TOBIN

Kilkenny County Council

IDA Belview Infrastructure Development

Co. Kilkenny

Engineering Planning Report

BUILT ON KNOWLEDGE

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List of Figures

1. INTRODUCTION

TOBIN have been appointed by Kilkenny County Council to prepare the preliminary design and Part 8 submission for road upgrade works at Belview, Co. Kilkenny (see Figure 1-1).

Figure 1-1 Site Location

1.1 PROJECT BACKGROUND

This project will provide access to the IDA Ireland land bank at Kilmurry, Belview, Co. Kilkenny (Fig. 1-2) to facilitate IDA development as well as provide active travel modes for the area. The subject site is located in South Kilkenny approximately 3 km east of Waterford and north of IDA Science and Technology Business Park.

The L3412 Road forms the northern boundary of the subject site. To the south of the site are Tirlan Belview, Kilkenny Cheese, and Waterford Wastewater Treatment Plant (Celtic Anglian Water).

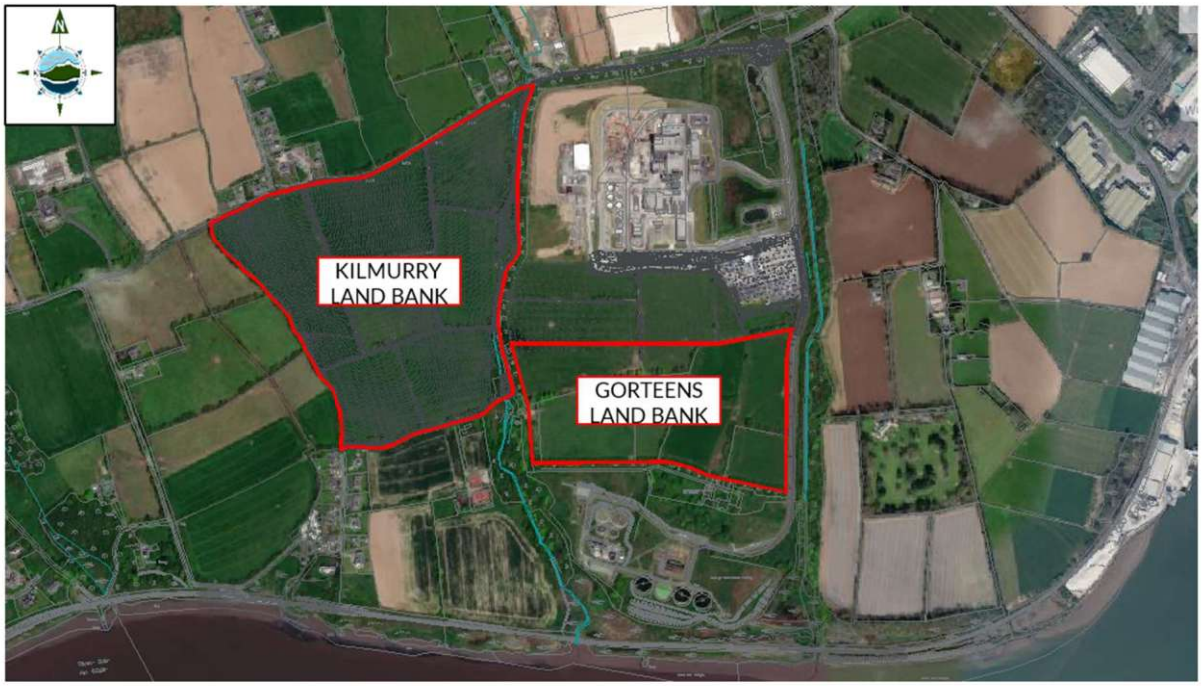


Figure 1-2 Kilmurry and Gorteens Land Bank

1.2 DEVELOPMENT DESCRIPTION

The proposed works consist of upgrade works to the local road L3412 and ancillary site development works which will provide access to the IDA Ireland land bank at Kilmurry, Slieverue and Gorteen, Belview, Co. Kilkenny. The proposal will provide an upgrade of local road L3412 from the existing eastern IDA Ireland roundabout to the new IDA Ireland land bank at Kilmurray and will tie back into the existing L3412 to the west via a new roundabout. The upgrade will be taken online on the existing road and offline on adjoining land.

The works will consist of the following items:

- Widening and realignment of the existing road,
- Construction of cycle tracks and footpaths
- Construction of new roundabout
- Construction of a new culvert at the existing watercourse
- Drainage works incorporating SuDS measures and interceptors as required
- Landscaping including amendments to the existing screening berm
- Ancillary road works including public lighting, signs and road markings
- Construction of a new watermain
- All associated site works

This application includes a Natura Impact Statement. Planning to include all associated site works.

Access will be maintained, during construction and once the proposed road is in use, to all houses and business currently accessed from local road L3412.

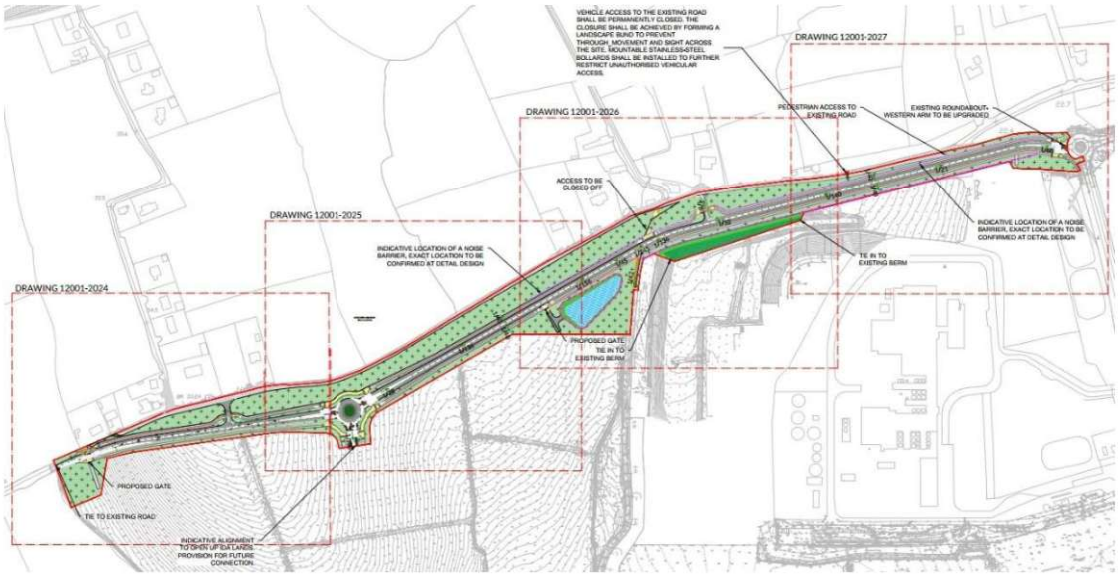


Figure 1-3 Proposed Site Layout

1.3 ENGINEERING INFORMATION

As part of the planning submission for the above development, TOBIN have prepared this Engineering Design Report to address the following design aspects of the proposed development

- Storm Water Drainage
- Water Supply
- Roads

The following drawings are included outlining the design proposals and a Drawing Register is included in Appendix A:

- 12001 - 2000 Site Location Map.
- 12001 - 2001 Proposed Access Road Layout – Masterplan.
- 12001 - 2002 Proposed Access Road Layout - Sheet 1 of 2.
- 12001 - 2003 Proposed Access Road Layout - Sheet 2 of 2.
- 12001 - 2004 Access Road Layout Visibility Splays.
- 12001 - 2005 Access Road Layout Proposed Roundabout.
- 12001 - 2006 Access Road Layout Link Roads.
- 12001 - 2007 Access Road Layout Existing Roundabout Upgrade Works.
- 12001 - 2008 Swept Path Analysis Truck.
- 12001 - 2009 Swept Path Analysis Large Car.
- 12001 - 2010 Swept Path Analysis Fire Truck.
- 12001 - 2011 Swept Path Analysis Refuse Truck.

- 12001 - 2012 Proposed Stormwater Layout Masterplan.
- 12001 - 2013 Proposed Stormwater Layout Sheet 1 of 2.
- 12001 - 2014 Proposed Stormwater Layout Sheet 2 of 2.
- 12001 - 2015 Proposed Watermain Layout Masterplan.
- 12001 - 2016 Proposed Watermain Layout Sheet 1 of 2.
- 12001 - 2017 Proposed Watermain Layout Sheet 2 of 2.
- 12001 - 2018 Proposed Ducting Masterplan.
- 12001 - 2019 Proposed Ducting Layout Sheet 1 of 2.
- 12001 - 2020 Proposed Ducting Layout Sheet 2 of 2.
- 12001 - 2021 Site Development Details Sheet 1 of 3.
- 12001 - 2022 Site Development Details Sheet 2 of 3.
- 12001 - 2023 Site Development Details Sheet 3 of 3.
- 12001 - 2024 Standard Manhole Details Sheet 1 of 2.
- 12001 - 2025 Standard Manhole Details Sheet 2 of 2.
- 12001 - 2026 Pipe Bedding Details.
- 12001 - 2027 Standard Water Details.
- 12001 - 2028-Standard Watermain Details Sheet 2.
- 12001 - 2030 Signage Layout Sheet 1 of 2.
- 12001 - 2031 Signage Layout Sheet 2 of 2.
- 12001 - 2032 – Culvert.

2. SURFACE WATER DRAINAGE

Storm water drainage services for the proposed development are considered to include the following:

- ✓ Storm Water Network for the proposed roads

The storm water drainage design has been designed to cater for surface water runoff from all hardstanding areas. The storm water drainage services have been designed to take account of the requirements of the Department of Environment "Recommendations for Site Development Works for Housing Areas", 1998, the "Greater Dublin Strategic Study" and "Sewers for Adoption" published by WRC, UK.

The storm water drainage network was designed using Causeway Flow Design software and the following parameters formed the basis of the design:

- The surface water run-off is calculated using the Modified Rational Method (Wallingford Procedure),

$Q = 2.78 \times Cv \times Cr \times I \times A$

Where,

Q	=	rate of run-off, l/s
Cv	=	Volumetric run-off coefficient
Cr	=	Routing coefficient
I	=	Intensity of rainfall, mm/hr
A	=	Impermeable Area, ha

- A design return period of 1 year has been adopted for the sewer network in accordance with good design practice.
- The rainfall intensity is based on rainfall data for Belview, Co. Kilkenny
- Minimum self-cleansing velocity of 0.75m/s
- M5-60 = 18.3
- Ratio (R) = 0.25

2.1 EXISTING STORM DRAINAGE

There is an existing stormwater network located along the eastern IDA roundabout.

