

Technical Note



PROJECT:	Former Gas Works Building, Reading
SUBJECT:	Maintenance & Management Plan of Sustainable Drainage Scheme Planning Reference: 160378
JOB NO.:	LO10488
DATE:	03/11/2017
PREPARED BY:	Andrea Nelmes
CHECKED BY:	Graham Whitehouse

1. INTRODUCTION

This technical note sets out the framework to be adopted for the management and maintenance of the proposed surface water and sustainable drainage systems to serve 20 residential apartments off Gas Works Road, Reading, RG1 3EE.

2. DESCRIPTION OF SURFACE WATER DRAINAGE SYSTEM

Drawing LO10488-007 provides a layout and details to the proposed surface water system which will incorporate Sustainable Drainage Systems (SuDS), consistent with those proposals set out within the approved Flood Risk Assessment for Gas Works Road (Weetwood, February 2016). The principle philosophy of the drainage system will be to attenuate all surface water runoff to a minimum discharge rate of 5l/s through the use of permeable paving and a geocellular tank, before discharging into the public surface water sewer system in Gas Works Road/Kings Road manhole ref. SU7273 2451.

3. MANAGEMENT ARRANGEMENT

Any communal SuDS features will be maintained by a private maintenance company to be set up by the developer. The operation of the maintenance company will be funded through service charges levied to local residents. The maintenance regime to which the company should adhere to for each SuDS feature and its components to ensure its effective operation for the lifetime of the development is set out below.

4. SUDS MAINTENANCE PLAN

The design of each SuDS feature is in compliance with the SuDS Manual (CIRIA C753). the following schedules provide guidance on how each SuDS element within the development should be maintained. These include:

- Permeable paving designed for pedestrian use
- Geocellular storage tank
- HydroBrake[®] device

Typical Maintenance Schedules

SuDS Component	Frequency of Maintenance			
	Monthly	Six Monthly	Annually	As Required
Permeable Paving	- Refer to manufacturers specification. - As the system is sealed inspection of catchpits and outfall should be undertaken. - Litter and debris removal from the catchment surface through regular sweeping.	- Brushing and suction sweeping of the surface. - Herbicide application and weed removal.	Replacement of top 20 mm of jointing material.	Inspect/check all inlets, outlets, inspections chambers to ensure that they are in good condition, free from blockages and operating as designed. Take action where required (for 3 months following installation).

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Geocellular Storage Tank	• Inspect system as specified by the manufacturers specification. • Inspect and identify any areas that are not operating correctly. If required take remedial action. To be undertaken on a monthly basis for first 3 months then annually.	• Inspect and identify any areas that are not operating correctly. If required take remedial action (following initial 3 month period).	• Inspect/check all inlets, outlets and vents to ensure that every component is in good condition and operating as designed. • Remove sediment from pre-treatment structures and/or internal forebays. • Inspect and document the presence of wildlife.	• Survey inside of tank for sediment build up and remove if necessary (every 5 years or as required) using high pressure water techniques. • Repair/rehabilitate inlets, outlets, overflows and vents.
HydroBrake	• Refer to manufacturers specification • Inspect and identify any components that are not operating correctly. If required, take remedial action (3 months following installation).	• Inspect and identify any areas that are not operating correctly. If required take remedial action (following initial 3 month period).		

As a cover all it should be noted that significant storms may cause significant damage to SuDS. In such circumstances the system should be inspected straight after the storm event and essential recovery works undertaken to return the feature to full working order.

