

Our Reference : D4617-L-01

Date : 22nd January 2025

**Higher College Farm – Longridge
Foul & Surface Water Drainage Philosophy**

Introduction

PSA Design have been asked to undertake the detailed drainage design of a development at the Higher College Farm, Longridge. The design relates to Planning Application Reference - 3/2025/0653. The associated drainage condition is extracted and reproduced below.

Condition 17 - 3/2025/0653

No development shall commence in any phase until a detailed, final surface water sustainable drainage strategy for the site has been submitted to, and approved in writing by, the Local Planning Authority.

The detailed surface water sustainable drainage strategy shall be based upon the site-specific flood risk assessment and indicative surface water sustainable drainage strategy (October 2023 / 23.1384 / REFORD) submitted and sustainable drainage principles and requirements set out in the National Planning Policy Framework, Planning Practice Guidance and Defra Technical Standards for Sustainable Drainage Systems. No surface water shall be allowed to discharge to the public foul sewer(s), directly or indirectly

Proposed Design

The proposed foul and surface water drainage scheme is presented on the following drawings, contained in **Appendix A**:

D4617-D-01 – Rev P1 – Proposed Foul and Surface Water Drainage Layout

D4617-D-02 – Rev P1 – Proposed Foul and Surface Water Drainage Layout – Typical Details

As conditioned, the scheme has been designed in accordance with the approved drainage strategy quoted above.

Surface Water Philosophy

Surface water from the site has been design with an outfall into a private 225mm diameter surface water pipe that currently serves Higher College Farm. This pipe network has been surveyed and found to be in good condition with ultimate outfall into open watercourse immediately south of the site.

As per the approved strategy, flows have been restricted to 10.2l/s via the introduction of a HydroBrake flow control chamber with associated upstream cellular storage.

The entire system has been modelled in Causeway FLOW software for the requisite storms set out below.

- (i) 100% (1 in 1-year) annual exceedance probability event;
- (ii) 3.3% (1 in 30-year) annual exceedance probability event + 40% climate change allowance.
- (iii) 1% (1 in 100-year) annual exceedance probability event + 50% climate change allowance

The models, presented in **Appendix B** demonstrate flows are maintained below 10.2l/s during all storm events, with zero surcharging during the 1 in 1yr and zero flooding during the 1 in 30yr + 40%cc. Some nominal amounts of flooding occur from 5 inspection chambers during the 1 in 100yr + 50% event, however, this is to be expected as the small chambers are engulfed. However, the proposed levels have been designed such that overland surface water flood flows are channelised along the roads and car parks, away from building thresholds. Flood flows would naturally accumulate in parking areas adjacent to kerb lines before overtopping into surrounding permeable landscape and planting areas. Drawing D4617-D-03 is an overland flood flow route plan, which is included in **Appendix A**. Contributing areas associated with the model are also included in **Appendix A** as drawing D4617-D-04, with the total drained area measuring 7650m².

Whilst in our engineering judgement we envisage the 225mm dia. outfall pipe would allow free flow of the 10.2l/s from our proposed site, for robustness we have also modelled the 1 in 100yr + 50% cc event against the outfall manhole being surcharged to cover level. These model results are included

within **Appendix C**. The results again show a nominal amount of flooding from a few inspection chambers, very similar to the corresponding non-surcharged event. The 1 in 30yr + 40% CC model demonstrates zero flooding during the same event.

The surface water drainage system includes silt trap manholes, there are also proprietary silt traps in all channel drain outfalls and the flow control chamber. The Polystorm storage system has been specified with Polystorm inspect unit to enable full CCTV inspection and jetting if required.

An appropriately sized Class 1 Bypass Oil Interceptor has also been included to ensure water quality is suitable for discharge direct to watercourse.

Operation and maintenance of the system is conditioned separately and will therefore be addressed under separate document

Foul Drainage

Foul drainage is shown discharging to the same outfall as the surface water via a suitably sized sewage treatment plant.

Consideration was given to connection into a UU foul sewer on the site, however, it was systematically ruled out for engineering and financial reasons.

A UU predevelopment enquiry was processed, the results of which requested the nearest point of connection would be to the adopted foul sewer at the junction of Lower Lane and Lower Road. This is over 130m (as the crow flies) to the most north-westerly corner of the application site. The application site itself falls from north to south by circa 3m.

A connection into the UU adopted sewer would require a rising main over 330m in length, 130m of which would be under adopted highway. The developer wants a private drainage system, which would not be allowed under an adopted highway. The associated costs of laying an adopted pumping station and rising main under Lower Road would be cost prohibitive to the development when considered in relation to the proposed foul loadings.

Calculations in accordance with Flows and Load indicate the development would generate a peak foul loading of 3.2m³ per day. Flows of less than 5m³/day fall under the general binding rules and thus don't require any specific permit requirements.

It would be the responsibility of the owner of the site and treatment plant to ensure that the general binding rules are adhered to in perpetuity.

Each unit has 1 WC, 1 sink and 1 Basin. In consultation with WTE Ltd (specialists in sewage treatment plants) a Cyclone GRP 75 has been specified which has adequate capacity to meet the treatment requirements for discharge to watercourse. Importantly, unlike some treatment plants on the market, the Cyclone GRP systems can operate efficiently on sites with fluctuating use, which will be ideal for this scenario as it would be very rare that the units are at peak occupancy.

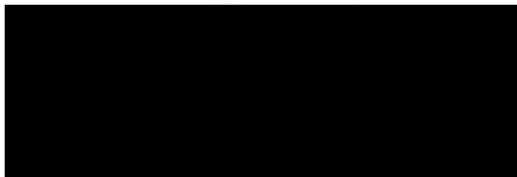
An inspection chamber is specified immediately downstream of the treatment plant to allow for sampling and monitoring.

Conclusion

The drainage system has been designed to meet with the principles set out and approved in the submitted drainage strategy. Calculations are provided within this document to demonstrate that it has been appropriately sized to meet with those requirements.

We trust that the above report, together with associated background, design and calculations meet with your approval and demonstrate an acceptable foul and surface water drainage solution.

Yours sincerely,

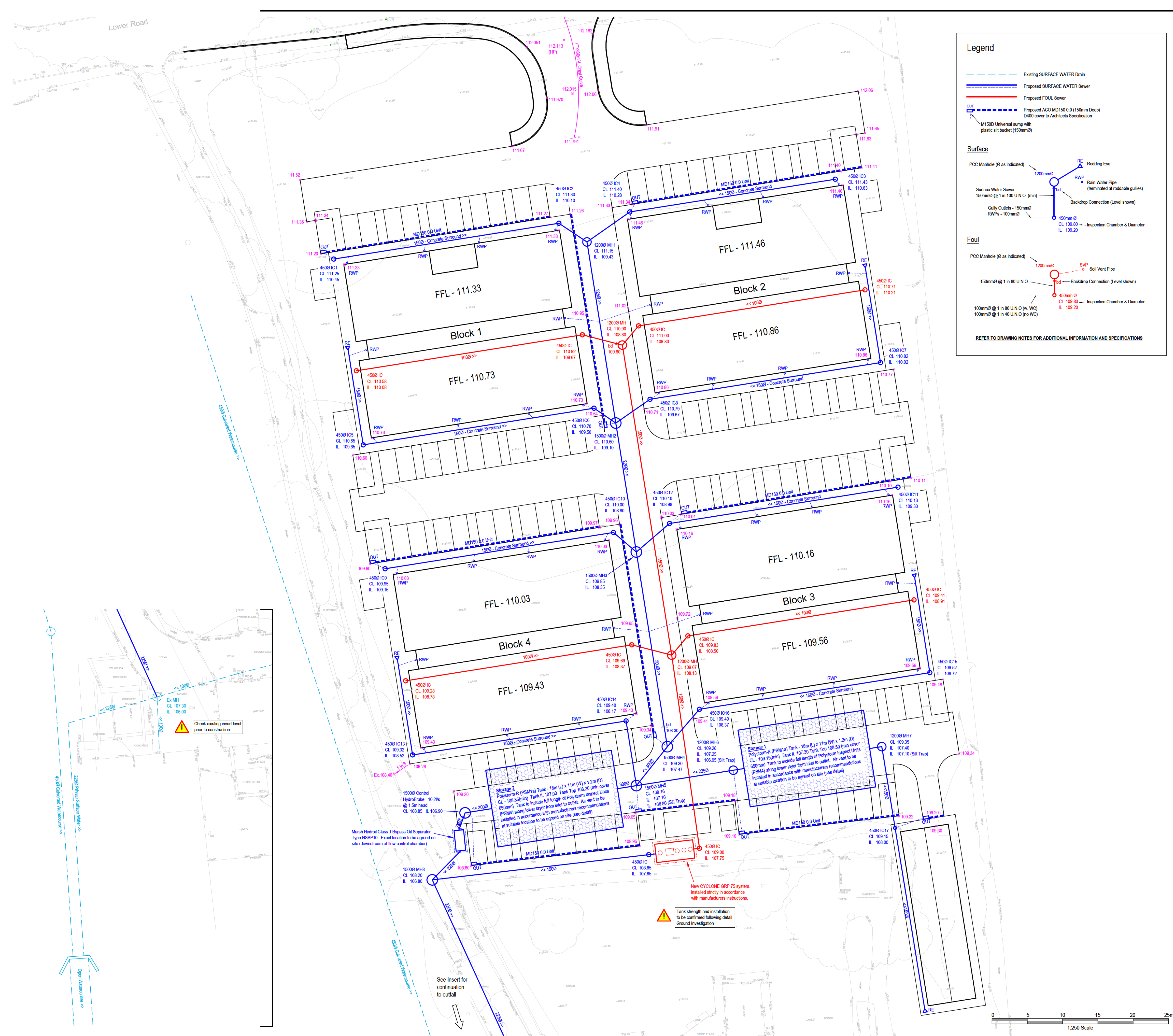


Graham Sanderson

Director, PSA Design Ltd.

Appendix A

Scheme Drawings



Legend

Existing SURFACE WATER Drain
Proposed SURFACE WATER Sewer
Proposed FOUL Sewer
Proposed ACO MD150 0.0 (150mm Deep)
D400 cover to Architects Specification
M1500 Universal sump with plastic silt bucket (150mmØ)

Surface

POC Manhole (Ø as indicated)
Surface Water Sewer 150mmØ @ 1 in 100 U.N.O. (min)
Gully Outlets - 150mmØ RWP's - 100mmØ
1200mmØ
RE Rodding Eye
Rain Water Pipe (terminated at roddable gullies)
Backdrop Connection (Level shown)
450mm Ø CL 109.80 IL 109.20
Inspection Chamber & Diameter

Foul

POC Manhole (Ø as indicated)
150mmØ @ 1 in 80 U.N.O.
100mmØ @ 1 in 80 U.N.O. (w. WC)
100mmØ @ 1 in 40 U.N.O. (no WC)
1200mmØ
SVP Soil Vent Pipe
Backdrop Connection (Level shown)
450mm Ø CL 109.80 IL 109.20
Inspection Chamber & Diameter

REFER TO DRAWING NOTES FOR ADDITIONAL INFORMATION AND SPECIFICATIONS

- Notes**
- Do not scale from this drawing, work to levels and dimensions shown, if not available refer to notes, if in doubt, refer to Engineer.
 - The Engineer shall be notified immediately, in writing, should any errors or discrepancies be found prior to to be commencement or continuation of any works.
 - Drawing to be read in conjunction with all other scheme drawings and relevant specifications.
 - Contractor to be responsible for the location and protection of all existing services.
 - Work to be undertaken in accordance in accordance with Design and Construction Guidance for foul and surface water sewers (App Ver 2.3) and Building Regulations - Document H.
 - Any existing drains encountered on site during construction (not picked up on the drawing) should be reported to the Engineer immediately.
 - All drains to be laid soffit to soffit unless otherwise indicated.
 - Cover levels shown are approximate only and should be altered to suit finished surface levels.
 - Minimum depth of cover to crown of pipe without protection should be as follows:
0.35m - Gardens and Pathways with no vehicular loading
0.50m - Driveways, Parking Areas and Narrow Accesses with height restrictions to prevent entry by vehicles with a gross weight in excess of 7.5 tonnes
0.9m - Driveways, Parking Areas and Narrow Accesses with limited access to vehicles with a gross weight in excess of 7.5 tonnes. Agricultural land and public open space.
1.2m - Other Highways and Parking Areas with unrestricted access to vehicles with a gross weight in excess of 7.5 tonnes
 - All rainwater pipes (RWP) and Yard Gullies to be terminated at roddable gullies connected to a minimum 100mm dia. drain.
 - Unless stipulated otherwise or invert levels are provided, all surface water pipes to be minimum 100mm dia. laid at 1 in 100. Foul sewers to be minimum 100mm dia laid at 1 in 80 (1 in 40 if no WC connected).
 - Proposed POC Manholes & Inspection Chambers and access points are to be as those defined in Design and Construction Guidance for foul and surface water sewers (App Ver 2.3). MH & IC diameters specified are minimum diameters and if necessary should be increased to accommodate minimum benching widths.
 - <800Ø diameter IC's > 1.0m deep to include reducing ring to reduce opening to max 350mm Ø
 - Drainage subject to vehicle loading - Pipes up to 300mmØ to be structured wallled PVCu (comply with the relevant provisions of BS EN 13476-1 and BS EN 13476-2 or BS EN 13476-3) or Clay (complying with the relevant requirements of BS EN 295-1 and BS 65). Pipes greater than 300Ø to be Concrete (complying with BS 5911-1 and BS EN 1916). All pipes to be in accordance with Design and Construction Guidance for foul and surface water sewers (App Ver 2.3).
 - All MH and IC chamber covers to be suitable for intended vehicle loading (i.e. D400 in areas subject to heavy vehicle loading, C250 standard vehicle loading, B125 light vehicle loading and A15 pedestrian only loading).
 - All other drainage to be in accordance with Building Regulations - Document H.
 - Any drains passing through brick footings are to have r.c. lintels over and flexible joints either side. All drainage passing through external walls to have cement fibre sheet collars provided either side of wall to prevent vermin entry.
 - Where drain is within 1m of a building, the trench is filled with concrete up to the underside of the foundations and where the trench is further away than 1m from the building, the trench is filled with concrete to a level below the lowest level for the building equal to the distance from the building, less 150mm.
 - Drainage indicated on drawing around buildings spaced out for illustrative purposes, exact positions of drains may be altered to suit and determined on site prior to commencement of work (subject to maintaining minimum gradients and cover). Any revisions are to be subject to the approval of the Building Inspector and Structural Engineer.
 - Any proposed soil or surface water pipes not picked up on the drawing to be reported to the Engineer immediately. Additional connections to be approved with Engineer and or Building Inspector prior to construction.
 - All outfall levels and existing pipe levels should be checked prior to construction to ensure the design is deliverable and no clashes occur. Contractor to report any discrepancies to Engineer immediately.
 - All building drainage up to connection into chambers shown to be as per Architects Building Regulations drawings.
 - Upon completion of the proposed drainage works, the contractor should arrange for all systems, including interfaces with existing pipes and manholes, to be levelled and CCTV surveyed and results provided to engineer for review.

Attenuation and Flow Control

- Attenuation tank(s) to be a Polystorm-R (PSM1a) system (or similar approved) suitable for installation at depths indicated (check with manufacturer prior to ordering). Unit size - 18.0m (L) x 11.0m (W) x 1.2m (D). Tank to be encapsulated in an impermeable geosynthetic and include a single width Polystorm Inspect Unit (PSM4) laid along entire length of lower layer, from inlet to outlet. Minimum cover should be checked with manufacturer when ordering to ensure unit is capable of withstanding proposed loading requirements at depths shown. Formation level to achieve CBR of 3-5%. **System to be fitted with all necessary vents** and constructed strictly in accordance with manufacturers guidelines.
- Flow Control Manhole to be fitted with Hydro-Brake Optimum® Flow Control Unit "SHE-0140-1020-1500-1020" based on maximum flow of 10.2l/s at 1.50m head. Manhole to be pre-cast or constructed in accordance with manufacturers guidelines.

Channel Drains

- Channel drains to be ACO MD150 (0.0 Units).
- Covers to be in accordance with Architects specification and suitable for intended loading.
- Units to be installed as per ACO's standard details. If in doubt, refer to Engineer.