2.2 SUSTAINABLE URBAN DRAINAGE SYSTEMS

The existing site primarily consists greenfield with no existing SuDS measures in place. Surface water currently discharges to ground water and the Rathpatrick Stream. To maintain surface water runoff from the site to those of the current state, the surface water drainage for the proposed development will be designed in accordance with the principles of Sustainable Urban Drainage Systems (SuDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). The GDSDS addresses the issue of sustainability by requiring designs

to comply with a set of drainage criteria which aim to minimise the impact of urbanisation by replicating the runoff characteristics of the greenfield site.

The requirements of SuDS are typically addressed by provision of the following:

- ✓ Interception storage
- ✓ Treatment storage (not required if interception storage is provided)
- ✓ Attenuation storage
- ✓ Long term storage (if this is not required growth rates should not be applied to Q_{bar})

In the case of the subject site, interception and attenuation storage has been proposed by implementing a combination of attenuation pond, cellular attenuation tanks, land drains. This means that both treatment storage and long-term storage (neither of which would be practical on this site) are not required. All SuDS measures will be designed with due reference to the recommendations set out in the EPA's document entitled 'Guidance on Authorisation of Discharges to Groundwater 2011'.

SuDS measures proposed include a combination of permeable surfacing, land drains and green - blue roofs. These measures would seek to achieve interception storage. Storage capacity has been calculated and provided in attenuation tank as though no interception storage were provided. Thereby is mitigated any seasonal performance of interception storage measures.

SuDS objectives relate to:

1.) Water Quality

2.) Water Quantity

3.) Amenity

4.) Biodiversity

2.2.1 Water Quality

Water quality is managed in the form of the proposed hydrocarbon interceptors.

2.2.2 Water Quantity

The use of land drains and proposed attenuation pond will increase the time to concentrate for the network whilst reducing the peak run-off rates. Attenuation storage is also proposed for the development in the form of cellular storage; these are provided due to the special constraints.

2.2.3 Amenity

The proposed pond integrates with the broader landscaping strategy to meet this requirement. However, the details of these measures are to be developed during the detailed design stage.

2.2.4 Biodiversity

The landscaping design requires further development in the detailed design stage to accommodate further SuDS measures to leverage opportunities for biodiversity. However, the SuDS measures already proposed support the landscaping measures as might be employed to meet the biodiversity goals of the development. The detention/infiltration pond has been designed to retain approximately 400mm of water, this will provide a habitat for wetland plants

and aquatic animals, whilst minimising the drowning risk for children. Sheltered banks will provide potential nesting habitat for waterfowl. Aquatic planting will be provided to the area, for further details refer to the landscape architect's layouts. The combination of these measures shall also create some overall diversity in hydro-morphology which will help prevent the pond from becoming a eutrophicated algae pool.

2.3 PROPOSED STORM DRAINAGE

The storm water drainage design has been undertaken using Causeway Flow's modelling software. The design inputs, results and outputs from the analysis are shown in Appendix B of this report. The analysis considered the 100-year return period plus an additional 20% to account for the effects of climate change.

A dedicated storm water drainage system will be provided to pick up surface water run-off from the proposed road. Surface water runoff from roads throughout the site will be collected by precast concrete gullies with lockable cast iron grating and frame connected to a land drains stormwater pipe.

The pipe diameter of the new network will be 225mm and will be laid at gradients varying between 1/20 and 1/150 given the site area and topography.

All velocities within said gradients will be required to fall within the limits of 0.75 and 3m/sec as set out in 'Recommendations for Site Development Works' as published by the Department for the Environment.

There are 3 separate drainage networks proposed for the site based on the site topography. Each of these networks will discharge to the lowest point in the area where they are located. Western network will discharge to an existing open drain; an attenuation tank is proposed in order to limit the discharge rate to 0.5 l/s. Eastern network will discharge to an existing stormwater network with a limited discharge to 0.5 l/s and proposed attenuation tank. Eastern and western networks will be supplied with a bypass interceptor upstream from the proposed attenuation tanks and outfall manholes.

The central stormwater network will collect storm water from the majority of the site and is proposed to discharge with a greenfield run-off rate of 1.7l/s to the existing Rathpatrick Stream via an attenuation pond. In order to prevent any pollutants entering the stream, a full retention interceptor will be located upstream from the proposed attenuation pond.

An infiltration rate of 0.01m/hr was assumed for the site based on existing ground conditions in the surrounding areas. This value will have to be confirmed at later stages of the project.

As noted above, the storm drainage for the entire development has been designed using the Causeway Flow Design Software in accordance with the Recommendations for Site Development Works for Housing Areas and also some of the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS).

The details of the Causeway Flow Outputs and associated long sections for each network are outlined at Appendix B of this report and the proposed storm water network can be found presented graphically on drawings No. 12001-2012 to 12001-2014.

2.4 PETROL INTERCEPTOR

Petrol interceptors are proposed for all 3 stormwater networks proposed for the site in order to prevent any hydrocarbon pollutants to enter the existing stormwater network. Class 1 Bypass interceptors are proposed for the western and eastern networks. A full retention interceptor will be installed for the central network that is proposed to discharge to the existing environmentally sensitive Rathpatrick Stream.

The location of the interceptors can be seen graphically on drawings No. 12001-2012 to 12001-2014.

The interceptors will be fitted with an oil alarm and flashing beacon in accordance with EN 858-1 & PPG3 notifying the maintenance company of an issue with the unit. The separators have been sized to cater for roads areas of each catchment area.

The selection tables in the Separator Product Brochure can be found in Appendix C.

3. WATER SUPPLY

The water supply services have been designed to take account of the requirements of the Civil Engineering Specification for the Water Industry (CESWI), subject to the particular requirements applied to it by Uisce Eireann, as outlined in the Uisce Eireann Code of Practice for Water Infrastructure. Other design guidelines adhered to include the Department of Environment "Recommendations for Site Development Works for Housing Areas", 1998.

Refer to Drawings 12001-2015 to 12001-2017 which outline the details of the proposed water supply network

3.1 EXISTING WATER SUPPLY INFRASTRUCTURE

There is an existing watermain located at the existing eastern IDA roundabout. From this it is proposed to provide a 150m diameter PE100 SDR17 feed to the site.

3.2 PROPOSED WATER SUPPLY INFRASTRUCTURE

As outlined in Section 3.1, it is proposed to supply water to this development through the existing water supply network in the vicinity of the proposed site. In accordance with Uisce Eireann and Local Authority standards a bulk metering point will be located at the connection point of the proposed watermain. All water mains are to be commissioned, and pressure tested to Uisce Eireann Standards.

Fire hydrants are strategically located along the proposed watermain. Washout hydrants are located at the lowest points, whereas air valves are located where at the highest levels of the proposed road.

The estimated water consumption for the development will need to be evaluated in accordance with the Uisce Eireann Code of Practice for Water Supply and the EPA Wastewater Treatment Manuals - Treatment Systems for Small Communities, Business, Leisure Centres and Hotels. This information will form part of the Uisce Eireann Connection Application.

A confirmation of Feasibility has been obtained from Uisce Eireann for the development. A copy of this confirmation of feasibility is provided in Appendix D of this report.

4. ROADS DESIGN

A new link road is proposed to provide local access from the proposed bypass road to the existing L3412.

A new junction will also be provided to retain connectivity with the existing Gyles Quay Road to the south.

Proposed western roundabout and upgrade works on the existing eastern IDA roundabout were designed in accordance with Cycle Design Manual 2023 and latest Transport Infrastructure Ireland (TII) Design Standards to provide safe vehicular and active travel access. The roundabouts include controlled shared crossing and traffic calming measures.

Western arm of the existing IDA will be upgraded to current standards and provide linkage to the existing active travel facilities.

The western portion of the existing L3412 for the proposed scheme is proposed to be upgraded to include a 6.0m carriageway and active travel measures on both sides. Access to existing properties will be maintained.

The section of the existing L3412 bypassed by the proposed road will be retained for local access only. Pedestrian access will be provided from the eastern and western end of the road. Landscaping is provided on the southern side of the existing road to discourage unauthorised parking. Mountable bollards will also be installed on the eastern and western ends of the existing road to prevent unauthorised access.

Visibility splay and sightline requirements at the point of vehicular egress are based on a 60 km/h Speed Limit, (Design Speed), of L3412 Road and consider Section 4.4.2 and Table 4.2 of the Department of Transport document 'Geometric Design of Junctions' (Transport Infrastructure Ireland). The required 90m visibility sightlines are available for drivers emerging from (Sightlines) and on the approach to the proposed site access junction (Stopping Sight Distance - SSD) as illustrated on the proposed roads layout drawings.

An independent Road Safety Audit has been carried out on the site and the auditor's report is included in the planning documentation.

Autotrack vehicle swept path analysis has been completed for the proposed roads layout for an articulated vehicle as well as for a tractor for the Giles Quay junction. The swept paths are shown on drawings 12001-2008 to 12001-2011.

4.1 ROAD GEOMETRY

The proposed road will consist of a 7.0m wide carriageway and 2.0m cycle lane and 2.0m footpath located on both sides of the carriageway. The footpaths and cycle lanes will be separated from the carriageway with a 1.0m wide grass verge.

The proposed road will be a local road and will have a speed limit of 60 km/h as decided by the Department of Transportation on the 7th of February 2025.

4.2 EARTHWORKS/EXCAVATION

The construction works will involve earthworks along the entire length of the scheme, varying in extent to facilitate the development of the roads, footpaths, cycle lanes, junctions, roundabout, and other associated infrastructure. The depth of excavation required for the proposed road will depend on the ground conditions encountered, with an average of 300mm of capping material expected. Any soft ground areas will be fully excavated. Road drainage systems will generally be installed at depths ranging from 1.2 to 1.8 metres below the proposed carriageway level.

4.3 LIGHTING DESING

Lighting design is proposed by Electric Skylight for the development is in line with the Kilkenny County Council Public Lighting Manual and Production Specifications 2021. to provide safe pedestrian, active travel and vehicular movement across the proposed development. Proposed lighting columns will be equipped with lighting cowls to mitigate illuminance in the area where existing residential properties are located.

