Vehicular Access

Secondary Vehicular Access

Pedestrian and/or cycle Access

School Site

Protected Woodland

Vehicular Access

The Green Core

Pedestrian and/or cycle Access

Emergency and Pedestrian Access

Water Pumping Station

Chiswell Green

Three Hammers (PH)

Pond

Pond

Pond

Chrysalis Lake

MIRIAM LANE

WATFORD ROAD

Key:

1. Drainage strategy: SUDS/Swale
2. Children Play Areas
3. General Amenity Areas

Illustrative Masterplan
Land South of Chiswell Green Lane
St Albans

A1

JOB Nº:	LHG61860
DATE:	30.03.2022
SCALE:	1:1000
DRAWING Nº:	REDC01-MCB-ZZ-ZZ-DR-A-0210-D5-P1 Illustrative masterplan

DRAWN BY:	CA/ES	REVISION:
REVIEWED BY:	POR	29.03.2022|P1d Issued for comments
APPROVED BY:	POR	30.03.2022|P1 Issued for planning approval

0 10 20 40 100m

CLIENT:

REDINGTON CAPITAL

CALA

McBains

McBains Ltd
5th Fl, 26 Finsbury Square London EC2A 1DS
+44 (0)20 7786 7900 mcbains.co.uk

Appendix H

Fluvial Flood Risk Mapping

KEY

Flood Zone 2

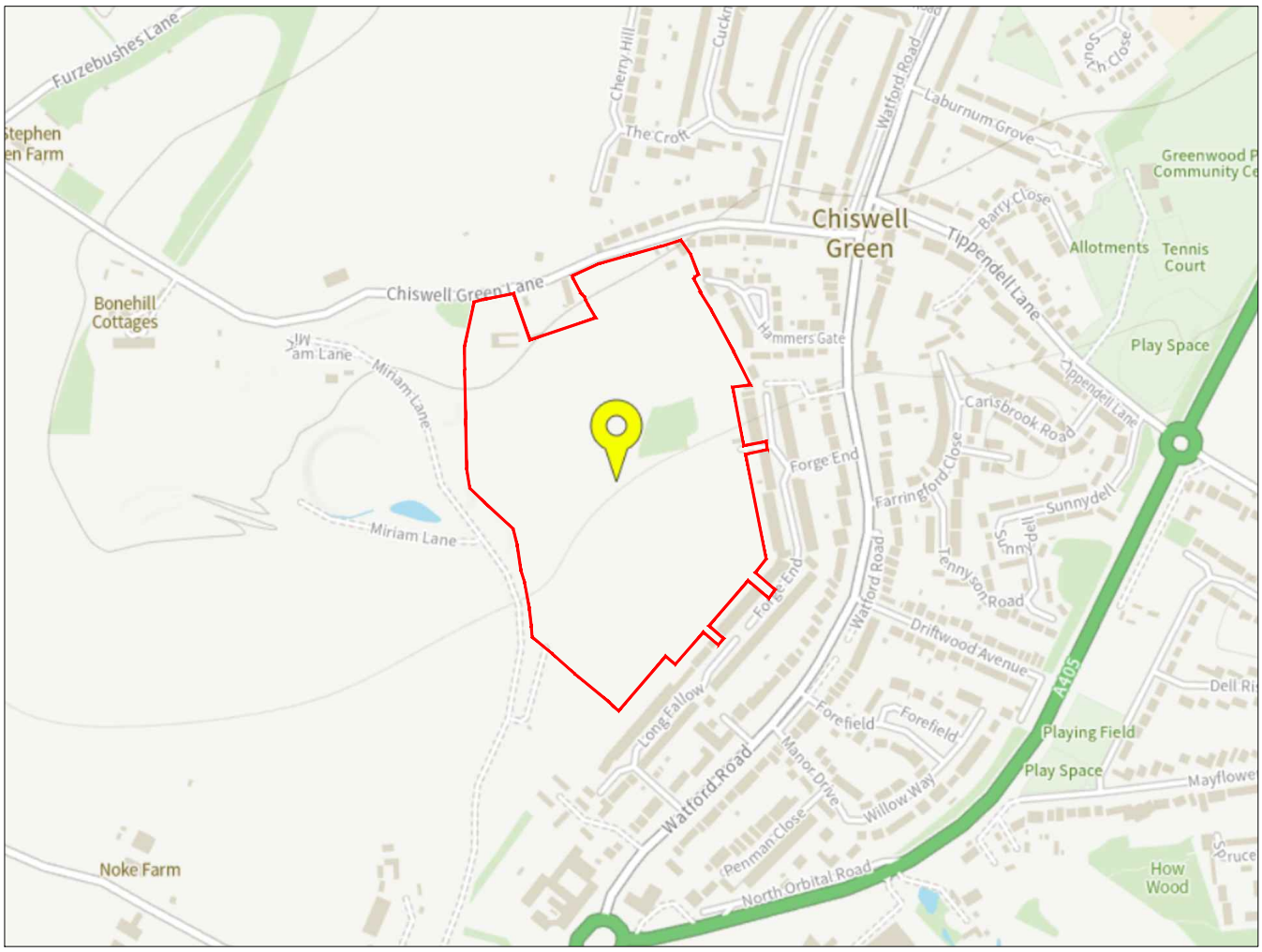
Flood Zone 3

Approximate Site Location

N

NOTES

1. This drawing is to be read in conjunction with all other documents and specifications
2. Dimensions not to be scaled from drawing



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Project :	Land West of Chiswell Green, St Albans				
Title :	Environment Agency Flood Zone Map				
Project Engineer :	A. Quigley	Scale :	NTS	Drawing No. CV8210856 - Flood Zone	Rev -
Project Director :	J. Birch	Date :	February 2022		

Appendix I

Surface Water Flood Risk Mapping

KEY

- Low risk of surface water flooding
- Medium risk of surface water flooding
- Approximate Site Location
- High risk of surface water flooding

N

NOTES

1. This drawing is to be read in conjunction with all other documents and specifications
2. Dimensions not to be scaled from drawing

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Project :	Land West of Chiswell Green, St Albans				
Title :	Environment Agency Surface Water Flood Map				
Project Engineer :	A. Quigley	Scale :	NTS	Drawing No. CV8210856 - SW Flood	Rev -
Project Director :	J. Birch	Date :	February 2022		

Appendix J

Indicative Surface Water Drainage Strategy Scheme

DRAINAGE STRATEGY

- All surface water run-off from the proposed development are to be discharged by gravity into two infiltration basins, established in 'cascade', before discharging to the underlaying chalk bedrock via deep boreholes, with no direct discharges off-site.
- Two attenuation basins will be established both to the west and south of the infiltration basins location in order to provide additional surface water storage. Flows will be attenuated at a restricted maximum rate of 3.0 l/s and 7.0 l/s for all rainfall events including 1:100 year+40%CC event, using Hydro-Brake flow controls, before discharging into infiltration basin 2 and then into the downstream drainage system allocated within the southern land parcel.
- Deep borehole soakaways will be assigned to the base level of the infiltration basin, in order to reach the chalk bedrock (Lewes Nodular Chalk and Seaford Chalk Formationst) and allow store run-off from the proposed development to infiltrate into the underlying chalk bedrock.
- Tree pits and swales will be established along the proposed major access roads as primary surface water treatment stage. Run-off from the proposed shared surfaces streets and private drives will be treated via permeable pavement as primary treatment stage.
- The SuDS features have been designed to cater for all storm events up to and including the 1 in 100 year + 40% climate change storm event.

Swale

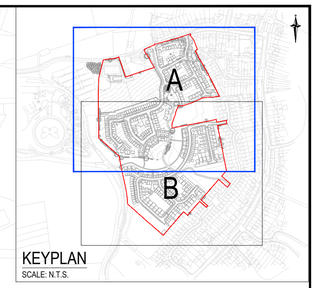
Tree Pits

Permeable Pavement

Infiltration / Attenuation Basin

15.0 0.0 15.0 30.0 45.0 60.0 75.0

Scale = 1:750 @ A1



KEYPLAN

SCALE: N.T.S.

Notes

1. This drawing is based on OS mapping and McBains Illustrative Masterplan (Job No. LHG61860, Drg. No. REDC01-MCB-ZZ-ZZ-DR-A-0210-D5-P1, date: March 2022).
2. Dimensions not to be scaled.
3. All proposed surface water sewers and levels shown on this drawing are indicative only.
4. SuDS features sized based on MicroDrainage calculations.
5. All drainage works to be constructed as detailed in Sewers for Adoption 7th Edition or as stipulated by Local Drainage Authority as appropriate.
6. All works within root protection areas to be agreed with Arboriculturalist. Services to be installed using sensitive construction methods under supervision of an arboriculturalist.