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APPENDIX

Technical Note

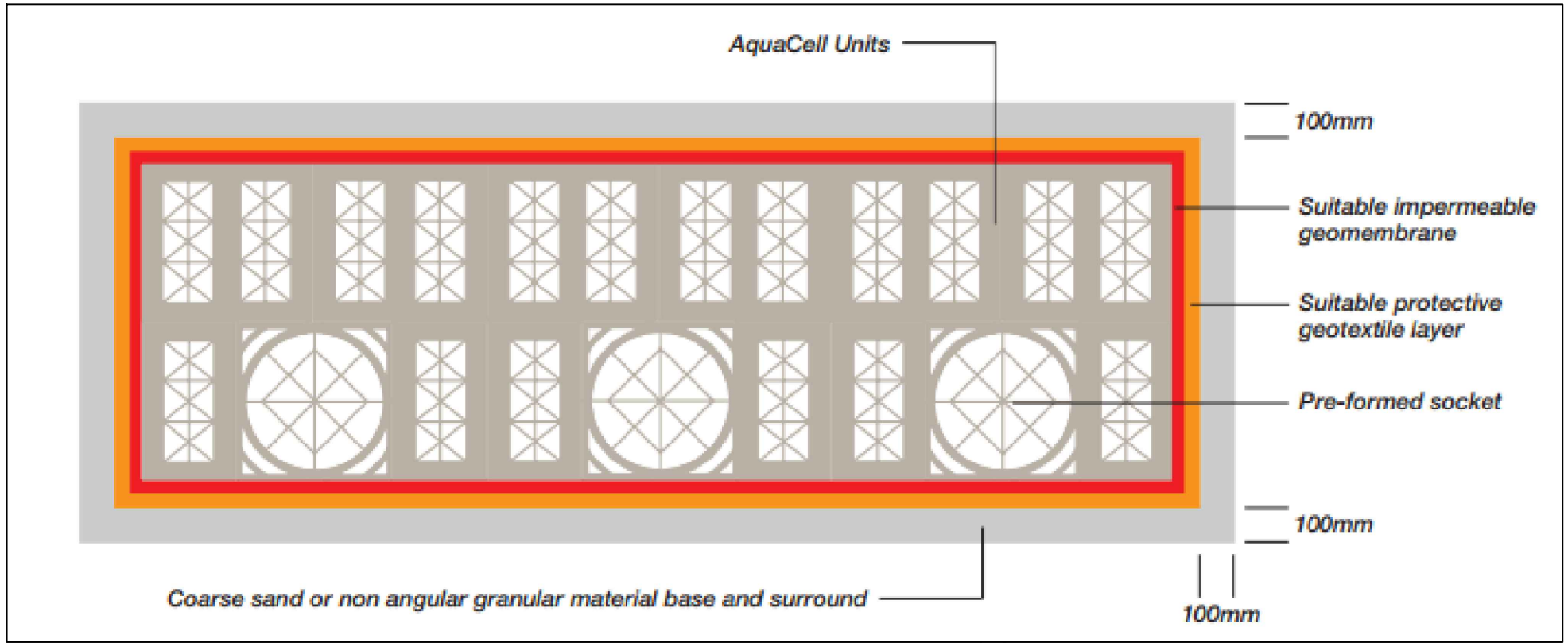
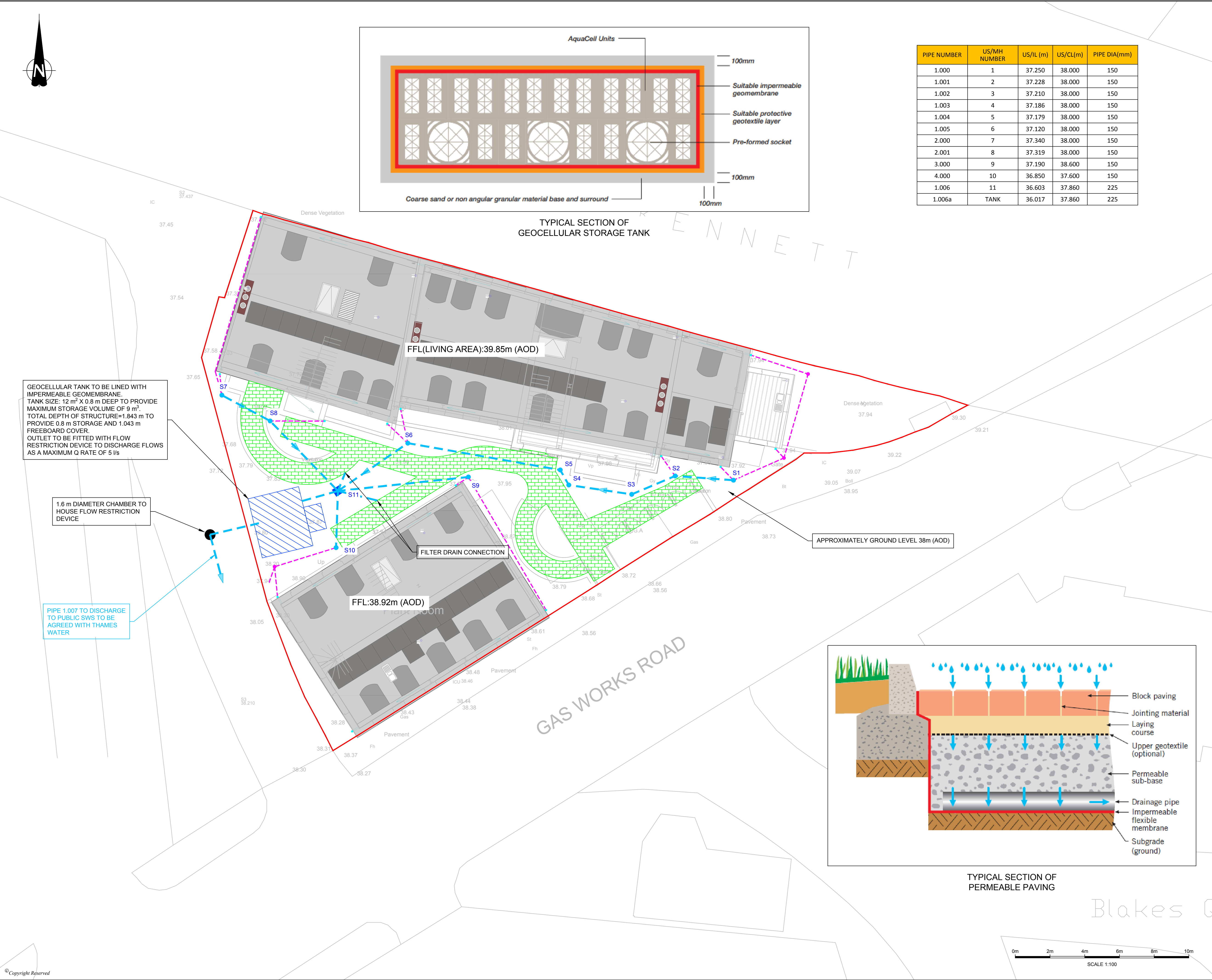