Lighting Desing is included in the planning pack.

4.4 LANDSCAPING DESING

Landscaping design is proposed for the development by Austen Landscape Architects to provide screening for the proposed road and reinstatement of the existing berm located on Tirlan site to the south of the proposed road. Proposed landscaping measures will mitigate the impact of the proposed development.

The landscaping design should identify, and Implement Nature Based Management Solutions of Rainwater as per the guidance document 'Riverwater Management Plans Guidance for Local Authorities 2024'.

Landscape proposals are included in the planning documentation.

4.5 CULVERT DESIGN

Proposed road upgrade works will require crossing of existing Rathpatrick stream and construction of a new culvert. Culvert Design Report was undertaken by TOBIN and is included in the planning application documentation pack.

Application to Office of Public Works (OPW) in accordance with Section 50 of the 1945 Arterial Drainage Act for construction/alteration works on bridges and culverts was submitted and is included in the Culvert Design Report.

All construction shall be carried out in line with the Inland Fisheries Ireland 2016 Guidelines, OPW requirements and mitigation measures included in NIS and CEMP.

5. TRAFFIC

As noted previously, the road has a current speed limit of 60 km/h and this is to be maintained on the proposed road. Automatic Traffic counts (ATC's) were carried out in two locations on the L3412 road as identified in the Figures below. The Annual Average Daily Traffic (AADT) figures were compiled from these counts and are summarised in Table 5.1.

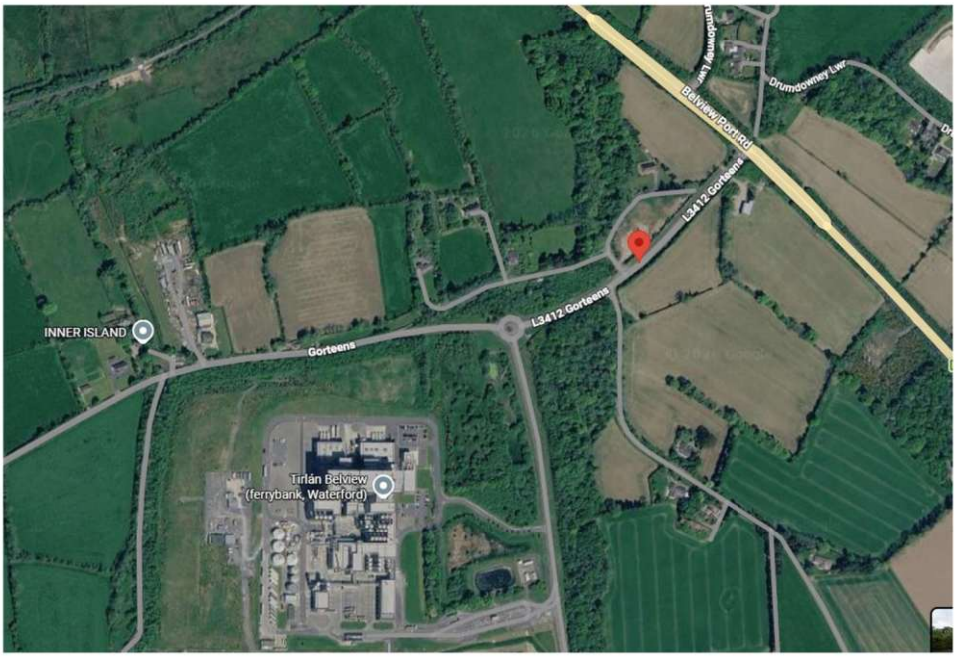


Figure 5-1: ATC Location 1

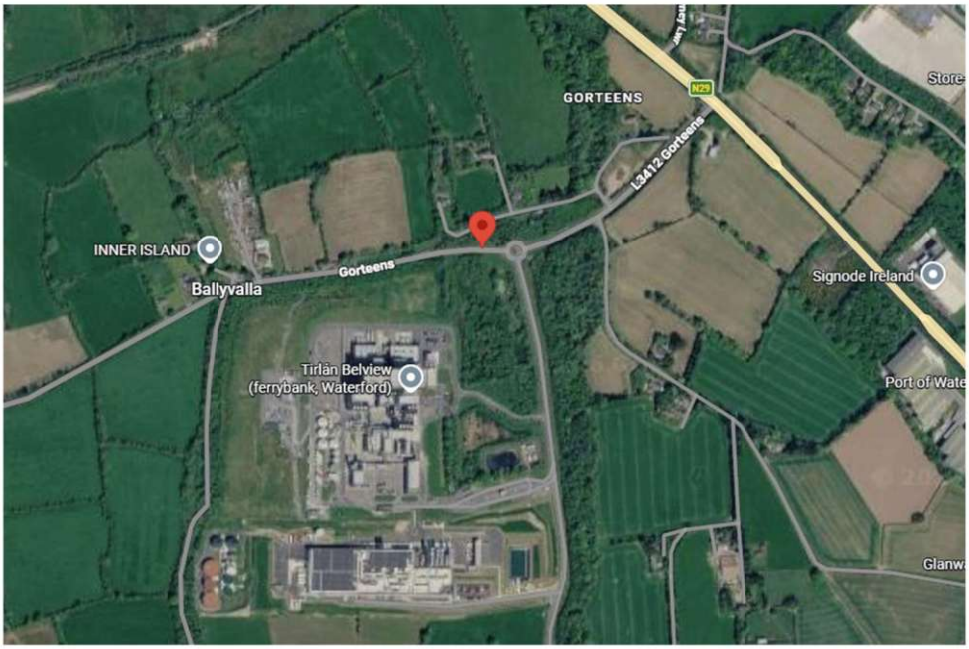


Figure 5-2: ATC Location 2

The AADT figures recorded for the two sites are compiled in the Table below.

Table 5.1: AADT Figures for the Traffic Counts dated 12.02.26 – 20.02.26

AADT Results			
ATC	Road	AADT	% HGV
Site 1	LP3412 Gorteens East Pt Of Glanbia Access	1369	15.3%
Site 2	LP3412 Gorteens West Pt Of Glanbia Access	816	3%

The proposed road is envisaged to be constructed in one phase which will take 18 – 24 months approximately. Therefore a forecast for the opening year is 2028 and the design years 2033 (+5 years) and 2043 (+ 15 years) are also addressed in accordance with TII guidance.

Annual growth indices for the transport modelling were obtained from the TII document PEPAG-02017 - Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, with cumulative growth forecasts shown for the Waterford County area in the Table below (Central growth rates). The Table is split into light vehicles and heavy vehicles.

Table 5-2: Growth Factors for light vehicle (LV) and heavy vehicles (HV)

	2028	2033	2043
LV	1.028	1.074	1.130
HV	1.064	1.186	1.397

The derived growth factors were applied to the 2026 AADTs to determine background traffic flows for the future years. The resulting expected AADT figures for the two count location sites are compiled in the Table below.

Table 5.3: Projected AADT Figures for the Future Design Years

Projected AADT Figures			
Site	Year	Projected AADT	Projected % increase*
Site 1	2028	1407	2.8%
Site 1	2033	1470	7.4%
Site 1	2043	1547	13.0%
Site 2	2028	839	2.8%
Site 2	2033	876	7.4%
Site 2	2043	922	13.0%

** based on TII growth rates*

6. PUBLIC CONSULTATION

A public consultation was held on the 17th of February 2026 to inform the local community of the proposed road upgrade works and active travel measures being implemented and to provide an opportunity for engagement with the local community and receive feedback prior to finalising the design.

The meeting was attended by elected members and officials of Kilkenny County Council, representatives of the surrounding community potentially affected by the development, and representation from TOBIN, the Consulting Engineers responsible for the design of the proposed works.

During the meeting, attendees were briefed on the rationale for the project, the alignment of the road, and the proposed traffic, active travel and access arrangements. Members of the local community raised concerns primarily relating to safety, property access, and the potential proliferation of direct access points onto the upgraded road, particularly at the western end of the scheme.

In response to these concerns, the project team undertook a design review. This review resulted in a realignment of the proposed road on the western side of the scheme. The revised layout removes multiple individual site accesses from the proposed road where possible and replaces them with a single consolidated access point. This design change significantly improves road safety, reduces conflict points, and responds directly to community feedback.

The proposed re-design will also increase the amount of off-road alignment which will in turn result in additional hedgerow being retained and reduce the amount of existing road forming the through route.

The consultation process materially influenced the final design proposal and demonstrates a responsive and collaborative approach to infrastructure planning in accordance with best practice.

Appendix A DRAWINGS REGISTER

Appendix B CAUSEWAY FLOW MODEL, LONGSECTIONS & RESULTS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.300	Minimum Backdrop Height (m)	1.000
Ratio-R	0.250	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)
S2.38	0.024	5.00	33.996	1350	663891.011	613140.861	0.875
S2.43			32.919	1350	663936.084	613151.574	0.875
S2.37	0.031	5.00	31.812	1350	663957.367	613150.879	0.875
S2.42			29.807	1350	664004.120	613135.164	0.875
S2.36			29.534	1350	664011.074	613132.827	0.875
S2.35	0.034	5.00	28.864	1350	664027.999	613122.111	1.525
S2.33	0.036	5.00	28.385	1350	664048.108	613108.587	1.676
S2.32	0.029	5.00	28.179	1350	664047.093	613123.335	1.625
S2.31	0.064	5.00	27.757	1350	664057.445	613142.881	1.597
S2.30			27.520	1350	664063.820	613146.561	1.527
S2.29	0.025	5.00	25.414	1350	664119.325	613178.535	0.875
S2.28	0.044	5.00	24.697	1350	664180.702	613213.072	0.925
S2.27			24.048	1200	664252.564	613254.914	0.925
S2.1	0.018	5.00	33.995	1350	663888.795	613147.573	0.875
S2.40			33.800	1350	663910.433	613153.010	1.425
S2.2			33.261	1350	663925.771	613156.406	1.391
S2.3	0.023	5.00	32.536	1350	663945.489	613159.000	0.875
S2.4			30.056	1350	664003.917	613149.282	0.875
S2.41	0.033	5.00	29.622	1350	664014.048	613147.207	0.875
S2.6	0.041	5.00	27.659	1350	664050.792	613157.300	0.875
S2.7			27.328	1350	664057.622	613160.597	0.875
S2.8	0.023	5.00	25.454	1350	664110.234	613185.939	1.124
S2.9	0.036	5.00	24.622	1350	664180.449	613223.971	1.263
S2.11	0.029	5.00	24.029	1200	664249.725	613263.107	1.251
S2.19	0.022	5.00	29.638	1350	664584.308	613388.124	0.875
S2.18	0.020	5.00	29.021	1350	664530.001	613374.560	0.875
S2.17			26.370	1350	664443.544	613353.787	1.870
S2.16		5.00	25.658	1350	664428.786	613377.300	1.425
S2.15	0.051	5.00	25.931	1200	664434.546	613351.787	1.871
S2.14	0.008	5.00	25.927	1200	664429.345	613350.249	1.907
S2.13	0.015	5.00	24.249	1350	664376.865	613333.477	0.875
S2.12			22.871	1200	664317.664	613301.475	1.125
S2.20	0.029	5.00	29.638	1350	664586.838	613380.320	0.875
S2.21	0.026	5.00	28.466	1350	664511.677	613361.643	0.875
S2.22			26.075	1200	664436.583	613342.740	0.875
S2.23	0.032	5.00	24.607	1350	664390.987	613330.220	0.875
S2.24			23.828	1350	664367.925	613320.203	1.025
S2.25			23.177	1350	664352.635	613311.596	1.025
S2.26			22.868	1200	664321.436	613293.976	1.178
S2.39			22.605	1350	664325.762	613285.911	1.076
HB2			22.600		664328.479	613263.383	1.160