KEY

Proposed Surface Water Drain

Impermeable Area managed by the SuDS:

Impermeable Area: 32,085m²

Imp. Area+10% Urban creep = **35,294m²**

Infiltration Basin (1):
Base Area: 291.2m²
Top Area: 1,150m²
Depth: 1.705m
IL: 88.095m AOD
Min. CL: 89.800m AOD
Max. Water level: 89.760m AOD *(1%AEP+40%CC)*
Max. Water depth: 1.665m deep *(1%AEP+40%CC)*
Max. Volume: 1,123.4m³ *(1%AEP+40%CC)*

Infiltration Basin (2):
Base Area: 411m²
Top Area: 810m²
Depth: 1.4m
IL: 87.000m AOD
Min. CL: 88.400m AOD
Max. Water level: 88.335m AOD *(1%AEP+40%CC)*
Max. Water depth: 1.335m deep *(1%AEP+40%CC)*
Max. Volume: 794.5m³ *(1%AEP+40%CC)*

Attenuation Basin (1):
Base Area: 181.2m²
Top Area: 530m²
Depth: 1.4m
IL: 86.000m AOD
Min. CL: 87.400m AOD
Max. Water level: 87.366m AOD *(1%AEP+40%CC)*
Max. Water depth: 1.366m deep *(1%AEP+40%CC)*
Max. Volume: 461.1m³ *(1%AEP+40%CC)*
Max. Outflow rate: 7.4 l/s *(1%AEP+40%CC)*

Attenuation Basin (2):
Base Area: 175.6m²
Top Area: 420m²
Depth: 1.094m
IL: 87.442m AOD
Min. CL: 88.536m AOD
Max. Water level: 88.509m AOD *(1%AEP+40%CC)*
Max. Water depth: 1.067m deep *(1%AEP+40%CC)*
Max. Volume: 310.6m³ *(1%AEP+40%CC)*
Max. Outflow rate: 3.0 l/s *(1%AEP+40%CC)*

Deep Borehole Soakaways:
Infiltration rate: 1l/s per borehole
6 No. Deep boreholes (Infiltration Basin 1)
7 No. Deep boreholes (Infiltration Basin 2)

Proposed headwall

Proposed permeable pavement

Indicative location of potential tree pits

Indicative location of potential swales

Rev.	Description	Date	Chkd
P8	Minor amendments	31/03/2022 AQ	JB
P7	New masterplan	30/03/2022 AQ	JB
P6	Minor amendments	03/03/2022 AQ	JB

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Client :
Alban Developments, Alban Peter Pearson, CALA Homes (Chiltern) & Redington Capital

Project :
Land south of Chiswell Green Lane

Title :
Indicative Surface Water Drainage Strategy (North Catchment)

Project Engineer :	A. Quigley	Scale :	1:750@A1
Project Director :	J. Birch	Date :	March 2022
Status :	Planning		

Drawing No. 8210856 - SK01/A Rev P8

DRAINAGE STRATEGY

- All surface water run-off from the proposed development are to be discharged by gravity into three infiltration basins before discharging to the underlaying chalk bedrock via deep boreholes, with no direct discharges off-site.
- Infiltration basin 1 established to the east of the site, behind the tree line, would also managed attenuated run-off rates from northern drainage system, allocated within the northern land parcel. Deep borehole soakaways will be assigned to the base level of the infiltration basin, in order to reach the chalk bedrock (Lewes Nodular Chalk and Seaford Chalk Formationst) and allow store run-off from the proposed development to infiltrate into the underlying chalk bedrock.
- Tree pits and swales will be established along the proposed major access roads as primary surface water treatment stage. Run-off from the proposed shared surfaces streets and private drives will be treated via permeable pavement as primary treatment stage.
- The SuDS features have been designed to cater for all storm events up to and including the 1 in 100 year + 40% climate change storm event.

Tree Pits

Infiltration Basin

Swale

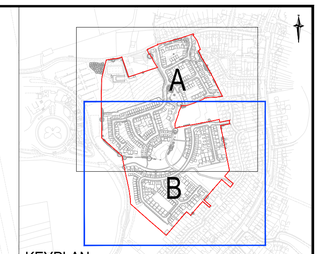
Permeable Pavement

Infiltration basin (1)
IL = 83.500m
Highest water level = 84.964m
Min. CL = 85.000m

Infiltration basin (3)
IL = 84.855m
Highest water level = 85.727m
Min. CL = 85.855m

Infiltration basin (2)
IL = 83.427m
Highest water level = 84.813m
Min. CL = 85.000m

15.0 0.0 15.0 30.0 45.0 60.0 75.0
Scale = 1:750 @ A1



KEYPLAN
SCALE: N.T.S.

Notes

1. This drawing is based on OS mapping and McBains Illustrative Masterplan (Job No. LHG61860, Drg. No. REDC01-MCB-ZZ-ZZ-DR-A-0210-D5-P1, date: March 2022)
2. Dimensions not to be scaled.
3. All proposed surface water sewers and levels shown on this drawing are indicative only.
4. SuDS features sized based on MicroDrainage calculations.
5. All drainage works to be constructed as detailed in Sewers for Adoption 7th Edition or as stipulated by Local Drainage Authority as appropriate.
6. All works within root protection areas to be agreed with Arboriculturalist. Services to be installed using sensitive construction methods under supervision of an arboriculturalist.

KEY

Proposed Surface Water Drain

Impermeable Area managed by the SuDS:

Impermeable Area: 26,055m²

Imp. Area+10% Urban creep = **28,661m²**

Infiltration Basin (1):
Base Area: 427.2m²
Top Area: 1,151m²
Sides Slope: 1/3
Depth: 1.5m
Min. CL: 85.000m AOD
IL: 83.500m AOD
Max. Water level: 84.964m AOD *(1%AEP+40%CC)*
Max. Water depth: 1.464m deep *(1%AEP+40%CC)*
Max. Volume: 1,108.3m³ *(1%AEP+40%CC)*

Infiltration Basin (2):
Base Area: 300m²
Top Area: 659.7m²
Sides Slope: 1/3
Depth: 1.573m
Min. CL: 85.000m AOD
IL: 83.427m AOD
Max. Water level: 84.813m AOD *(1%AEP+40%CC)*
Max. Water depth: 1.386m deep *(1%AEP+40%CC)*
Max. Volume: 623.0m³ *(1%AEP+40%CC)*

Infiltration Basin (3):
Base Area: 169m²
Top Area: 335.5m²
Sides Slope: 1/3
Depth: 1.0m
Min. CL: 85.855m AOD
IL: 84.855m AOD
Max. Water level: 85.727m AOD *(1%AEP+40%CC)*
Max. Water depth: 0.872m deep *(1%AEP+40%CC)*
Max. Volume: 208.0m³ *(1%AEP+40%CC)*

Deep Borehole Soakaways:
Infiltration rate: 1l/s per borehole
7 No. Deep boreholes *(Infiltration Basin 1)*
5 No. Deep boreholes *(Infiltration Basin 2)*
2 No. Deep boreholes *(Infiltration Basin 3)*

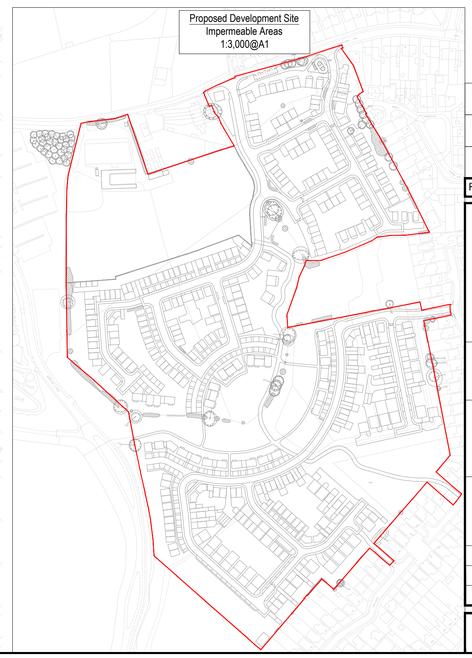
Proposed headwall

Proposed permeable pavement

Indicative location of potential tree pits

Indicative location of potential swales

Proposed Development Site
Impermeable Areas
1:3,000@A1



Rev.	Description	Date	Chkd
P7	Minor amendments	31/03/2022 AQ	JB
P6	New masterplan	30/03/2022 AQ	JB
P5	Minor amendments	03/03/2022 AQ	JB

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Client :
Alban Developments, Alban Peter Pearson, CALA Homes (Chiltern) & Redington Capital

Project :
Land south of Chiswell Green Lane

Title :
Indicative Surface Water Drainage Strategy (South Catchment)

Project Engineer : A. Quigley
Scale : 1:750@A1
Project Director : J. Birch
Date : March 2022
Status : Planning

Drawing No. 8210856 - SK01/B
Rev P7

Appendix K

MicroDrainage Network Outputs

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.418	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm at outfall S (pipe S1.017)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.228	4-8	3.435	8-12	0.355

Total Area Contributing (ha) = 5.018

Total Pipe Volume (m³) = 267.234

Time Area Diagram at outfall S (pipe S20.007)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.542	4-8	0.498

Total Area Contributing (ha) = 1.040

Total Pipe Volume (m³) = 53.367

Time Area Diagram at outfall S (pipe S23.003)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.283	4-8	0.054

