td><td></td><td></td></tr></table> Tank or Pond Manhole: BASIN 4, DS/PN: 1.019 Invert Level (m) 3.249 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>63.2</td><td>1.820</td><td>322.8</td></tr></table> Tank or Pond Manhole: BASIN 5, DS/PN: 19.008 Invert Level (m) 2.948 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr><tr><td>0.000</td><td>209.5</td><td>2.000</td><td>944.9</td></tr></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	952.2	1.700	2459.3	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	110.1	1.220	344.8	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	187.2	1.500	501.8	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	240.0	240.0	1.501	0.0	333.0	1.500	240.0	333.0				Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	63.2	1.820	322.8	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	209.5	2.000	944.9
Depth (m)	Area (m²)	Depth (m)	Area (m²)																																																									
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Summary of Critical Results by Maximum Level (Rank 1) for Storm									
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		6			
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				2013					
Site Location		GB 497526 102719		SU 97526 02719					
Data Type				Point					
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				ON					
Inertia 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)				100					
Climate Change (%)				40					
Water Level									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
1.000	1	15 Winter	100	+40%	100/15 Summer				6.505
2.000	2	15 Winter	100	+40%	100/15 Summer				6.631
2.001	3	15 Winter	100	+40%	100/15 Summer				6.522
1.001	4	15 Winter	100	+40%	100/15 Summer				6.483
1.002	5	15 Winter	100	+40%	100/15 Summer				6.364
3.000	6	15 Winter	100	+40%	100/15 Summer				6.379
3.001	7	15 Winter	100	+40%	100/15 Summer				6.248
1.003	8	15 Winter	100	+40%	100/15 Summer				6.131
1.004	9	15 Winter	100	+40%	100/15 Summer				5.894
1.005	10	15 Winter	100	+40%	100/15 Summer				5.595
4.000	11	10080 Winter	100	+40%	100/15 Summer				5.588
1.006	12	10080 Winter	100	+40%	100/15 Summer				5.588
5.000	13	15 Winter	100	+40%	100/15 Summer				6.623
5.001	14	15 Winter	100	+40%	100/15 Summer				6.461
5.002	15	15 Winter	100	+40%	100/15 Summer				6.393
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<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>							

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Summary of Critical Results by Maximum Level (Rank 1) for Storm							
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow Act.
5.003	16	15 Winter	100	+40%	100/15 Summer		
6.000	17	15 Winter	100	+40%	100/15 Summer		
6.001	18	15 Winter	100	+40%	100/15 Summer		
6.002	19	15 Winter	100	+40%	100/15 Summer		
5.004	20	15 Winter	100	+40%	100/15 Summer		
5.005	21	15 Winter	100	+40%	100/15 Summer		
7.000	22	15 Winter	100	+40%	100/15 Summer		