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S2.45			21.926	1350	664341.496	613239.548	0.626

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)
1.000	S2.38	S2.43	46.329	0.600	33.121	32.044	1.077	43.0	225	5.39	41.7
1.001	S2.43	S2.37	21.294	0.600	32.044	30.937	1.107	19.2	225	5.50	41.4
1.002	S2.37	S2.42	49.324	0.600	30.937	28.932	2.005	24.6	225	5.81	40.6
1.003	S2.42	S2.36	7.336	0.600	28.932	28.659	0.273	26.9	225	5.86	40.5
1.004	S2.36	S2.35	20.032	0.600	28.659	27.989	0.670	29.9	225	6.00	40.1
1.005	S2.35	S2.32	19.133	0.600	27.339	26.554	0.785	24.4	225	6.12	39.8
2.000	S2.33	S2.32	14.784	0.600	26.709	26.554	0.155	95.4	225	5.18	42.3
1.006	S2.32	S2.31	22.117	0.600	26.554	26.160	0.394	56.1	225	6.33	39.3
1.007	S2.31	S2.30	7.362	0.600	26.160	25.993	0.167	44.1	225	6.39	39.2
1.008	S2.30	S2.29	64.055	0.600	25.993	24.539	1.454	44.1	225	6.94	38.0
1.009	S2.29	S2.28	70.427	0.600	24.539	23.822	0.717	98.2	225	7.83	36.2
1.010	S2.28	S2.27	83.156	0.600	23.772	23.123	0.649	128.1	225	9.03	34.1
1.011	S2.27	S2.26	79.179	0.600	23.123	21.993	1.130	70.1	225	9.87	32.8
3.000	S2.1	S2.40	22.311	0.600	33.120	32.925	0.195	114.4	225	5.30	42.0
3.001	S2.40	S2.2	15.709	0.600	32.375	31.870	0.505	31.1	225	5.42	41.7
3.002	S2.2	S2.3	19.888	0.600	31.870	31.661	0.209	95.2	225	5.66	41.0
3.003	S2.3	S2.4	59.231	0.600	31.661	29.181	2.480	23.9	225	6.03	40.1
3.004	S2.4	S2.41	10.341	0.600	29.181	28.747	0.434	23.8	225	6.09	39.9
3.005	S2.41	S2.6	38.105	0.600	28.747	26.784	1.963	19.4	225	6.31	39.4
3.006	S2.6	S2.7	7.584	0.600	26.784	26.453	0.331	22.9	225	6.35	39.3
3.007	S2.7	S2.8	58.398	0.600	26.453	24.330	2.123	27.5	225	6.74	38.4

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)
1.000	2.000	79.5	2.7	0.650	0.650	0.024	0.0	29	0.943
1.001	2.997	119.2	2.7	0.650	0.650	0.024	0.0	23	1.244
1.002	2.648	105.3	6.0	0.650	0.650	0.055	0.0	36	1.455
1.003	2.534	100.7	6.0	0.650	0.650	0.055	0.0	37	1.411
1.004	2.401	95.5	6.0	0.650	0.650	0.055	0.0	38	1.356
1.005	2.661	105.8	9.6	1.300	1.400	0.089	0.0	45	1.663
2.000	1.339	53.2	4.2	1.451	1.400	0.036	0.0	43	0.805
1.006	1.749	69.5	16.4	1.400	1.372	0.154	0.0	74	1.438
1.007	1.975	78.5	23.2	1.372	1.302	0.218	0.0	84	1.729
1.008	1.976	78.6	22.5	1.302	0.650	0.218	0.0	82	1.711
1.009	1.319	52.4	23.8	0.650	0.650	0.243	0.0	106	1.286
1.010	1.153	45.9	26.5	0.700	0.700	0.287	0.0	123	1.193
1.011	1.564	62.2	25.5	0.700	0.650	0.287	0.0	100	1.485
3.000	1.221	48.6	2.1	0.650	0.650	0.018	0.0	31	0.606
3.001	2.354	93.6	2.1	1.200	1.166	0.018	0.0	23	0.976
3.002	1.340	53.3	2.0	1.166	0.650	0.018	0.0	30	0.654
3.003	2.688	106.9	4.5	0.650	0.650	0.042	0.0	31	1.341
3.004	2.691	107.0	4.5	0.650	0.650	0.042	0.0	31	1.343
3.005	2.983	118.6	8.0	0.650	0.650	0.075	0.0	39	1.710
3.006	2.745	109.1	12.3	0.650	0.650	0.116	0.0	51	1.829
3.007	2.504	99.6	12.1	0.650	0.899	0.116	0.0	52	1.701

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)
3.008	S2.8	S2.9	79.853	0.600	24.330	23.747	0.583	137.0	225	7.94	36.0
3.009	S2.9	S2.11	79.566	0.600	23.359	22.778	0.581	136.9	225	9.12	33.9
3.010	S2.11	S2.12	78.025	0.600	22.778	21.996	0.782	99.8	225	10.12	32.4
4.000	S2.19	S2.18	55.975	0.600	28.763	28.146	0.617	90.7	225	5.68	41.0
4.001	S2.18	S2.17	88.918	0.600	28.146	25.495	2.651	33.5	225	6.33	39.3
4.002	S2.17	S2.15	9.217	0.600	24.500	24.060	0.440	20.9	225	6.39	39.2
5.000	S2.16	S2.15	26.155	0.600	24.233	24.060	0.173	151.2	225	5.41	41.7
4.003	S2.15	S2.14	5.424	0.600	24.060	24.020	0.040	135.6	225	6.47	39.0
4.004	S2.14	S2.13	55.095	0.600	24.020	23.379	0.641	86.0	225	7.12	37.6
4.005	S2.13	S2.12	67.297	0.600	23.374	21.996	1.378	48.8	225	7.72	36.4
3.011	S2.12	S2.26	8.394	0.600	21.746	21.690	0.056	149.9	225	10.25	32.2
6.000	S2.20	S2.21	77.447	0.600	28.763	27.591	1.172	66.1	225	5.80	40.6
6.001	S2.21	S2.22	77.436	0.600	27.591	25.200	2.391	32.4	225	6.36	39.3
6.002	S2.22	S2.23	47.284	0.600	25.200	23.732	1.468	32.2	225	6.70	38.5
6.003	S2.23	S2.24	25.144	0.600	23.732	22.953	0.779	32.3	225	6.88	38.1
6.004	S2.24	S2.25	17.545	0.600	22.803	22.152	0.651	27.0	225	7.00	37.8
6.005	S2.25	S2.26	35.831	0.600	22.152	21.993	0.159	225.4	225	7.69	36.4
1.012	S2.26	S2.39	9.152	0.600	21.690	21.529	0.161	56.8	225	10.34	32.1
1.013	S2.39	HB2	43.809	0.600	21.529	21.440	0.089	492.2	375	11.24	30.9
1.014	HB2	S2.45	10.661	0.600	21.440	21.300	0.140	76.2	375	11.32	30.8

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)
3.008	1.115	44.3	13.6	0.899	0.650	0.139	0.0	85	0.980
3.009	1.115	44.3	16.1	1.038	1.026	0.175	0.0	94	1.028
3.010	1.309	52.0	17.9	1.026	0.650	0.204	0.0	91	1.190
4.000	1.373	54.6	2.4	0.650	0.650	0.022	0.0	32	0.694
4.001	2.266	90.1	4.5	0.650	0.650	0.042	0.0	34	1.188
4.002	2.871	114.2	4.4	1.645	1.646	0.042	0.0	30	1.408
5.000	1.061	42.2	0.0	1.200	1.646	0.000	0.0	0	0.000
4.003	1.121	44.6	9.8	1.646	1.682	0.093	0.0	72	0.904
4.004	1.411	56.1	10.2	1.682	0.645	0.100	0.0	65	1.077
4.005	1.876	74.6	11.4	0.650	0.650	0.115	0.0	59	1.367
3.011	1.065	42.4	27.9	0.900	0.953	0.319	0.0	133	1.135
6.000	1.611	64.1	3.2	0.650	0.650	0.029	0.0	34	0.843
6.001	2.307	91.7	5.8	0.650	0.650	0.055	0.0	38	1.303
6.002	2.313	92.0	5.7	0.650	0.650	0.055	0.0	37	1.288
6.003	2.311	91.9	9.0	0.650	0.650	0.087	0.0	47	1.476
6.004	2.530	100.6	8.9	0.800	0.800	0.087	0.0	45	1.580
6.005	0.867	34.5	8.6	0.800	0.650	0.087	0.0	77	0.725
1.012	1.738	69.1	60.3	0.953	0.851	0.693	0.0	163	1.950
1.013	0.810	89.4	58.1	0.701	0.785	0.693	0.0	220	0.859
1.014	2.078	229.5	57.9	0.785	0.251	0.693	0.0	128	1.742