Total Area Contributing (ha) = 0.337

Total Pipe Volume (m³) = 7.474

Network Design Table for Storm

« - Indicates pipe capacity < flow

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
S1.000	12.232	0.207	59.1	0.039	4.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	35.412	0.598	59.2	0.045	4.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	42.324	1.578	26.8	0.117	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	61.925	2.957	20.9	0.236	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	58.495	2.467	23.7	0.170	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	28.388	0.284	100.0	0.042	4.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	75.629	0.392	192.9	0.090	0.00	0.0	0.600	oo	375	Double Pipe	
S4.000	58.069	1.161	50.0	0.164	4.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	58.350	1.909	30.6	0.133	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	32.329	0.122	265.0	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S5.000	11.555	0.195	59.3	0.033	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 (l/s)
S1.000	50.00	4.12	98.575	0.039	0.0	0.0	0.0	1.70	67.8	5.3
S2.000	50.00	4.45	99.058	0.045	0.0	0.0	0.0	1.31	23.1	6.1
S1.001	50.00	4.68	98.293	0.201	0.0	0.0	0.0	3.05	215.4	27.2
S1.002	50.00	4.98	96.715	0.437	0.0	0.0	0.0	3.45	243.9	59.2
S1.003	50.00	5.24	93.683	0.607	0.0	0.0	0.0	3.73	412.5	82.2
S3.000	50.00	4.36	92.237	0.042	0.0	0.0	0.0	1.31	52.0	5.7
S1.004	50.00	6.21	91.216	0.739	0.0	0.0	0.0	1.30	287.4	100.1
S4.000	50.00	4.52	94.044	0.164	0.0	0.0	0.0	1.85	73.7	22.2
S4.001	50.00	4.86	92.808	0.297	0.0	0.0	0.0	2.85	201.8	40.2
S1.005	50.00	6.70	90.824	1.036	0.0	0.0	0.0	1.11	244.8	140.3
S5.000	50.00	4.15	92.700	0.033	0.0	0.0	0.0	1.31	23.1	4.5

Network Design Table for Storm

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
S5.001	10.997	0.442	24.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.006	42.190	0.210	200.9	0.091	0.00	0.0	0.600	oo	375	Double Pipe	
S1.007	46.852	1.551	30.2	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S1.008	43.024	0.846	50.9	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S6.000	55.103	0.930	59.3	0.097	4.00	0.0	0.600	o	225	Pipe/Conduit	
S6.001	50.776	0.537	94.6	0.154	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.002	15.335	0.629	24.4	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.000	67.297	1.346	50.0	0.173	4.00	0.0	0.600	o	300	Pipe/Conduit	
S6.003	9.955	0.041	242.8	0.096	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.004	29.633	1.198	24.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.005	14.609	0.455	32.1	0.021	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.006	23.342	0.829	28.2	0.032	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.007	23.317	0.728	32.0	0.034	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.008	23.661	0.074	319.7	0.045	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.009	22.644	0.056	404.4	0.075	0.00	0.0	0.600	o	450	Pipe/Conduit	
S6.010	69.815	2.146	32.5	0.222	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 (l/s)
S5.001	50.00	4.24	92.505	0.033	0.0	0.0	0.0	2.03	35.8	4.5
S1.006	50.00	7.25	90.702	1.160	0.0	0.0	0.0	1.27	281.6	157.1
S1.007	50.00	7.49	90.492	1.160	0.0	0.0	0.0	3.31	730.6	157.1
S1.008	50.00	7.77	88.941	1.160	0.0	0.0	0.0	2.55	562.4	157.1
S6.000	50.00	4.54	99.064	0.097	0.0	0.0	0.0	1.70	67.7	13.1
S6.001	50.00	5.06	98.059	0.251	0.0	0.0	0.0	1.62	114.3	34.0
S6.002	50.00	5.14	97.522	0.277	0.0	0.0	0.0	3.20	226.0	37.5
S7.000	50.00	4.50	96.926	0.173	0.0	0.0	0.0	2.23	157.5	23.4
S6.003	50.00	5.31	95.580	0.546	0.0	0.0	0.0	1.00	71.0«	73.9
S6.004	50.00	5.44	95.464	0.546	0.0	0.0	0.0	3.66	403.8	73.9
S6.005	50.00	5.52	94.266	0.567	0.0	0.0	0.0	3.21	354.3	76.8
S6.006	50.00	5.63	93.811	0.599	0.0	0.0	0.0	3.43	378.4	81.1
S6.007	50.00	5.75	92.982	0.633	0.0	0.0	0.0	3.21	354.7	85.7
S6.008	50.00	6.14	92.254	0.678	0.0	0.0	0.0	1.01	111.3	91.8
S6.009	50.00	6.52	92.105	0.753	0.0	0.0	0.0	1.00	159.8	102.0
S6.010	50.00	6.85	92.049	0.975	0.0	0.0	0.0	3.57	568.5	132.0

Network Design Table for Storm

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
S8.000	34.547	0.535	64.6	0.084	4.00	0.0	0.600	o	225	Pipe/Conduit	
S6.011	26.924	0.220	122.4	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S6.012	28.644	0.946	30.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	48.609	0.324	150.0	0.168	4.00	0.0	0.600	o	300	Pipe/Conduit	
S10.000	20.716	0.350	59.2	0.055	4.00	0.0	0.600	o	150	Pipe/Conduit	
S10.001	23.981	0.413	58.1	0.064	0.00	0.0	0.600	o	225	Pipe/Conduit	
S9.001	28.936	0.207	139.8	0.071	0.00	0.0	0.600	o	300	Pipe/Conduit	
S11.000	32.444	0.649	50.0	0.078	4.00	0.0	0.600	o	300	Pipe/Conduit	
S9.002	29.280	0.610	48.0	0.092	0.00	0.0	0.600	o	375	Pipe/Conduit	
S9.003	30.112	1.247	24.1	0.096	0.00	0.0	0.600	o	375	Pipe/Conduit	
S12.000	35.855	0.600	59.8	0.140	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)
S8.000	50.00	4.35	89.796	0.084	0.0	0.0	0.0	1.63	64.8	11.4
S6.011	50.00	7.09	89.261	1.059	0.0	0.0	0.0	1.84	292.1	143.4
S6.012	50.00	7.22	89.041	1.059	0.0	0.0	0.0	3.71	589.3	143.4
S9.000	50.00	4.63	93.677	0.168	0.0	0.0	0.0	1.28	90.6	22.7
S10.000	50.00	4.26	95.384	0.055	0.0	0.0	0.0	1.31	23.1	7.4
S10.001	50.00	4.50	94.959	0.119	0.0	0.0	0.0	1.72	68.4	16.1
S9.001	50.00	5.00	93.353	0.358	0.0	0.0	0.0	1.33	93.9	48.5
S11.000	50.00	4.24	92.798	0.078	0.0	0.0	0.0	2.23	157.6	10.6
S9.002	50.00	5.18	92.074	0.528	0.0	0.0	0.0	2.62	289.5	71.5
S9.003	50.00	5.32	91.464	0.624	0.0	0.0	0.0	3.70	408.7	84.5
S12.000	50.00	4.35	90.883	0.140	0.0	0.0	0.0	1.70	67.4	19.0

Network Design Table for Storm

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
S9.004	32.447	1.392	23.3	0.017	0.00	0.0	0.600	o	375	Pipe/Conduit	
S9.005	28.311	0.730	38.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.009	37.376	0.870	43.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.000	13.285	0.651	20.4	0.055	4.00	0.0	0.600	o	150	Pipe/Conduit	
S13.001	12.144	0.539	22.5	0.026	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.002	39.704	1.539	25.8	0.125	0.00	0.0	0.600	o	225	Pipe/Conduit	
S13.003	37.532	1.746	21.5	0.114	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.004	11.617	0.193	60.2	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
S13.005	22.865	0.815	28.1	0.080	0.00	0.0	0.600	o	375	Pipe/Conduit	
S13.006	39.584	0.815	48.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S14.000	16.251	0.179	90.8	0.077	4.00	0.0	0.600	o	225	Pipe/Conduit	
S13.007	31.278	0.711	44.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S13.008	77.920	1.771	44.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S13.009	6.217	0.336	18.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.010	3.108	0.100	31.1	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 (l/s)
S9.004	50.00	5.46	90.217	0.781	0.0	0.0	0.0	3.77	416.0	105.8
S9.005	50.00	5.62	88.825	0.781	0.0	0.0	0.0	2.92	322.2	105.8
S1.009	50.00	7.97	88.095	3.000	0.0	0.0	0.0	3.11	494.4	406.2
S13.000	50.00	4.10	96.528	0.055	0.0	0.0	0.0	2.24	39.6	7.4
S13.001	50.00	4.17	95.802	0.081	0.0	0.0	0.0	2.77	110.1	11.0
S13.002	50.00	4.43	95.263	0.206	0.0	0.0	0.0	2.59	102.8	27.9
S13.003	50.00	4.61	93.649	0.320	0.0	0.0	0.0	3.41	240.8	43.3
S13.004	50.00	4.71	91.903	0.337	0.0	0.0	0.0	2.03	143.5	45.6
S13.005	50.00	4.82	91.710	0.417	0.0	0.0	0.0	3.43	379.1	56.5
S13.006	50.00	5.07	90.895	0.417	0.0	0.0	0.0	2.61	287.8	56.5
S14.000	50.00	4.20	90.113	0.077	0.0	0.0	0.0	1.37	54.6	10.4
S13.007	50.00	5.26	89.925	0.494	0.0	0.0	0.0	2.74	302.4	66.9
S13.008	50.00	5.74	89.214	0.494	0.0	0.0	0.0	2.74	302.4	66.9
S13.009	50.00	5.76	87.442	0.494	0.0	0.0	0.0	4.23	467.1	66.9
S1.010	50.00	7.98	87.000	3.494	0.0	0.0	0.0	3.66	581.6	473.1