Oil Interceptor

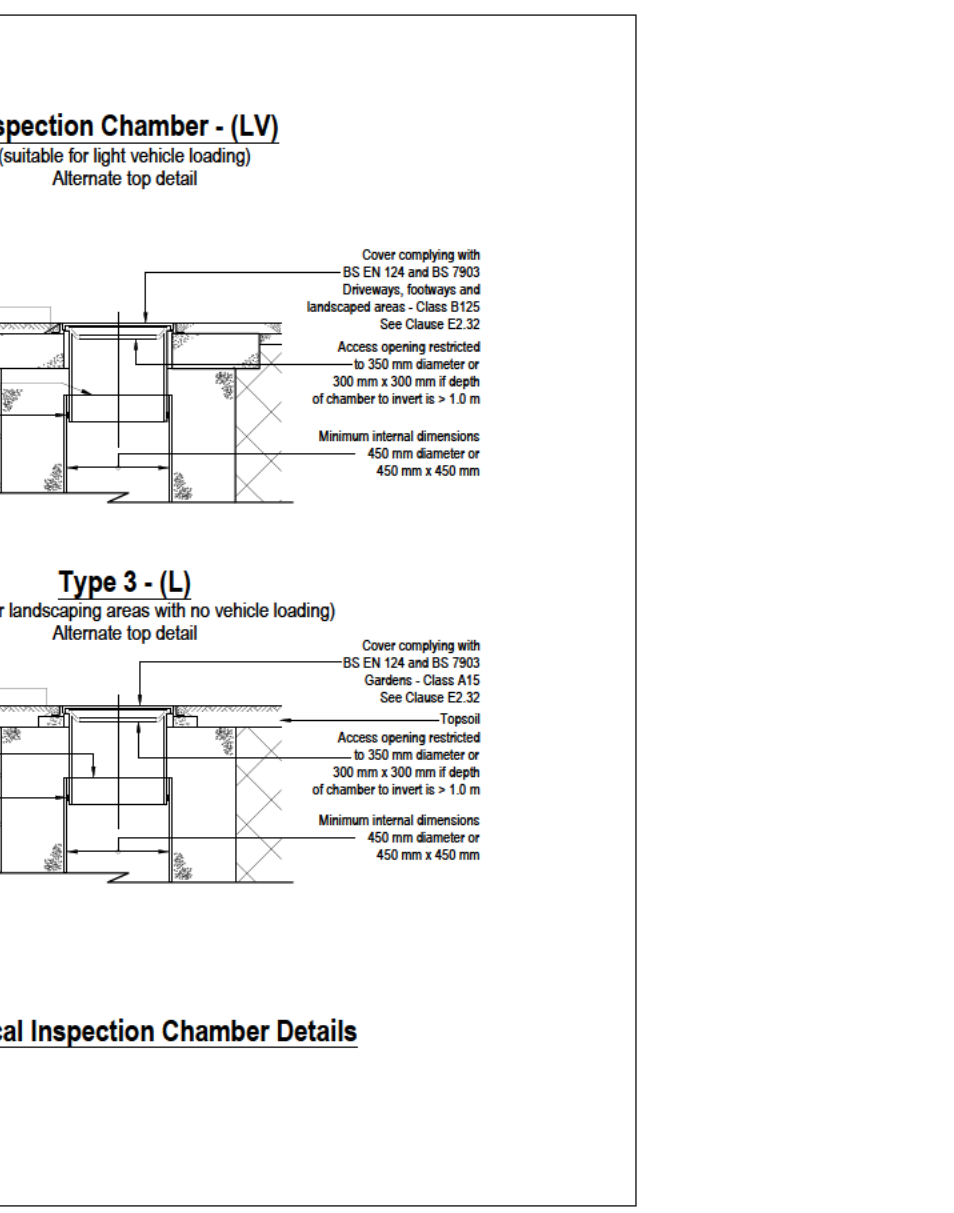
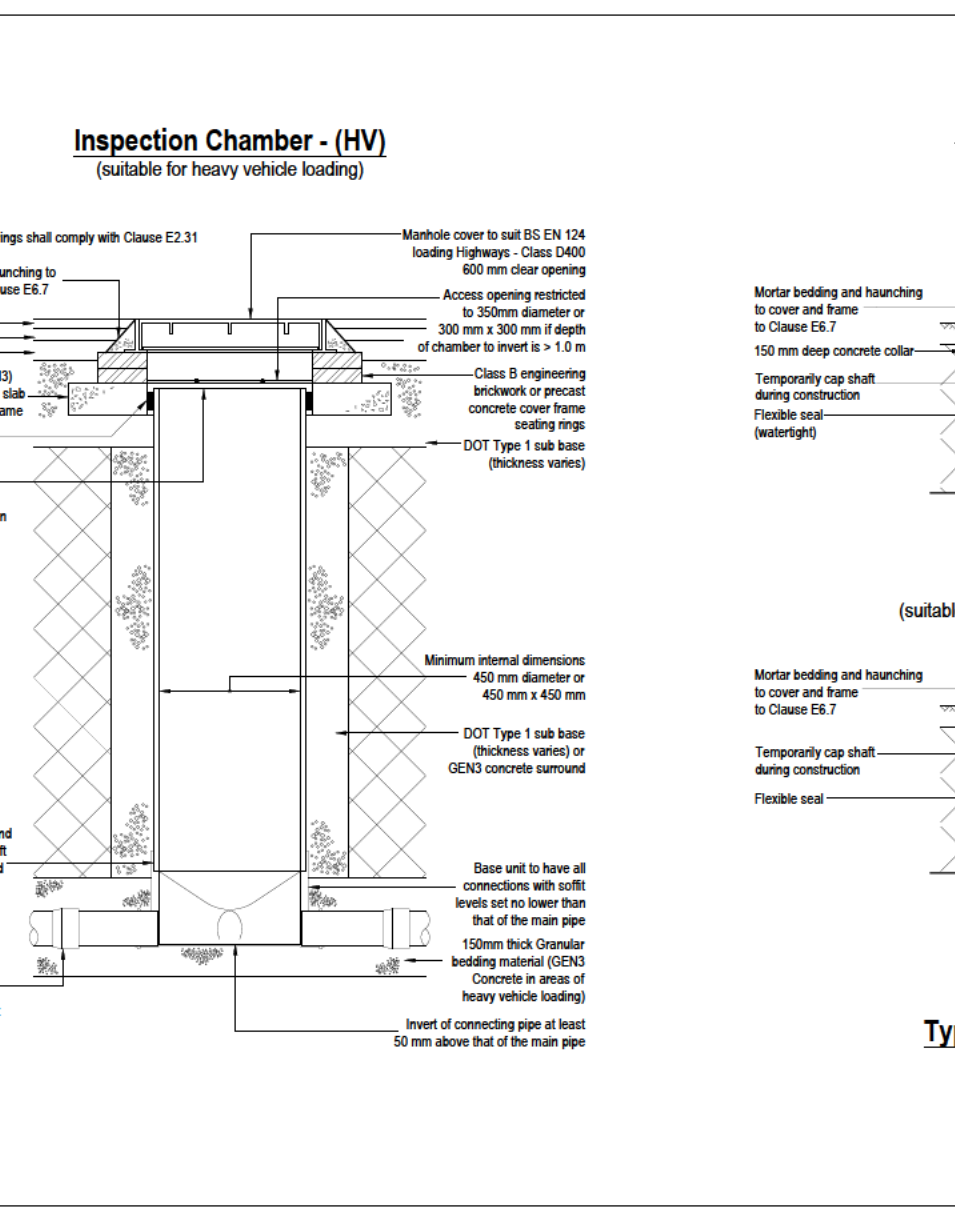
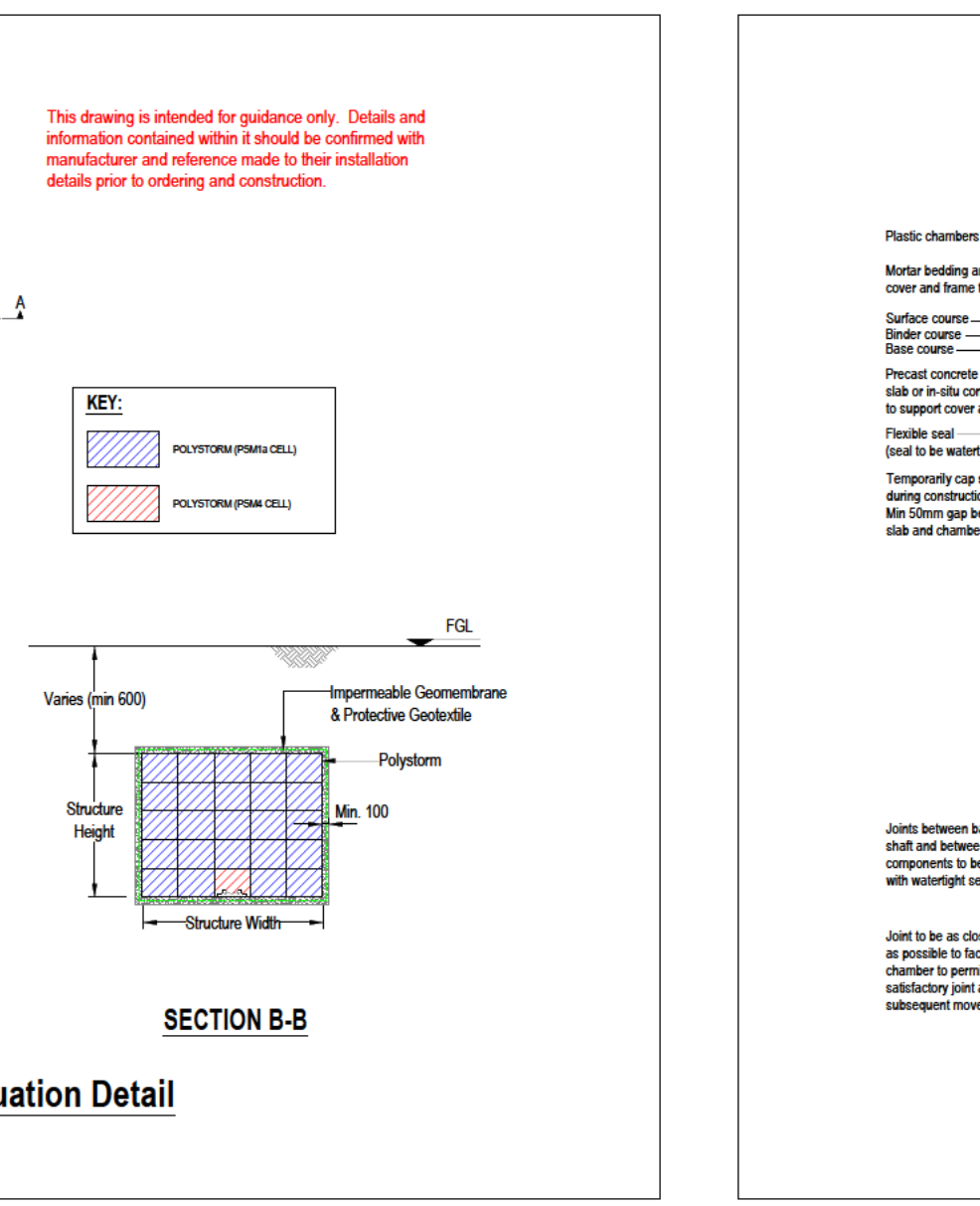
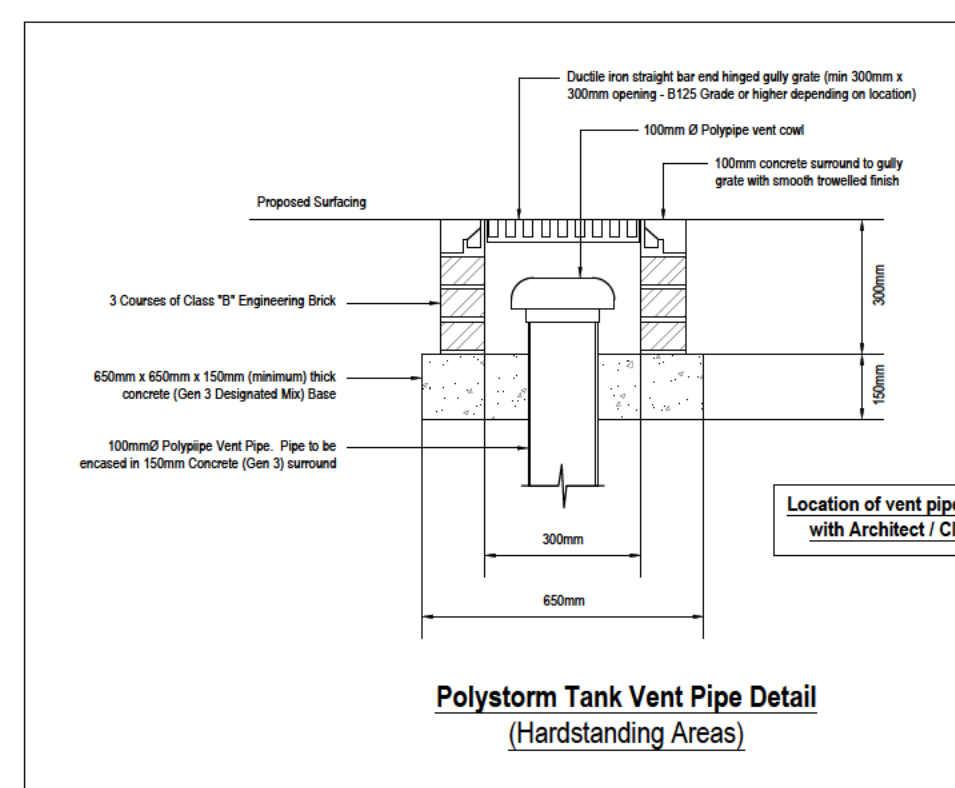
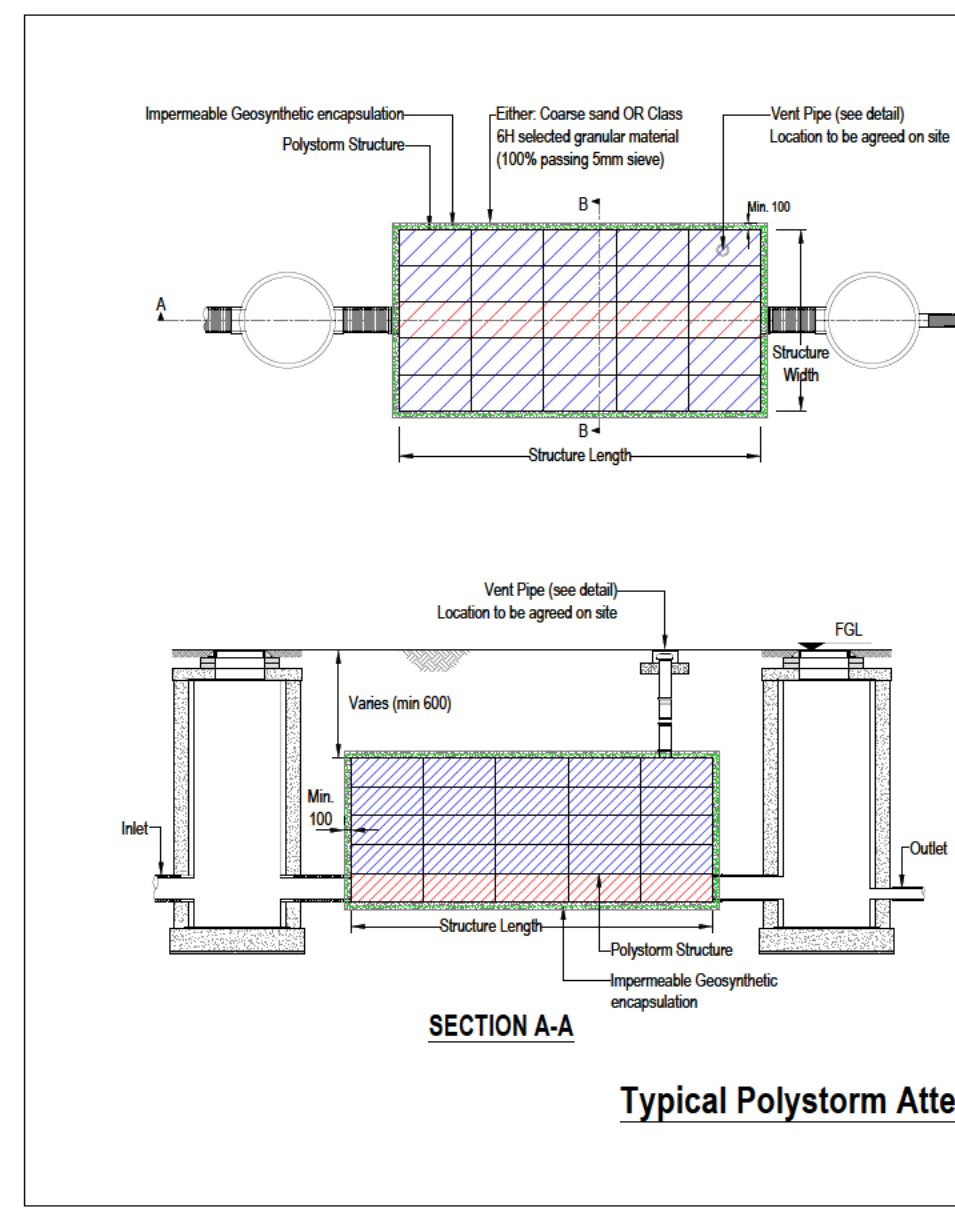
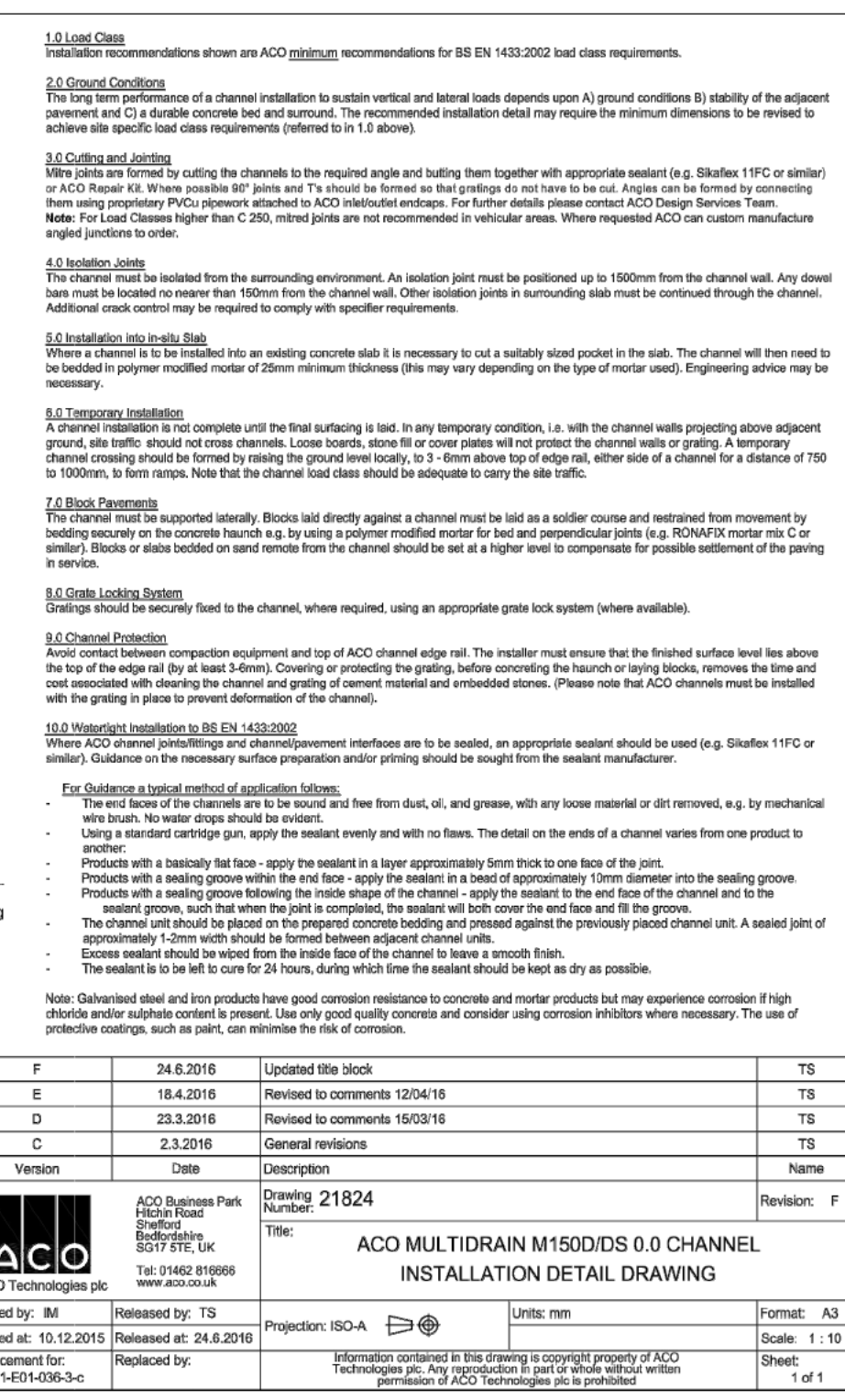
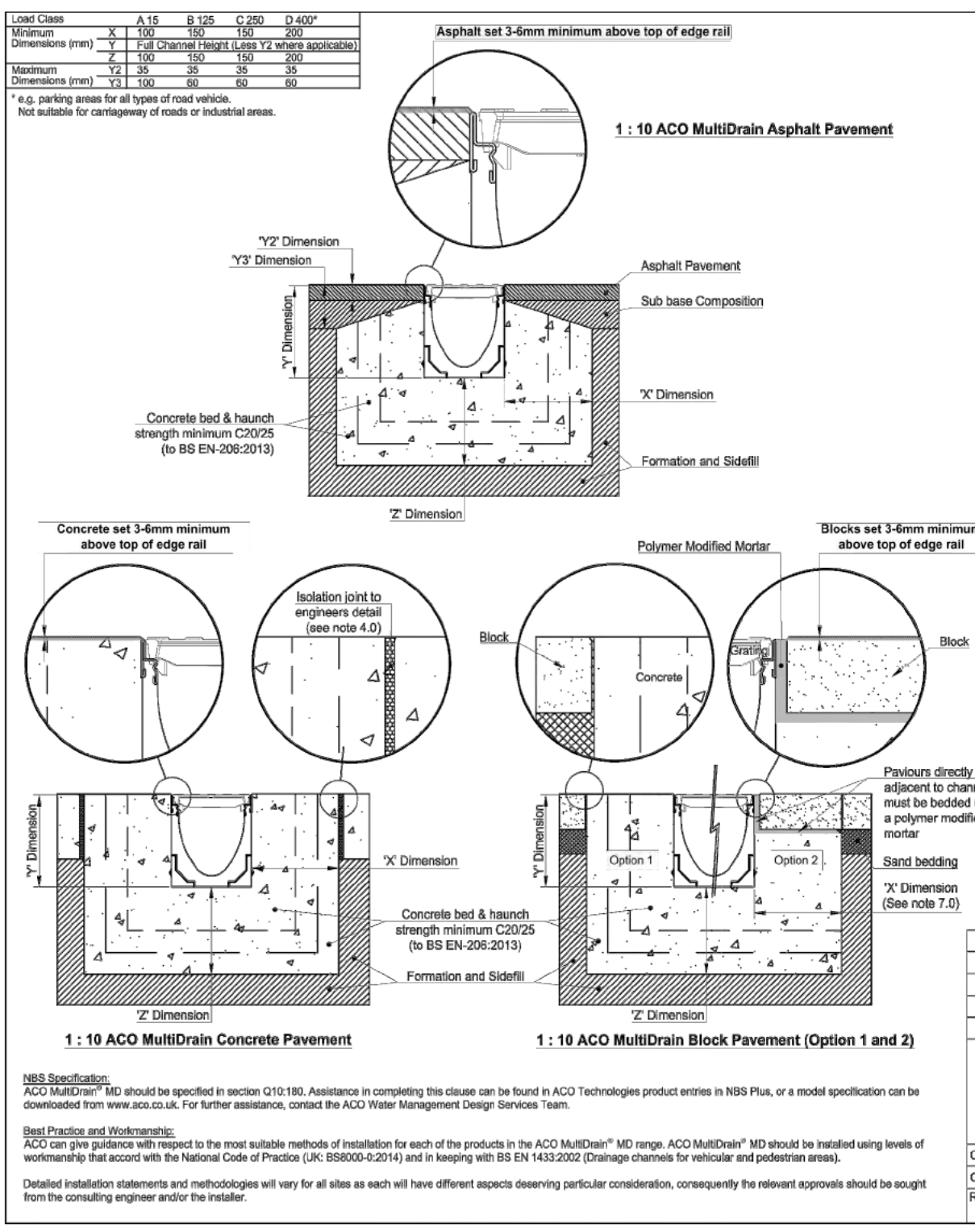
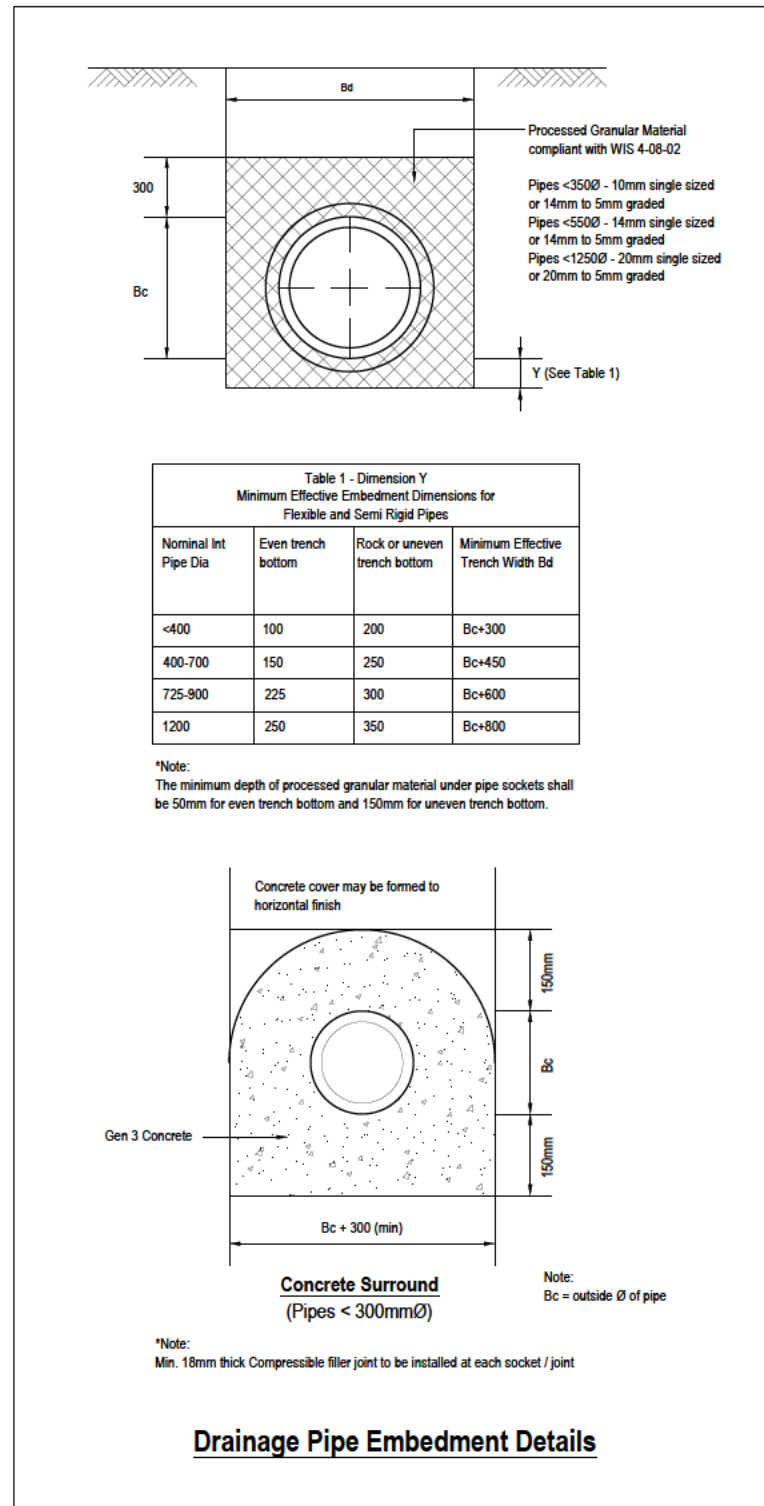
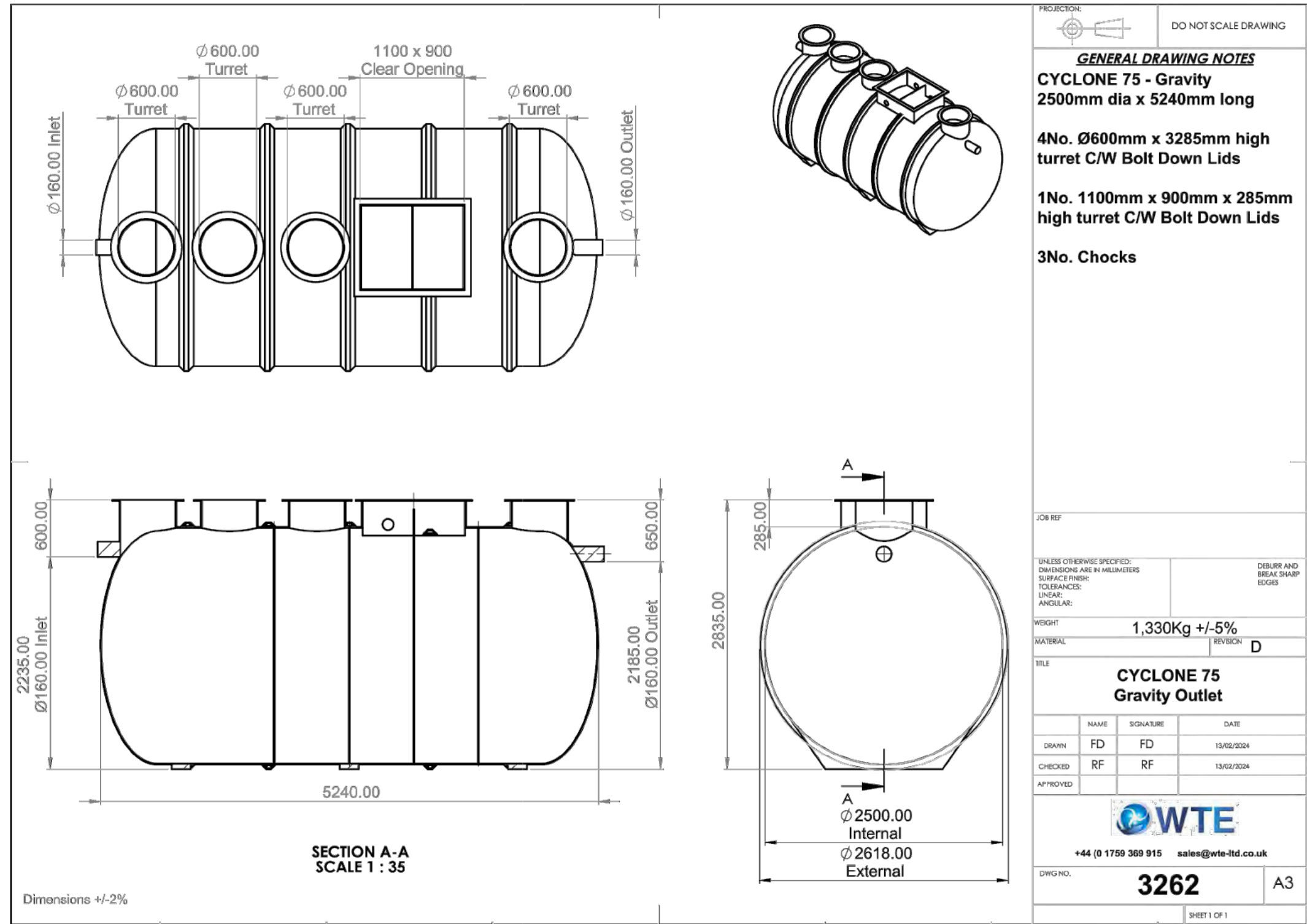
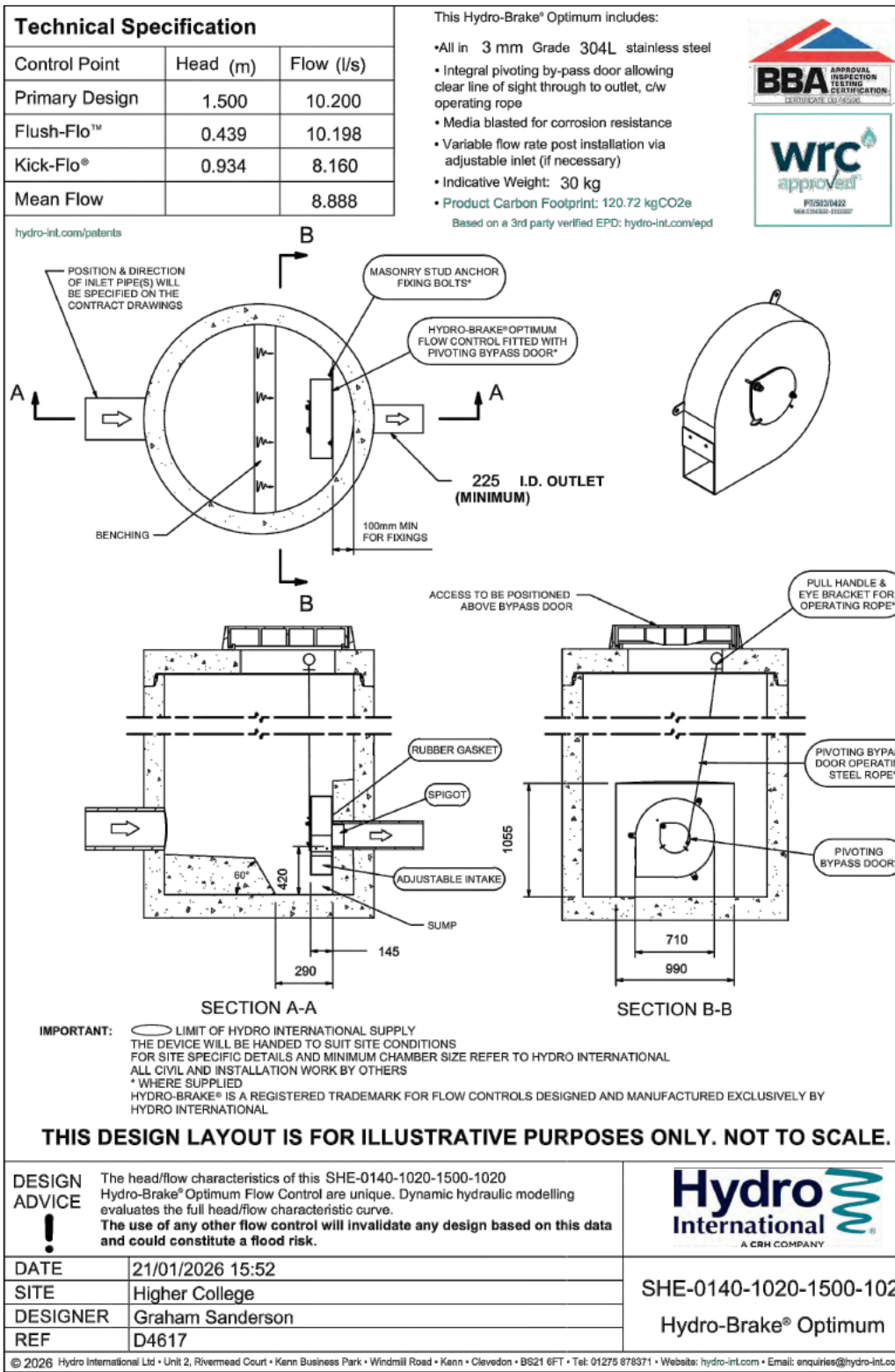