7.001	23	15 Winter	100	+40%	100/15 Summer		
5.006	24	15 Winter	100	+40%	100/15 Summer		
5.007	25	10080 Winter	100	+40%	100/15 Summer		
8.000	26	10080 Winter	100	+40%	100/15 Summer		
5.008	27	10080 Winter	100	+40%	100/15 Summer		
9.000	28	10080 Winter	100	+40%	100/15 Summer		
5.009	29	10080 Winter	100	+40%	100/15 Summer		
10.000	30	15 Winter	100	+40%	100/15 Summer		
10.001	31	15 Winter	100	+40%	100/15 Summer		
10.002	32	15 Winter	100	+40%	100/15 Summer		
10.003	33	15 Winter	100	+40%	100/15 Summer		
10.004	34	15 Winter	100	+40%	100/15 Summer		
10.005	35	15 Winter	100	+40%	100/15 Summer		
10.006	36	10080 Winter	100	+40%	100/15 Summer		
1.007	BASIN 1	10080 Winter	100	+40%	100/15 Summer		
1.008	38	1440 Winter	100	+40%	100/360 Winter		
1.009	39	1440 Winter	100	+40%	100/360 Winter		
1.010	40	1440 Winter	100	+40%	100/240 Winter		
1.011	41	1440 Winter	100	+40%	100/180 Winter		
1.012	42	1440 Winter	100	+40%	100/180 Winter		
1.013	43	1440 Winter	100	+40%	100/15 Winter		
11.000	44	1440 Winter	100	+40%	100/15 Summer		
11.001	45	1440 Winter	100	+40%	100/15 Summer		
1.014	46	960 Winter	100	+40%	100/15 Summer		
1.015	47	960 Winter	100	+40%	100/15 Summer		
12.000	48	15 Winter	100	+40%	100/15 Summer		
13.000	49	15 Winter	100	+40%	100/15 Summer		
13.001	50	15 Winter	100	+40%	100/15 Summer		
13.002	51	15 Winter	100	+40%	100/15 Summer		
12.001	52	15 Winter	100	+40%	100/15 Summer		
12.002	53	60 Winter	100	+40%	100/15 Summer		
12.003	54	60 Winter	100	+40%	100/15 Summer		
12.004	55	60 Winter	100	+40%	100/15 Summer		
14.000	56	60 Winter	100	+40%	100/15 Summer		
12.005	57	60 Winter	100	+40%	100/15 Summer		
12.006	58	60 Winter	100	+40%	100/15 Summer		
15.000	59	15 Winter	100	+40%	100/15 Summer		
15.001	60	15 Winter	100	+40%	100/15 Summer		
15.002	61	60 Winter	100	+40%	100/15 Summer		
16.000	62	15 Winter	100	+40%	100/15 Summer		
16.001	63	15 Winter	100	+40%	100/15 Summer		
15.003	64	60 Winter	100	+40%	100/15 Summer		
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Summary of Critical Results by Maximum Level (Rank 1) for Storm									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
5.003	16	6.274	0.788	0.000	1.64		153.8	SURCHARGED	
6.000	17	6.426	0.626	0.000	0.79		55.7	FLOOD RISK	
6.001	18	6.310	0.710	0.000	0.85		52.1	SURCHARGED	
6.002	19	6.228	0.678	0.000	0.61		54.1	SURCHARGED	
5.004	20	6.112	0.687	0.000	1.52		210.4	SURCHARGED	
5.005	21	5.954	0.597	0.000	1.29		235.7	SURCHARGED	
7.000	22	6.056	0.206	0.000	0.28		49.2	SURCHARGED	
7.001	23	5.919	0.424	0.000	0.52		103.6	SURCHARGED	
5.006	24	5.749	0.513	0.000	1.12		334.2	SURCHARGED	
5.007	25	5.589	0.503	0.000	0.02		6.2	SURCHARGED	
8.000	26	5.589	0.617	0.000	0.03		0.3	FLOOD RISK	
5.008	27	5.589	0.674	0.000	0.03		7.0	FLOOD RISK	
9.000	28	5.589	0.637	0.000	0.02		0.8	SURCHARGED	
5.009	29	5.588	0.733	0.000	0.03		8.1	FLOOD RISK	
10.000	30	6.756	1.179	0.000	0.69		55.5	FLOOD RISK	