Network Design Table for Storm

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
S1.011	36.811	0.490	75.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S15.000	22.196	0.675	32.9	0.092	4.00	0.0	0.600	o	225	Pipe/Conduit	
S15.001	22.694	0.656	34.6	0.048	0.00	0.0	0.600	o	225	Pipe/Conduit	
S15.002	37.592	1.364	27.6	0.116	0.00	0.0	0.600	o	300	Pipe/Conduit	
S15.003	42.486	0.637	66.7	0.143	0.00	0.0	0.600	oo	375	Double Pipe	
S15.004	30.273	0.454	66.7	0.070	0.00	0.0	0.600	oo	375	Double Pipe	
S1.012	47.754	0.716	66.7	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S16.000	28.750	1.095	26.3	0.151	4.00	0.0	0.600	o	225	Pipe/Conduit	
S16.001	29.148	0.733	39.8	0.111	0.00	0.0	0.600	o	300	Pipe/Conduit	
S16.002	32.163	0.904	35.6	0.138	0.00	0.0	0.600	o	375	Pipe/Conduit	
S16.003	33.346	0.865	38.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.013	52.669	0.411	128.0	0.115	0.00	0.0	0.600	oo	375	Double Pipe	
S17.000	36.773	0.368	99.9	0.058	4.00	0.0	0.600	o	300	Pipe/Conduit	
S18.000	43.870	0.731	60.0	0.045	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)
S1.011	50.00	8.32	86.000	3.494	0.0	0.0	0.0	1.82	128.4«	473.1
S15.000	50.00	4.16	89.003	0.092	0.0	0.0	0.0	2.29	91.0	12.5
S15.001	50.00	4.33	88.328	0.140	0.0	0.0	0.0	2.23	88.7	19.0
S15.002	50.00	4.54	87.597	0.256	0.0	0.0	0.0	3.01	212.5	34.7
S15.003	50.00	4.86	86.233	0.399	0.0	0.0	0.0	2.22	490.7	54.0
S15.004	50.00	5.09	85.596	0.469	0.0	0.0	0.0	2.22	490.8	63.5
S1.012	50.00	8.68	85.142	3.963	0.0	0.0	0.0	2.22	490.7«	536.6
S16.000	50.00	4.19	88.180	0.151	0.0	0.0	0.0	2.56	101.9	20.4
S16.001	50.00	4.38	87.010	0.262	0.0	0.0	0.0	2.50	176.8	35.5
S16.002	50.00	4.56	86.202	0.400	0.0	0.0	0.0	3.05	336.5	54.2
S16.003	50.00	4.75	85.298	0.400	0.0	0.0	0.0	2.93	323.2	54.2
S1.013	50.00	9.23	84.426	4.478	0.0	0.0	0.0	1.60	353.4«	606.4
S17.000	50.00	4.39	87.178	0.058	0.0	0.0	0.0	1.57	111.2	7.9
S18.000	50.00	4.43	88.441	0.045	0.0	0.0	0.0	1.69	67.3	6.1

Network Design Table for Storm

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
S17.001	67.681	1.281	52.8	0.253	0.00	0.0	0.600	o	300	Pipe/Conduit	
S19.000	23.333	0.393	59.4	0.049	4.00	0.0	0.600	o	225	Pipe/Conduit	
S17.002	45.805	0.958	47.8	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.014	23.952	0.187	127.8	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S1.015	28.886	0.226	127.8	0.057	0.00	0.0	0.600	oo	375	Double Pipe	
S1.016	6.369	0.026	245.0	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S1.017	5.424	0.030	180.8	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S20.000	43.255	0.290	149.2	0.107	4.00	0.0	0.600	o	300	Pipe/Conduit	
S20.001	51.400	0.309	166.3	0.184	0.00	0.0	0.600	oo	375	Double Pipe	
S20.002	22.716	0.095	240.0	0.063	0.00	0.0	0.600	oo	375	Double Pipe	
S21.000	11.241	0.201	55.9	0.068	4.00	0.0	0.600	o	225	Pipe/Conduit	
S21.001	64.310	1.548	41.5	0.243	0.00	0.0	0.600	o	300	Pipe/Conduit	
S20.003	68.081	0.302	225.4	0.181	0.00	0.0	0.600	oo	375	Double Pipe	

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)
S17.001	50.00	4.95	86.810	0.356	0.0	0.0	0.0	2.17	153.2	48.2
S19.000	50.00	4.23	85.885	0.049	0.0	0.0	0.0	1.70	67.6	6.6
S17.002	50.00	5.24	85.454	0.483	0.0	0.0	0.0	2.63	290.0	65.4
S1.014	50.00	9.48	84.015	4.961	0.0	0.0	0.0	1.60	353.7«	671.8
S1.015	50.00	9.78	83.828	5.018	0.0	0.0	0.0	1.60	353.7«	679.5
S1.016	50.00	9.87	83.500	5.018	0.0	0.0	0.0	1.15	254.7«	679.5
S1.017	50.00	9.94	83.099	5.018	0.0	0.0	0.0	1.34	296.9«	679.5
S20.000	50.00	4.56	85.008	0.107	0.0	0.0	0.0	1.29	90.8	14.5
S20.001	50.00	5.17	84.643	0.291	0.0	0.0	0.0	1.40	309.7	39.4
S20.002	50.00	5.50	84.334	0.354	0.0	0.0	0.0	1.17	257.4	47.9
S21.000	50.00	4.11	86.100	0.068	0.0	0.0	0.0	1.75	69.7	9.2
S21.001	50.00	4.55	85.824	0.311	0.0	0.0	0.0	2.45	172.9	42.1
S20.003	50.00	6.44	84.126	0.846	0.0	0.0	0.0	1.20	265.6	114.6

Network Design Table for Storm

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
S22.000	48.821	1.000	48.8	0.139	4.00	0.0	0.600	o	225	Pipe/Conduit	
S20.004	18.189	0.124	146.7	0.019	0.00	0.0	0.600	oo	375	Double Pipe	
S20.005	18.354	0.125	146.8	0.036	0.00	0.0	0.600	oo	375	Double Pipe	
S20.006	10.568	0.148	71.4	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S20.007	7.057	0.018	392.1	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
S23.000	54.827	1.746	31.4	0.242	4.00	0.0	0.600	o	300	Pipe/Conduit	
S23.001	30.903	0.996	31.0	0.095	0.00	0.0	0.600	o	300	Pipe/Conduit	
S23.002	13.160	0.219	60.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S23.003	6.849	0.028	244.6	0.000	0.00	0.0	0.600	o	300	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)
S22.000	50.00	4.43	84.974	0.139	0.0	0.0	0.0	1.88	74.6	18.8
S20.004	50.00	6.64	83.824	1.004	0.0	0.0	0.0	1.49	330.0	136.0
S20.005	50.00	6.85	83.700	1.040	0.0	0.0	0.0	1.49	329.8	140.8
S20.006	50.00	6.93	83.575	1.040	0.0	0.0	0.0	2.15	474.2	140.8
S20.007	50.00	7.06	83.427	1.040	0.0	0.0	0.0	0.91	200.8	140.8
S23.000	50.00	4.32	87.816	0.242	0.0	0.0	0.0	2.82	199.0	32.8
S23.001	50.00	4.51	86.070	0.337	0.0	0.0	0.0	2.83	200.2	45.6
S23.002	50.00	4.61	85.074	0.337	0.0	0.0	0.0	2.03	143.6	45.6
S23.003	50.00	4.73	84.855	0.337	0.0	0.0	0.0	1.00	70.7	45.6