1) Drawings:

LO10488-007	Proposed Surface Water Drainage System	1:100
LO10488-008	HydroBrake Details	1:100

2) MicroDrainage Calculations

MicroDrainage Calculations Rev E	24.11.2017
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TYPICAL SECTION OF GEOCELLULAR STORAGE TANK

PIPE NUMBER	US/MH NUMBER	US/IL (m)	US/CL(m)	PIPE DIA(mm)
1.000	1	37.250	38.000	150
1.001	2	37.228	38.000	150
1.002	3	37.210	38.000	150
1.003	4	37.186	38.000	150
1.004	5	37.179	38.000	150
1.005	6	37.120	38.000	150
2.000	7	37.340	38.000	150
2.001	8	37.319	38.000	150
3.000	9	37.190	38.600	150
4.000	10	36.850	37.600	150
1.006	11	36.603	37.860	225
1.006a	TANK	36.017	37.860	225

DO NOT SCALE FROM THIS DRAWING

- REFERENCES:
- BOUNDARY
 - PROPOSED SURFACE WATER
 - PROPOSED SURFACE WATER MANHOLE TYPE 4 MIN. 250 Ø REFER SFA 7TH EDITION
 - PROPOSED SURFACE WATER MANHOLE CATCHPITS
 - PROPOSED LINEDPERMEABLE PAVING
 - PROPOSED SURFACE WATER ATTENUATION FEATURE
 - FLOW CONTROL DEVICE
 - PROPOSED SURFACE WATER INTERNAL CONNECTION 100 mm PIPE
 - PROPOSED SURFACE WATER MANHOLE TYPE 4 MIN. 180 Ø REFER SFA 7TH EDITION

- NOTES:
- DO NOT SCALE FROM THIS DRAWING.
 - ALL UNITS ARE IN METERS UNLESS NOTED OTHERWISE.
 - DRAWING BASED ON SITE LOCATION PLAN PROVIDED BY E3 DESIGN DRW. SITE LOCATION PLAN JUNE 2014
 - DESIGN IS BASED ON ASSUMED INVERT LEVEL OF RECEIVING PUBLIC SEWER NETWORK. DESIGN MAY CHANGE ONCE THE INVERT LEVEL OF MH 2451 IS DETERMINED.
 - DESIGN SUBJECT TO APPROVAL BY THAMES WATER.
 - ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM (AOD)
 - ALL ADOPTABLE DRAINAGE MUST COMPLY WITH SEWERS FOR ADOPTION 7TH EDITION, THAMES WATER REQUIREMENTS, AND ARE TO BE SUBJECT TO A SECTION 104 AGREEMENT WITH THE UNDERTAKER.
 - THE LOCATION AND DEPTH OF ALL EXISTING SERVICE APPARATUS SHOULD BE CONFIRMED WITH THE SERVICE AUTHORITIES PRIOR TO ANY EXCAVATION WORKS.
 - RWP LOCATIONS ASSUMED. ASSUMED TO DISCHARGE TO FRONT OF BUILDING EITHER INTERNALLY OR UNDER SLAB.
 - FILTER DRAINS TO BE INSTALLED UNDER PERMEABLE PAVING TO DISCHARGE INTO A COLLECTIVE CATCHPIT(S) PRIOR TO SURFACE WATER SYSTEM.
 - RODDING EYE TO BE INSTALLED UPSTREAM OF FILTER DRAINS.
 - REFER TO DWG. LO10488-008 TO SEE HYDROBRAKE DETAILS.
 - REFER TO MICRODRAINAGE CALCULATION REV E - 20-11-2017 FOR DETAILS.

GEOCELLULAR TANK TO BE LINED WITH IMPERMEABLE GEOMEMBRANE. TANK SIZE: 12 m² X 0.8 m DEEP TO PROVIDE MAXIMUM STORAGE VOLUME OF 9 m³. TOTAL DEPTH OF STRUCTURE=1.843 m TO PROVIDE 0.8 m STORAGE AND 1.043 m FREEBOARD COVER. OUTLET TO BE FITTED WITH FLOW RESTRICTION DEVICE TO DISCHARGE FLOWS AS A MAXIMUM Q RATE OF 5 l/s