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)
1.000	46.329	43.0	225	Circular	33.996	33.121	0.650	32.919	32.044	0.650
1.001	21.294	19.2	225	Circular	32.919	32.044	0.650	31.812	30.937	0.650
1.002	49.324	24.6	225	Circular	31.812	30.937	0.650	29.807	28.932	0.650
1.003	7.336	26.9	225	Circular	29.807	28.932	0.650	29.534	28.659	0.650
1.004	20.032	29.9	225	Circular	29.534	28.659	0.650	28.864	27.989	0.650
1.005	19.133	24.4	225	Circular	28.864	27.339	1.300	28.179	26.554	1.400
2.000	14.784	95.4	225	Circular	28.385	26.709	1.451	28.179	26.554	1.400
1.006	22.117	56.1	225	Circular	28.179	26.554	1.400	27.757	26.160	1.372
1.007	7.362	44.1	225	Circular	27.757	26.160	1.372	27.520	25.993	1.302
1.008	64.055	44.1	225	Circular	27.520	25.993	1.302	25.414	24.539	0.650
1.009	70.427	98.2	225	Circular	25.414	24.539	0.650	24.697	23.822	0.650
1.010	83.156	128.1	225	Circular	24.697	23.772	0.700	24.048	23.123	0.700
1.011	79.179	70.1	225	Circular	24.048	23.123	0.700	22.868	21.993	0.650
3.000	22.311	114.4	225	Circular	33.995	33.120	0.650	33.800	32.925	0.650
3.001	15.709	31.1	225	Circular	33.800	32.375	1.200	33.261	31.870	1.166
3.002	19.888	95.2	225	Circular	33.261	31.870	1.166	32.536	31.661	0.650
3.003	59.231	23.9	225	Circular	32.536	31.661	0.650	30.056	29.181	0.650
3.004	10.341	23.8	225	Circular	30.056	29.181	0.650	29.622	28.747	0.650
3.005	38.105	19.4	225	Circular	29.622	28.747	0.650	27.659	26.784	0.650
3.006	7.584	22.9	225	Circular	27.659	26.784	0.650	27.328	26.453	0.650
3.007	58.398	27.5	225	Circular	27.328	26.453	0.650	25.454	24.330	0.899
3.008	79.853	137.0	225	Circular	25.454	24.330	0.899	24.622	23.747	0.650
3.009	79.566	136.9	225	Circular	24.622	23.359	1.038	24.029	22.778	1.026
3.010	78.025	99.8	225	Circular	24.029	22.778	1.026	22.871	21.996	0.650
4.000	55.975	90.7	225	Circular	29.638	28.763	0.650	29.021	28.146	0.650

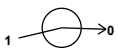
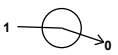
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S2.38	1350	Manhole	Adoptable	S2.43	1350	Manhole	Adoptable
1.001	S2.43	1350	Manhole	Adoptable	S2.37	1350	Manhole	Adoptable
1.002	S2.37	1350	Manhole	Adoptable	S2.42	1350	Manhole	Adoptable
1.003	S2.42	1350	Manhole	Adoptable	S2.36	1350	Manhole	Adoptable
1.004	S2.36	1350	Manhole	Adoptable	S2.35	1350	Manhole	Adoptable
1.005	S2.35	1350	Manhole	Adoptable	S2.32	1350	Manhole	Adoptable
2.000	S2.33	1350	Manhole	Adoptable	S2.32	1350	Manhole	Adoptable
1.006	S2.32	1350	Manhole	Adoptable	S2.31	1350	Manhole	Adoptable
1.007	S2.31	1350	Manhole	Adoptable	S2.30	1350	Manhole	Adoptable
1.008	S2.30	1350	Manhole	Adoptable	S2.29	1350	Manhole	Adoptable
1.009	S2.29	1350	Manhole	Adoptable	S2.28	1350	Manhole	Adoptable
1.010	S2.28	1350	Manhole	Adoptable	S2.27	1200	Manhole	Adoptable
1.011	S2.27	1200	Manhole	Adoptable	S2.26	1200	Manhole	Adoptable
3.000	S2.1	1350	Manhole	Adoptable	S2.40	1350	Manhole	Adoptable
3.001	S2.40	1350	Manhole	Adoptable	S2.2	1350	Manhole	Adoptable
3.002	S2.2	1350	Manhole	Adoptable	S2.3	1350	Manhole	Adoptable
3.003	S2.3	1350	Manhole	Adoptable	S2.4	1350	Manhole	Adoptable
3.004	S2.4	1350	Manhole	Adoptable	S2.41	1350	Manhole	Adoptable
3.005	S2.41	1350	Manhole	Adoptable	S2.6	1350	Manhole	Adoptable
3.006	S2.6	1350	Manhole	Adoptable	S2.7	1350	Manhole	Adoptable
3.007	S2.7	1350	Manhole	Adoptable	S2.8	1350	Manhole	Adoptable
3.008	S2.8	1350	Manhole	Adoptable	S2.9	1350	Manhole	Adoptable
3.009	S2.9	1350	Manhole	Adoptable	S2.11	1200	Manhole	Adoptable
3.010	S2.11	1200	Manhole	Adoptable	S2.12	1200	Manhole	Adoptable
4.000	S2.19	1350	Manhole	Adoptable	S2.18	1350	Manhole	Adoptable

Pipeline Schedule

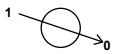
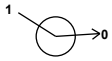
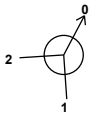
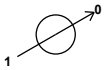
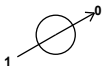
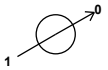
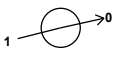
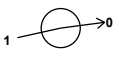
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
4.001	88.918	33.5	225	Circular	29.021	28.146	0.650	26.370	25.495	0.650
4.002	9.217	20.9	225	Circular	26.370	24.500	1.645	25.931	24.060	1.646
5.000	26.155	151.2	225	Circular	25.658	24.233	1.200	25.931	24.060	1.646
4.003	5.424	135.6	225	Circular	25.931	24.060	1.646	25.927	24.020	1.682
4.004	55.095	86.0	225	Circular	25.927	24.020	1.682	24.249	23.379	0.645
4.005	67.297	48.8	225	Circular	24.249	23.374	0.650	22.871	21.996	0.650
3.011	8.394	149.9	225	Circular	22.871	21.746	0.900	22.868	21.690	0.953
6.000	77.447	66.1	225	Circular	29.638	28.763	0.650	28.466	27.591	0.650
6.001	77.436	32.4	225	Circular	28.466	27.591	0.650	26.075	25.200	0.650
6.002	47.284	32.2	225	Circular	26.075	25.200	0.650	24.607	23.732	0.650
6.003	25.144	32.3	225	Circular	24.607	23.732	0.650	23.828	22.953	0.650
6.004	17.545	27.0	225	Circular	23.828	22.803	0.800	23.177	22.152	0.800
6.005	35.831	225.4	225	Circular	23.177	22.152	0.800	22.868	21.993	0.650
1.012	9.152	56.8	225	Circular	22.868	21.690	0.953	22.605	21.529	0.851
1.013	43.809	492.2	375	Circular	22.605	21.529	0.701	22.600	21.440	0.785
1.014	10.661	76.2	375	Circular	22.600	21.440	0.785	21.926	21.300	0.251

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.001	S2.18	1350	Manhole	Adoptable	S2.17	1350	Manhole	Adoptable
4.002	S2.17	1350	Manhole	Adoptable	S2.15	1200	Manhole	Adoptable
5.000	S2.16	1350	Manhole	Adoptable	S2.15	1200	Manhole	Adoptable
4.003	S2.15	1200	Manhole	Adoptable	S2.14	1200	Manhole	Adoptable
4.004	S2.14	1200	Manhole	Adoptable	S2.13	1350	Manhole	Adoptable
4.005	S2.13	1350	Manhole	Adoptable	S2.12	1200	Manhole	Adoptable
3.011	S2.12	1200	Manhole	Adoptable	S2.26	1200	Manhole	Adoptable
6.000	S2.20	1350	Manhole	Adoptable	S2.21	1350	Manhole	Adoptable
6.001	S2.21	1350	Manhole	Adoptable	S2.22	1200	Manhole	Adoptable
6.002	S2.22	1200	Manhole	Adoptable	S2.23	1350	Manhole	Adoptable
6.003	S2.23	1350	Manhole	Adoptable	S2.24	1350	Manhole	Adoptable
6.004	S2.24	1350	Manhole	Adoptable	S2.25	1350	Manhole	Adoptable
6.005	S2.25	1350	Manhole	Adoptable	S2.26	1200	Manhole	Adoptable
1.012	S2.26	1200	Manhole	Adoptable	S2.39	1350	Manhole	Adoptable
1.013	S2.39	1350	Manhole	Adoptable	HB2		Junction	
1.014	HB2		Junction		S2.45	1350	Manhole	Adoptable

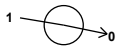
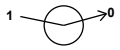
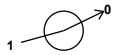
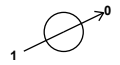
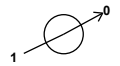
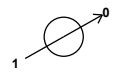
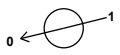
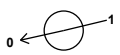
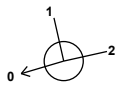
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S2.38	663891.011	613140.861	33.996	0.875	1350				
						0	1.000	33.121	225
S2.43	663936.084	613151.574	32.919	0.875	1350	1	1.000	32.044	225
									
						0	1.001	32.044	225
S2.37	663957.367	613150.879	31.812	0.875	1350	1	1.001	30.937	225
									
						0	1.002	30.937	225

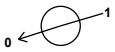
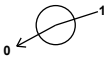
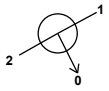
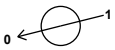
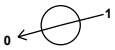
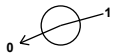
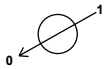
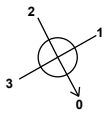
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S2.42	664004.120	613135.164	29.807	0.875	1350		1	1.002	28.932	225
							0	1.003	28.932	225
S2.36	664011.074	613132.827	29.534	0.875	1350		1	1.003	28.659	225
							0	1.004	28.659	225
S2.35	664027.999	613122.111	28.864	1.525	1350		1	1.004	27.989	225
							0	1.005	27.339	225
S2.33	664048.108	613108.587	28.385	1.676	1350		0	2.000	26.709	225
S2.32	664047.093	613123.335	28.179	1.625	1350		1	2.000	26.554	225
							2	1.005	26.554	225
							0	1.006	26.554	225
S2.31	664057.445	613142.881	27.757	1.597	1350		1	1.006	26.160	225
							0	1.007	26.160	225
S2.30	664063.820	613146.561	27.520	1.527	1350		1	1.007	25.993	225
							0	1.008	25.993	225
S2.29	664119.325	613178.535	25.414	0.875	1350		1	1.008	24.539	225
							0	1.009	24.539	225
S2.28	664180.702	613213.072	24.697	0.925	1350		1	1.009	23.822	225
							0	1.010	23.772	225
S2.27	664252.564	613254.914	24.048	0.925	1200		1	1.010	23.123	225
							0	1.011	23.123	225
S2.1	663888.795	613147.573	33.995	0.875	1350		0	3.000	33.120	225
S2.40	663910.433	613153.010	33.800	1.425	1350		1	3.000	32.925	225
							0	3.001	32.375	225
S2.2	663925.771	613156.406	33.261	1.391	1350		1	3.001	31.870	225
							0	3.002	31.870	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S2.3	663945.489	613159.000	32.536	0.875	1350	1	3.002	31.661	225
									