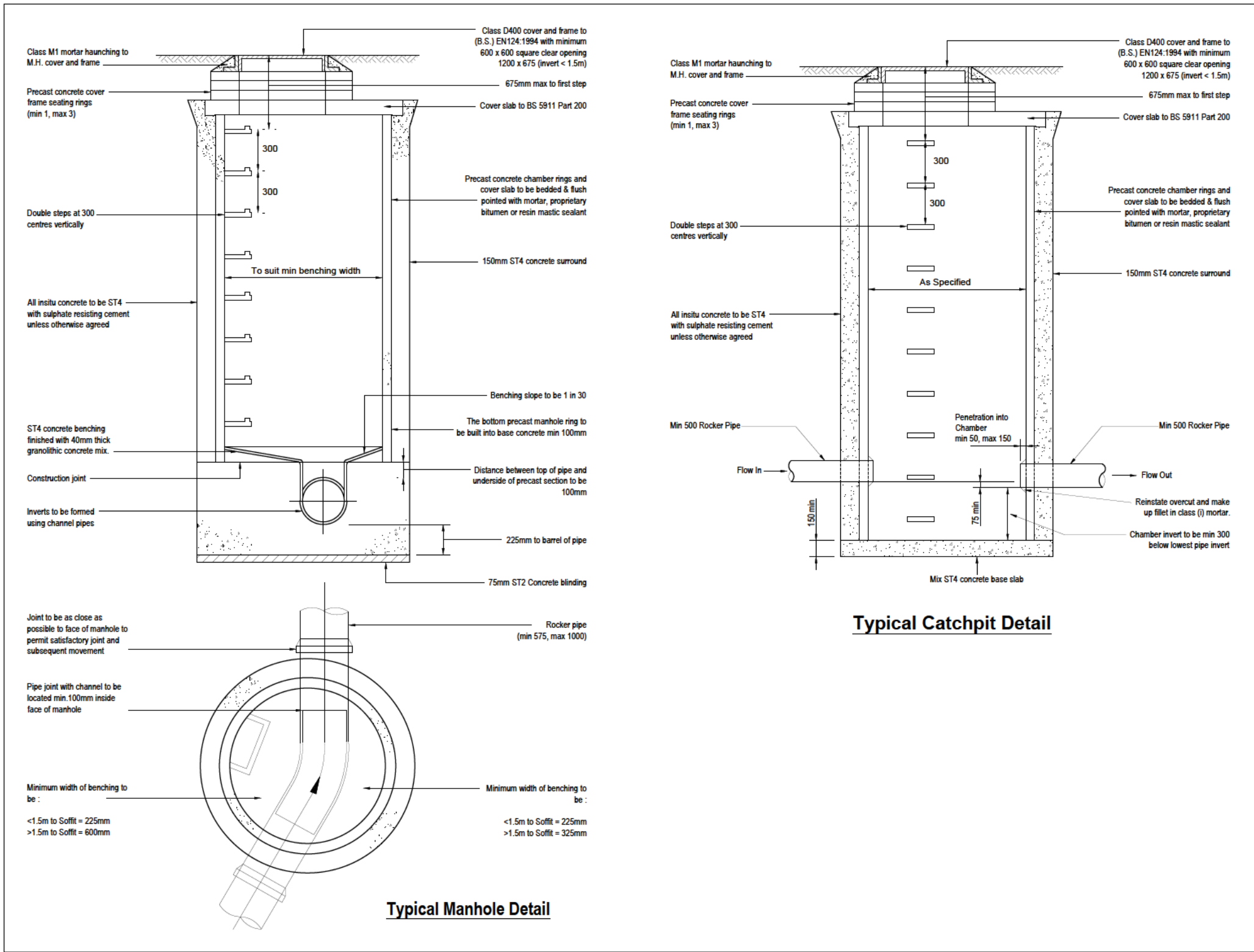
- Oil Interceptor to be Marsh Industries "Hydroil Class 1 Bypass Separator" Type NSBP10, fitted downstream of control manhole.
- System to be checked with manufacturer for suitability prior to order and any discrepancy to be reported to Engineer prior to purchasing. System to be installed strictly in accordance with manufacturers recommendations.