1.6 m DIAMETER CHAMBER TO HOUSE FLOW RESTRICTION DEVICE

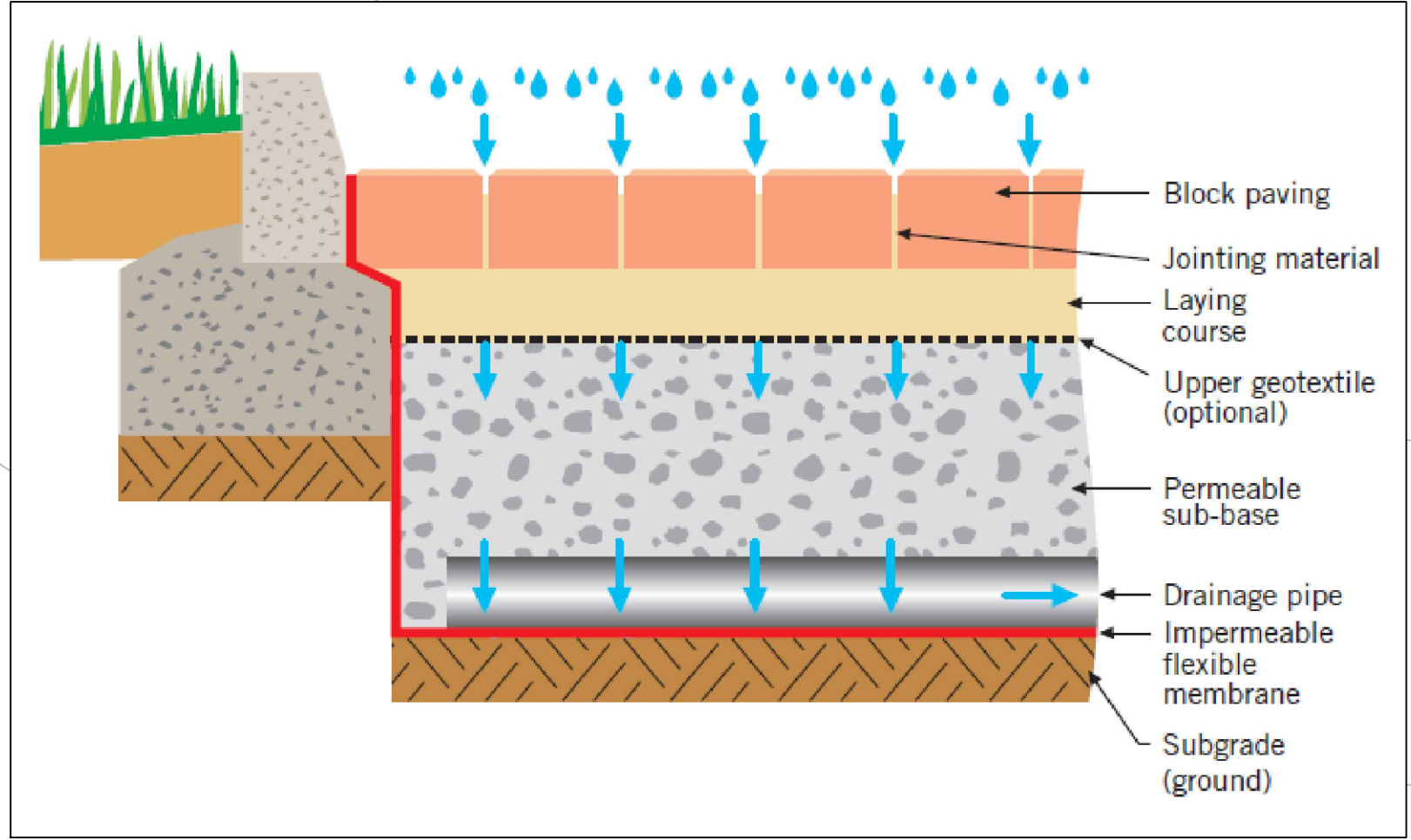
PIPE 1.007 TO DISCHARGE TO PUBLIC SWS TO BE AGREED WITH THAMES WATER

FILTER DRAIN CONNECTION

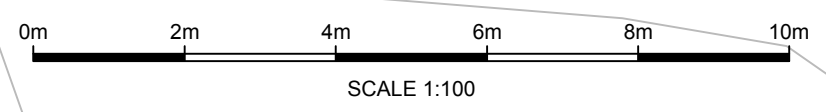
FFL:38.92m (AOD)

FFL(LIVING AREA):39.85m (AOD)

APPROXIMATELY GROUND LEVEL 38m (AOD)