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	225	S1	100.000	98.575	1.200	Open Manhole	1200
S2.000	o	150	S2	100.408	99.058	1.200	Open Manhole	1200
S1.001	o	300	S3	99.426	98.293	0.833	Open Manhole	1200
S1.002	o	300	S4	98.215	96.715	1.200	Open Manhole	1200
S1.003	o	375	S5	95.358	93.683	1.300	Open Manhole	1350
S3.000	o	225	S6	93.162	92.237	0.700	Open Manhole	1200
S1.004	oo	375	S7	93.169	91.216	1.578	Open Manhole	1800
S4.000	o	225	S8	95.469	94.044	1.200	Open Manhole	1200
S4.001	o	300	S9	95.390	92.808	2.282	Open Manhole	1200
S1.005	oo	375	S10	93.381	90.824	2.182	Open Manhole	1800
S5.000	o	150	S11	94.050	92.700	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	12.232	59.1	S3	99.426	98.368	0.833	Open Manhole	1200
S2.000	35.412	59.2	S3	99.426	98.460	0.816	Open Manhole	1200
S1.001	42.324	26.8	S4	98.215	96.715	1.200	Open Manhole	1200
S1.002	61.925	20.9	S5	95.358	93.758	1.300	Open Manhole	1350
S1.003	58.495	23.7	S7	93.169	91.216	1.578	Open Manhole	1800
S3.000	28.388	100.0	S7	93.169	91.953	0.991	Open Manhole	1800
S1.004	75.629	192.9	S10	93.381	90.824	2.182	Open Manhole	1800
S4.000	58.069	50.0	S9	95.390	92.883	2.282	Open Manhole	1200
S4.001	58.350	30.6	S10	93.381	90.899	2.182	Open Manhole	1800
S1.005	32.329	265.0	S13	93.413	90.702	2.336	Open Manhole	1800
S5.000	11.555	59.3	S12	93.576	92.505	0.921	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.001	o	150	S12	93.576	92.505	0.921	Open Manhole	1200
S1.006	oo	375	S13	93.413	90.702	2.336	Open Manhole	1800
S1.007	oo	375	S14	92.266	90.492	1.399	Open Manhole	1800
S1.008	oo	375	S15	90.563	88.941	1.247	Open Manhole	1800
S6.000	o	225	S16	100.489	99.064	1.200	Open Manhole	1200
S6.001	o	300	S17	101.008	98.059	2.649	Open Manhole	1200
S6.002	o	300	S18	99.022	97.522	1.200	Open Manhole	1200
S7.000	o	300	S19	98.351	96.926	1.125	Open Manhole	1200
S6.003	o	300	S20	98.393	95.580	2.513	Open Manhole	1200
S6.004	o	375	S21	97.923	95.464	2.084	Open Manhole	1350
S6.005	o	375	S22	96.663	94.266	2.022	Open Manhole	1350
S6.006	o	375	S23	96.288	93.811	2.102	Open Manhole	1350
S6.007	o	375	S24	95.403	92.982	2.046	Open Manhole	1350
S6.008	o	375	S25	94.651	92.254	2.022	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.001	10.997	24.9	S13	93.413	92.063	1.200	Open Manhole	1800
S1.006	42.190	200.9	S14	92.266	90.492	1.399	Open Manhole	1800
S1.007	46.852	30.2	S15	90.563	88.941	1.247	Open Manhole	1800
S1.008	43.024	50.9	S41	89.800	88.095	1.330	Open Manhole	1800
S6.000	55.103	59.3	S17	101.008	98.134	2.649	Open Manhole	1200
S6.001	50.776	94.6	S18	99.022	97.522	1.200	Open Manhole	1200
S6.002	15.335	24.4	S20	98.393	96.893	1.200	Open Manhole	1200
S7.000	67.297	50.0	S20	98.393	95.580	2.513	Open Manhole	1200
S6.003	9.955	242.8	S21	97.923	95.539	2.084	Open Manhole	1350
S6.004	29.633	24.7	S22	96.663	94.266	2.022	Open Manhole	1350
S6.005	14.609	32.1	S23	96.288	93.811	2.102	Open Manhole	1350
S6.006	23.342	28.2	S24	95.403	92.982	2.046	Open Manhole	1350
S6.007	23.317	32.0	S25	94.651	92.254	2.022	Open Manhole	1350
S6.008	23.661	319.7	S26	94.636	92.180	2.081	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.009	o	450	S26	94.636	92.105	2.081	Open Manhole	1350
S6.010	o	450	S27	94.941	92.049	2.442	Open Manhole	1350
S8.000	o	225	S28	91.221	89.796	1.200	Open Manhole	1200
S6.011	o	450	S29	92.017	89.261	2.306	Open Manhole	1350
S6.012	o	450	S30	90.864	89.041	1.373	Open Manhole	1350
S9.000	o	300	S31	95.177	93.677	1.200	Open Manhole	1200
S10.000	o	150	S32	96.734	95.384	1.200	Open Manhole	1200
S10.001	o	225	S33	96.323	94.959	1.139	Open Manhole	1200
S9.001	o	300	S34	95.971	93.353	2.318	Open Manhole	1200
S11.000	o	300	S35	94.298	92.798	1.200	Open Manhole	1200
S9.002	o	375	S36	94.646	92.074	2.197	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.009	22.644	404.4	S27	94.941	92.049	2.442	Open Manhole	1350
S6.010	69.815	32.5	S29	92.017	89.903	1.664	Open Manhole	1350
S8.000	34.547	64.6	S29	92.017	89.261	2.531	Open Manhole	1350
S6.011	26.924	122.4	S30	90.864	89.041	1.373	Open Manhole	1350
S6.012	28.644	30.3	S41	89.800	88.095	1.255	Open Manhole	1800
S9.000	48.609	150.0	S34	95.971	93.353	2.318	Open Manhole	1200
S10.000	20.716	59.2	S33	96.323	95.034	1.139	Open Manhole	1200
S10.001	23.981	58.1	S34	95.971	94.546	1.200	Open Manhole	1200
S9.001	28.936	139.8	S36	94.646	93.146	1.200	Open Manhole	1350
S11.000	32.444	50.0	S36	94.646	92.149	2.197	Open Manhole	1350
S9.002	29.280	48.0	S37	93.364	91.464	1.525	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S9.003	o	375	S37	93.364	91.464	1.525	Open Manhole	1350
S12.000	o	225	S38	92.308	90.883	1.200	Open Manhole	1200
S9.004	o	375	S39	92.190	90.217	1.598	Open Manhole	1350
S9.005	o	375	S40	90.801	88.825	1.601	Open Manhole	1350
S1.009	o	450	S41	89.800	88.095	1.255	Open Manhole	1800
S13.000	o	150	S42	97.773	96.528	1.095	Open Manhole	1200
S13.001	o	225	S43	97.227	95.802	1.200	Open Manhole	1200
S13.002	o	225	S44	96.688	95.263	1.200	Open Manhole	1200
S13.003	o	300	S45	95.149	93.649	1.200	Open Manhole	1200
S13.004	o	300	S46	93.400	91.903	1.197	Open Manhole	1200
S13.005	o	375	S47	93.397	91.710	1.312	Open Manhole	1350
S13.006	o	375	S48	92.467	90.895	1.197	Open Manhole	1350
S14.000	o	225	S49	91.538	90.113	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S9.003	30.112	24.1	S39	92.190	90.217	1.598	Open Manhole	1350
S12.000	35.855	59.8	S39	92.190	90.283	1.682	Open Manhole	1350
S9.004	32.447	23.3	S40	90.801	88.825	1.601	Open Manhole	1350
S9.005	28.311	38.8	S41	89.800	88.095	1.330	Open Manhole	1800
S1.009	37.376	43.0	S53	88.400	87.225	0.725	Open Manhole	1200
S13.000	13.285	20.4	S43	97.227	95.877	1.200	Open Manhole	1200
S13.001	12.144	22.5	S44	96.688	95.263	1.200	Open Manhole	1200
S13.002	39.704	25.8	S45	95.149	93.724	1.200	Open Manhole	1200
S13.003	37.532	21.5	S46	93.400	91.903	1.197	Open Manhole	1200
S13.004	11.617	60.2	S47	93.397	91.710	1.387	Open Manhole	1350
S13.005	22.865	28.1	S48	92.467	90.895	1.197	Open Manhole	1350
S13.006	39.584	48.6	S50	91.200	90.080	0.745	Open Manhole	1350
S14.000	16.251	90.8	S50	91.200	89.934	1.041	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S13.007	o	375	S50	91.200	89.925	0.900	Open Manhole	1350
S13.008	o	375	S51	90.562	89.214	0.973	Open Manhole	1350
S13.009	o	375	S52	88.536	87.442	0.719	Open Manhole	1200
S1.010	o	450	S53	88.400	87.000	0.950	Open Manhole	1200
S1.011	o	300	S54	87.400	86.000	1.100	Open Manhole	1350
S15.000	o	225	S55	90.428	89.003	1.200	Open Manhole	1200
S15.001	o	225	S56	89.753	88.328	1.200	Open Manhole	1200
S15.002	o	300	S57	89.097	87.597	1.200	Open Manhole	1200
S15.003	oo	375	S58	88.000	86.233	1.392	Open Manhole	1800
S15.004	oo	375	S59	87.700	85.596	1.729	Open Manhole	1800
S1.012	oo	375	S60	87.300	85.142	1.783	Open Manhole	1800
S16.000	o	225	S61	89.605	88.180	1.200	Open Manhole	1200
S16.001	o	300	S62	88.510	87.010	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S13.007	31.278	44.0	S51	90.562	89.214	0.973	Open Manhole	1350
S13.008	77.920	44.0	S52	88.536	87.443	0.718	Open Manhole	1200
S13.009	6.217	18.5	S53	88.400	87.106	0.919	Open Manhole	1200
S1.010	3.108	31.1	S54	87.400	86.900	0.050	Open Manhole	1350
S1.011	36.811	75.1	S60	87.300	85.510	1.490	Open Manhole	1800
S15.000	22.196	32.9	S56	89.753	88.328	1.200	Open Manhole	1200
S15.001	22.694	34.6	S57	89.097	87.672	1.200	Open Manhole	1200
S15.002	37.592	27.6	S58	88.000	86.233	1.467	Open Manhole	1800
S15.003	42.486	66.7	S59	87.700	85.596	1.729	Open Manhole	1800
S15.004	30.273	66.7	S60	87.300	85.142	1.783	Open Manhole	1800
S1.012	47.754	66.7	S65	86.700	84.426	1.899	Open Manhole	1800
S16.000	28.750	26.3	S62	88.510	87.085	1.200	Open Manhole	1200
S16.001	29.148	39.8	S63	87.877	86.277	1.300	Open Manhole	1350