Sewage Treatment

- Sewage treatment plant to be CYCLONE GRP 75 unit. System to be fitted with all necessary sample chambers and alarms as required and recommended by manufacturer.
- Unit to be installed and maintained strictly in accordance with manufacturers guidelines. Tank strength and installation to be confirmed following detail Ground Investigation
- Invert levels shown relate to pipe invert levels NOT treatment plant base levels.
- Total loadings calculated based on industrial site (Flows & Loads 4). Maximum peak site occupancy at any one time calculated at 64 people. Therefore 64 x 50 litres / person / day = 3200 litres or 3.2m³. Loadings therefore fall within the general binding rules and permit is not required.

Please read all notes carefully - Refer to drawing D4095-D-02 for typical details

P1	22/01/26	For Approval	GS	DLW	GS
REV	DATE	AMENDMENT DETAILS	DRAWN	CHECKED	APPROVED
Eco Providers					
Land at Higher College Farm, Longridge			Drwg No.	Rev.	
Proposed Foul & Surface Water Drainage			D4617-D-01	P1	
			Scale	Sheet Size	
			1:250	A1	
PSA Design Ltd The Old Bank House, 6 Berry Lane, Longridge, Preston, PR3 3JA			Date	22 January 2026	
			Drawn	Checked	Approved
			GS	DW	GS



Refer to drawing D4617-D-01 for layout & associated notes

Sewage Treatment Plant detail provided by WTE for reference only. Tank to be installed strictly in accordance with WTE "CYCLONE Installation Manual" Rev V4 (at the time of drawing production). Contractor to liaise with WTE as necessary prior to construction.

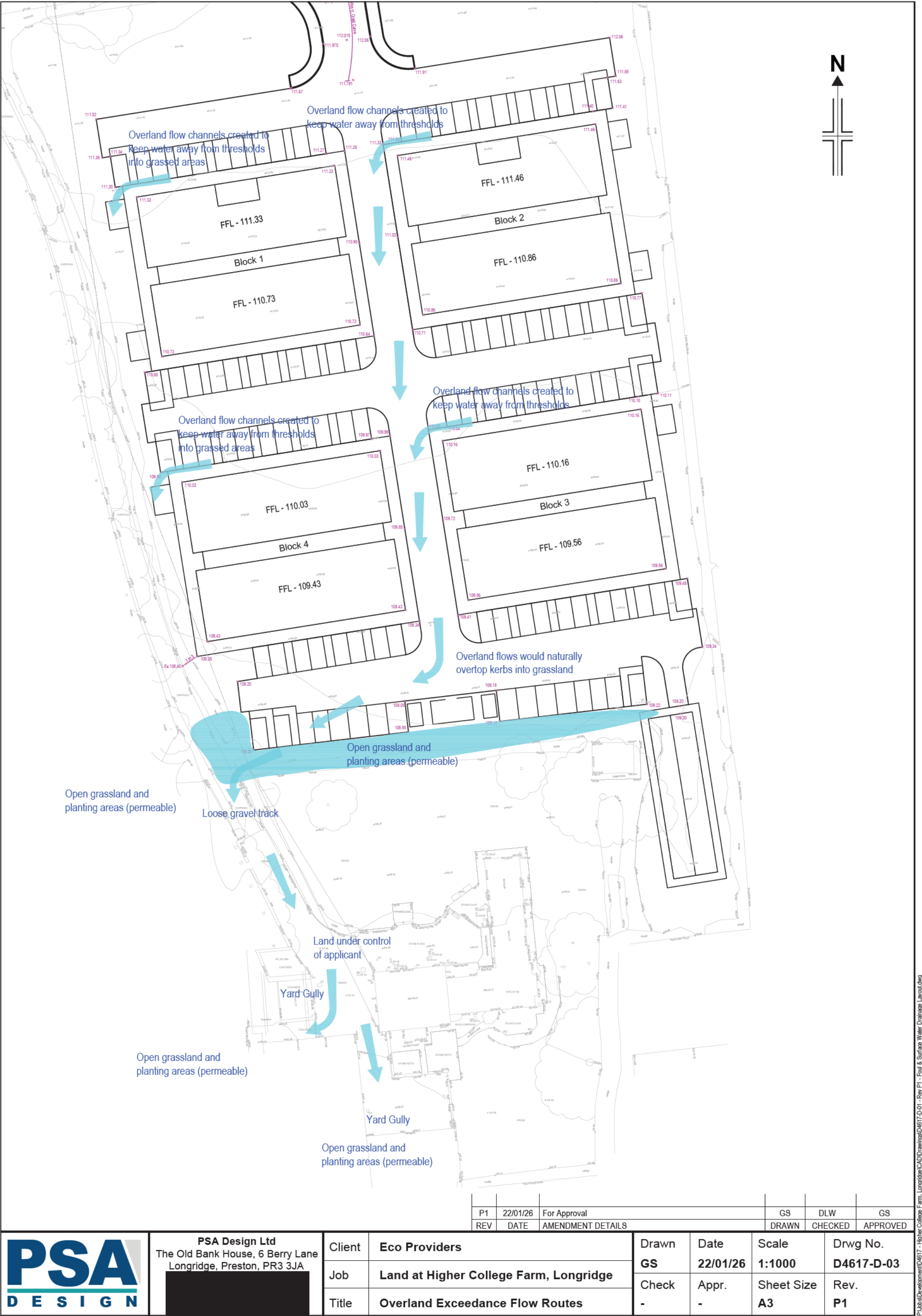
ACO Detail reproduced from ACO Standard Detail. System to be installed strictly in accordance with manufacturers guidelines

Polystorm attenuation system to be fitted with all necessary vents and constructed strictly in accordance with manufacturers guidelines

Hydro-Brake® Chamber Detail reproduced from Hydro International Standard Detail. System to be installed strictly in accordance with manufacturers guidelines.

P1	22/01/26	For Approval	GS	DLW	GS
REV	DATE	AMENDMENT DETAILS	DRAWN	CHECKED	APPROVED

Eco Providers			Drwg No.		Rev.	
Land at Higher College Farm, Longridge			D4617-D-02		P1	
Proposed Foul & Surface Water Drainage Typical Details			Scale		Sheet Size	
			N.T.S.		A1	
			Date		22 January 2026	
			Drawn		Checked	
			GS		GS	



P1	22/01/26	For Approval	GS	DLW	GS
REV	DATE	AMENDMENT DETAILS	DRAWN	CHECKED	APPROVED



PSA Design Ltd
The Old Bank House, 6 Berry Lane
Longridge, Preston, PR3 3JA

Client	Eco Providers
Job	Land at Higher College Farm, Longridge
Title	Overland Exceedance Flow Routes

Drawn	Date	Scale	Drwg No.
GS	22/01/26	1:1000	D4617-D-03
Check	Appr.	Sheet Size	Rev.
-	-	A3	P1



P1	22/01/26	For Approval	GS	DLW	GS
REV	DATE	AMENDMENT DETAILS	DRAWN	CHECKED	APPROVED

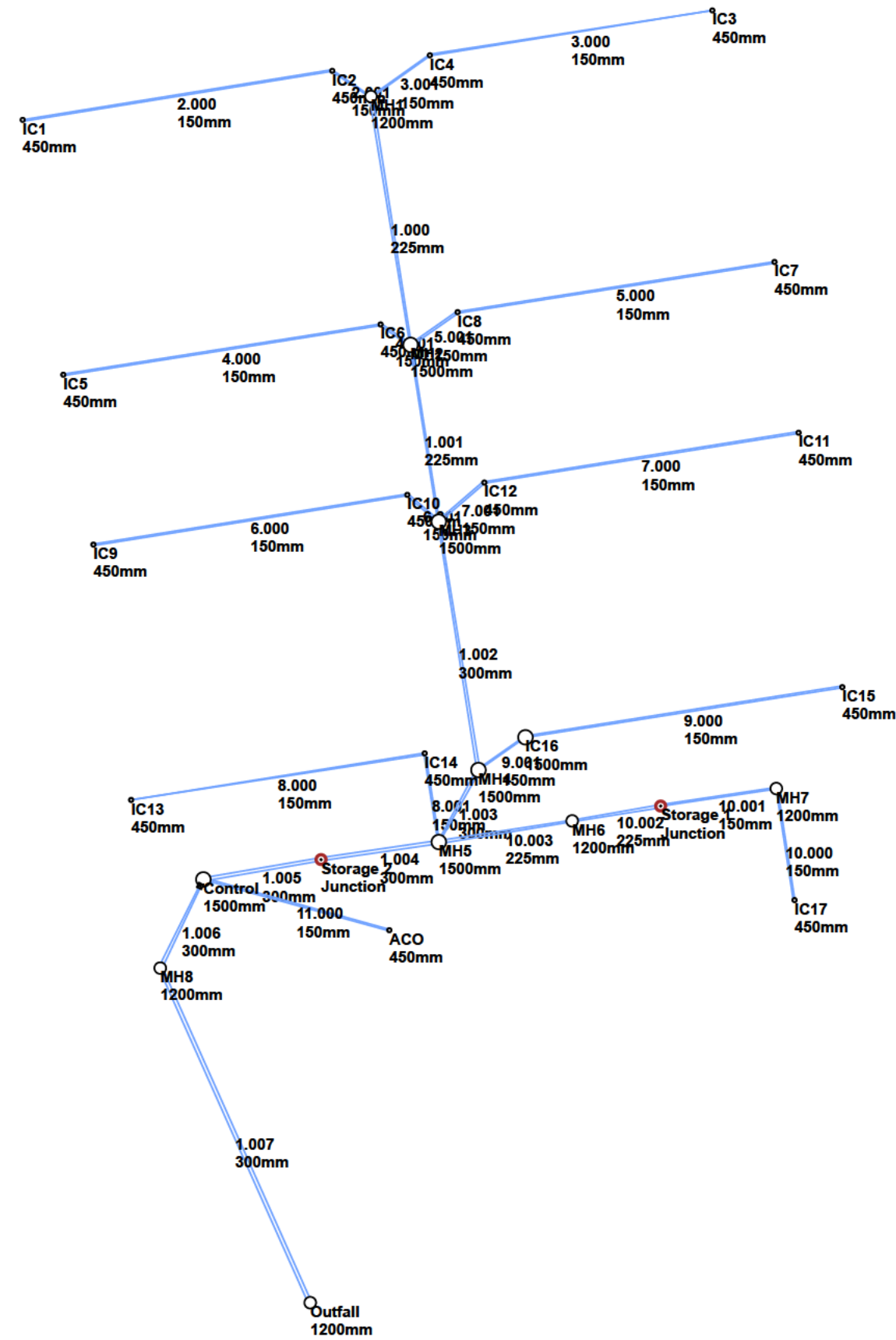


PSA Design Ltd
The Old Bank House, 6 Berry Lane
Longridge, Preston, PR3 3JA

Client	Eco Providers	Drawn GS	Date 22/01/26	Scale 1:500	Drwg No. D4617-D-03
Job	Land at Higher College Farm, Longridge	Check	Appr.	Sheet Size	Rev.
Title	Contributing Areas	-	-	A3	P1

Appendix B

Flow SW Model Calculations



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.100	Minimum Backdrop Height (m)	0.200
Ratio-R	0.290	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
IC1	0.054	5.00	111.250	450	361519.366	437216.406	0.800
IC2	0.038	5.00	111.300	450	361551.246	437221.472	1.200
IC3	0.038	5.00	111.430	450	361590.380	437227.705	0.800
IC4	0.042	5.00	111.400	450	361561.295	437223.077	1.120
MH1			111.150	1200	361555.226	437218.821	1.720
IC5	0.038	5.00	110.650	450	361523.550	437190.091	0.800
IC6			110.700	450	361556.222	437195.284	1.200
IC7	0.038	5.00	110.820	450	361596.778	437201.736	0.800
IC8			110.790	450	361564.152	437196.552	1.120
MH2	0.050	5.00	110.600	1500	361559.306	437193.176	1.500
IC9	0.067	5.00	109.950	450	361526.651	437172.551	0.800
IC10	0.038	5.00	110.000	450	361558.973	437177.688	1.200
IC11	0.065	5.00	110.130	450	361599.263	437184.105	0.800
IC12	0.038	5.00	110.100	450	361566.903	437178.956	1.120
MH3			109.850	1500	361562.211	437174.917	1.500
IC13	0.038	5.00	109.320	450	361530.536	437146.184	0.800
IC14			109.400	450	361560.761	437150.994	1.230
IC15	0.038	5.00	109.520	450	361603.763	437157.836	0.800
IC16			109.490	1500	361571.138	437152.651	1.120
MH4	0.046	5.00	109.300	1500	361566.293	437149.276	1.830
IC17	0.025	5.00	109.150	450	361598.845	437135.843	1.150
MH6	0.049	5.00	109.260	1200	361575.946	437144.021	2.310
MH7			109.350	1200	361596.963	437147.364	2.250
Storage 1			109.150		361585.058	437145.555	1.850
MH5	0.017	5.00	109.300	1500	361562.218	437141.837	2.500
ACO	0.046	5.00	108.800	450	361557.123	437132.736	0.710
Storage 2			108.850		361550.092	437140.025	1.850
Control			108.800	1500	361537.971	437137.979	2.200
MH8			108.200	1200	361533.532	437128.823	1.400
Outfall			107.350	1200	361548.977	437094.274	1.350

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000	IC1	IC2	32.280	0.600	110.450	110.100	0.350	92.2	150	5.51	50.0
2.001	IC2	MH1	4.782	0.600	110.100	109.505	0.595	8.0	150	5.54	50.0
3.000	IC3	IC4	29.451	0.600	110.630	110.280	0.350	84.1	150	5.45	50.0
3.001	IC4	MH1	7.413	0.600	110.280	109.505	0.775	9.6	150	5.49	50.0
1.000	MH1	MH2	25.968	0.600	109.430	109.100	0.330	78.7	225	5.83	50.0
4.000	IC5	IC6	33.082	0.600	109.850	109.500	0.350	94.5	150	5.53	50.0
4.001	IC6	MH2	3.736	0.600	109.500	109.175	0.325	11.5	150	5.55	50.0
5.000	IC7	IC8	33.035	0.600	110.020	109.670	0.350	94.4	150	5.53	50.0
5.001	IC8	MH2	5.906	0.600	109.670	109.175	0.495	11.9	150	5.57	50.0
1.001	MH2	MH3	18.489	0.600	109.100	108.425	0.675	27.4	225	5.95	50.0
6.000	IC9	IC10	32.728	0.600	109.150	108.800	0.350	93.5	150	5.52	50.0
6.001	IC10	MH3	4.262	0.600	108.800	108.500	0.300	14.2	150	5.55	50.0
7.000	IC11	IC12	32.767	0.600	109.330	108.980	0.350	93.6	150	5.53	50.0
7.001	IC12	MH3	6.191	0.600	108.980	108.500	0.480	12.9	150	5.56	50.0
1.002	MH3	MH4	25.964	0.600	108.350	107.470	0.880	29.5	300	6.10	50.0
8.000	IC13	IC14	30.605	0.600	108.520	108.170	0.350	87.4	150	5.47	50.0
8.001	IC14	MH5	9.272	0.600	108.170	107.250	0.920	10.1	150	5.52	50.0
9.000	IC15	IC16	33.034	0.600	108.720	108.370	0.350	94.4	150	5.53	50.0
9.001	IC16	MH4	5.905	0.600	108.370	108.300	0.070	84.4	150	5.62	50.0
1.003	MH4	MH5	8.482	0.600	107.470	107.100	0.370	22.9	300	6.14	50.0
10.000	IC17	MH7	11.674	0.600	108.000	107.400	0.600	19.5	150	5.08	50.0
10.001	MH7	Storage 1	12.042	0.600	107.400	107.300	0.100	120.4	150	5.30	50.0
10.002	Storage 1	MH6	10.000	0.600	107.300	107.250	0.050	200.0	225	5.49	50.0
10.003	MH6	MH5	13.901	0.600	107.250	107.100	0.150	92.7	225	5.66	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.000	1.047	18.5	7.3	0.650	1.050	0.054	0.0	65	0.985
2.001	3.576	63.2	12.5	1.050	1.495	0.092	0.0	45	2.783
3.000	1.096	19.4	5.1	0.650	0.970	0.038	0.0	53	0.931
3.001	3.277	57.9	10.8	0.970	1.495	0.080	0.0	44	2.514
1.000	1.475	58.7	23.3	1.495	1.275	0.172	0.0	99	1.395
4.000	1.034	18.3	5.1	0.650	1.050	0.038	0.0	54	0.888
4.001	2.988	52.8	5.1	1.050	1.275	0.038	0.0	31	1.898
5.000	1.034	18.3	5.1	0.650	0.970	0.038	0.0	54	0.888
5.001	2.932	51.8	5.1	0.970	1.275	0.038	0.0	32	1.883
1.001	2.509	99.8	40.4	1.275	1.200	0.298	0.0	100	2.383
6.000	1.039	18.4	9.1	0.650	1.050	0.067	0.0	75	1.038
6.001	2.686	47.5	14.2	1.050	1.200	0.105	0.0	56	2.347
7.000	1.039	18.4	8.8	0.650	0.970	0.065	0.0	73	1.027
7.001	2.820	49.8	14.0	0.970	1.200	0.103	0.0	54	2.425
1.002	2.905	205.3	68.6	1.200	1.530	0.506	0.0	119	2.625
8.000	1.075	19.0	5.1	0.650	1.080	0.038	0.0	53	0.913
8.001	3.192	56.4	5.1	1.080	1.900	0.038	0.0	31	2.005
9.000	1.034	18.3	5.1	0.650	0.970	0.038	0.0	54	0.888
9.001	1.095	19.3	5.1	0.970	0.850	0.038	0.0	53	0.930
1.003	3.297	233.1	80.0	1.530	1.900	0.590	0.0	121	3.000
10.000	2.294	40.5	3.4	1.000	1.800	0.025	0.0	29	1.390
10.001	0.914	16.2	3.4	1.800	1.700	0.025	0.0	47	0.725
10.002	0.921	36.6	3.4	1.625	1.785	0.025	0.0	46	0.579
10.003	1.358	54.0	10.0	1.785	1.975	0.074	0.0	65	1.044