TYPICAL SECTION OF PERMEABLE PAVING



AFirst Issue2011/17AFANGW

REVISIONDETAILSDATESUBMITTANCEAPPROVAL

CLIENTUNIT 22, THE ARTWORKS, ELEPHANT ROAD LONDON, SE17 1AY

PROJECTFORMER GAS WORKS BUILDINGS GAS WORKS ROAD

DRAWING TITLEPROPOSED SURFACE WATER DRAINAGE SYSTEM

DRG No. LO10488-007REV A

DRG SIZE A1SCALE 1:100DATE 23/11/17

DRAWN BY AFCHECKED BY ANAPPROVED BY GW

☐ BIRMINGHAM☐ CARDIFF☐ GLASGOW☐ NEWCASTLE UPON TYNE

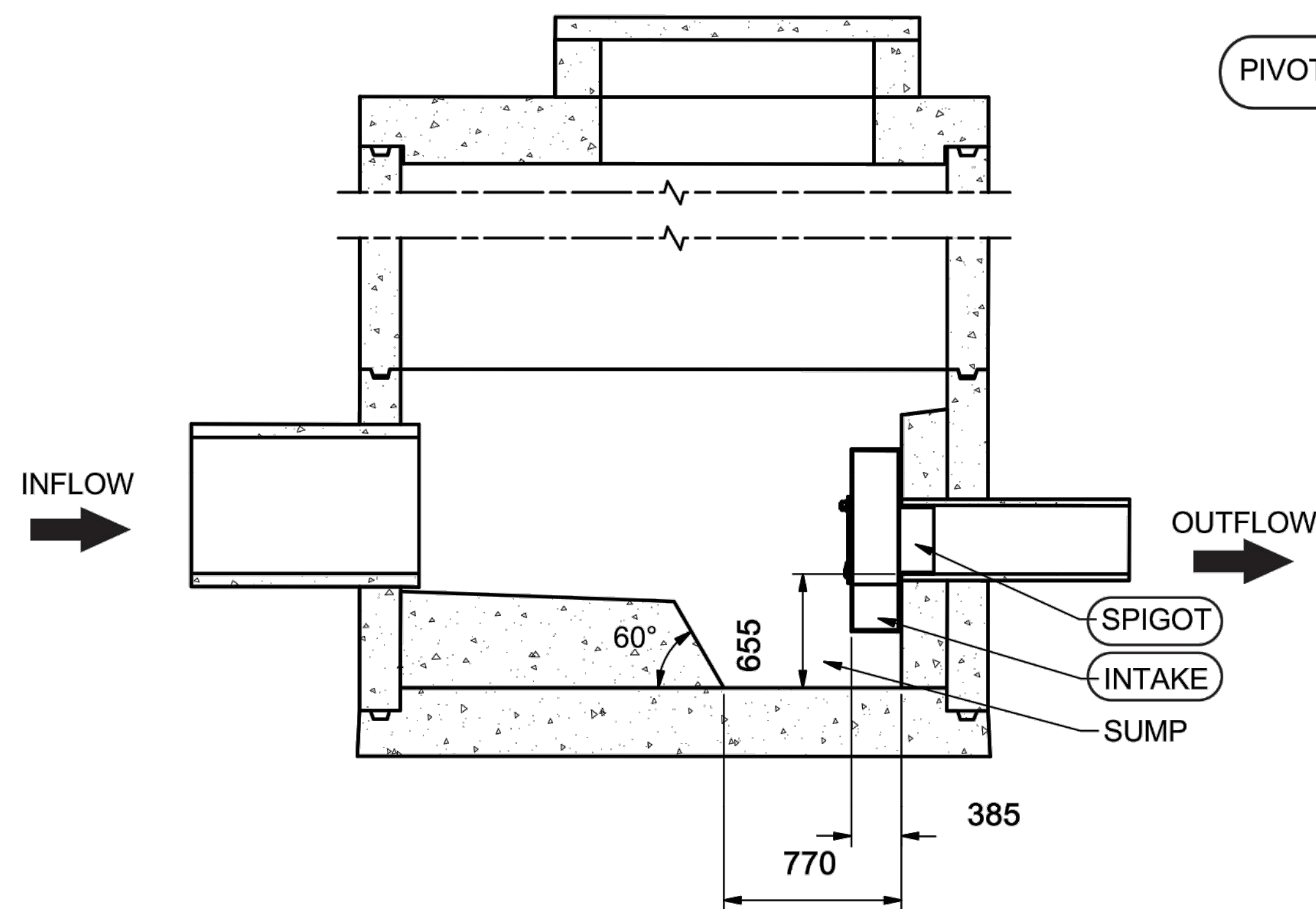
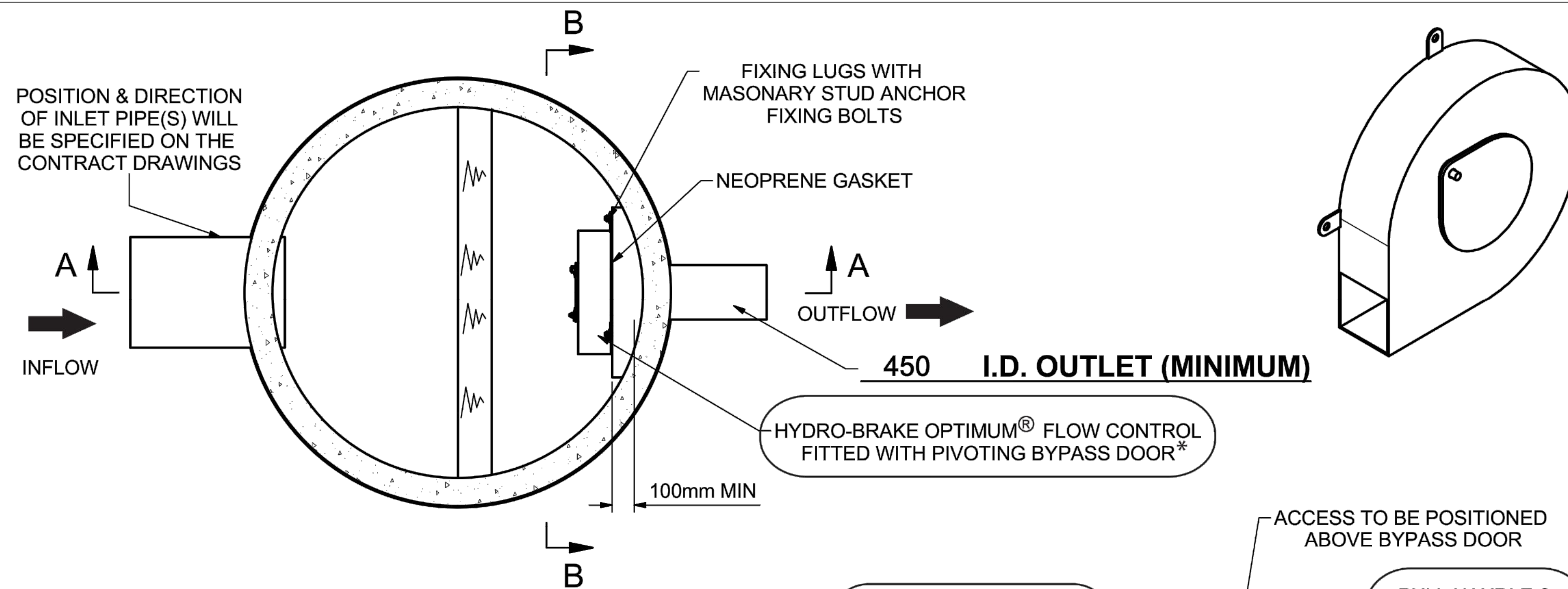
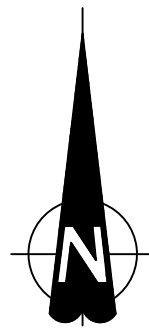
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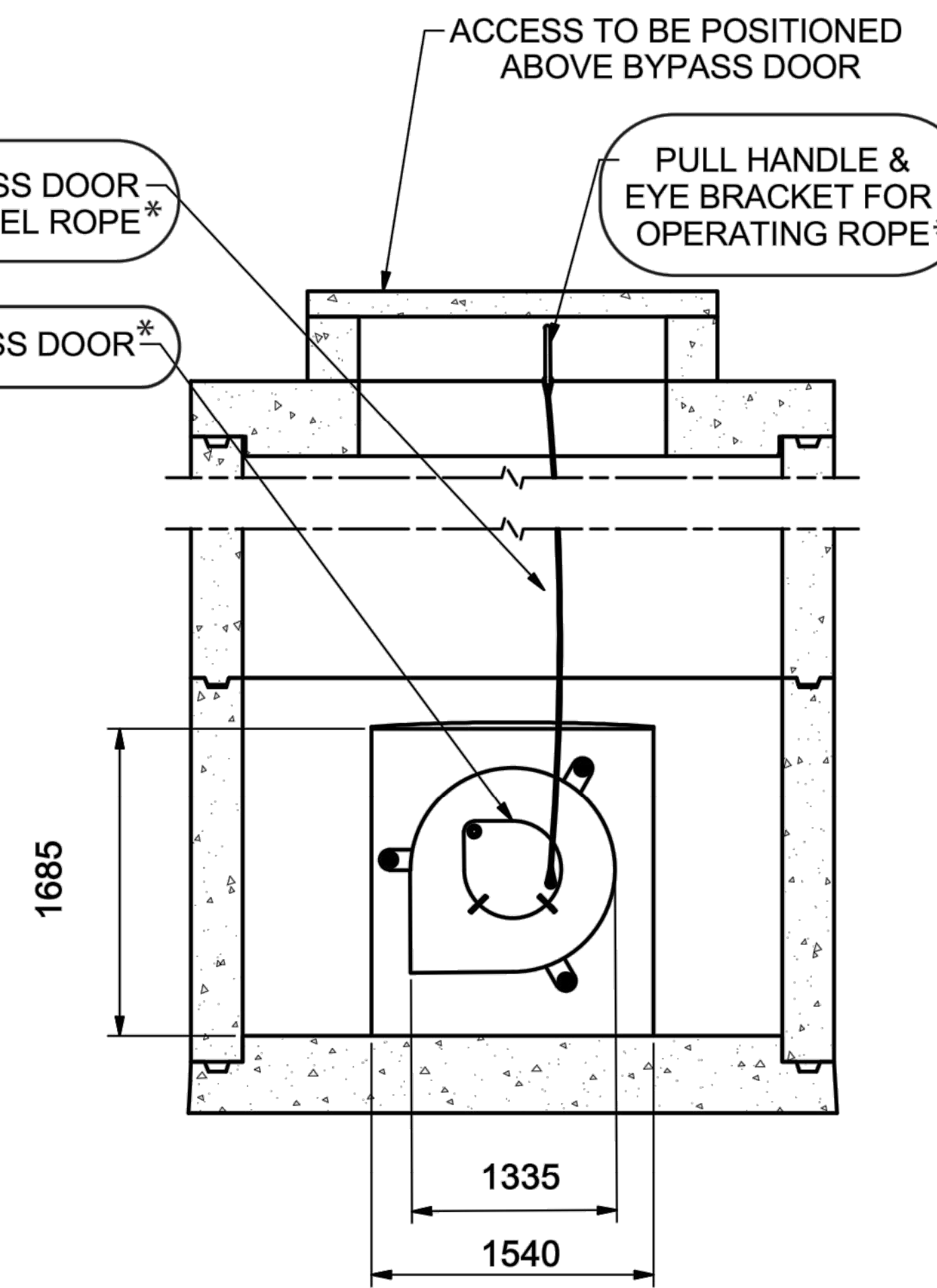
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SECTION A-A