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S16.002	o	375	S63	87.877	86.202	1.300	Open Manhole	1350
S16.003	o	375	S64	87.531	85.298	1.858	Open Manhole	1350
S1.013	oo	375	S65	86.700	84.426	1.899	Open Manhole	1800
S17.000	o	300	S66	88.678	87.178	1.200	Open Manhole	1200
S18.000	o	225	S67	89.866	88.441	1.200	Open Manhole	1200
S17.001	o	300	S68	89.149	86.810	2.039	Open Manhole	1200
S19.000	o	225	S69	87.310	85.885	1.200	Open Manhole	1200
S17.002	o	375	S70	87.050	85.454	1.221	Open Manhole	1350
S1.014	oo	375	S71	85.850	84.015	1.460	Open Manhole	1800
S1.015	oo	375	S72	85.800	83.828	1.597	Open Manhole	1800
S1.016	oo	375	S73	85.000	83.500	1.125	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S16.002	32.163	35.6	S64	87.531	85.298	1.858	Open Manhole	1350
S16.003	33.346	38.6	S65	86.700	84.433	1.892	Open Manhole	1800
S1.013	52.669	128.0	S71	85.850	84.015	1.460	Open Manhole	1800
S17.000	36.773	99.9	S68	89.149	86.810	2.039	Open Manhole	1200
S18.000	43.870	60.0	S68	89.149	87.710	1.214	Open Manhole	1200
S17.001	67.681	52.8	S70	87.050	85.529	1.221	Open Manhole	1350
S19.000	23.333	59.4	S70	87.050	85.492	1.333	Open Manhole	1350
S17.002	45.805	47.8	S71	85.850	84.496	0.979	Open Manhole	1800
S1.014	23.952	127.8	S72	85.800	83.828	1.597	Open Manhole	1800
S1.015	28.886	127.8	S73	85.000	83.602	1.023	Open Manhole	1800
S1.016	6.369	245.0	S74	85.000	83.474	1.151	Open Manhole	1800

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.017	oo	375	S74	85.000	83.099	1.526	Open Manhole	1800
S20.000	o	300	S75	86.471	85.008	1.163	Open Manhole	1200
S20.001	oo	375	S76	86.232	84.643	1.214	Open Manhole	1800
S20.002	oo	375	S77	86.121	84.334	1.412	Open Manhole	1800
S21.000	o	225	S78	87.525	86.100	1.200	Open Manhole	1200
S21.001	o	300	S79	87.377	85.824	1.253	Open Manhole	1200
S20.003	oo	375	S80	86.060	84.126	1.559	Open Manhole	1800
S22.000	o	225	S81	86.399	84.974	1.200	Open Manhole	1200
S20.004	oo	375	S82	85.531	83.824	1.332	Open Manhole	1800
S20.005	oo	375	S83	85.500	83.700	1.425	Open Manhole	1800
S20.006	oo	375	S84	85.500	83.575	1.550	Open Manhole	1800
S20.007	oo	375	S85	85.016	83.427	1.214	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.017	5.424	180.8	S	85.000	83.069	1.556	Open Manhole	0
S20.000	43.255	149.2	S76	86.232	84.718	1.214	Open Manhole	1800
S20.001	51.400	166.3	S77	86.121	84.334	1.412	Open Manhole	1800
S20.002	22.716	240.0	S80	86.060	84.239	1.446	Open Manhole	1800
S21.000	11.241	55.9	S79	87.377	85.899	1.253	Open Manhole	1200
S21.001	64.310	41.5	S80	86.060	84.276	1.484	Open Manhole	1800
S20.003	68.081	225.4	S82	85.531	83.824	1.332	Open Manhole	1800
S22.000	48.821	48.8	S82	85.531	83.974	1.332	Open Manhole	1800
S20.004	18.189	146.7	S83	85.500	83.700	1.425	Open Manhole	1800
S20.005	18.354	146.8	S84	85.500	83.575	1.550	Open Manhole	1800
S20.006	10.568	71.4	S85	85.016	83.427	1.214	Open Manhole	1800
S20.007	7.057	392.1	S	85.000	83.409	1.216	Open Manhole	0

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S23.000	o	300	S86	89.316	87.816	1.200	Open Manhole	1200
S23.001	o	300	S87	87.570	86.070	1.200	Open Manhole	1200
S23.002	o	300	S88	86.574	85.074	1.200	Open Manhole	1200
S23.003	o	300	S89	85.855	84.855	0.700	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S23.000	54.827	31.4	S87	87.570	86.070	1.200	Open Manhole	1200
S23.001	30.903	31.0	S88	86.574	85.074	1.200	Open Manhole	1200
S23.002	13.160	60.1	S89	85.855	84.855	0.700	Open Manhole	1200
S23.003	6.849	244.6	S	85.855	84.827	0.728	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.017	S	85.000	83.069	83.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S20.007	S	85.000	83.409	83.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S23.003	S	85.855	84.827	84.500	0	0

Online Controls for Storm

Weir Manhole: S41, DS/PN: S1.009, Volume (m³): 20.7

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 89.445

Hydro-Brake® Optimum Manhole: S52, DS/PN: S13.009, Volume (m³): 9.7

Unit Reference	MD-SHE-0082-3000-1000-3000
Design Head (m)	1.000
Design Flow (l/s)	3.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	82
Invert Level (m)	87.442
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	3.0	Kick-Flo®	0.623	2.4
Flush-Flo™	0.297	3.0	Mean Flow over Head Range	-	2.6

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	2.4	1.200	3.3	3.000	5.0	7.000	7.4
0.200	2.9	1.400	3.5	3.500	5.4	7.500	7.7
0.300	3.0	1.600	3.7	4.000	5.7	8.000	7.9
0.400	2.9	1.800	3.9	4.500	6.0	8.500	8.2
0.500	2.8	2.000	4.1	5.000	6.3	9.000	8.4
0.600	2.5	2.200	4.3	5.500	6.6	9.500	8.6
0.800	2.7	2.400	4.5	6.000	6.9		
1.000	3.0	2.600	4.7	6.500	7.2		

Weir Manhole: S53, DS/PN: S1.010, Volume (m³): 7.8

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 88.200

Hydro-Brake® Optimum Manhole: S54, DS/PN: S1.011, Volume (m³): 2.3

Unit Reference	MD-SHE-0121-7000-1200-7000
Design Head (m)	1.200
Design Flow (l/s)	7.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	121
Invert Level (m)	86.000
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)	1.200	7.0	Kick-Flo®	0.755	5.6
Flush-Flo™	0.351	7.0	Mean Flow over Head Range	-	6.1

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	4.3	1.200	7.0	3.000	10.8	7.000	16.1
0.200	6.6	1.400	7.5	3.500	11.6	7.500	16.7
0.300	7.0	1.600	8.0	4.000	12.4	8.000	17.2
0.400	7.0	1.800	8.5	4.500	13.1	8.500	17.7
0.500	6.8	2.000	8.9	5.000	13.7	9.000	18.2
0.600	6.6	2.200	9.3	5.500	14.4	9.500	18.7
0.800	5.8	2.400	9.7	6.000	15.0		
1.000	6.4	2.600	10.1	6.500	15.6		

Depth/Flow Relationship Manhole: S73, DS/PN: S1.016, Volume (m³): 9.8

Invert Level (m) 83.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.0000	0.900	7.0000	1.700	7.0000	2.500	7.0000
0.200	7.0000	1.000	7.0000	1.800	7.0000	2.600	7.0000
0.300	7.0000	1.100	7.0000	1.900	7.0000	2.700	7.0000
0.400	7.0000	1.200	7.0000	2.000	7.0000	2.800	7.0000
0.500	7.0000	1.300	7.0000	2.100	7.0000	2.900	7.0000
0.600	7.0000	1.400	7.0000	2.200	7.0000	3.000	7.0000
0.700	7.0000	1.500	7.0000	2.300	7.0000		
0.800	7.0000	1.600	7.0000	2.400	7.0000		

Depth/Flow Relationship Manhole: S85, DS/PN: S20.007, Volume (m³): 6.0

Invert Level (m) 83.427

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.0000	0.900	5.0000	1.700	5.0000	2.500	5.0000
0.200	5.0000	1.000	5.0000	1.800	5.0000	2.600	5.0000
0.300	5.0000	1.100	5.0000	1.900	5.0000	2.700	5.0000
0.400	5.0000	1.200	5.0000	2.000	5.0000	2.800	5.0000
0.500	5.0000	1.300	5.0000	2.100	5.0000	2.900	5.0000
0.600	5.0000	1.400	5.0000	2.200	5.0000	3.000	5.0000
0.700	5.0000	1.500	5.0000	2.300	5.0000		
0.800	5.0000	1.600	5.0000	2.400	5.0000		

Depth/Flow Relationship Manhole: S89, DS/PN: S23.003, Volume (m³): 2.0

Invert Level (m) 84.855

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0000	0.900	2.0000	1.700	2.0000	2.500	2.0000
0.200	2.0000	1.000	2.0000	1.800	2.0000	2.600	2.0000
0.300	2.0000	1.100	2.0000	1.900	2.0000	2.700	2.0000
0.400	2.0000	1.200	2.0000	2.000	2.0000	2.800	2.0000
0.500	2.0000	1.300	2.0000	2.100	2.0000	2.900	2.0000
0.600	2.0000	1.400	2.0000	2.200	2.0000	3.000	2.0000
0.700	2.0000	1.500	2.0000	2.300	2.0000		
0.800	2.0000	1.600	2.0000	2.400	2.0000		

Offline Controls for Storm

Depth/Flow Relationship Manhole: S41, DS/PN: S1.009, Loop to PN: S1.017

Invert Level (m) 88.095

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.0000	0.900	6.0000	1.700	6.0000	2.500	6.0000
0.200	6.0000	1.000	6.0000	1.800	6.0000	2.600	6.0000
0.300	6.0000	1.100	6.0000	1.900	6.0000	2.700	6.0000
0.400	6.0000	1.200	6.0000	2.000	6.0000	2.800	6.0000
0.500	6.0000	1.300	6.0000	2.100	6.0000	2.900	6.0000
0.600	6.0000	1.400	6.0000	2.200	6.0000	3.000	6.0000
0.700	6.0000	1.500	6.0000	2.300	6.0000		
0.800	6.0000	1.600	6.0000	2.400	6.0000		