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.004	MH5	Storage 2	12.261	0.600	107.100	107.000	0.100	122.6	300	6.29	50.0
1.005	Storage 2	Control	12.292	0.600	107.000	106.900	0.100	122.9	300	6.43	50.0
11.000	ACO	Control	19.857	0.600	108.090	107.050	1.040	19.1	150	5.14	50.0
1.006	Control	MH8	8.400	0.600	106.900	106.800	0.100	84.0	300	6.51	50.0
1.007	MH8	Outfall	37.844	0.600	106.800	106.000	0.800	47.3	300	6.79	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.004	1.418	100.3	97.4	1.900	1.550	0.719	0.0	240	1.607
1.005	1.417	100.1	97.4	1.550	1.600	0.719	0.0	241	1.605
11.000	2.315	40.9	6.2	0.560	1.600	0.046	0.0	40	1.681
1.006	1.716	121.3	103.7	1.600	1.100	0.765	0.0	214	1.919
1.007	2.291	162.0	103.7	1.100	1.050	0.765	0.0	175	2.426

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.000	32.280	92.2	150	Circular	111.250	110.450	0.650	111.300	110.100	1.050
2.001	4.782	8.0	150	Circular	111.300	110.100	1.050	111.150	109.505	1.495
3.000	29.451	84.1	150	Circular	111.430	110.630	0.650	111.400	110.280	0.970
3.001	7.413	9.6	150	Circular	111.400	110.280	0.970	111.150	109.505	1.495
1.000	25.968	78.7	225	Circular	111.150	109.430	1.495	110.600	109.100	1.275
4.000	33.082	94.5	150	Circular	110.650	109.850	0.650	110.700	109.500	1.050
4.001	3.736	11.5	150	Circular	110.700	109.500	1.050	110.600	109.175	1.275
5.000	33.035	94.4	150	Circular	110.820	110.020	0.650	110.790	109.670	0.970
5.001	5.906	11.9	150	Circular	110.790	109.670	0.970	110.600	109.175	1.275
1.001	18.489	27.4	225	Circular	110.600	109.100	1.275	109.850	108.425	1.200
6.000	32.728	93.5	150	Circular	109.950	109.150	0.650	110.000	108.800	1.050
6.001	4.262	14.2	150	Circular	110.000	108.800	1.050	109.850	108.500	1.200
7.000	32.767	93.6	150	Circular	110.130	109.330	0.650	110.100	108.980	0.970
7.001	6.191	12.9	150	Circular	110.100	108.980	0.970	109.850	108.500	1.200
1.002	25.964	29.5	300	Circular	109.850	108.350	1.200	109.300	107.470	1.530

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	IC1	450	Manhole	PCC	IC2	450	Manhole	PCC
2.001	IC2	450	Manhole	PCC	MH1	1200	Manhole	PCC
3.000	IC3	450	Manhole	PCC	IC4	450	Manhole	PCC
3.001	IC4	450	Manhole	PCC	MH1	1200	Manhole	PCC
1.000	MH1	1200	Manhole	PCC	MH2	1500	Manhole	PCC
4.000	IC5	450	Manhole	PCC	IC6	450	Manhole	PCC
4.001	IC6	450	Manhole	PCC	MH2	1500	Manhole	PCC
5.000	IC7	450	Manhole	PCC	IC8	450	Manhole	PCC
5.001	IC8	450	Manhole	PCC	MH2	1500	Manhole	PCC
1.001	MH2	1500	Manhole	PCC	MH3	1500	Manhole	PCC
6.000	IC9	450	Manhole	PCC	IC10	450	Manhole	PCC
6.001	IC10	450	Manhole	PCC	MH3	1500	Manhole	PCC
7.000	IC11	450	Manhole	PCC	IC12	450	Manhole	PCC
7.001	IC12	450	Manhole	PCC	MH3	1500	Manhole	PCC
1.002	MH3	1500	Manhole	PCC	MH4	1500	Manhole	PCC

Pipeline Schedule

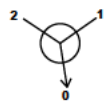
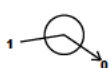
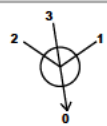
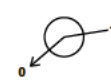
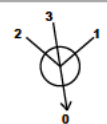
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
8.000	30.605	87.4	150	Circular	109.320	108.520	0.650	109.400	108.170	1.080
8.001	9.272	10.1	150	Circular	109.400	108.170	1.080	109.300	107.250	1.900
9.000	33.034	94.4	150	Circular	109.520	108.720	0.650	109.490	108.370	0.970
9.001	5.905	84.4	150	Circular	109.490	108.370	0.970	109.300	108.300	0.850
1.003	8.482	22.9	300	Circular	109.300	107.470	1.530	109.300	107.100	1.900
10.000	11.674	19.5	150	Circular	109.150	108.000	1.000	109.350	107.400	1.800
10.001	12.042	120.4	150	Circular	109.350	107.400	1.800	109.150	107.300	1.700
10.002	10.000	200.0	225	Circular	109.150	107.300	1.625	109.260	107.250	1.785
10.003	13.901	92.7	225	Circular	109.260	107.250	1.785	109.300	107.100	1.975
1.004	12.261	122.6	300	Circular	109.300	107.100	1.900	108.850	107.000	1.550
1.005	12.292	122.9	300	Circular	108.850	107.000	1.550	108.800	106.900	1.600
11.000	19.857	19.1	150	Circular	108.800	108.090	0.560	108.800	107.050	1.600
1.006	8.400	84.0	300	Circular	108.800	106.900	1.600	108.200	106.800	1.100
1.007	37.844	47.3	300	Circular	108.200	106.800	1.100	107.350	106.000	1.050

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
8.000	IC13	450	Manhole	PCC	IC14	450	Manhole	PCC
8.001	IC14	450	Manhole	PCC	MH5	1500	Manhole	PCC
9.000	IC15	450	Manhole	PCC	IC16	1500	Manhole	PCC
9.001	IC16	1500	Manhole	PCC	MH4	1500	Manhole	PCC
1.003	MH4	1500	Manhole	PCC	MH5	1500	Manhole	PCC
10.000	IC17	450	Manhole	PCC	MH7	1200	Manhole	PCC
10.001	MH7	1200	Manhole	PCC	Storage 1		Junction	
10.002	Storage 1		Junction		MH6	1200	Manhole	PCC
10.003	MH6	1200	Manhole	PCC	MH5	1500	Manhole	PCC
1.004	MH5	1500	Manhole	PCC	Storage 2		Junction	
1.005	Storage 2		Junction		Control	1500	Manhole	PCC
11.000	ACO	450	Manhole	PCC	Control	1500	Manhole	PCC
1.006	Control	1500	Manhole	PCC	MH8	1200	Manhole	PCC
1.007	MH8	1200	Manhole	PCC	Outfall	1200	Manhole	PCC

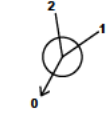
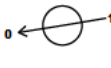
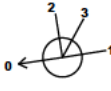
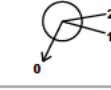
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
IC1	361519.366	437216.406	111.250	0.800	450				
						0	2.000	110.450	150
IC2	361551.246	437221.472	111.300	1.200	450				
						0	2.001	110.100	150
IC3	361590.380	437227.705	111.430	0.800	450				
						0	3.000	110.630	150
IC4	361561.295	437223.077	111.400	1.120	450				
						0	3.001	110.280	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MH1	361555.226	437218.821	111.150	1.720	1200		1 3.001 109.505 150 2 2.001 109.505 150 0 1.000 109.430 225		
IC5	361523.550	437190.091	110.650	0.800	450		0 4.000 109.850 150 1 4.000 109.500 150		
IC6	361556.222	437195.284	110.700	1.200	450		0 4.001 109.500 150		
IC7	361596.778	437201.736	110.820	0.800	450		0 5.000 110.020 150 1 5.000 109.670 150		
IC8	361564.152	437196.552	110.790	1.120	450		0 5.001 109.670 150 1 5.001 109.175 150 2 4.001 109.175 150 3 1.000 109.100 225 0 1.001 109.100 225		
MH2	361559.306	437193.176	110.600	1.500	1500		1 5.001 109.175 150 2 4.001 109.175 150 3 1.000 109.100 225 0 1.001 109.100 225		
IC9	361526.651	437172.551	109.950	0.800	450		0 6.000 109.150 150 1 6.000 108.800 150		
IC10	361558.973	437177.688	110.000	1.200	450		0 6.001 108.800 150		
IC11	361599.263	437184.105	110.130	0.800	450		0 7.000 109.330 150 1 7.000 108.980 150		
IC12	361566.903	437178.956	110.100	1.120	450		0 7.001 108.980 150 1 7.001 108.500 150 2 6.001 108.500 150 3 1.001 108.425 225 0 1.002 108.350 300		
MH3	361562.211	437174.917	109.850	1.500	1500				
IC13	361530.536	437146.184	109.320	0.800	450		0 8.000 108.520 150 1 8.000 108.170 150		
IC14	361560.761	437150.994	109.400	1.230	450		0 8.001 108.170 150		

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
IC15	361603.763	437157.836	109.520	0.800	450		0	9.000	108.720	150
IC16	361571.138	437152.651	109.490	1.120	1500		1	9.000	108.370	150
						0	9.001	108.370	150	
MH4	361566.293	437149.276	109.300	1.830	1500		1	9.001	108.300	150
						2	1.002	107.470	300	
						0	1.003	107.470	300	
IC17	361598.845	437135.843	109.150	1.150	450		0	10.000	108.000	150
MH6	361575.946	437144.021	109.260	2.310	1200		1	10.002	107.250	225
						0	10.003	107.250	225	
MH7	361596.963	437147.364	109.350	2.250	1200		1	10.000	107.400	150
						0	10.001	107.400	150	
Storage 1	361585.058	437145.555	109.150	1.850			1	10.001	107.300	150
						0	10.002	107.300	225	
MH5	361562.218	437141.837	109.300	2.500	1500		1	10.003	107.100	225
						2	8.001	107.250	150	
						3	1.003	107.100	300	
						0	1.004	107.100	300	
ACO	361557.123	437132.736	108.800	0.710	450		0	11.000	108.090	150
Storage 2	361550.092	437140.025	108.850	1.850			1	1.004	107.000	300
						0	1.005	107.000	300	
Control	361537.971	437137.979	108.800	2.200	1500		1	11.000	107.050	150
						2	1.005	106.900	300	
						0	1.006	106.900	300	
MH8	361533.532	437128.823	108.200	1.400	1200		1	1.006	106.800	300
						0	1.007	106.800	300	
Outfall	361548.977	437094.274	107.350	1.350	1200		1	1.007	106.000	300

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	18.700	Additional Storage (m³/ha)	20.0
Ratio-R	0.320	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	40	0	0
100	50	0	0

Node Control Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	106.900	Product Number	CTL-SHE-0139-1020-1500-1020
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	10.2	Min Node Diameter (mm)	1500

Node Storage 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	198.0	198.0	1.200	198.0	257.9	1.201	0.0	257.9

Node Storage 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	198.0	198.0	1.200	198.0	257.9	1.201	0.0	257.9

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	10	110.515	0.065	6.6	0.0982	0.0000	OK
15 minute winter	IC2	10	110.146	0.046	11.0	0.0367	0.0000	OK
15 minute winter	IC3	10	110.681	0.051	4.6	0.0568	0.0000	OK
15 minute winter	IC4	10	110.324	0.044	9.6	0.0398	0.0000	OK
15 minute winter	MH1	10	109.524	0.094	20.5	0.1064	0.0000	OK
15 minute winter	IC5	10	109.905	0.055	4.6	0.0615	0.0000	OK
15 minute winter	IC6	11	109.532	0.032	4.5	0.0051	0.0000	OK
15 minute winter	IC7	10	110.076	0.056	4.6	0.0616	0.0000	OK
15 minute winter	IC8	11	109.701	0.031	4.5	0.0050	0.0000	OK
15 minute winter	MH2	11	109.198	0.098	35.3	0.2385	0.0000	OK
15 minute winter	IC9	10	109.223	0.073	8.2	0.1330	0.0000	OK
15 minute winter	IC10	10	108.860	0.060	12.6	0.0472	0.0000	OK
15 minute winter	IC11	10	109.402	0.072	7.9	0.1279	0.0000	OK
15 minute winter	IC12	10	109.035	0.055	12.3	0.0463	0.0000	OK
15 minute winter	MH3	11	108.464	0.114	60.0	0.2013	0.0000	OK
15 minute winter	IC13	10	108.575	0.055	4.6	0.0610	0.0000	OK
15 minute winter	IC14	11	108.199	0.029	4.5	0.0046	0.0000	OK
15 minute winter	IC15	10	108.772	0.052	4.6	0.0573	0.0000	OK
15 minute winter	IC16	11	108.423	0.053	4.5	0.0934	0.0000	OK
15 minute winter	MH4	11	107.596	0.126	70.0	0.2864	0.0000	OK
15 minute winter	IC17	10	108.028	0.028	3.1	0.0167	0.0000	OK
15 minute winter	MH6	11	107.303	0.053	6.0	0.0857	0.0000	OK
15 minute winter	MH7	10	107.450	0.050	3.1	0.0570	0.0000	OK
360 minute winter	Storage 1	240	107.314	0.014	0.6	2.6811	0.0000	OK
15 minute winter	MH5	11	107.303	0.203	81.9	0.3907	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	6.4	1.083	0.348	0.1928	
15 minute winter	IC2	2.001	MH1	10.9	2.519	0.173	0.0208	
15 minute winter	IC3	3.000	IC4	4.5	0.948	0.234	0.1411	
15 minute winter	IC4	3.001	MH1	9.5	2.329	0.165	0.0304	
15 minute winter	MH1	1.000	MH2	20.4	1.265	0.347	0.4182	
15 minute winter	IC5	4.000	IC6	4.5	1.063	0.247	0.1429	
15 minute winter	IC6	4.001	MH2	4.5	1.734	0.085	0.0097	
15 minute winter	IC7	5.000	IC8	4.5	1.070	0.247	0.1419	
15 minute winter	IC8	5.001	MH2	4.5	1.743	0.087	0.0153	
15 minute winter	MH2	1.001	MH3	35.4	2.223	0.355	0.2946	
15 minute winter	IC9	6.000	IC10	8.0	1.071	0.435	0.2445	
15 minute winter	IC10	6.001	MH3	12.5	2.079	0.262	0.0256	
15 minute winter	IC11	7.000	IC12	7.7	1.092	0.421	0.2326	
15 minute winter	IC12	7.001	MH3	12.2	2.199	0.245	0.0344	
15 minute winter	MH3	1.002	MH4	60.2	2.288	0.293	0.6835	
15 minute winter	IC13	8.000	IC14	4.5	1.127	0.238	0.1254	
15 minute winter	IC14	8.001	MH5	4.5	1.802	0.080	0.0368	
15 minute winter	IC15	9.000	IC16	4.5	0.846	0.249	0.1783	
15 minute winter	IC16	9.001	MH4	4.5	0.855	0.233	0.0312	
15 minute winter	MH4	1.003	MH5	70.3	1.775	0.302	0.3348	
15 minute winter	IC17	10.000	MH7	3.1	0.841	0.076	0.0435	
15 minute winter	MH6	10.003	MH5	5.9	0.388	0.109	0.3119	
15 minute winter	MH7	10.001	Storage 1	3.0	1.425	0.186	0.0317	
360 minute winter	Storage 1	10.002	MH6	0.3	0.246	0.008	0.0151	
15 minute winter	MH5	1.004	Storage 2	82.1	2.816	0.819	0.4526	

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	ACO	10	108.128	0.038	5.6	0.0554	0.0000	OK
120 minute winter	Storage 2	92	107.272	0.272	38.3	51.1461	0.0000	OK
120 minute winter	Control	92	107.271	0.371	27.8	0.6554	0.0000	SURCHARGED
120 minute winter	MH8	92	106.851	0.051	10.0	0.0576	0.0000	OK
120 minute winter	Outfall	92	106.050	0.050	10.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ACO	11.000	Control	5.5	1.597	0.135	0.1712	
120 minute winter	Storage 2	1.005	Control	25.8	0.553	0.257	0.8453	
120 minute winter	Control	1.006	MH8	10.0	1.087	0.082	0.0774	
120 minute winter	MH8	1.007	Outfall	10.0	1.276	0.062	0.2960	96.1