SECTION B-B

IMPORTANT:  LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE OPTIMUM® FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW
CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

DO NOT SCALE FROM THIS DRAWING

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE IN METERS ABOVE ORDNANCE DATUM (AOD).
4. STANDARD DETAIL BASED ON HYDRO INTERNATIONAL DRAWING SHE-0380-9845-2000-9845.
5. HYDROBRAKE BASED ON 5 l/s DISCHARGE WITH 1.2 m HEAD DESIGN.
6. THE INVERT LEVEL OF THIS HYDROBRAKE HAVE TO BE AT 36.017 m (AOD)

A	First Issue	2011/11/17	AF	AN	GW
REVISION	DETAILS	DATE	DRAWN	CHECKED	APPROVED
CLIENT UNIT 22, THE ARTWORKS, ELEPHANT ROAD LONDON, SE17 1AY					
PROJECT FORMER GAS WORKS BUILDINGS GAS WORKS ROAD					
DRAWING TITLE HYDROBRAKE DETAIL STANDARD DETAIL					
DRG No.	LO10488-008	REV	A		
DRG SIZE	A1	SCALE	NTS	DATE	23/11/17
DRAWN BY	AF	CHECKED BY	AN	APPROVED BY	GW
BRIMINGHAM GLASGOW NEWCASTLE UPON TYNE CARDIFF GLASGOW SHEFFIELD CARLISLE LEIGH LONDON CROYDON EDINBURGH MANCHESTER STOKE-ON-TRENT TAUNTON					



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XP Solutions	Network 2016.1.1	

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)	2	PIMP (%)	100
M5-60 (mm)	18.800	Add Flow / Climate Change (%)	0
Ratio R	0.400	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

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
S1.000	3.368	0.022	150.0	0.001	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	2.716	0.018	150.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	3.664	0.024	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	0.996	0.007	150.0	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.004	8.915	0.059	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	4.874	0.292	16.7	0.012	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	3.148	0.021	150.0	0.002	5.00	0.0	0.600	o	150	Pipe/Conduit	
S2.001	5.616	0.491	11.4	0.006	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	7.555	0.362	20.9	0.006	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.000	3.266	0.022	150.0	0.008	5.00	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	5.07	37.250	0.001	0.0	0.0	0.0	0.82	14.5	0.2
S1.001	50.00	5.12	37.228	0.004	0.0	0.0	0.0	0.82	14.5	0.6
S1.002	50.00	5.20	37.210	0.004	0.0	0.0	0.0	0.82	14.5	0.6
S1.003	50.00	5.22	37.186	0.010	0.0	0.0	0.0	0.82	14.5	1.4
S1.004	50.00	5.40	37.179	0.010	0.0	0.0	0.0	0.82	14.5	1.4
S1.005	50.00	5.43	37.120	0.022	0.0	0.0	0.0	2.48	43.8	2.9
S2.000	50.00	5.06	37.340	0.002	0.0	0.0	0.0	0.82	14.5	0.3
S2.001	50.00	5.10	37.319	0.008	0.0	0.0	0.0	3.00	52.9	1.1
S3.000	50.00	5.06	37.190	0.006	0.0	0.0	0.0	2.21	39.1	0.8
S4.000	50.00	5.07	36.850	0.008	0.0	0.0	0.0	0.82	14.5	1.0

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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
S1.006	2.142	0.011	200.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.007	0.768	0.005	150.0	0.000	0.00	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)
S1.006	50.00	5.47	36.603	0.050	0.0	0.0	0.0	0.92	36.6	6.8
S1.007	50.00	5.49	36.017	0.050	0.0	0.0	0.0	0.82	14.5	6.8

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	38.000	0.750	Open Manhole	250	S1.000	37.250	150				
S2	38.000	0.772	Open Manhole	250	S1.001	37.228	150	S1.000	37.228	150	
S3	38.000	0.790	Open Manhole	250	S1.002	37.210	150	S1.001	37.210	150	
S4	38.000	0.814	Open Manhole	250	S1.003	37.186	150	S1.002	37.186	150	
S5	38.000	0.821	Open Manhole	250	S1.004	37.179	150	S1.003	37.179	150	
S6	38.000	0.880	Open Manhole	250	S1.005	37.120	150	S1.004	37.120	150	
S7	38.000	0.660	Open Manhole	250	S2.000	37.340	150				
S8	38.000	0.681	Open Manhole	250	S2.001	37.319	150	S2.000	37.319	150	
S9	38.600	1.410	Open Manhole	250	S3.000	37.190	150				
S10	37.600	0.750	Open Manhole	250	S4.000	36.850	150				
S11	37.860	1.257	Open Manhole	450	S1.006	36.603	225	S1.005	36.828	150	150
								S2.001	36.828	150	150
								S3.000	36.828	150	150
								S4.000	36.828	150	150
S12	37.860	1.843	Open Manhole	450	S1.007	36.017	150	S1.006	36.592	225	650
S13	37.870	1.858	Open Manhole	0		OUTFALL		S1.007	36.012	150	