10.001	31	6.665	1.191	0.000	1.02		103.1	FLOOD RISK	
10.002	32	6.540	1.181	0.000	1.28		128.9	SURCHARGED	
10.003	33	6.359	1.108	0.000	1.71		170.6	SURCHARGED	
10.004	34	6.057	0.905	0.000	1.14		174.6	SURCHARGED	
10.005	35	5.873	0.875	0.000	2.70		247.9	SURCHARGED	
10.006	36	5.588	0.644	0.000	0.02		4.3	SURCHARGED	
1.007	BASIN	1	5.588	0.937	0.000	0.03	4.2	SURCHARGED	
1.008		38	4.802	0.219	0.000	0.05	5.2	SURCHARGED	
1.009		39	4.801	0.232	0.000	0.04	5.2	SURCHARGED	
1.010		40	4.800	0.341	0.000	0.06	6.2	SURCHARGED	
1.011		41	4.796	0.374	0.000	0.07	7.3	SURCHARGED	
1.012		42	4.794	0.396	0.000	0.08	8.1	SURCHARGED	
1.013		43	4.793	0.425	0.000	0.03	8.9	SURCHARGED	
11.000		44	4.786	0.436	0.000	0.05	4.3	SURCHARGED	
11.001		45	4.785	0.660	0.000	0.07	4.4	SURCHARGED	
1.014		46	4.783	0.707	0.000	0.13	17.6	SURCHARGED	
1.015	47	4.781	0.782	0.000	0.14	19.5	SURCHARGED		
12.000	48	6.414	0.384	0.000	0.51	24.2	SURCHARGED		
13.000	49	6.541	0.396	0.000	0.17	14.8	SURCHARGED		
13.001	50	6.531	0.511	0.000	0.59	42.0	SURCHARGED		
13.002	51	6.437	0.497	0.000	0.79	51.5	SURCHARGED		
12.001	52	6.364	0.548	0.000	1.73	110.1	SURCHARGED		
12.002	53	6.230	0.513	0.000	0.98	59.7	SURCHARGED		
12.003	54	6.168	0.522	0.000	0.79	73.6	SURCHARGED		
12.004	55	6.090	0.500	0.000	0.44	77.9	SURCHARGED		
14.000	56	6.008	0.508	0.000	0.69	37.2	SURCHARGED		
12.005	57	6.004	0.538	0.000	0.84	110.4	FLOOD RISK		
12.006	58	5.992	0.576	0.000	0.71	108.5	FLOOD RISK		
15.000	59	6.371	0.431	0.000	0.90	51.1	SURCHARGED		
15.001	60	6.301	0.406	0.000	0.55	51.3	SURCHARGED		
15.002	61	6.196	0.497	0.000	0.69	55.3	SURCHARGED		
16.000	62	6.269	0.289	0.000	0.37	40.5	SURCHARGED		
16.001	63	6.135	0.415	0.000	0.77	67.9	SURCHARGED		
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Innovyze				Network 2018.1						
<u>Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>										
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded	
15.003	64	6.120	0.523	0.000	0.52		105.7	SURCHARGED		
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Innovyze				Network 2018.1					
Summary of Critical Results by Maximum Level (Rank 1) for Storm									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	
15.004	65	60 Winter	100	+40%	100/15 Summer				
12.007	BASIN 2	60 Winter	100	+40%	100/15 Summer				
12.008	67	120 Winter	100	+40%	100/30 Summer				
12.009	68	180 Winter	100	+40%	100/30 Summer				
17.000	69	15 Winter	100	+40%	100/15 Summer				
17.001	70	15 Winter	100	+40%	100/15 Summer				
17.002	71	15 Winter	100	+40%	100/15 Summer				
17.003	72	15 Winter	100	+40%	100/15 Summer				
12.010	73	180 Winter	100	+40%	100/30 Summer				
12.011	BASIN 3	240 Winter	100	+40%	100/15 Summer				
12.012	75	960 Winter	100	+40%	100/120 Summer				
12.013	76	960 Winter	100	+40%	100/15 Summer				
1.016	77	960 Winter	100	+40%	100/15 Summer				
1.017	78	960 Winter	100	+40%	100/15 Summer				
18.000	TANK	960 Winter	100	+40%	100/30 Summer				
1.018	80	1440 Winter	100	+40%	100/15 Summer				
