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The Genesis Centre Science Park South Birchwood WA3 7BH		6697 - Hafod Road Johnstown Network 2 Simulations	
Date 01/01/0001 File sws n2.MDX		Designed by LR Checked by	
Innovyze		Network 2019.1	

Existing Network Details for SWS NETWORK 2.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	24.854	0.149	167.0	0.068	5.00	0.600	o	225	Pipe/Conduit
1.001	18.220	0.109	167.2	0.068	0.00	0.600	o	225	Pipe/Conduit
1.002	18.604	0.079	235.0	0.105	0.00	0.600	o	300	Pipe/Conduit
1.003	66.363	0.166	400.0	0.105	0.00	0.600	o	450	Pipe/Conduit
1.004	22.008	0.068	325.0	0.105	0.00	0.600	o	375	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	64	103.700	102.575	0.900	103.603	102.426	0.952		1500
1.001	65	103.603	102.426	0.952	103.500	102.317	0.958		1500
1.002	66	103.500	102.242	0.958	103.500	102.163	1.037		1500
1.003	67	103.500	102.013	1.037	103.500	101.847	1.203		2400
1.004	68	103.500	101.847	1.278	102.517	101.779	0.363	Hydro-Brake®	2400

Simulation Criteria for SWS NETWORK 2.SWS

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 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 Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.306		

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Online Controls for SWS NETWORK 2.SWS

Hydro-Brake® Optimum Manhole: 68, DS/PN: 1.004, Volume (m³): 17.7

Unit Reference	MD-SHE-0096-5000-1653-5000
Design Head (m)	1.653
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	96
Invert Level (m)	101.847
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.653	5.0	Kick-Flo®	0.854	3.7
Flush-Flo™	0.418	4.6	Mean Flow over Head Range	-	4.2

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	3.1	1.200	4.3	3.000	6.6	7.000	9.9
0.200	4.2	1.400	4.6	3.500	7.1	7.500	10.2
0.300	4.5	1.600	4.9	4.000	7.6	8.000	10.5
0.400	4.6	1.800	5.2	4.500	8.0	8.500	10.8
0.500	4.6	2.000	5.5	5.000	8.4	9.000	11.1
0.600	4.5	2.200	5.7	5.500	8.8	9.500	11.4
0.800	4.0	2.400	5.9	6.000	9.2		
1.000	4.0	2.600	6.2	6.500	9.5		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for
SWS NETWORK 2.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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.306
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 ON
Analysis Timestep Fine Inertia Status ON
DTS Status OFF

Profile(s)

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960
Return Period(s) (years) 1, 2, 30, 100
Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	64	15 Winter	1	+0%	100/15 Summer				102.645
1.001	65	15 Winter	1	+0%	100/15 Summer				102.524
1.002	66	15 Winter	1	+0%	100/15 Summer				102.371
1.003	67	15 Winter	1	+0%	100/180 Winter				102.158
1.004	68	480 Winter	1	+0%	100/120 Summer				101.963

Surcharged Flooded					Pipe			
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	64	-0.155	0.000	0.21		7.6	OK	
1.001	65	-0.127	0.000	0.39		14.1	OK	
1.002	66	-0.171	0.000	0.38		23.9	OK	
1.003	67	-0.305	0.000	0.22		33.5	OK	
1.004	68	-0.259	0.000	0.04		3.4	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for
SWS NETWORK 2.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 Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.306
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	ON
Analysis Timestep	Fine	Inertia Status	ON
DTS Status	OFF		

Profile(s)

Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960	Summer and Winter
Return Period(s) (years)	1, 2, 30, 100	
Climate Change (%)	0, 0, 0, 30	

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	64	15 Winter	2	+0%	100/15 Summer				102.655
1.001	65	15 Winter	2	+0%	100/15 Summer				102.540
1.002	66	15 Winter	2	+0%	100/15 Summer				102.392
1.003	67	15 Winter	2	+0%	100/180 Winter				102.179
1.004	68	480 Winter	2	+0%	100/120 Summer				101.989

Surcharged Flooded					Pipe		Level	
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Exceeded
1.000	64	-0.145	0.000	0.27		9.9	OK	
1.001	65	-0.111	0.000	0.51		18.2	OK	
1.002	66	-0.150	0.000	0.49		30.8	OK	
1.003	67	-0.284	0.000	0.29		43.3	OK	
1.004	68	-0.234	0.000	0.04		3.8	OK	

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

for SWS NETWORK 2.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 Offline Controls 0

Number of Time/Area Diagrams 0

Number of Online Controls 1

Number of Storage Structures 1

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.306

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 ON

Analysis Timestep Fine

Inertia Status ON

DTS Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960

Return Period(s) (years) 1, 2, 30, 100

Climate Change (%) 0, 0, 0, 30

US/MH

PN

Name

Storm

Return

Period

Climate

Change

First (X)

Surcharge

First (Y)

Flood

First (Z)

Overflow

Overflow

Act.

Water

Level

(m)

1.000

64

15 Winter

30

+0%

100/15 Summer

102.690

1.001

65

15 Winter

30

+0%

100/15 Summer

102.632

1.002

66

15 Winter

30

+0%

100/15 Summer

102.525

1.003

67

15 Winter

30

+0%

100/180 Winter

102.271

1.004

68

480 Winter

30

+0%

100/120 Summer

102.120

Surcharged Flooded

US/MH

PN

Name

Depth (m)

Volume (m³)

Flow / Cap.

Overflow (l/s)

Pipe Flow (l/s)

Level Exceeded

1.000

64

-0.110

0.000

0.50

18.6

OK

1.001

65

-0.019

0.000

0.99

35.7

OK

1.002

66

-0.017

0.000

1.00

62.3

OK

1.003

67

-0.192

0.000

0.60

90.2

OK

1.004

68

-0.102

0.000

0.05

4.5

OK

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Micro
Drainage

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for SWS NETWORK 2.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 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 Offline Controls 0

Number of Time/Area Diagrams 0

Number of Online Controls 1

Number of Storage Structures 1

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model

FSR

Ratio R 0.306

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 ON

Analysis Timestep

Fine Inertia Status ON

DTS Status

OFF

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960

Return Period(s) (years) 1, 2, 30, 100

Climate Change (%) 0, 0, 0, 30

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surcharge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level (m)

1.000

64

480

Winter

100

+30%

100/15

Summer

103.439

1.001

65

480

Winter

100

+30%

100/15

Summer

103.438

1.002

66

480

Winter

100

+30%

100/15

Summer

103.435

1.003

67

480

Winter

100

+30%

100/180

Winter

103.432

1.004

68

480

Winter

100

+30%

100/120

Summer

103.430

Surcharged Flooded

US/MH

PN

Name

Depth (m)

Volume (m³)

Flow / Cap.

Overflow (l/s)

Pipe Flow (l/s)

Status

Level Exceeded

1.000

64

0.639

0.000

0.12

4.4

FLOOD RISK

1.001

65

0.787

0.000

0.25

8.9

FLOOD RISK

1.002

66

0.893

0.000

0.25

15.8

FLOOD RISK

1.003

67

0.969

0.000

0.15

22.4

FLOOD RISK

1.004

68

1.208

0.000

0.05

4.9

FLOOD RISK

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