						0	3.003	31.661	225
S2.4	664003.917	613149.282	30.056	0.875	1350	1	3.003	29.181	225
									
						0	3.004	29.181	225
S2.41	664014.048	613147.207	29.622	0.875	1350	1	3.004	28.747	225
									
						0	3.005	28.747	225
S2.6	664050.792	613157.300	27.659	0.875	1350	1	3.005	26.784	225
									
						0	3.006	26.784	225
S2.7	664057.622	613160.597	27.328	0.875	1350	1	3.006	26.453	225
									
						0	3.007	26.453	225
S2.8	664110.234	613185.939	25.454	1.124	1350	1	3.007	24.330	225
									
						0	3.008	24.330	225
S2.9	664180.449	613223.971	24.622	1.263	1350	1	3.008	23.747	225
									
						0	3.009	23.359	225
S2.11	664249.725	613263.107	24.029	1.251	1200	1	3.009	22.778	225
									
						0	3.010	22.778	225
S2.19	664584.308	613388.124	29.638	0.875	1350				
						0	4.000	28.763	225
S2.18	664530.001	613374.560	29.021	0.875	1350	1	4.000	28.146	225
									
						0	4.001	28.146	225
S2.17	664443.544	613353.787	26.370	1.870	1350	1	4.001	25.495	225
									
						0	4.002	24.500	225
S2.16	664428.786	613377.300	25.658	1.425	1350				
						0	5.000	24.233	225
S2.15	664434.546	613351.787	25.931	1.871	1200	1	5.000	24.060	225
						2	4.002	24.060	225
									
						0	4.003	24.060	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S2.14	664429.345	613350.249	25.927	1.907	1200	1	4.003	24.020	225
									
						0	4.004	24.020	225
S2.13	664376.865	613333.477	24.249	0.875	1350	1	4.004	23.379	225
									
						0	4.005	23.374	225
S2.12	664317.664	613301.475	22.871	1.125	1200	1	4.005	21.996	225
						2	3.010	21.996	225
									
						0	3.011	21.746	225
S2.20	664586.838	613380.320	29.638	0.875	1350				
						0	6.000	28.763	225
S2.21	664511.677	613361.643	28.466	0.875	1350	1	6.000	27.591	225
									
						0	6.001	27.591	225
S2.22	664436.583	613342.740	26.075	0.875	1200	1	6.001	25.200	225
									
						0	6.002	25.200	225
S2.23	664390.987	613330.220	24.607	0.875	1350	1	6.002	23.732	225
									
						0	6.003	23.732	225
S2.24	664367.925	613320.203	23.828	1.025	1350	1	6.003	22.953	225
									
						0	6.004	22.803	225
S2.25	664352.635	613311.596	23.177	1.025	1350	1	6.004	22.152	225
									
						0	6.005	22.152	225
S2.26	664321.436	613293.976	22.868	1.178	1200		1	6.005	21.993	225
							2	3.011	21.690	225
							3	1.011	21.993	225
							0	1.012	21.690	225
S2.39	664325.762	613285.911	22.605	1.076	1350		1	1.012	21.529	225
							0	1.013	21.529	375
HB2	664328.479	613263.383	22.600	1.160			1	1.013	21.440	375
							0	1.014	21.440	375
S2.45	664341.496	613239.548	21.926	0.626	1350		1	1.014	21.300	375

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	Scotland and Ireland	Skip Steady State	x
M5-60 (mm)	18.300	Drain Down Time (mins)	1000
Ratio-R	0.250	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160
30	120	240	480	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	10	0	0
100	20	0	0

Node HB2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.014	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0062-1700-1000-1700
Invert Level (m)	21.440	Min Outlet Diameter (m)	0.075
Design Depth (m)	1.000	Min Node Diameter (mm)	1200
Design Flow (l/s)	1.7		

Node S2.18 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	4.000
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	28.146	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.17 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	4.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	25.495	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.13 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	4.004
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	23.379	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.21 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	6.000
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	27.591	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.22 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	6.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	25.200	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.23 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	6.002
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	23.732	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.24 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	6.003
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	22.953	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.12 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	4.005
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	21.996	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	660	Diameter (mm)	1000

Node S2.26 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	6.005
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	21.993	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	720	Diameter (mm)	1000

Node S2.12 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.010
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	21.996	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	720	Diameter (mm)	1000

Node S2.26 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.011
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	21.993	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	660	Diameter (mm)	1000

Node S2.11 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.009
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	22.778	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	5	Diameter (mm)	1000

Node S2.27 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.010
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	23.123	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	9	Diameter (mm)	1000

Node S2.9 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.008
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	23.747	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.28 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.009
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	23.822	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	9	Diameter (mm)	1000

Node S2.8 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.007
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	24.330	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	2	Diameter (mm)	1000

Node S2.29 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.008
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	24.539	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	7	Diameter (mm)	1000

Node S2.6 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.005
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	26.784	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.31 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.006
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	26.160	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	3	Diameter (mm)	1000

Node S2.35 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.004
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	27.989	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.42 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.002
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	28.932	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.2 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	31.870	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.37 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	30.937	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S2.43 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.000
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	32.044	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node HB2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Safety Factor	2.0	Invert Level (m)	21.440
Side Inf Coefficient (m/hr)	0.01000	Porosity	1.00	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	1400.0	0.0	0.400	1400.0	0.0	0.401	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.38	10	33.151	0.030	2.9	0.0435	0.0000	OK
15 minute winter	S2.43	11	32.068	0.024	2.8	0.0453	0.0000	OK
15 minute winter	S2.37	11	30.975	0.038	6.5	0.0659	0.0000	OK
15 minute winter	S2.42	11	28.972	0.040	6.4	0.0751	0.0000	OK
15 minute winter	S2.36	11	28.699	0.040	6.4	0.0573	0.0000	OK
15 minute winter	S2.35	11	27.386	0.047	10.2	0.0674	0.0000	OK
15 minute winter	S2.33	10	26.753	0.044	4.5	0.0625	0.0000	OK
15 minute winter	S2.32	11	26.632	0.078	17.8	0.1111	0.0000	OK
15 minute winter	S2.31	11	26.259	0.099	25.2	0.3684	0.0000	OK
15 minute winter	S2.30	11	26.080	0.087	25.2	0.1242	0.0000	OK
15 minute winter	S2.29	12	24.653	0.114	27.8	0.3976	0.0000	OK
15 minute winter	S2.28	13	23.910	0.138	30.2	0.5194	0.0000	OK
15 minute winter	S2.27	14	23.229	0.106	29.8	0.7163	0.0000	OK
15 minute winter	S2.1	11	33.152	0.032	2.2	0.0464	0.0000	OK
15 minute winter	S2.40	11	32.399	0.024	2.1	0.0337	0.0000	OK
15 minute winter	S2.2	11	31.900	0.030	2.1	0.0564	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	S2.38	1.000	S2.43	2.8	1.059	0.035	0.1241	
15 minute winter	S2.43	1.001	S2.37	2.8	0.864	0.024	0.0702	
15 minute winter	S2.43	Infiltration		0.0				
15 minute winter	S2.37	1.002	S2.42	6.4	1.415	0.061	0.2257	
15 minute winter	S2.37	Infiltration		0.0				
15 minute winter	S2.42	1.003	S2.36	6.4	1.343	0.064	0.0351	
15 minute winter	S2.42	Infiltration		0.0				
15 minute winter	S2.36	1.004	S2.35	6.3	1.352	0.066	0.0939	
15 minute winter	S2.35	1.005	S2.32	10.2	1.142	0.097	0.1735	
15 minute winter	S2.35	Infiltration		0.0				
15 minute winter	S2.33	2.000	S2.32	4.4	0.530	0.083	0.1284	
15 minute winter	S2.32	1.006	S2.31	17.8	1.237	0.256	0.3193	
15 minute winter	S2.31	1.007	S2.30	25.2	1.637	0.321	0.1136	
15 minute winter	S2.31	Infiltration		0.0				
15 minute winter	S2.30	1.008	S2.29	25.0	1.549	0.319	1.0884	
15 minute winter	S2.29	1.009	S2.28	26.0	1.316	0.496	1.3959	
15 minute winter	S2.29	Infiltration		0.0				
15 minute winter	S2.28	1.010	S2.27	29.8	1.397	0.650	1.7969	
15 minute winter	S2.28	Infiltration		0.0				
15 minute winter	S2.27	1.011	S2.26	27.5	1.515	0.443	1.4391	
15 minute winter	S2.27	Infiltration		0.0				
15 minute winter	S2.1	3.000	S2.40	2.1	0.615	0.044	0.0776	
15 minute winter	S2.40	3.001	S2.2	2.1	0.814	0.023	0.0423	
15 minute winter	S2.2	3.002	S2.3	2.1	0.634	0.039	0.0670	
15 minute winter	S2.2	Infiltration		0.0				