Depth/Flow Relationship Manhole: S53, DS/PN: S1.010, Loop to PN: S1.017

Invert Level (m) 87.000

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.0000	0.900	7.0000	1.700	7.0000	2.500	7.0000
0.200	7.0000	1.000	7.0000	1.800	7.0000	2.600	7.0000
0.300	7.0000	1.100	7.0000	1.900	7.0000	2.700	7.0000
0.400	7.0000	1.200	7.0000	2.000	7.0000	2.800	7.0000
0.500	7.0000	1.300	7.0000	2.100	7.0000	2.900	7.0000
0.600	7.0000	1.400	7.0000	2.200	7.0000	3.000	7.0000
0.700	7.0000	1.500	7.0000	2.300	7.0000		
0.800	7.0000	1.600	7.0000	2.400	7.0000		

Storage Structures for Storm

Tank or Pond Manhole: S41, DS/PN: S1.009

Invert Level (m) 88.095

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	291.2	1.705	1150.0

Tank or Pond Manhole: S52, DS/PN: S13.009

Invert Level (m) 87.442

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	175.6	1.094	420.0

Tank or Pond Manhole: S53, DS/PN: S1.010

Invert Level (m) 87.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	411.0	1.400	810.0

Tank or Pond Manhole: S54, DS/PN: S1.011

Invert Level (m) 86.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	181.2	1.400	530.0

Tank or Pond Manhole: S73, DS/PN: S1.016

Invert Level (m) 83.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	427.2	1.500	1151.0

Tank or Pond Manhole: S85, DS/PN: S20.007

Invert Level (m) 83.427

Tank or Pond Manhole: S85, DS/PN: S20.007

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	300.0	1.573	659.7

Tank or Pond Manhole: S89, DS/PN: S23.003

Invert Level (m) 84.855

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	169.0	1.000	335.5

100 year Return Period 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 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 2 Number of Time/Area Diagrams 0
Number of Online Controls 7 Number of Storage Structures 7 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.418
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S1.000	S1	15 minute 100 year Winter I+40%	100.000	98.681	-0.119	0.000	0.45
S2.000	S2	15 minute 100 year Winter I+40%	100.408	99.529	0.321	0.000	1.23
S1.001	S3	15 minute 100 year Winter I+40%	99.426	98.474	-0.119	0.000	0.65
S1.002	S4	15 minute 100 year Winter I+40%	98.215	97.983	0.968	0.000	1.04
S1.003	S5	15 minute 100 year Winter I+40%	95.358	94.859	0.801	0.000	0.85
S3.000	S6	15 minute 100 year Winter I+40%	93.162	93.159	0.697	0.000	0.63
S1.004	S7	15 minute 100 year Winter I+40%	93.169	93.159	1.568	0.000	1.31
S4.000	S8	15 minute 100 year Winter I+40%	95.469	95.366	1.097	0.000	1.23
S4.001	S9	15 minute 100 year Winter I+40%	95.390	93.648	0.540	0.000	0.82
S1.005	S10	15 minute 100 year Winter I+40%	93.381	92.477	1.278	0.000	2.31
S5.000	S11	15 minute 100 year Winter I+40%	94.050	92.869	0.019	0.000	1.05
S5.001	S12	15 minute 100 year Summer I+40%	93.576	92.597	-0.058	0.000	0.68
S1.006	S13	15 minute 100 year Winter I+40%	93.413	91.822	0.745	0.000	2.13
S1.007	S14	15 minute 100 year Winter I+40%	92.266	90.863	-0.004	0.000	0.79
S1.008	S15	30 minute 100 year Winter I+40%	90.563	90.095	0.779	0.000	0.93

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

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
S1.000	S1		0.114	11.491	1.4	26.3	OK
S2.000	S2		0.528	13.256	1.6	27.6	SURCHARGED
S1.001	S3		0.250	59.217	3.0	131.2	OK
S1.002	S4		3.475	128.726	3.6	241.9	FLOOD RISK
S1.003	S5		3.049	178.783	3.9	329.3	SURCHARGED
S3.000	S6		1.038	12.371	1.2	30.6	FLOOD RISK
S1.004	S7		10.459	217.666	1.6	358.3	FLOOD RISK
S4.000	S8		1.490	48.313	2.2	87.3	FLOOD RISK
S4.001	S9		2.207	87.491	3.0	156.7	SURCHARGED
S1.005	S10		23.497	305.169	2.3	504.9	SURCHARGED
S5.000	S11		0.185	9.722	1.3	22.0	SURCHARGED
S5.001	S12		0.124	8.681	2.0	21.8	OK
S1.006	S13		9.582	341.682	2.5	546.8	SURCHARGED
S1.007	S14		7.326	341.686	3.3	530.7	OK
S1.008	S15		9.109	441.353	2.4	479.9	SURCHARGED

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S6.000	S16	15 minute 100 year Winter I+40%	100.489	99.646	0.357	0.000	0.89
S6.001	S17	15 minute 100 year Winter I+40%	101.008	98.906	0.547	0.000	1.40
S6.002	S18	15 minute 100 year Winter I+40%	99.022	97.936	0.114	0.000	0.82
S7.000	S19	15 minute 100 year Winter I+40%	98.351	98.025	0.799	0.000	0.63
S6.003	S20	15 minute 100 year Winter I+40%	98.393	97.542	1.662	0.000	5.25
S6.004	S21	15 minute 100 year Winter I+40%	97.923	96.348	0.509	0.000	0.79
S6.005	S22	15 minute 100 year Winter I+40%	96.663	95.641	1.000	0.000	1.07
S6.006	S23	15 minute 100 year Winter I+40%	96.288	95.128	0.942	0.000	0.91
S6.007	S24	15 minute 100 year Winter I+40%	95.403	94.451	1.094	0.000	1.00
S6.008	S25	15 minute 100 year Winter I+40%	94.651	93.713	1.084	0.000	3.35
S6.009	S26	15 minute 100 year Winter I+40%	94.636	92.872	0.317	0.000	2.61
S6.010	S27	15 minute 100 year Winter I+40%	94.941	92.377	-0.122	0.000	0.86
S8.000	S28	15 minute 100 year Winter I+40%	91.221	90.711	0.690	0.000	0.77
S6.011	S29	30 minute 100 year Winter I+40%	92.017	90.551	0.840	0.000	1.73
S6.012	S30	30 minute 100 year Winter I+40%	90.864	89.976	0.485	0.000	0.85
S9.000	S31	15 minute 100 year Winter I+40%	95.177	95.105	1.128	0.000	1.13
S10.000	S32	15 minute 100 year Winter I+40%	96.734	96.097	0.563	0.000	1.49
S10.001	S33	15 minute 100 year Winter I+40%	96.323	95.319	0.135	0.000	1.14
S9.001	S34	15 minute 100 year Winter I+40%	95.971	94.680	1.027	0.000	2.43
S11.000	S35	15 minute 100 year Winter I+40%	94.298	93.207	0.109	0.000	0.37
S9.002	S36	15 minute 100 year Winter I+40%	94.646	93.166	0.717	0.000	1.10
S9.003	S37	15 minute 100 year Winter I+40%	93.364	92.491	0.652	0.000	0.86
S12.000	S38	15 minute 100 year Winter I+40%	92.308	92.169	1.061	0.000	1.14
S9.004	S39	15 minute 100 year Winter I+40%	92.190	91.580	0.988	0.000	1.02
S9.005	S40	15 minute 100 year Winter I+40%	90.801	90.222	1.022	0.000	1.30
S1.009	S41	120 minute 100 year Winter I+40%	89.800	89.760	1.215	0.000	0.69
S13.000	S42	15 minute 100 year Winter I+40%	97.773	96.838	0.160	0.000	0.96
S13.001	S43	15 minute 100 year Winter I+40%	97.227	96.345	0.318	0.000	0.52
S13.002	S44	15 minute 100 year Winter I+40%	96.688	96.227	0.739	0.000	1.22
S13.003	S45	15 minute 100 year Winter I+40%	95.149	93.912	-0.037	0.000	0.85
S13.004	S46	15 minute 100 year Winter I+40%	93.400	92.635	0.432	0.000	1.81
S13.005	S47	15 minute 100 year Winter I+40%	93.397	91.961	-0.124	0.000	0.77
S13.006	S48	15 minute 100 year Winter I+40%	92.467	91.188	-0.082	0.000	0.95
S14.000	S49	15 minute 100 year Winter I+40%	91.538	90.598	0.260	0.000	0.96
S13.007	S50	15 minute 100 year Winter I+40%	91.200	90.424	0.124	0.000	1.10
S13.008	S51	15 minute 100 year Winter I+40%	90.562	89.589	0.000	0.000	1.00
S13.009	S52	600 minute 100 year Winter I+40%	88.536	88.509	0.692	0.000	0.01
S1.010	S53	480 minute 100 year Winter I+40%	88.400	88.335	0.885	0.000	0.47
S1.011	S54	720 minute 100 year Winter I+40%	87.400	87.366	1.066	0.000	0.06
S15.000	S55	15 minute 100 year Winter I+40%	90.428	89.149	-0.079	0.000	0.75
S15.001	S56	15 minute 100 year Winter I+40%	89.753	88.746	0.193	0.000	1.12
S15.002	S57	15 minute 100 year Winter I+40%	89.097	87.813	-0.084	0.000	0.85
S15.003	S58	15 minute 100 year Winter I+40%	88.000	86.880	0.272	0.000	0.58