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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	150	S1	38.000	37.250	0.600	Open Manhole	250
S1.001	o	150	S2	38.000	37.228	0.622	Open Manhole	250
S1.002	o	150	S3	38.000	37.210	0.640	Open Manhole	250
S1.003	o	150	S4	38.000	37.186	0.664	Open Manhole	250
S1.004	o	150	S5	38.000	37.179	0.671	Open Manhole	250
S1.005	o	150	S6	38.000	37.120	0.730	Open Manhole	250
S2.000	o	150	S7	38.000	37.340	0.510	Open Manhole	250
S2.001	o	150	S8	38.000	37.319	0.531	Open Manhole	250
S3.000	o	150	S9	38.600	37.190	1.260	Open Manhole	250
S4.000	o	150	S10	37.600	36.850	0.600	Open Manhole	250
S1.006	o	225	S11	37.860	36.603	1.032	Open Manhole	450
S1.007	o	150	S12	37.860	36.017	1.693	Open Manhole	450

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	3.368	150.0	S2	38.000	37.228	0.622	Open Manhole	250
S1.001	2.716	150.0	S3	38.000	37.210	0.640	Open Manhole	250
S1.002	3.664	150.0	S4	38.000	37.186	0.664	Open Manhole	250
S1.003	0.996	150.0	S5	38.000	37.179	0.671	Open Manhole	250
S1.004	8.915	150.0	S6	38.000	37.120	0.730	Open Manhole	250
S1.005	4.874	16.7	S11	37.860	36.828	0.882	Open Manhole	450
S2.000	3.148	150.0	S8	38.000	37.319	0.531	Open Manhole	250
S2.001	5.616	11.4	S11	37.860	36.828	0.882	Open Manhole	450
S3.000	7.555	20.9	S11	37.860	36.828	0.882	Open Manhole	450
S4.000	3.266	150.0	S11	37.860	36.828	0.882	Open Manhole	450
S1.006	2.142	200.0	S12	37.860	36.592	1.043	Open Manhole	450
S1.007	0.768	150.0	S13	37.870	36.012	1.708	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)
S1.007	S13	37.870	36.012	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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.800	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S12, DS/PN: S1.007, Volume (m³): 0.4

Unit Reference	MD-SHE-0103-5000-1200-5000
Design Head (m)	1.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	36.017
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	5.0
Flush-Flo™	0.354	5.0
Kick-Flo®	0.745	4.0
Mean Flow over Head Range	-	4.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.4	1.200	5.0	3.000	7.7	7.000	11.5
0.200	4.7	1.400	5.4	3.500	8.3	7.500	11.8
0.300	5.0	1.600	5.7	4.000	8.8	8.000	12.2
0.400	5.0	1.800	6.0	4.500	9.3	8.500	12.6
0.500	4.9	2.000	6.3	5.000	9.8	9.000	12.9
0.600	4.7	2.200	6.6	5.500	10.2	9.500	13.3
0.800	4.1	2.400	6.9	6.000	10.7		
1.000	4.6	2.600	7.2	6.500	11.1		

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Storage Structures for Storm

Cellular Storage Manhole: S12, DS/PN: S1.007

Invert Level (m) 36.017 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	12.0	0.0	0.801	0.0	0.0
0.800	12.0	0.0	1.843	0.0	0.0

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region England and Wales	Cv (Summer)	0.750	
M5-60 (mm)	18.800 Cv (Winter)	0.840	

Margin for Flood Risk Warning (mm)	600.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)

Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440	Summer and Winter
Return Period(s) (years)	1, 30, 100	
Climate Change (%)	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)
S1.000	S1	15 Winter	100	+30%					37.282
S1.001	S2	15 Winter	100	+30%					37.277
S1.002	S3	15 Winter	100	+30%					37.269
S1.003	S4	15 Winter	100	+30%					37.263
S1.004	S5	15 Winter	100	+30%					37.249
S1.005	S6	30 Winter	100	+30%					37.231
S2.000	S7	15 Winter	100	+30%					37.372
S2.001	S8	15 Winter	100	+30%					37.351
S3.000	S9	30 Winter	100	+30%					37.229
S4.000	S10	30 Winter	100	+30%	100/30 Winter				37.228
S1.006	S11	30 Winter	100	+30%	100/30 Winter				37.227
S1.007	S12	30 Winter	100	+30%	30/15 Summer				37.225

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap. (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.118	0.000	0.07	0.8	OK	
S1.001	S2	-0.101	0.000	0.22	2.4	OK	
S1.002	S3	-0.091	0.000	0.22	2.4	OK	
S1.003	S4	-0.073	0.000	0.52	5.7	OK	

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Flooded		Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)		
S1.004	S5	-0.080	0.000	0.44	5.7	OK	
S1.005	S6	-0.039	0.000	0.28	9.3	OK	
S2.000	S7	-0.118	0.000	0.10	1.1	OK	
S2.001	S8	-0.118	0.000	0.10	4.5	OK	
S3.000	S9	-0.111	0.000	0.07	2.5	OK	
S4.000	S10	0.228	0.000	0.30	3.2	FLOOD RISK	
S1.006	S11	0.399	0.000	0.74	21.3	SURCHARGED	
S1.007	S12	1.058	0.000	0.46	5.0	SURCHARGED	