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	10	110.525	0.075	8.5	0.1134	0.0000	OK
15 minute winter	IC2	10	110.154	0.054	14.3	0.0426	0.0000	OK
15 minute winter	IC3	10	110.689	0.059	6.0	0.0656	0.0000	OK
15 minute winter	IC4	10	110.331	0.051	12.5	0.0460	0.0000	OK
15 minute winter	MH1	10	109.540	0.110	26.6	0.1241	0.0000	OK
15 minute winter	IC5	10	109.914	0.064	6.0	0.0710	0.0000	OK
15 minute winter	IC6	10	109.536	0.036	5.9	0.0057	0.0000	OK
15 minute winter	IC7	10	110.084	0.064	6.0	0.0712	0.0000	OK
15 minute winter	IC8	10	109.705	0.035	5.9	0.0056	0.0000	OK
15 minute winter	MH2	11	109.215	0.115	46.0	0.2793	0.0000	OK
15 minute winter	IC9	10	109.235	0.085	10.6	0.1553	0.0000	OK
15 minute winter	IC10	10	108.870	0.070	16.4	0.0555	0.0000	OK
15 minute winter	IC11	10	109.414	0.084	10.3	0.1496	0.0000	OK
15 minute winter	IC12	10	109.045	0.065	16.1	0.0541	0.0000	OK
15 minute winter	MH3	11	108.482	0.132	77.8	0.2324	0.0000	OK
15 minute winter	IC13	10	108.584	0.064	6.0	0.0705	0.0000	OK
15 minute winter	IC14	10	108.203	0.033	5.9	0.0052	0.0000	OK
15 minute winter	IC15	10	108.780	0.060	6.0	0.0661	0.0000	OK
15 minute winter	IC16	11	108.431	0.061	5.9	0.1085	0.0000	OK
15 minute winter	MH4	11	107.623	0.153	90.8	0.3479	0.0000	OK
15 minute winter	IC17	10	108.032	0.032	4.0	0.0189	0.0000	OK
15 minute winter	MH6	11	107.352	0.102	7.7	0.1646	0.0000	OK
15 minute winter	MH7	10	107.457	0.057	4.0	0.0642	0.0000	OK
120 minute winter	Storage 1	108	107.338	0.038	3.3	7.2243	0.0000	OK
120 minute winter	MH5	90	107.352	0.252	38.5	0.4836	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	8.3	1.150	0.450	0.2342	
15 minute winter	IC2	2.001	MH1	14.2	2.683	0.225	0.0253	
15 minute winter	IC3	3.000	IC4	5.9	1.014	0.305	0.1717	
15 minute winter	IC4	3.001	MH1	12.4	2.491	0.214	0.0369	
15 minute winter	MH1	1.000	MH2	26.3	1.339	0.449	0.5112	
15 minute winter	IC5	4.000	IC6	5.9	1.147	0.322	0.1721	
15 minute winter	IC6	4.001	MH2	5.9	1.792	0.111	0.0129	
15 minute winter	IC7	5.000	IC8	5.9	1.156	0.321	0.1708	
15 minute winter	IC8	5.001	MH2	5.9	1.803	0.113	0.0202	
15 minute winter	MH2	1.001	MH3	45.9	2.365	0.460	0.3592	
15 minute winter	IC9	6.000	IC10	10.4	1.133	0.565	0.2995	
15 minute winter	IC10	6.001	MH3	16.2	2.204	0.341	0.0313	
15 minute winter	IC11	7.000	IC12	10.1	1.159	0.548	0.2848	
15 minute winter	IC12	7.001	MH3	15.9	2.342	0.319	0.0420	
15 minute winter	MH3	1.002	MH4	78.1	2.371	0.380	0.8555	
15 minute winter	IC13	8.000	IC14	5.9	1.210	0.310	0.1519	
15 minute winter	IC14	8.001	MH5	5.9	1.803	0.104	0.0707	
15 minute winter	IC15	9.000	IC16	5.9	0.902	0.324	0.2169	
15 minute winter	IC16	9.001	MH4	5.9	0.915	0.304	0.0380	
15 minute winter	MH4	1.003	MH5	91.2	1.840	0.391	0.4193	
15 minute winter	IC17	10.000	MH7	4.0	0.915	0.098	0.0515	
15 minute winter	MH6	10.003	MH5	6.5	0.374	0.120	0.3974	
15 minute winter	MH7	10.001	Storage 1	3.9	1.515	0.240	0.0376	
120 minute winter	Storage 1	10.002	MH6	-2.8	0.414	-0.076	0.1007	
120 minute winter	MH5	1.004	Storage 2	38.4	1.530	0.383	0.8185	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	ACO	10	108.134	0.044	7.3	0.0635	0.0000	OK
120 minute winter	Storage 2	90	107.351	0.351	44.3	66.0268	0.0000	SURCHARGED
120 minute winter	Control	90	107.350	0.450	22.3	0.7949	0.0000	SURCHARGED
120 minute winter	MH8	90	106.851	0.051	10.2	0.0582	0.0000	OK
120 minute winter	Outfall	90	106.051	0.051	10.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ACO	11.000	Control	7.2	1.718	0.175	0.1976	
120 minute winter	Storage 2	1.005	Control	20.2	0.501	0.202	0.8656	
120 minute winter	Control	1.006	MH8	10.2	1.091	0.084	0.0785	
120 minute winter	MH8	1.007	Outfall	10.2	1.283	0.063	0.3000	119.9

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	12	110.834	0.384	22.6	0.5790	0.0000	SURCHARGED
15 minute winter	IC2	12	110.436	0.336	36.4	0.2662	0.0000	SURCHARGED
15 minute winter	IC3	10	110.738	0.108	15.9	0.1196	0.0000	OK
15 minute winter	IC4	12	110.451	0.170	33.4	0.1549	0.0000	SURCHARGED
15 minute winter	MH1	12	110.202	0.772	64.6	0.8734	0.0000	SURCHARGED
15 minute winter	IC5	12	109.976	0.125	15.9	0.1391	0.0000	OK
15 minute winter	IC6	12	109.839	0.339	15.9	0.0539	0.0000	SURCHARGED
15 minute winter	IC7	10	110.140	0.120	15.9	0.1327	0.0000	OK
15 minute winter	IC8	12	109.857	0.187	15.7	0.0297	0.0000	SURCHARGED
15 minute winter	MH2	12	109.809	0.709	106.0	1.7265	0.0000	SURCHARGED
15 minute winter	IC9	12	109.822	0.672	28.0	1.2317	0.0000	FLOOD RISK
15 minute winter	IC10	12	109.228	0.428	37.2	0.3392	0.0000	SURCHARGED
15 minute winter	IC11	12	109.887	0.557	27.2	0.9940	0.0000	FLOOD RISK
15 minute winter	IC12	12	109.306	0.326	39.0	0.2729	0.0000	SURCHARGED
15 minute winter	MH3	12	108.954	0.604	168.2	1.0666	0.0000	SURCHARGED
15 minute winter	IC13	10	108.638	0.118	15.9	0.1308	0.0000	OK
15 minute winter	IC14	10	108.224	0.054	15.6	0.0086	0.0000	OK
15 minute winter	IC15	10	108.831	0.111	15.9	0.1227	0.0000	OK
15 minute winter	IC16	11	108.486	0.116	15.6	0.2048	0.0000	OK
15 minute winter	MH4	12	108.191	0.721	198.8	1.6358	0.0000	SURCHARGED
15 minute winter	IC17	10	108.052	0.052	10.5	0.0309	0.0000	OK
240 minute winter	MH6	236	107.876	0.626	29.7	1.0134	0.0000	SURCHARGED
240 minute winter	MH7	236	107.876	0.476	2.3	0.5385	0.0000	SURCHARGED
240 minute winter	Storage 1	236	107.876	0.576	31.2	108.3666	0.0000	SURCHARGED
240 minute winter	MH5	232	107.876	0.776	58.3	1.4909	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	20.5	1.307	1.108	0.5683	
15 minute winter	IC2	2.001	MH1	33.1	2.853	0.524	0.0842	
15 minute winter	IC3	3.000	IC4	15.8	1.288	0.815	0.4279	
15 minute winter	IC4	3.001	MH1	31.5	2.656	0.544	0.1305	
15 minute winter	MH1	1.000	MH2	58.8	1.488	1.003	1.0328	
15 minute winter	IC5	4.000	IC6	15.9	1.410	0.873	0.5515	
15 minute winter	IC6	4.001	MH2	13.7	1.794	0.260	0.0658	
15 minute winter	IC7	5.000	IC8	15.7	1.418	0.861	0.4820	
15 minute winter	IC8	5.001	MH2	14.7	1.805	0.283	0.1040	
15 minute winter	MH2	1.001	MH3	98.7	2.763	0.989	0.7353	
15 minute winter	IC9	6.000	IC10	22.3	1.320	1.212	0.5762	
15 minute winter	IC10	6.001	MH3	34.9	2.517	0.735	0.0750	
15 minute winter	IC11	7.000	IC12	23.1	1.319	1.261	0.5769	
15 minute winter	IC12	7.001	MH3	36.3	2.726	0.729	0.1090	
15 minute winter	MH3	1.002	MH4	167.8	2.456	0.817	1.8284	
15 minute winter	IC13	8.000	IC14	15.6	1.500	0.820	0.3142	
15 minute winter	IC14	8.001	MH5	15.5	1.725	0.275	0.1079	
15 minute winter	IC15	9.000	IC16	15.6	1.107	0.854	0.4660	
15 minute winter	IC16	9.001	MH4	15.5	1.137	0.803	0.0805	
15 minute winter	MH4	1.003	MH5	196.8	2.794	0.844	0.5973	
15 minute winter	IC17	10.000	MH7	10.4	1.278	0.258	0.0956	
240 minute winter	MH6	10.003	MH5	-25.2	-0.634	-0.467	0.5529	
240 minute winter	MH7	10.001	Storage 1	2.2	0.819	0.135	0.2120	
240 minute winter	Storage 1	10.002	MH6	-29.5	-0.968	-0.805	0.3977	
240 minute winter	MH5	1.004	Storage 2	40.7	1.588	0.406	0.8634	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	ACO	10	108.162	0.072	19.2	0.1048	0.0000	OK
240 minute winter	Storage 2	236	107.875	0.875	40.7	164.5951	0.0000	SURCHARGED
240 minute winter	Control	236	107.874	0.974	26.1	1.7214	0.0000	SURCHARGED
480 minute summer	MH8	656	106.852	0.052	10.2	0.0583	0.0000	OK
480 minute summer	Outfall	656	106.051	0.051	10.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ACO	11.000	Control	19.1	2.012	0.466	0.2578	
240 minute winter	Storage 2	1.005	Control	24.1	0.523	0.240	0.8656	
240 minute winter	Control	1.006	MH8	10.2	1.091	0.084	0.0787	
480 minute summer	MH8	1.007	Outfall	10.2	1.284	0.063	0.3006	369.5

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	10	111.250	0.800	31.2	1.2072	2.6300	FLOOD
15 minute winter	IC2	12	111.083	0.983	41.7	0.7787	0.0000	FLOOD RISK
15 minute winter	IC3	11	111.430	0.800	22.0	0.8872	0.5401	FLOOD
15 minute winter	IC4	12	111.234	0.954	40.2	0.8670	0.0000	FLOOD RISK
15 minute winter	MH1	12	110.873	1.443	68.8	1.6325	0.0000	FLOOD RISK
15 minute winter	IC5	11	110.650	0.800	22.0	0.8872	0.5438	FLOOD
15 minute winter	IC6	12	110.458	0.958	16.1	0.1524	0.0000	FLOOD RISK
15 minute winter	IC7	12	110.816	0.796	22.0	0.8824	0.0000	FLOOD RISK
15 minute winter	IC8	12	110.496	0.826	17.9	0.1313	0.0000	FLOOD RISK
15 minute winter	MH2	12	110.428	1.328	115.3	3.2319	0.0000	FLOOD RISK
15 minute winter	IC9	10	109.950	0.800	38.8	1.4672	3.4049	FLOOD
15 minute winter	IC10	12	109.622	0.822	43.0	0.6513	0.0000	SURCHARGED
15 minute winter	IC11	10	110.130	0.800	37.6	1.4272	2.8245	FLOOD
15 minute winter	IC12	12	109.735	0.755	43.2	0.6323	0.0000	SURCHARGED
15 minute winter	MH3	12	109.358	1.008	181.2	1.7809	0.0000	SURCHARGED
15 minute winter	IC13	11	108.804	0.284	22.0	0.3147	0.0000	SURCHARGED
360 minute winter	IC14	344	108.332	0.162	3.6	0.0257	0.0000	SURCHARGED
15 minute winter	IC15	11	109.042	0.322	22.0	0.3566	0.0000	SURCHARGED
15 minute winter	IC16	12	108.578	0.208	20.3	0.3676	0.0000	SURCHARGED
30 minute winter	MH4	21	108.480	1.010	208.8	2.2917	0.0000	SURCHARGED
360 minute winter	IC17	344	108.332	0.332	2.4	0.1973	0.0000	SURCHARGED
360 minute winter	MH6	344	108.332	1.082	27.8	1.7517	0.0000	SURCHARGED
360 minute winter	MH7	344	108.332	0.932	2.4	1.0542	0.0000	SURCHARGED
360 minute winter	Storage 1	344	108.332	1.032	29.6	194.1308	0.0000	SURCHARGED
360 minute winter	MH5	344	108.332	1.232	60.3	2.3676	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	19.7	1.303	1.066	0.5683	
15 minute winter	IC2	2.001	MH1	35.8	2.858	0.567	0.0842	
15 minute winter	IC3	3.000	IC4	17.4	1.273	0.896	0.5185	
15 minute winter	IC4	3.001	MH1	34.5	2.664	0.596	0.1305	
15 minute winter	MH1	1.000	MH2	63.2	1.589	1.077	1.0328	
15 minute winter	IC5	4.000	IC6	16.1	1.396	0.884	0.5824	
15 minute winter	IC6	4.001	MH2	15.4	1.748	0.292	0.0658	
15 minute winter	IC7	5.000	IC8	17.9	1.424	0.979	0.5816	
15 minute winter	IC8	5.001	MH2	16.6	1.756	0.321	0.1040	
15 minute winter	MH2	1.001	MH3	110.9	2.789	1.112	0.7353	
15 minute winter	IC9	6.000	IC10	22.4	1.273	1.220	0.5762	
15 minute winter	IC10	6.001	MH3	38.8	2.510	0.816	0.0750	
15 minute winter	IC11	7.000	IC12	22.5	1.281	1.229	0.5769	
15 minute winter	IC12	7.001	MH3	39.7	2.722	0.797	0.1090	
15 minute winter	MH3	1.002	MH4	180.1	2.558	0.877	1.8284	
15 minute winter	IC13	8.000	IC14	20.4	1.481	1.071	0.4053	
360 minute winter	IC14	8.001	MH5	3.6	1.381	0.064	0.1632	
15 minute winter	IC15	9.000	IC16	20.3	1.154	1.111	0.5816	
15 minute winter	IC16	9.001	MH4	19.2	1.151	0.994	0.1040	
30 minute winter	MH4	1.003	MH5	207.0	2.940	0.888	0.5973	
360 minute winter	IC17	10.000	MH7	2.4	0.810	0.059	0.2055	
360 minute winter	MH6	10.003	MH5	-23.3	-0.586	-0.432	0.5529	
360 minute winter	MH7	10.001	Storage 1	2.2	0.732	0.133	0.2120	
360 minute winter	Storage 1	10.002	MH6	-27.6	-0.735	-0.753	0.3977	
360 minute winter	MH5	1.004	Storage 2	37.0	1.565	0.369	0.8634	

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	ACO	344	108.330	0.240	4.4	0.3491	0.0000	SURCHARGED
360 minute winter	Storage 2	344	108.331	1.331	37.0	225.8141	0.0000	SURCHARGED
360 minute winter	Control	344	108.330	1.430	28.8	2.5262	0.0000	SURCHARGED
15 minute summer	MH8	130	106.852	0.052	10.2	0.0583	0.0000	OK
15 minute summer	Outfall	130	106.051	0.051	10.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	ACO	11.000	Control	4.4	0.906	0.107	0.3496	
360 minute winter	Storage 2	1.005	Control	27.7	0.548	0.276	0.8656	
360 minute winter	Control	1.006	MH8	10.2	1.091	0.084	0.0787	
15 minute summer	MH8	1.007	Outfall	10.2	1.284	0.063	0.3006	148.9

Appendix C

Flow SW Model Calculations Surcharged Outfall

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.100	Minimum Backdrop Height (m)	0.200
Ratio-R	0.290	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
IC1	0.054	5.00	111.250	450	361519.366	437216.406	0.800
IC2	0.038	5.00	111.300	450	361551.246	437221.472	1.200
IC3	0.038	5.00	111.430	450	361590.380	437227.705	0.800
IC4	0.042	5.00	111.400	450	361561.295	437223.077	1.120
MH1			111.150	1200	361555.226	437218.821	1.720
IC5	0.038	5.00	110.650	450	361523.550	437190.091	0.800
IC6			110.700	450	361556.222	437195.284	1.200
IC7	0.038	5.00	110.820	450	361596.778	437201.736	0.800
IC8			110.790	450	361564.152	437196.552	1.120
MH2	0.050	5.00	110.600	1500	361559.306	437193.176	1.500
IC9	0.067	5.00	109.950	450	361526.651	437172.551	0.800
IC10	0.038	5.00	110.000	450	361558.973	437177.688	1.200
IC11	0.065	5.00	110.130	450	361599.263	437184.105	0.800
IC12	0.038	5.00	110.100	450	361566.903	437178.956	1.120
MH3			109.850	1500	361562.211	437174.917	1.500
IC13	0.038	5.00	109.320	450	361530.536	437146.184	0.800
IC14			109.400	450	361560.761	437150.994	1.230
IC15	0.038	5.00	109.520	450	361603.763	437157.836	0.800
IC16			109.490	1500	361571.138	437152.651	1.120
MH4	0.046	5.00	109.300	1500	361566.293	437149.276	1.830
IC17	0.025	5.00	109.150	450	361598.845	437135.843	1.150
MH6	0.049	5.00	109.260	1200	361575.946	437144.021	2.310
MH7			109.350	1200	361596.963	437147.364	2.250
Storage 1			109.150		361585.058	437145.555	1.850
MH5	0.017	5.00	109.300	1500	361562.218	437141.837	2.500
ACO	0.046	5.00	108.800	450	361557.123	437132.736	0.710
Storage 2			108.850		361550.092	437140.025	1.850
Control			108.800	1500	361537.971	437137.979	2.200
MH8			108.200	1200	361533.532	437128.823	1.400
Outfall			107.350	1200	361548.977	437094.274	1.350