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

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
S6.000	S16		0.653	28.573	1.8	57.7	SURCHARGED
S6.001	S17		2.462	73.932	2.1	150.4	SURCHARGED
S6.002	S18		2.152	81.592	2.9	156.0	SURCHARGED
S7.000	S19		1.237	50.953	2.1	94.1	SURCHARGED
S6.003	S20		7.666	160.828	4.2	291.0	SURCHARGED
S6.004	S21		1.872	160.828	3.5	283.1	SURCHARGED
S6.005	S22		4.942	167.015	2.6	282.6	SURCHARGED
S6.006	S23		3.342	176.443	3.1	293.6	SURCHARGED
S6.007	S24		4.524	186.460	2.8	305.1	SURCHARGED
S6.008	S25		4.507	199.725	2.9	320.0	SURCHARGED
S6.009	S26		3.555	221.836	2.2	344.8	SURCHARGED
S6.010	S27		2.638	287.238	3.7	454.5	OK
S8.000	S28		1.029	24.746	1.6	47.1	SURCHARGED
S6.011	S29		5.284	405.848	2.7	429.2	SURCHARGED
S6.012	S30		5.399	401.665	3.4	426.5	SURCHARGED
S9.000	S31		1.609	49.490	1.4	96.3	FLOOD RISK
S10.000	S32		0.801	16.202	1.9	32.6	SURCHARGED
S10.001	S33		0.603	35.058	1.8	71.9	SURCHARGED
S9.001	S34		4.973	105.468	2.9	206.3	SURCHARGED
S11.000	S35		0.457	22.983	1.9	52.7	SURCHARGED
S9.002	S36		3.848	155.556	2.6	280.3	SURCHARGED
S9.003	S37		4.547	183.839	3.5	311.1	SURCHARGED
S12.000	S38		1.449	41.234	1.8	72.3	FLOOD RISK
S9.004	S39		6.251	230.082	3.7	376.6	SURCHARGED
S9.005	S40		4.960	228.021	3.3	366.7	SURCHARGED
S1.009	S41	6.0	1123.410	812.947	3.3	302.5	FLOOD RISK
S13.000	S42		0.345	16.204	2.3	34.7	SURCHARGED
S13.001	S43		0.735	23.864	2.3	49.4	SURCHARGED
S13.002	S44		1.520	60.692	3.0	118.6	SURCHARGED
S13.003	S45		0.370	94.278	3.5	188.6	OK
S13.004	S46		1.670	99.287	2.8	199.6	SURCHARGED
S13.005	S47		0.716	122.857	3.2	249.6	OK
S13.006	S48		0.730	122.857	2.7	249.0	OK
S14.000	S49		0.543	22.686	1.3	46.4	SURCHARGED
S13.007	S50		2.095	145.543	2.7	294.1	SURCHARGED
S13.008	S51		1.383	145.540	3.0	287.1	OK
S13.009	S52		310.555	191.032	1.0	3.0	FLOOD RISK
S1.010	S53	7.0	794.480	507.070	2.6	84.3	FLOOD RISK
S1.011	S54		461.110	397.157	1.0	7.4	FLOOD RISK
S15.000	S55		0.159	27.106	2.3	62.1	OK
S15.001	S56		0.839	41.248	2.3	90.8	SURCHARGED
S15.002	S57		0.291	75.424	3.1	167.5	OK

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

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
S15.003	S58		2.556	117.545	2.1	260.6	SURCHARGED

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S15.004	S59	15 minute 100 year Winter I+40%	87.700	86.790	0.819	0.000	0.61
S1.012	S60	15 minute 100 year Winter I+40%	87.300	86.689	1.172	0.000	0.44
S16.000	S61	15 minute 100 year Winter I+40%	89.605	88.588	0.183	0.000	1.00
S16.001	S62	15 minute 100 year Winter I+40%	88.510	87.716	0.406	0.000	0.99
S16.002	S63	15 minute 100 year Winter I+40%	87.877	87.226	0.649	0.000	0.80
S16.003	S64	15 minute 100 year Winter I+40%	87.531	86.892	1.219	0.000	0.68
S1.013	S65	15 minute 100 year Winter I+40%	86.700	86.548	1.747	0.000	1.30
S17.000	S66	15 minute 100 year Winter I+40%	88.678	88.475	0.997	0.000	0.32
S18.000	S67	15 minute 100 year Winter I+40%	89.866	88.550	-0.116	0.000	0.47
S17.001	S68	15 minute 100 year Winter I+40%	89.149	88.439	1.329	0.000	1.27
S19.000	S69	15 minute 100 year Winter I+40%	87.310	86.539	0.429	0.000	0.52
S17.002	S70	15 minute 100 year Winter I+40%	87.050	86.498	0.669	0.000	0.85
S1.014	S71	15 minute 100 year Winter I+40%	85.850	85.839	1.449	0.000	2.13
S1.015	S72	15 minute 100 year Winter I+40%	85.800	84.988	0.785	0.000	2.13
S1.016	S73	1440 minute 100 year Winter I+40%	85.000	84.964	1.089	0.000	0.04
S1.017	S74	120 minute 100 year Winter I+40%	85.000	83.172	-0.302	0.000	0.11
S20.000	S75	15 minute 100 year Winter I+40%	86.471	85.783	0.475	0.000	0.76
S20.001	S76	15 minute 100 year Winter I+40%	86.232	85.691	0.673	0.000	0.54
S20.002	S77	15 minute 100 year Winter I+40%	86.121	85.633	0.924	0.000	0.73
S21.000	S78	15 minute 100 year Winter I+40%	87.525	87.063	0.738	0.000	0.62
S21.001	S79	15 minute 100 year Winter I+40%	87.377	87.003	0.879	0.000	1.01
S20.003	S80	15 minute 100 year Winter I+40%	86.060	85.585	1.084	0.000	1.52
S22.000	S81	15 minute 100 year Winter I+40%	86.399	85.864	0.665	0.000	1.11
S20.004	S82	15 minute 100 year Winter I+40%	85.531	84.877	0.678	0.000	1.67
S20.005	S83	600 minute 100 year Winter I+40%	85.500	84.815	0.740	0.000	0.20
S20.006	S84	600 minute 100 year Winter I+40%	85.500	84.813	0.863	0.000	0.18
S20.007	S85	600 minute 100 year Winter I+40%	85.016	84.812	1.010	0.000	0.04
S23.000	S86	15 minute 100 year Winter I+40%	89.316	88.193	0.077	0.000	0.81
S23.001	S87	15 minute 100 year Winter I+40%	87.570	87.074	0.704	0.000	1.13
S23.002	S88	15 minute 100 year Winter I+40%	86.574	85.820	0.446	0.000	1.74
S23.003	S89	480 minute 100 year Winter I+40%	85.855	85.727	0.572	0.000	0.04

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
S15.004	S59		12.012	138.168	2.0	266.3	SURCHARGED
S1.012	S60		12.703	136.311	2.0	200.6	SURCHARGED
S16.000	S61		0.456	44.488	2.7	94.7	SURCHARGED
S16.001	S62		1.306	77.191	2.6	158.7	SURCHARGED
S16.002	S63		3.394	117.849	2.9	240.0	SURCHARGED
S16.003	S64		5.678	117.849	2.7	197.3	SURCHARGED

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

PN	US/MH Name	Overflow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Maximum Velocity (m/s)	Pipe Flow (l/s)	Status
S1.013	S65		19.047	288.037	1.9	425.0	FLOOD RISK
S17.000	S66		1.461	17.083	1.2	32.8	FLOOD RISK
S18.000	S67		0.118	13.257	1.6	30.4	OK
S17.001	S68		5.756	104.874	2.6	186.5	SURCHARGED
S19.000	S69		0.734	14.437	1.6	32.0	SURCHARGED
S17.002	S70		5.355	142.283	2.7	226.8	SURCHARGED
S1.014	S71		20.749	428.570	2.9	646.6	FLOOD RISK
S1.015	S72		7.834	440.193	3.0	661.9	SURCHARGED
S1.016	S73		1108.320	1146.758	0.9	7.0	FLOOD RISK
S1.017	S74		0.173	249.700	0.7	20.0	OK
S20.000	S75		0.871	31.515	1.3	64.6	SURCHARGED
S20.001	S76		5.606	85.752	1.3	153.7	SURCHARGED
S20.002	S77		14.250	104.274	1.0	160.1	SURCHARGED
S21.000	S78		1.084	20.034	1.6	36.6	SURCHARGED
S21.001	S79		1.727	91.635	2.6	167.3	SURCHARGED
S20.003	S80		11.627	249.138	1.8	380.4	SURCHARGED
S22.000	S81		1.001	40.951	2.0	79.3	SURCHARGED
S20.004	S82		18.781	288.061	2.1	455.0	SURCHARGED
S20.005	S83		6.446	801.612	0.8	53.3	SURCHARGED
S20.006	S84		6.796	795.556	0.9	53.0	SURCHARGED
S20.007	S85		622.954	336.839	0.6	5.0	FLOOD RISK
S23.000	S86		0.421	71.287	2.9	153.5	SURCHARGED
S23.001	S87		2.980	99.275	2.9	205.2	SURCHARGED
S23.002	S88		2.083	98.839	2.9	203.7	SURCHARGED
S23.003	S89		208.038	106.181	0.4	2.0	FLOOD RISK

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