1.019	BASIN 4	960 Winter	100	+40%	100/15 Summer				
1.020	82	960 Winter	100	+40%					
19.000	83	15 Winter	100	+40%	100/15 Summer				
20.000	84	15 Winter	100	+40%	100/15 Summer				
20.001	85	15 Winter	100	+40%	100/15 Summer				
19.001	86	15 Winter	100	+40%	100/15 Summer				
19.002	87	15 Winter	100	+40%	100/15 Summer				
21.000	88	15 Winter	100	+40%	100/15 Summer				
21.001	89	15 Winter	100	+40%	100/15 Winter				
19.003	90	15 Winter	100	+40%	100/15 Summer				
22.000	91	15 Winter	100	+40%	100/15 Summer				
22.001	92	15 Winter	100	+40%	100/15 Summer				
19.004	93	15 Winter	100	+40%	100/15 Summer				
19.005	94	15 Winter	100	+40%	100/15 Summer				
19.006	95	2880 Winter	100	+40%	100/15 Summer				
19.007	96	2880 Winter	100	+40%	100/60 Summer				
19.008	BASIN 5	2880 Winter	100	+40%	100/15 Summer				
1.021	98	960 Winter	100	+40%					
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
15.004	65	6.007	0.707	0.000	1.07		141.9	SURCHARGED	
12.007	BASIN 2	5.900	0.655	0.000	0.42		59.8	FLOOD RISK	
12.008	67	5.555	0.397	0.000	0.43		59.3	SURCHARGED	
12.009	68	5.544	0.450	0.000	0.41		56.3	SURCHARGED	
17.000	69	6.450	0.810	0.000	0.88		78.2	SURCHARGED	
17.001	70	6.335	0.835	0.000	1.83		101.9	SURCHARGED	
17.002	71	6.160	0.700	0.000	1.20		103.9	SURCHARGED	
17.003	72	5.809	0.609	0.000	2.11		191.1	SURCHARGED	
12.010	73	5.532	0.506	0.000	0.29		101.0	SURCHARGED	
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Summary of Critical Results by Maximum Level (Rank 1) for Storm									
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
12.011	BASIN 3	5.512	0.898	0.000	0.06		17.8	FLOOD RISK	
12.012	75	4.791	0.591	0.000	0.09		18.7	SURCHARGED	
12.013	76	4.782	0.782	0.000	0.11		19.1	SURCHARGED	
1.016	77	4.779	0.866	0.000	0.28		42.0	FLOOD RISK	
1.017	78	4.775	0.899	0.000	0.24		44.8	FLOOD RISK	
18.000	TANK	4.768	0.942	0.000	0.08		12.1	SURCHARGED	
1.018	80	4.788	0.975	0.000	0.27		37.6	FLOOD RISK	
1.019	BASIN 4	4.763	0.989	0.000	0.14		19.9	SURCHARGED	
1.020	82	3.283	-0.457	0.000	0.04		19.9	OK	
19.000	83	5.274	0.417	0.000	0.23		63.7	SURCHARGED	
20.000	84	5.466	0.216	0.000	0.86		87.1	SURCHARGED	
20.001	85	5.389	0.252	0.000	0.31		77.7	SURCHARGED	
19.001	86	5.160	0.442	0.000	0.62		133.7	SURCHARGED	
19.002	87	5.103	0.523	0.000	1.12		157.5	SURCHARGED	
21.000	88	5.364	0.114	0.000	1.21		78.2	SURCHARGED	
21.001	89	5.252	0.120	0.000	0.38		73.0	SURCHARGED	
19.003	90	5.072	0.518	0.000	1.03		222.1	SURCHARGED	
22.000	91	5.518	0.368	0.000	1.94		70.8	SURCHARGED	
22.001	92	5.130	0.107	0.000	0.60		65.3	SURCHARGED	
19.004	93	4.929	0.505	0.000	1.88		320.6	SURCHARGED	
19.005	94	4.750	0.369	0.000	1.55		338.6	SURCHARGED	
19.006	95	4.646	0.393	0.000	0.07		14.9	SURCHARGED	
19.007	96	4.645	0.464	0.000	0.02		16.1	SURCHARGED	
19.008	BASIN 5	4.645	1.171	0.000	0.00		1.9	SURCHARGED	
1.021	98	2.548	-0.461	0.000	0.12		21.8	OK	
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