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000	IC1	IC2	32.280	0.600	110.450	110.100	0.350	92.2	150	5.51	50.0
2.001	IC2	MH1	4.782	0.600	110.100	109.505	0.595	8.0	150	5.54	50.0
3.000	IC3	IC4	29.451	0.600	110.630	110.280	0.350	84.1	150	5.45	50.0
3.001	IC4	MH1	7.413	0.600	110.280	109.505	0.775	9.6	150	5.49	50.0
1.000	MH1	MH2	25.968	0.600	109.430	109.100	0.330	78.7	225	5.83	50.0
4.000	IC5	IC6	33.082	0.600	109.850	109.500	0.350	94.5	150	5.53	50.0
4.001	IC6	MH2	3.736	0.600	109.500	109.175	0.325	11.5	150	5.55	50.0
5.000	IC7	IC8	33.035	0.600	110.020	109.670	0.350	94.4	150	5.53	50.0
5.001	IC8	MH2	5.906	0.600	109.670	109.175	0.495	11.9	150	5.57	50.0
1.001	MH2	MH3	18.489	0.600	109.100	108.425	0.675	27.4	225	5.95	50.0
6.000	IC9	IC10	32.728	0.600	109.150	108.800	0.350	93.5	150	5.52	50.0
6.001	IC10	MH3	4.262	0.600	108.800	108.500	0.300	14.2	150	5.55	50.0
7.000	IC11	IC12	32.767	0.600	109.330	108.980	0.350	93.6	150	5.53	50.0
7.001	IC12	MH3	6.191	0.600	108.980	108.500	0.480	12.9	150	5.56	50.0
1.002	MH3	MH4	25.964	0.600	108.350	107.470	0.880	29.5	300	6.10	50.0
8.000	IC13	IC14	30.605	0.600	108.520	108.170	0.350	87.4	150	5.47	50.0
8.001	IC14	MH5	9.272	0.600	108.170	107.250	0.920	10.1	150	5.52	50.0
9.000	IC15	IC16	33.034	0.600	108.720	108.370	0.350	94.4	150	5.53	50.0
9.001	IC16	MH4	5.905	0.600	108.370	108.300	0.070	84.4	150	5.62	50.0
1.003	MH4	MH5	8.482	0.600	107.470	107.100	0.370	22.9	300	6.14	50.0
10.000	IC17	MH7	11.674	0.600	108.000	107.400	0.600	19.5	150	5.08	50.0
10.001	MH7	Storage 1	12.042	0.600	107.400	107.300	0.100	120.4	150	5.30	50.0
10.002	Storage 1	MH6	10.000	0.600	107.300	107.250	0.050	200.0	225	5.49	50.0
10.003	MH6	MH5	13.901	0.600	107.250	107.100	0.150	92.7	225	5.66	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.000	1.047	18.5	7.3	0.650	1.050	0.054	0.0	65	0.985
2.001	3.576	63.2	12.5	1.050	1.495	0.092	0.0	45	2.783
3.000	1.096	19.4	5.1	0.650	0.970	0.038	0.0	53	0.931
3.001	3.277	57.9	10.8	0.970	1.495	0.080	0.0	44	2.514
1.000	1.475	58.7	23.3	1.495	1.275	0.172	0.0	99	1.395
4.000	1.034	18.3	5.1	0.650	1.050	0.038	0.0	54	0.888
4.001	2.988	52.8	5.1	1.050	1.275	0.038	0.0	31	1.898
5.000	1.034	18.3	5.1	0.650	0.970	0.038	0.0	54	0.888
5.001	2.932	51.8	5.1	0.970	1.275	0.038	0.0	32	1.883
1.001	2.509	99.8	40.4	1.275	1.200	0.298	0.0	100	2.383
6.000	1.039	18.4	9.1	0.650	1.050	0.067	0.0	75	1.038
6.001	2.686	47.5	14.2	1.050	1.200	0.105	0.0	56	2.347
7.000	1.039	18.4	8.8	0.650	0.970	0.065	0.0	73	1.027
7.001	2.820	49.8	14.0	0.970	1.200	0.103	0.0	54	2.425
1.002	2.905	205.3	68.6	1.200	1.530	0.506	0.0	119	2.625
8.000	1.075	19.0	5.1	0.650	1.080	0.038	0.0	53	0.913
8.001	3.192	56.4	5.1	1.080	1.900	0.038	0.0	31	2.005
9.000	1.034	18.3	5.1	0.650	0.970	0.038	0.0	54	0.888
9.001	1.095	19.3	5.1	0.970	0.850	0.038	0.0	53	0.930
1.003	3.297	233.1	80.0	1.530	1.900	0.590	0.0	121	3.000
10.000	2.294	40.5	3.4	1.000	1.800	0.025	0.0	29	1.390
10.001	0.914	16.2	3.4	1.800	1.700	0.025	0.0	47	0.725
10.002	0.921	36.6	3.4	1.625	1.785	0.025	0.0	46	0.579
10.003	1.358	54.0	10.0	1.785	1.975	0.074	0.0	65	1.044

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.004	MH5	Storage 2	12.261	0.600	107.100	107.000	0.100	122.6	300	6.29	50.0
1.005	Storage 2	Control	12.292	0.600	107.000	106.900	0.100	122.9	300	6.43	50.0
11.000	ACO	Control	19.857	0.600	108.090	107.050	1.040	19.1	150	5.14	50.0
1.006	Control	MH8	8.400	0.600	106.900	106.800	0.100	84.0	300	6.51	50.0
1.007	MH8	Outfall	37.844	0.600	106.800	106.000	0.800	47.3	300	6.79	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.004	1.418	100.3	97.4	1.900	1.550	0.719	0.0	240	1.607
1.005	1.417	100.1	97.4	1.550	1.600	0.719	0.0	241	1.605
11.000	2.315	40.9	6.2	0.560	1.600	0.046	0.0	40	1.681
1.006	1.716	121.3	103.7	1.600	1.100	0.765	0.0	214	1.919
1.007	2.291	162.0	103.7	1.100	1.050	0.765	0.0	175	2.426

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.000	32.280	92.2	150	Circular	111.250	110.450	0.650	111.300	110.100	1.050
2.001	4.782	8.0	150	Circular	111.300	110.100	1.050	111.150	109.505	1.495
3.000	29.451	84.1	150	Circular	111.430	110.630	0.650	111.400	110.280	0.970
3.001	7.413	9.6	150	Circular	111.400	110.280	0.970	111.150	109.505	1.495
1.000	25.968	78.7	225	Circular	111.150	109.430	1.495	110.600	109.100	1.275
4.000	33.082	94.5	150	Circular	110.650	109.850	0.650	110.700	109.500	1.050
4.001	3.736	11.5	150	Circular	110.700	109.500	1.050	110.600	109.175	1.275
5.000	33.035	94.4	150	Circular	110.820	110.020	0.650	110.790	109.670	0.970
5.001	5.906	11.9	150	Circular	110.790	109.670	0.970	110.600	109.175	1.275
1.001	18.489	27.4	225	Circular	110.600	109.100	1.275	109.850	108.425	1.200
6.000	32.728	93.5	150	Circular	109.950	109.150	0.650	110.000	108.800	1.050
6.001	4.262	14.2	150	Circular	110.000	108.800	1.050	109.850	108.500	1.200
7.000	32.767	93.6	150	Circular	110.130	109.330	0.650	110.100	108.980	0.970
7.001	6.191	12.9	150	Circular	110.100	108.980	0.970	109.850	108.500	1.200
1.002	25.964	29.5	300	Circular	109.850	108.350	1.200	109.300	107.470	1.530

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	IC1	450	Manhole	PCC	IC2	450	Manhole	PCC
2.001	IC2	450	Manhole	PCC	MH1	1200	Manhole	PCC
3.000	IC3	450	Manhole	PCC	IC4	450	Manhole	PCC
3.001	IC4	450	Manhole	PCC	MH1	1200	Manhole	PCC
1.000	MH1	1200	Manhole	PCC	MH2	1500	Manhole	PCC
4.000	IC5	450	Manhole	PCC	IC6	450	Manhole	PCC
4.001	IC6	450	Manhole	PCC	MH2	1500	Manhole	PCC
5.000	IC7	450	Manhole	PCC	IC8	450	Manhole	PCC
5.001	IC8	450	Manhole	PCC	MH2	1500	Manhole	PCC
1.001	MH2	1500	Manhole	PCC	MH3	1500	Manhole	PCC
6.000	IC9	450	Manhole	PCC	IC10	450	Manhole	PCC
6.001	IC10	450	Manhole	PCC	MH3	1500	Manhole	PCC
7.000	IC11	450	Manhole	PCC	IC12	450	Manhole	PCC
7.001	IC12	450	Manhole	PCC	MH3	1500	Manhole	PCC
1.002	MH3	1500	Manhole	PCC	MH4	1500	Manhole	PCC

Pipeline Schedule

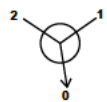
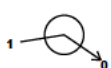
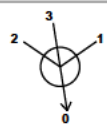
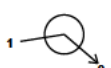
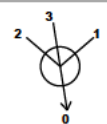
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
8.000	30.605	87.4	150	Circular	109.320	108.520	0.650	109.400	108.170	1.080
8.001	9.272	10.1	150	Circular	109.400	108.170	1.080	109.300	107.250	1.900
9.000	33.034	94.4	150	Circular	109.520	108.720	0.650	109.490	108.370	0.970
9.001	5.905	84.4	150	Circular	109.490	108.370	0.970	109.300	108.300	0.850
1.003	8.482	22.9	300	Circular	109.300	107.470	1.530	109.300	107.100	1.900
10.000	11.674	19.5	150	Circular	109.150	108.000	1.000	109.350	107.400	1.800
10.001	12.042	120.4	150	Circular	109.350	107.400	1.800	109.150	107.300	1.700
10.002	10.000	200.0	225	Circular	109.150	107.300	1.625	109.260	107.250	1.785
10.003	13.901	92.7	225	Circular	109.260	107.250	1.785	109.300	107.100	1.975
1.004	12.261	122.6	300	Circular	109.300	107.100	1.900	108.850	107.000	1.550
1.005	12.292	122.9	300	Circular	108.850	107.000	1.550	108.800	106.900	1.600
11.000	19.857	19.1	150	Circular	108.800	108.090	0.560	108.800	107.050	1.600
1.006	8.400	84.0	300	Circular	108.800	106.900	1.600	108.200	106.800	1.100
1.007	37.844	47.3	300	Circular	108.200	106.800	1.100	107.350	106.000	1.050

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
8.000	IC13	450	Manhole	PCC	IC14	450	Manhole	PCC
8.001	IC14	450	Manhole	PCC	MH5	1500	Manhole	PCC
9.000	IC15	450	Manhole	PCC	IC16	1500	Manhole	PCC
9.001	IC16	1500	Manhole	PCC	MH4	1500	Manhole	PCC
1.003	MH4	1500	Manhole	PCC	MH5	1500	Manhole	PCC
10.000	IC17	450	Manhole	PCC	MH7	1200	Manhole	PCC
10.001	MH7	1200	Manhole	PCC	Storage 1		Junction	
10.002	Storage 1		Junction		MH6	1200	Manhole	PCC
10.003	MH6	1200	Manhole	PCC	MH5	1500	Manhole	PCC
1.004	MH5	1500	Manhole	PCC	Storage 2		Junction	
1.005	Storage 2		Junction		Control	1500	Manhole	PCC
11.000	ACO	450	Manhole	PCC	Control	1500	Manhole	PCC
1.006	Control	1500	Manhole	PCC	MH8	1200	Manhole	PCC
1.007	MH8	1200	Manhole	PCC	Outfall	1200	Manhole	PCC

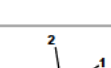
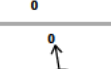
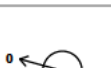
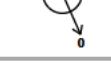
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
IC1	361519.366	437216.406	111.250	0.800	450				
						0	2.000	110.450	150
IC2	361551.246	437221.472	111.300	1.200	450				
						0	2.001	110.100	150
IC3	361590.380	437227.705	111.430	0.800	450				
						0	3.000	110.630	150
IC4	361561.295	437223.077	111.400	1.120	450				
						0	3.001	110.280	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
MH1	361555.226	437218.821	111.150	1.720	1200		1 2 0	3.001 2.001 1.000	109.505 109.505 109.430	150 150 225
IC5	361523.550	437190.091	110.650	0.800	450		0	4.000	109.850	150
IC6	361556.222	437195.284	110.700	1.200	450		1 0	4.000 4.001	109.500 109.500	150 150
IC7	361596.778	437201.736	110.820	0.800	450		0	5.000	110.020	150
IC8	361564.152	437196.552	110.790	1.120	450		1 0	5.000 5.001	109.670 109.670	150 150
MH2	361559.306	437193.176	110.600	1.500	1500		1 2 3 0	5.001 4.001 1.000 1.001	109.175 109.175 109.100 109.100	150 150 225 225
IC9	361526.651	437172.551	109.950	0.800	450		0	6.000	109.150	150
IC10	361558.973	437177.688	110.000	1.200	450		1 0	6.000 6.001	108.800 108.800	150 150
IC11	361599.263	437184.105	110.130	0.800	450		0	7.000	109.330	150
IC12	361566.903	437178.956	110.100	1.120	450		1 0	7.000 7.001	108.980 108.980	150 150
MH3	361562.211	437174.917	109.850	1.500	1500		1 2 3 0	7.001 6.001 1.001 1.002	108.500 108.500 108.425 108.350	150 150 225 300
IC13	361530.536	437146.184	109.320	0.800	450		0	8.000	108.520	150
IC14	361560.761	437150.994	109.400	1.230	450		1 0	8.000 8.001	108.170 108.170	150 150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
IC15	361603.763	437157.836	109.520	0.800	450		0	9.000	108.720	150
IC16	361571.138	437152.651	109.490	1.120	1500		1	9.000	108.370	150
							0	9.001	108.370	150
MH4	361566.293	437149.276	109.300	1.830	1500		1	9.001	108.300	150
							2	1.002	107.470	300
							0	1.003	107.470	300
IC17	361598.845	437135.843	109.150	1.150	450		0	10.000	108.000	150
MH6	361575.946	437144.021	109.260	2.310	1200		1	10.002	107.250	225
							0	10.003	107.250	225
MH7	361596.963	437147.364	109.350	2.250	1200		1	10.000	107.400	150
							0	10.001	107.400	150
Storage 1	361585.058	437145.555	109.150	1.850			1	10.001	107.300	150
							0	10.002	107.300	225
MH5	361562.218	437141.837	109.300	2.500	1500		1	10.003	107.100	225
							2	8.001	107.250	150
							3	1.003	107.100	300
							0	1.004	107.100	300
ACO	361557.123	437132.736	108.800	0.710	450		0	11.000	108.090	150
Storage 2	361550.092	437140.025	108.850	1.850			1	1.004	107.000	300
							0	1.005	107.000	300
Control	361537.971	437137.979	108.800	2.200	1500		1	11.000	107.050	150
							2	1.005	106.900	300
							0	1.006	106.900	300
MH8	361533.532	437128.823	108.200	1.400	1200		1	1.006	106.800	300
							0	1.007	106.800	300
Outfall	361548.977	437094.274	107.350	1.350	1200		1	1.007	106.000	300

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	18.700	Additional Storage (m³/ha)	20.0
Ratio-R	0.320	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	40	0	0
100	50	0	0

Node Outfall Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		
Applies to All storms					

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	1.300	250	1.300	500	1.300	750	1.300	1000	1.300	1250	1.300
10	1.300	260	1.300	510	1.300	760	1.300	1010	1.300	1260	1.300
20	1.300	270	1.300	520	1.300	770	1.300	1020	1.300	1270	1.300
30	1.300	280	1.300	530	1.300	780	1.300	1030	1.300	1280	1.300
40	1.300	290	1.300	540	1.300	790	1.300	1040	1.300	1290	1.300
50	1.300	300	1.300	550	1.300	800	1.300	1050	1.300	1300	1.300
60	1.300	310	1.300	560	1.300	810	1.300	1060	1.300	1310	1.300
70	1.300	320	1.300	570	1.300	820	1.300	1070	1.300	1320	1.300
80	1.300	330	1.300	580	1.300	830	1.300	1080	1.300	1330	1.300
90	1.300	340	1.300	590	1.300	840	1.300	1090	1.300	1340	1.300
100	1.300	350	1.300	600	1.300	850	1.300	1100	1.300	1350	1.300
110	1.300	360	1.300	610	1.300	860	1.300	1110	1.300	1360	1.300
120	1.300	370	1.300	620	1.300	870	1.300	1120	1.300	1370	1.300
130	1.300	380	1.300	630	1.300	880	1.300	1130	1.300	1380	1.300
140	1.300	390	1.300	640	1.300	890	1.300	1140	1.300	1390	1.300
150	1.300	400	1.300	650	1.300	900	1.300	1150	1.300	1400	1.300
160	1.300	410	1.300	660	1.300	910	1.300	1160	1.300	1410	1.300
170	1.300	420	1.300	670	1.300	920	1.300	1170	1.300	1420	1.300
180	1.300	430	1.300	680	1.300	930	1.300	1180	1.300	1430	1.300
190	1.300	440	1.300	690	1.300	940	1.300	1190	1.300	1440	1.300
200	1.300	450	1.300	700	1.300	950	1.300	1200	1.300		
210	1.300	460	1.300	710	1.300	960	1.300	1210	1.300		
220	1.300	470	1.300	720	1.300	970	1.300	1220	1.300		
230	1.300	480	1.300	730	1.300	980	1.300	1230	1.300		
240	1.300	490	1.300	740	1.300	990	1.300	1240	1.300		

Node Control Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	106.900	Product Number	CTL-SHE-0139-1020-1500-1020
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	10.2	Min Node Diameter (mm)	1500

Node Storage 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	198.0	198.0	1.200	198.0	257.9	1.201	0.0	257.9

Node Storage 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	198.0	198.0	1.200	198.0	257.9	1.201	0.0	257.9

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	10	110.515	0.065	6.6	0.0982	0.0000	OK
15 minute winter	IC2	10	110.146	0.046	11.0	0.0367	0.0000	OK
15 minute winter	IC3	10	110.681	0.051	4.6	0.0568	0.0000	OK
15 minute winter	IC4	10	110.324	0.044	9.6	0.0398	0.0000	OK
15 minute winter	MH1	10	109.524	0.094	20.5	0.1064	0.0000	OK
15 minute winter	IC5	10	109.905	0.055	4.6	0.0615	0.0000	OK
15 minute winter	IC6	11	109.532	0.032	4.5	0.0051	0.0000	OK
15 minute winter	IC7	10	110.076	0.056	4.6	0.0616	0.0000	OK
15 minute winter	IC8	11	109.701	0.031	4.5	0.0050	0.0000	OK
15 minute winter	MH2	11	109.198	0.098	35.3	0.2385	0.0000	OK
15 minute winter	IC9	10	109.223	0.073	8.2	0.1330	0.0000	OK
15 minute winter	IC10	10	108.860	0.060	12.6	0.0472	0.0000	OK
15 minute winter	IC11	10	109.402	0.072	7.9	0.1279	0.0000	OK
15 minute winter	IC12	10	109.035	0.055	12.3	0.0463	0.0000	OK
15 minute winter	MH3	11	108.464	0.114	60.0	0.2013	0.0000	OK
15 minute winter	IC13	10	108.575	0.055	4.6	0.0610	0.0000	OK
15 minute winter	IC14	11	108.199	0.029	4.5	0.0046	0.0000	OK
15 minute winter	IC15	10	108.772	0.052	4.6	0.0573	0.0000	OK
15 minute winter	IC16	11	108.423	0.053	4.5	0.0934	0.0000	OK
15 minute winter	MH4	11	107.596	0.126	70.0	0.2864	0.0000	OK
15 minute winter	IC17	10	108.028	0.028	3.1	0.0167	0.0000	OK
600 minute winter	MH6	405	107.421	0.171	5.4	0.2766	0.0000	OK
15 minute winter	MH7	10	107.450	0.050	3.1	0.0570	0.0000	OK
600 minute winter	Storage 1	405	107.421	0.121	5.8	22.7348	0.0000	OK
600 minute winter	MH5	405	107.421	0.321	10.2	0.6165	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	6.4	1.083	0.348	0.1928	
15 minute winter	IC2	2.001	MH1	10.9	2.519	0.173	0.0208	
15 minute winter	IC3	3.000	IC4	4.5	0.948	0.234	0.1411	
15 minute winter	IC4	3.001	MH1	9.5	2.329	0.165	0.0304	
15 minute winter	MH1	1.000	MH2	20.4	1.265	0.347	0.4182	
15 minute winter	IC5	4.000	IC6	4.5	1.063	0.247	0.1429	
15 minute winter	IC6	4.001	MH2	4.5	1.734	0.085	0.0097	
15 minute winter	IC7	5.000	IC8	4.5	1.070	0.247	0.1419	
15 minute winter	IC8	5.001	MH2	4.5	1.743	0.087	0.0153	
15 minute winter	MH2	1.001	MH3	35.4	2.223	0.355	0.2946	
15 minute winter	IC9	6.000	IC10	8.0	1.071	0.435	0.2445	
15 minute winter	IC10	6.001	MH3	12.5	2.079	0.262	0.0256	
15 minute winter	IC11	7.000	IC12	7.7	1.092	0.421	0.2326	
15 minute winter	IC12	7.001	MH3	12.2	2.199	0.245	0.0344	
15 minute winter	MH3	1.002	MH4	60.2	2.288	0.293	0.6835	
15 minute winter	IC13	8.000	IC14	4.5	1.127	0.238	0.1254	
15 minute winter	IC14	8.001	MH5	4.5	1.802	0.080	0.0368	
15 minute winter	IC15	9.000	IC16	4.5	0.846	0.249	0.1783	
15 minute winter	IC16	9.001	MH4	4.5	0.855	0.233	0.0312	
15 minute winter	MH4	1.003	MH5	70.3	1.775	0.302	0.3348	
15 minute winter	IC17	10.000	MH7	3.1	0.841	0.076	0.0435	
600 minute winter	MH6	10.003	MH5	-4.7	0.135	-0.087	0.5013	
15 minute winter	MH7	10.001	Storage 1	3.0	1.425	0.186	0.0317	
600 minute winter	Storage 1	10.002	MH6	-5.4	-0.385	-0.147	0.2703	
600 minute winter	MH5	1.004	Storage 2	9.4	0.960	0.094	0.8634	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	ACO	10	108.128	0.038	5.6	0.0554	0.0000	OK
600 minute winter	Storage 2	405	107.420	0.420	9.7	79.0692	0.0000	SURCHARGED
600 minute winter	Control	405	107.420	0.520	6.3	0.9187	0.0000	SURCHARGED
600 minute winter	MH8	405	107.302	0.501	6.3	0.5672	0.0000	SURCHARGED
15 minute summer	Outfall	1	107.300	1.300	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ACO	11.000	Control	5.5	1.597	0.135	0.1763	
600 minute winter	Storage 2	1.005	Control	5.9	0.139	0.059	0.8656	
600 minute winter	Control	1.006	MH8	6.3	0.276	0.052	0.5915	
600 minute winter	MH8	1.007	Outfall	6.3	0.090	0.039	2.6649	99.2

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	10	110.525	0.075	8.5	0.1134	0.0000	OK
15 minute winter	IC2	10	110.154	0.054	14.3	0.0426	0.0000	OK
15 minute winter	IC3	10	110.689	0.059	6.0	0.0656	0.0000	OK
15 minute winter	IC4	10	110.331	0.051	12.5	0.0460	0.0000	OK
15 minute winter	MH1	10	109.540	0.110	26.6	0.1241	0.0000	OK
15 minute winter	IC5	10	109.914	0.064	6.0	0.0710	0.0000	OK
15 minute winter	IC6	10	109.536	0.036	5.9	0.0057	0.0000	OK
15 minute winter	IC7	10	110.084	0.064	6.0	0.0712	0.0000	OK
15 minute winter	IC8	10	109.705	0.035	5.9	0.0056	0.0000	OK
15 minute winter	MH2	11	109.215	0.115	46.0	0.2793	0.0000	OK
15 minute winter	IC9	10	109.235	0.085	10.6	0.1553	0.0000	OK
15 minute winter	IC10	10	108.870	0.070	16.4	0.0555	0.0000	OK
15 minute winter	IC11	10	109.414	0.084	10.3	0.1496	0.0000	OK
15 minute winter	IC12	10	109.045	0.065	16.1	0.0541	0.0000	OK
15 minute winter	MH3	11	108.482	0.132	77.8	0.2324	0.0000	OK
15 minute winter	IC13	10	108.584	0.064	6.0	0.0705	0.0000	OK
15 minute winter	IC14	10	108.203	0.033	5.9	0.0052	0.0000	OK
15 minute winter	IC15	10	108.780	0.060	6.0	0.0661	0.0000	OK
15 minute winter	IC16	11	108.431	0.061	5.9	0.1085	0.0000	OK
15 minute winter	MH4	11	107.623	0.153	90.8	0.3479	0.0000	OK
15 minute winter	IC17	10	108.032	0.032	4.0	0.0189	0.0000	OK
600 minute winter	MH6	390	107.452	0.202	6.5	0.3275	0.0000	OK
15 minute winter	MH7	10	107.457	0.057	4.0	0.0642	0.0000	OK
600 minute winter	Storage 1	390	107.452	0.152	7.0	28.6523	0.0000	OK
600 minute winter	MH5	390	107.452	0.352	12.0	0.6770	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	8.3	1.150	0.450	0.2342	
15 minute winter	IC2	2.001	MH1	14.2	2.683	0.225	0.0253	
15 minute winter	IC3	3.000	IC4	5.9	1.014	0.305	0.1717	
15 minute winter	IC4	3.001	MH1	12.4	2.491	0.214	0.0369	
15 minute winter	MH1	1.000	MH2	26.3	1.339	0.449	0.5112	
15 minute winter	IC5	4.000	IC6	5.9	1.147	0.322	0.1721	
15 minute winter	IC6	4.001	MH2	5.9	1.792	0.111	0.0129	
15 minute winter	IC7	5.000	IC8	5.9	1.156	0.321	0.1708	
15 minute winter	IC8	5.001	MH2	5.9	1.803	0.113	0.0202	
15 minute winter	MH2	1.001	MH3	45.9	2.365	0.460	0.3592	
15 minute winter	IC9	6.000	IC10	10.4	1.133	0.565	0.2995	
15 minute winter	IC10	6.001	MH3	16.2	2.204	0.341	0.0313	
15 minute winter	IC11	7.000	IC12	10.1	1.159	0.548	0.2848	
15 minute winter	IC12	7.001	MH3	15.9	2.342	0.319	0.0420	
15 minute winter	MH3	1.002	MH4	78.1	2.371	0.380	0.8555	
15 minute winter	IC13	8.000	IC14	5.9	1.210	0.310	0.1519	
15 minute winter	IC14	8.001	MH5	5.9	1.803	0.104	0.0707	
15 minute winter	IC15	9.000	IC16	5.9	0.902	0.324	0.2169	
15 minute winter	IC16	9.001	MH4	5.9	0.915	0.304	0.0380	
15 minute winter	MH4	1.003	MH5	91.2	1.840	0.391	0.4193	
15 minute winter	IC17	10.000	MH7	4.0	0.915	0.098	0.0515	
600 minute winter	MH6	10.003	MH5	-5.6	-0.156	-0.104	0.5380	
15 minute winter	MH7	10.001	Storage 1	3.9	1.515	0.240	0.0376	
600 minute winter	Storage 1	10.002	MH6	-6.5	-0.403	-0.177	0.3312	
600 minute winter	MH5	1.004	Storage 2	10.2	0.969	0.102	0.8634	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.53%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	ACO	10	108.134	0.044	7.3	0.0635	0.0000	OK
600 minute winter	Storage 2	390	107.452	0.451	10.6	84.9244	0.0000	SURCHARGED
600 minute winter	Control	390	107.451	0.551	8.1	0.9732	0.0000	SURCHARGED
600 minute winter	MH8	390	107.302	0.502	8.1	0.5682	0.0000	SURCHARGED
15 minute summer	Outfall	1	107.300	1.300	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ACO	11.000	Control	7.2	1.718	0.175	0.1976	
600 minute winter	Storage 2	1.005	Control	7.6	0.149	0.076	0.8656	
600 minute winter	Control	1.006	MH8	8.1	0.277	0.066	0.5915	
600 minute winter	MH8	1.007	Outfall	8.1	0.114	0.050	2.6649	133.3

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	12	110.834	0.384	22.6	0.5790	0.0000	SURCHARGED
15 minute winter	IC2	12	110.436	0.336	36.4	0.2663	0.0000	SURCHARGED
15 minute winter	IC3	10	110.738	0.108	15.9	0.1196	0.0000	OK
15 minute winter	IC4	12	110.451	0.171	33.4	0.1550	0.0000	SURCHARGED
15 minute winter	MH1	12	110.202	0.772	64.6	0.8736	0.0000	SURCHARGED
15 minute winter	IC5	12	109.976	0.126	15.9	0.1392	0.0000	OK
15 minute winter	IC6	12	109.839	0.339	15.9	0.0540	0.0000	SURCHARGED
15 minute winter	IC7	10	110.140	0.120	15.9	0.1327	0.0000	OK
15 minute winter	IC8	12	109.857	0.187	15.7	0.0297	0.0000	SURCHARGED
15 minute winter	MH2	12	109.810	0.710	106.0	1.7274	0.0000	SURCHARGED
15 minute winter	IC9	12	109.822	0.672	28.0	1.2321	0.0000	FLOOD RISK
15 minute winter	IC10	12	109.229	0.429	37.2	0.3399	0.0000	SURCHARGED
15 minute winter	IC11	12	109.887	0.557	27.2	0.9943	0.0000	FLOOD RISK
15 minute winter	IC12	12	109.306	0.326	39.0	0.2735	0.0000	SURCHARGED
15 minute winter	MH3	12	108.955	0.605	168.1	1.0690	0.0000	SURCHARGED
15 minute winter	IC13	10	108.638	0.118	15.9	0.1308	0.0000	OK
15 minute winter	IC14	10	108.224	0.054	15.6	0.0086	0.0000	OK
15 minute winter	IC15	10	108.831	0.111	15.9	0.1227	0.0000	OK
15 minute winter	IC16	11	108.486	0.116	15.6	0.2048	0.0000	OK
15 minute winter	MH4	12	108.193	0.723	198.7	1.6420	0.0000	SURCHARGED
15 minute winter	IC17	10	108.052	0.052	10.5	0.0309	0.0000	OK
480 minute winter	MH6	368	107.964	0.714	14.2	1.1561	0.0000	SURCHARGED
480 minute winter	MH7	368	107.964	0.564	1.4	0.6380	0.0000	SURCHARGED
480 minute winter	Storage 1	368	107.964	0.664	15.3	124.9189	0.0000	SURCHARGED
480 minute winter	MH5	368	107.964	0.864	35.0	1.6605	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	20.5	1.307	1.108	0.5683	
15 minute winter	IC2	2.001	MH1	33.1	2.853	0.524	0.0842	
15 minute winter	IC3	3.000	IC4	15.8	1.288	0.815	0.4279	
15 minute winter	IC4	3.001	MH1	31.5	2.656	0.544	0.1305	
15 minute winter	MH1	1.000	MH2	58.8	1.488	1.002	1.0328	
15 minute winter	IC5	4.000	IC6	15.9	1.410	0.873	0.5517	
15 minute winter	IC6	4.001	MH2	13.7	1.794	0.260	0.0658	
15 minute winter	IC7	5.000	IC8	15.7	1.418	0.861	0.4820	
15 minute winter	IC8	5.001	MH2	14.7	1.805	0.283	0.1040	
15 minute winter	MH2	1.001	MH3	98.6	2.745	0.989	0.7353	
15 minute winter	IC9	6.000	IC10	22.2	1.322	1.211	0.5762	
15 minute winter	IC10	6.001	MH3	34.9	2.517	0.735	0.0750	
15 minute winter	IC11	7.000	IC12	23.1	1.319	1.261	0.5769	
15 minute winter	IC12	7.001	MH3	36.3	2.726	0.729	0.1090	
15 minute winter	MH3	1.002	MH4	167.7	2.456	0.817	1.8284	
15 minute winter	IC13	8.000	IC14	15.6	1.500	0.820	0.3142	
15 minute winter	IC14	8.001	MH5	15.5	1.725	0.275	0.1079	
15 minute winter	IC15	9.000	IC16	15.6	1.107	0.854	0.4660	
15 minute winter	IC16	9.001	MH4	15.5	1.137	0.803	0.0805	
15 minute winter	MH4	1.003	MH5	196.6	2.792	0.844	0.5973	
15 minute winter	IC17	10.000	MH7	10.4	1.278	0.258	0.0956	
480 minute winter	MH6	10.003	MH5	-11.5	-0.289	-0.213	0.5529	
480 minute winter	MH7	10.001	Storage 1	1.3	0.613	0.079	0.2120	
480 minute winter	Storage 1	10.002	MH6	-14.1	-0.528	-0.385	0.3977	
480 minute winter	MH5	1.004	Storage 2	23.3	1.271	0.232	0.8634	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	ACO	10	108.162	0.072	19.2	0.1048	0.0000	OK
480 minute winter	Storage 2	368	107.963	0.963	23.3	181.1135	0.0000	SURCHARGED
480 minute winter	Control	368	107.962	1.062	10.4	1.8761	0.0000	SURCHARGED
15 minute summer	MH8	13	107.308	0.508	8.9	0.5748	0.0000	SURCHARGED
15 minute summer	Outfall	1	107.300	1.300	8.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	ACO	11.000	Control	19.1	2.015	0.466	0.2578	
480 minute winter	Storage 2	1.005	Control	10.1	0.169	0.101	0.8656	
480 minute winter	Control	1.006	MH8	10.2	0.358	0.084	0.5915	
15 minute summer	MH8	1.007	Outfall	8.9	0.126	0.055	2.6649	53.2

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	IC1	10	111.250	0.800	31.2	1.2072	2.6249	FLOOD
15 minute winter	IC2	12	111.083	0.983	41.7	0.7788	0.0000	FLOOD RISK
15 minute winter	IC3	11	111.430	0.800	22.0	0.8872	0.5381	FLOOD
15 minute winter	IC4	12	111.234	0.954	40.2	0.8671	0.0000	FLOOD RISK
15 minute winter	MH1	12	110.874	1.444	68.8	1.6327	0.0000	FLOOD RISK
15 minute winter	IC5	11	110.650	0.800	22.0	0.8872	0.5431	FLOOD
15 minute winter	IC6	12	110.459	0.959	16.1	0.1524	0.0000	FLOOD RISK
15 minute winter	IC7	12	110.816	0.796	22.0	0.8826	0.0000	FLOOD RISK
15 minute winter	IC8	12	110.496	0.826	17.9	0.1313	0.0000	FLOOD RISK
15 minute winter	MH2	12	110.428	1.328	115.3	3.2329	0.0000	FLOOD RISK
15 minute winter	IC9	10	109.950	0.800	38.8	1.4672	3.3990	FLOOD
15 minute winter	IC10	12	109.623	0.823	43.0	0.6519	0.0000	SURCHARGED
15 minute winter	IC11	10	110.130	0.800	37.6	1.4272	2.8181	FLOOD
15 minute winter	IC12	12	109.735	0.755	43.2	0.6330	0.0000	SURCHARGED
15 minute winter	MH3	12	109.359	1.009	181.1	1.7831	0.0000	SURCHARGED
15 minute winter	IC13	11	108.804	0.284	22.0	0.3146	0.0000	SURCHARGED
600 minute winter	IC14	480	108.771	0.601	2.4	0.0956	0.0000	SURCHARGED
15 minute winter	IC15	11	109.042	0.322	22.0	0.3566	0.0000	SURCHARGED
600 minute winter	IC16	480	108.772	0.402	2.4	0.7100	0.0000	SURCHARGED
600 minute winter	MH4	480	108.772	1.302	37.7	2.9548	0.0000	SURCHARGED
600 minute winter	IC17	480	108.771	0.771	1.6	0.4580	0.0000	SURCHARGED
600 minute winter	MH6	480	108.771	1.521	22.8	2.4625	0.0000	SURCHARGED
600 minute winter	MH7	480	108.771	1.371	1.6	1.5506	0.0000	SURCHARGED
600 minute winter	Storage 1	480	108.771	1.471	23.5	225.8141	0.0000	SURCHARGED
600 minute winter	MH5	480	108.771	1.671	40.8	3.2115	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	IC1	2.000	IC2	19.7	1.303	1.065	0.5683	
15 minute winter	IC2	2.001	MH1	35.8	2.858	0.567	0.0842	
15 minute winter	IC3	3.000	IC4	17.4	1.273	0.896	0.5185	
15 minute winter	IC4	3.001	MH1	34.5	2.664	0.596	0.1305	
15 minute winter	MH1	1.000	MH2	63.2	1.589	1.077	1.0328	
15 minute winter	IC5	4.000	IC6	16.1	1.396	0.884	0.5824	
15 minute winter	IC6	4.001	MH2	15.4	1.748	0.292	0.0658	
15 minute winter	IC7	5.000	IC8	17.9	1.424	0.979	0.5816	
15 minute winter	IC8	5.001	MH2	16.6	1.756	0.321	0.1040	
15 minute winter	MH2	1.001	MH3	110.9	2.788	1.111	0.7353	
15 minute winter	IC9	6.000	IC10	22.4	1.273	1.220	0.5762	
15 minute winter	IC10	6.001	MH3	38.7	2.510	0.816	0.0750	
15 minute winter	IC11	7.000	IC12	22.5	1.281	1.229	0.5769	
15 minute winter	IC12	7.001	MH3	39.7	2.722	0.797	0.1090	
15 minute winter	MH3	1.002	MH4	180.0	2.557	0.877	1.8284	
15 minute winter	IC13	8.000	IC14	20.4	1.481	1.071	0.4060	
600 minute winter	IC14	8.001	MH5	2.4	0.978	0.043	0.1632	
15 minute winter	IC15	9.000	IC16	20.3	1.153	1.111	0.5816	
600 minute winter	IC16	9.001	MH4	2.4	0.723	0.124	0.1040	
600 minute winter	MH4	1.003	MH5	37.3	0.982	0.160	0.5973	
600 minute winter	IC17	10.000	MH7	1.6	0.633	0.039	0.2055	
600 minute winter	MH6	10.003	MH5	-20.7	-0.520	-0.383	0.5529	
600 minute winter	MH7	10.001	Storage 1	1.4	0.626	0.090	0.2120	
600 minute winter	Storage 1	10.002	MH6	-22.7	-0.571	-0.620	0.3977	
600 minute winter	MH5	1.004	Storage 2	26.4	1.313	0.264	0.8634	

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	ACO	480	108.769	0.679	3.0	0.9878	0.0000	FLOOD RISK
600 minute winter	Storage 2	480	108.770	1.770	26.4	225.8141	0.0000	FLOOD RISK
600 minute winter	Control	480	108.769	1.869	10.4	3.3019	0.0000	FLOOD RISK
15 minute summer	MH8	12	107.312	0.512	10.0	0.5795	0.0000	SURCHARGED
15 minute summer	Outfall	1	107.300	1.300	10.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	ACO	11.000	Control	3.0	0.782	0.073	0.3496	
600 minute winter	Storage 2	1.005	Control	9.7	0.170	0.097	0.8656	
600 minute winter	Control	1.006	MH8	10.2	0.274	0.084	0.5915	
15 minute summer	MH8	1.007	Outfall	10.0	0.143	0.062	2.6649	91.9