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.3	11	31.694	0.033	4.8	0.0468	0.0000	OK
15 minute winter	S2.4	11	29.213	0.032	4.8	0.0461	0.0000	OK
15 minute winter	S2.41	11	28.788	0.041	8.5	0.0583	0.0000	OK
15 minute winter	S2.6	11	26.841	0.057	13.3	0.1081	0.0000	OK
15 minute winter	S2.7	11	26.508	0.055	13.4	0.0792	0.0000	OK
15 minute winter	S2.8	12	24.418	0.088	16.0	0.2167	0.0000	OK
15 minute winter	S2.9	12	23.460	0.101	17.6	0.1444	0.0000	OK
15 minute winter	S2.11	14	22.870	0.092	20.2	0.5867	0.0000	OK
15 minute winter	S2.19	10	28.797	0.034	2.7	0.0482	0.0000	OK
15 minute winter	S2.18	12	28.180	0.034	5.1	0.0965	0.0000	OK
15 minute winter	S2.17	12	24.531	0.031	4.5	0.0438	0.0000	OK
15 minute summer	S2.16	1	24.233	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2.15	11	24.139	0.079	10.3	0.0893	0.0000	OK
15 minute winter	S2.14	12	24.088	0.068	11.1	0.0764	0.0000	OK
15 minute winter	S2.13	12	23.435	0.061	12.2	0.2055	0.0000	OK
15 minute winter	S2.12	14	21.994	0.248	29.3	0.2801	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	S2.3	3.003	S2.4	4.8	1.369	0.045	0.2079	
15 minute winter	S2.4	3.004	S2.41	4.7	1.151	0.044	0.0432	
15 minute winter	S2.41	3.005	S2.6	8.5	1.351	0.072	0.2424	
15 minute winter	S2.6	3.006	S2.7	13.4	1.736	0.123	0.0584	
15 minute winter	S2.6	Infiltration		0.0				
15 minute winter	S2.7	3.007	S2.8	13.3	1.323	0.134	0.6367	
15 minute winter	S2.8	3.008	S2.9	14.2	0.999	0.321	1.1426	
15 minute winter	S2.8	Infiltration		0.0				
15 minute winter	S2.9	3.009	S2.11	17.4	1.118	0.393	1.2698	
15 minute winter	S2.9	Infiltration		0.0				
15 minute winter	S2.11	3.010	S2.12	18.0	1.193	0.346	1.1782	
15 minute winter	S2.11	Infiltration		0.0				
15 minute winter	S2.19	4.000	S2.18	2.6	0.721	0.048	0.2083	
15 minute winter	S2.18	4.001	S2.17	4.5	1.191	0.050	0.3374	
15 minute winter	S2.18	Infiltration		0.0				
15 minute winter	S2.17	4.002	S2.15	4.5	0.634	0.040	0.0718	
15 minute winter	S2.17	Infiltration		0.0				
15 minute summer	S2.16	5.000	S2.15	0.0	0.000	0.000	0.1550	
15 minute winter	S2.15	4.003	S2.14	10.2	0.916	0.229	0.0604	
15 minute winter	S2.14	4.004	S2.13	10.8	1.094	0.193	0.5462	
15 minute winter	S2.13	4.005	S2.12	11.9	1.378	0.160	0.5838	
15 minute winter	S2.13	Infiltration		0.0				
15 minute winter	S2.12	3.011	S2.26	28.5	0.796	0.673	0.3338	
15 minute winter	S2.12	Infiltration		0.0				
15 minute winter	S2.12	Infiltration		0.0				

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.20	11	28.798	0.035	3.6	0.0503	0.0000	OK
15 minute winter	S2.21	11	27.632	0.041	6.6	0.1061	0.0000	OK
15 minute winter	S2.22	12	25.240	0.040	6.4	0.0670	0.0000	OK
15 minute winter	S2.23	12	23.782	0.050	9.6	0.1055	0.0000	OK
15 minute winter	S2.24	12	22.850	0.047	9.5	0.0665	0.0000	OK
15 minute winter	S2.25	13	22.233	0.080	9.5	0.1152	0.0000	OK
15 minute winter	S2.26	14	21.954	0.264	64.6	0.2987	0.0000	SURCHARGED
15 minute winter	S2.39	14	21.739	0.210	64.6	0.3012	0.0000	OK
2160 minute winter	HB2	1680	21.587	0.147	6.2	206.2433	0.0000	OK
15 minute summer	S2.45	1	21.300	0.000	0.2	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	S2.20	6.000	S2.21	3.4	0.786	0.053	0.3407	
15 minute winter	S2.21	6.001	S2.22	6.4	1.359	0.069	0.3633	
15 minute winter	S2.21	Infiltration		0.0				
15 minute winter	S2.22	6.002	S2.23	6.2	1.119	0.068	0.2636	
15 minute winter	S2.22	Infiltration		0.0				
15 minute winter	S2.23	6.003	S2.24	9.5	1.483	0.103	0.1605	
15 minute winter	S2.23	Infiltration		0.0				
15 minute winter	S2.24	6.004	S2.25	9.5	1.089	0.094	0.1625	
15 minute winter	S2.24	Infiltration		0.0				
15 minute winter	S2.25	6.005	S2.26	9.2	0.736	0.267	0.4480	
15 minute winter	S2.26	1.012	S2.39	64.6	1.625	0.935	0.3589	
15 minute winter	S2.26	Infiltration		0.0				
15 minute winter	S2.26	Infiltration		0.0				
15 minute winter	S2.39	1.013	HB2	63.9	2.371	0.714	1.4103	
2160 minute winter	HB2	Hydro-Brake®	S2.45	1.5				197.5
2160 minute winter	HB2	Infiltration		0.0				

Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.38	10	33.168	0.047	7.1	0.0677	0.0000	OK
15 minute winter	S2.43	11	32.081	0.037	7.0	0.0782	0.0000	OK
15 minute winter	S2.37	11	30.996	0.059	16.1	0.1128	0.0000	OK
15 minute winter	S2.42	11	28.997	0.065	15.9	0.1382	0.0000	OK
15 minute winter	S2.36	11	28.723	0.064	15.9	0.0919	0.0000	OK
15 minute winter	S2.35	11	27.414	0.075	25.5	0.1073	0.0000	OK
15 minute winter	S2.33	10	26.777	0.068	10.9	0.0978	0.0000	OK
15 minute winter	S2.32	11	26.691	0.137	44.3	0.1954	0.0000	OK
15 minute winter	S2.31	11	26.346	0.186	62.6	1.0506	0.0000	OK
15 minute winter	S2.30	11	26.142	0.149	62.4	0.2138	0.0000	OK
15 minute winter	S2.29	13	24.870	0.331	68.9	2.5929	0.0000	SURCHARGED
30 minute winter	S2.28	24	24.131	0.359	64.2	4.5885	0.0000	SURCHARGED
15 minute winter	S2.27	17	23.274	0.151	50.0	1.3562	0.0000	OK
15 minute winter	S2.1	10	33.171	0.051	5.5	0.0737	0.0000	OK
15 minute winter	S2.40	11	32.411	0.036	5.3	0.0521	0.0000	OK
15 minute winter	S2.2	11	31.919	0.049	5.4	0.1016	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	S2.38	1.000	S2.43	7.0	1.377	0.088	0.2362	
15 minute winter	S2.43	1.001	S2.37	6.9	1.128	0.058	0.1325	
15 minute winter	S2.43	Infiltration		0.0				
15 minute winter	S2.37	1.002	S2.42	15.9	1.801	0.151	0.4386	
15 minute winter	S2.37	Infiltration		0.0				
15 minute winter	S2.42	1.003	S2.36	15.9	1.691	0.158	0.0692	
15 minute winter	S2.42	Infiltration		0.0				
15 minute winter	S2.36	1.004	S2.35	15.9	1.751	0.167	0.1821	
15 minute winter	S2.35	1.005	S2.32	25.5	1.394	0.241	0.3517	
15 minute winter	S2.35	Infiltration		0.0				
15 minute winter	S2.33	2.000	S2.32	10.8	0.638	0.203	0.2594	
15 minute winter	S2.32	1.006	S2.31	44.4	1.467	0.639	0.6664	
15 minute winter	S2.31	1.007	S2.30	62.4	1.968	0.794	0.2321	
15 minute winter	S2.31	Infiltration		0.0				
15 minute winter	S2.30	1.008	S2.29	62.0	1.861	0.789	2.1684	
15 minute winter	S2.29	1.009	S2.28	55.3	1.471	1.055	2.8010	
15 minute winter	S2.29	Infiltration		0.0				
30 minute winter	S2.28	1.010	S2.27	50.1	1.470	1.092	2.8308	
30 minute winter	S2.28	Infiltration		0.1				
15 minute winter	S2.27	1.011	S2.26	49.9	1.676	0.802	2.6955	
15 minute winter	S2.27	Infiltration		0.0				
15 minute winter	S2.1	3.000	S2.40	5.3	0.800	0.110	0.1494	
15 minute winter	S2.40	3.001	S2.2	5.4	1.050	0.057	0.0821	
15 minute winter	S2.2	3.002	S2.3	5.3	0.822	0.100	0.1300	
15 minute winter	S2.2	Infiltration		0.0				

Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.3	11	31.712	0.051	12.0	0.0733	0.0000	OK
15 minute winter	S2.4	11	29.232	0.051	12.0	0.0732	0.0000	OK
15 minute winter	S2.41	11	28.811	0.064	21.3	0.0920	0.0000	OK
15 minute winter	S2.6	11	26.879	0.095	33.0	0.2098	0.0000	OK
15 minute winter	S2.7	11	26.542	0.089	33.1	0.1273	0.0000	OK
15 minute winter	S2.8	12	24.489	0.159	39.7	0.5101	0.0000	OK
15 minute winter	S2.9	12	23.554	0.195	45.0	0.2787	0.0000	OK
15 minute winter	S2.11	13	22.946	0.168	51.5	1.7575	0.0000	OK
15 minute winter	S2.19	10	28.815	0.052	6.5	0.0746	0.0000	OK
15 minute winter	S2.18	11	28.201	0.055	12.3	0.1951	0.0000	OK
15 minute winter	S2.17	11	24.548	0.048	11.5	0.0688	0.0000	OK
15 minute summer	S2.16	1	24.233	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2.15	11	24.196	0.136	25.9	0.1533	0.0000	OK
15 minute winter	S2.14	11	24.134	0.114	28.0	0.1285	0.0000	OK
15 minute winter	S2.13	12	23.475	0.101	31.7	0.4719	0.0000	OK
30 minute winter	S2.12	25	22.358	0.612	71.1	9.3789	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	S2.3	3.003	S2.4	12.0	1.776	0.113	0.4010	
15 minute winter	S2.4	3.004	S2.41	12.0	1.495	0.112	0.0833	
15 minute winter	S2.41	3.005	S2.6	21.3	1.692	0.180	0.4826	
15 minute winter	S2.6	3.006	S2.7	33.1	2.166	0.303	0.1159	
15 minute winter	S2.6	Infiltration		0.0				
15 minute winter	S2.7	3.007	S2.8	33.1	1.614	0.333	1.2825	
15 minute winter	S2.8	3.008	S2.9	36.7	1.247	0.829	2.3568	
15 minute winter	S2.8	Infiltration		0.0				
15 minute winter	S2.9	3.009	S2.11	44.7	1.341	1.009	2.6717	
15 minute winter	S2.9	Infiltration		0.0				
15 minute winter	S2.11	3.010	S2.12	48.0	1.319	0.922	2.7927	
15 minute winter	S2.11	Infiltration		0.0				
15 minute winter	S2.19	4.000	S2.18	6.3	0.913	0.116	0.3976	
15 minute winter	S2.18	4.001	S2.17	11.5	1.563	0.128	0.6561	
15 minute winter	S2.18	Infiltration		0.0				
15 minute winter	S2.17	4.002	S2.15	11.5	0.781	0.101	0.1437	
15 minute winter	S2.17	Infiltration		0.0				
15 minute summer	S2.16	5.000	S2.15	0.0	0.000	0.000	0.3144	
15 minute winter	S2.15	4.003	S2.14	25.8	1.152	0.579	0.1222	
15 minute winter	S2.14	4.004	S2.13	27.5	1.398	0.490	1.0855	
15 minute winter	S2.13	4.005	S2.12	31.2	1.619	0.418	1.8985	
15 minute winter	S2.13	Infiltration		0.0				
30 minute winter	S2.12	3.011	S2.26	52.0	1.307	1.227	0.3338	
30 minute winter	S2.12	Infiltration		0.0				
30 minute winter	S2.12	Infiltration		0.1				

Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.20	10	28.818	0.055	8.7	0.0784	0.0000	OK
15 minute winter	S2.21	11	27.655	0.064	16.2	0.2070	0.0000	OK
15 minute winter	S2.22	11	25.262	0.062	15.9	0.1237	0.0000	OK
15 minute winter	S2.23	11	23.814	0.082	24.6	0.2067	0.0000	OK
15 minute winter	S2.24	11	22.878	0.075	24.1	0.1066	0.0000	OK
15 minute winter	S2.25	12	22.295	0.143	24.0	0.2044	0.0000	OK
30 minute winter	S2.26	27	22.271	0.581	113.2	9.0006	0.0000	SURCHARGED
30 minute winter	S2.39	27	21.786	0.257	97.0	0.3677	0.0000	OK
2880 minute winter	HB2	2760	21.781	0.341	9.6	477.7211	0.0000	OK
15 minute summer	S2.45	1	21.300	0.000	0.9	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	S2.20	6.000	S2.21	8.4	1.019	0.131	0.6469	
15 minute winter	S2.21	6.001	S2.22	15.9	1.749	0.173	0.7034	
15 minute winter	S2.21	Infiltration		0.0				
15 minute winter	S2.22	6.002	S2.23	15.4	1.430	0.168	0.5170	
15 minute winter	S2.22	Infiltration		0.0				
15 minute winter	S2.23	6.003	S2.24	24.1	1.912	0.262	0.3173	
15 minute winter	S2.23	Infiltration		0.0				
15 minute winter	S2.24	6.004	S2.25	24.0	1.335	0.238	0.3333	
15 minute winter	S2.24	Infiltration		0.0				
15 minute winter	S2.25	6.005	S2.26	23.9	0.923	0.694	1.0563	
30 minute winter	S2.26	1.012	S2.39	97.0	2.438	1.403	0.3640	
30 minute winter	S2.26	Infiltration		0.1				
30 minute winter	S2.26	Infiltration		0.0				
30 minute winter	S2.39	1.013	HB2	97.0	2.450	1.085	2.0238	
2880 minute winter	HB2	Hydro-Brake®	S2.45	1.6				293.2
2880 minute winter	HB2	Infiltration		0.0				

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.38	10	33.178	0.057	10.1	0.0809	0.0000	OK
15 minute winter	S2.43	11	32.088	0.044	9.9	0.0981	0.0000	OK
15 minute winter	S2.37	11	31.007	0.070	22.9	0.1412	0.0000	OK
15 minute winter	S2.42	11	29.012	0.080	22.6	0.1800	0.0000	OK
15 minute winter	S2.36	11	28.737	0.078	22.7	0.1113	0.0000	OK
15 minute winter	S2.35	11	27.429	0.090	36.2	0.1293	0.0000	OK
15 minute winter	S2.33	12	26.803	0.094	15.5	0.1343	0.0000	OK
15 minute winter	S2.32	12	26.788	0.234	63.1	0.3355	0.0000	SURCHARGED
15 minute winter	S2.31	13	26.491	0.331	88.2	3.1837	0.0000	SURCHARGED
15 minute winter	S2.30	13	26.285	0.292	77.7	0.4176	0.0000	SURCHARGED
30 minute winter	S2.29	23	25.154	0.615	78.6	8.6729	0.0000	FLOOD RISK
30 minute winter	S2.28	27	24.265	0.493	69.8	9.4832	0.0000	SURCHARGED
30 minute winter	S2.27	28	23.283	0.160	54.2	1.5175	0.0000	OK
15 minute winter	S2.1	10	33.182	0.062	7.8	0.0883	0.0000	OK
15 minute winter	S2.40	11	32.418	0.043	7.6	0.0616	0.0000	OK
15 minute winter	S2.2	11	31.928	0.058	7.5	0.1291	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	S2.38	1.000	S2.43	9.9	1.523	0.125	0.3041	
15 minute winter	S2.43	1.001	S2.37	9.8	1.246	0.082	0.1700	
15 minute winter	S2.43	Infiltration		0.0				
15 minute winter	S2.37	1.002	S2.42	22.6	1.967	0.214	0.5715	
15 minute winter	S2.37	Infiltration		0.0				
15 minute winter	S2.42	1.003	S2.36	22.7	1.835	0.225	0.0907	
15 minute winter	S2.42	Infiltration		0.0				
15 minute winter	S2.36	1.004	S2.35	22.7	1.925	0.238	0.2363	
15 minute winter	S2.35	1.005	S2.32	36.3	1.424	0.343	0.5159	
15 minute winter	S2.35	Infiltration		0.0				
15 minute winter	S2.33	2.000	S2.32	15.4	0.672	0.289	0.4098	
15 minute winter	S2.32	1.006	S2.31	60.8	1.557	0.875	0.8796	
15 minute winter	S2.31	1.007	S2.30	77.7	1.991	0.989	0.2928	
15 minute winter	S2.31	Infiltration		0.0				
15 minute winter	S2.30	1.008	S2.29	75.7	1.949	0.963	2.5475	
30 minute winter	S2.29	1.009	S2.28	56.4	1.467	1.075	2.8010	
30 minute winter	S2.29	Infiltration		0.1				
30 minute winter	S2.28	1.010	S2.27	54.2	1.465	1.181	2.9123	
30 minute winter	S2.28	Infiltration		0.1				
30 minute winter	S2.27	1.011	S2.26	54.1	1.670	0.869	2.7731	
30 minute winter	S2.27	Infiltration		0.0				
15 minute winter	S2.1	3.000	S2.40	7.6	0.881	0.156	0.1923	
15 minute winter	S2.40	3.001	S2.2	7.5	1.153	0.081	0.1056	
15 minute winter	S2.2	3.002	S2.3	7.6	0.904	0.142	0.1673	
15 minute winter	S2.2	Infiltration		0.0				

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.3	11	31.722	0.061	17.0	0.0872	0.0000	OK
15 minute winter	S2.4	11	29.243	0.062	17.0	0.0886	0.0000	OK
15 minute winter	S2.41	11	28.824	0.077	30.2	0.1105	0.0000	OK
15 minute winter	S2.6	11	26.903	0.119	47.1	0.2842	0.0000	OK
15 minute winter	S2.7	11	26.561	0.108	47.1	0.1552	0.0000	OK
15 minute winter	S2.8	12	24.568	0.238	56.5	0.9895	0.0000	SURCHARGED
15 minute winter	S2.9	14	23.860	0.501	60.8	1.4386	0.0000	SURCHARGED
30 minute winter	S2.11	25	23.086	0.308	61.7	5.9857	0.0000	SURCHARGED
15 minute winter	S2.19	10	28.826	0.063	9.3	0.0895	0.0000	OK
15 minute winter	S2.18	11	28.212	0.066	17.6	0.2616	0.0000	OK
15 minute winter	S2.17	11	24.558	0.058	16.6	0.0826	0.0000	OK
15 minute summer	S2.16	1	24.233	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S2.15	11	24.232	0.172	37.0	0.1950	0.0000	OK
15 minute winter	S2.14	11	24.163	0.143	40.0	0.1617	0.0000	OK
15 minute winter	S2.13	12	23.498	0.124	45.2	0.6778	0.0000	OK
2880 minute winter	S2.12	2700	22.596	0.850	5.7	25.9722	0.0000	FLOOD RISK

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	S2.3	3.003	S2.4	17.0	1.948	0.159	0.5189	
15 minute winter	S2.4	3.004	S2.41	17.0	1.634	0.159	0.1080	
15 minute winter	S2.41	3.005	S2.6	30.3	1.821	0.256	0.6366	
15 minute winter	S2.6	3.006	S2.7	47.1	2.339	0.432	0.1528	
15 minute winter	S2.6	Infiltration		0.0				
15 minute winter	S2.7	3.007	S2.8	47.2	1.730	0.474	1.6839	
15 minute winter	S2.8	3.008	S2.9	47.1	1.287	1.062	2.9553	
15 minute winter	S2.8	Infiltration		0.0				
15 minute winter	S2.9	3.009	S2.11	52.7	1.360	1.189	3.1644	
15 minute winter	S2.9	Infiltration		0.0				
30 minute winter	S2.11	3.010	S2.12	51.2	1.325	0.985	3.1031	
30 minute winter	S2.11	Infiltration		0.1				
15 minute winter	S2.19	4.000	S2.18	9.1	1.005	0.167	0.5144	
15 minute winter	S2.18	4.001	S2.17	16.6	1.734	0.184	0.8516	
15 minute winter	S2.18	Infiltration		0.0				
15 minute winter	S2.17	4.002	S2.15	16.6	0.835	0.145	0.1875	
15 minute winter	S2.17	Infiltration		0.0				
15 minute summer	S2.16	5.000	S2.15	0.0	0.000	0.000	0.4120	
15 minute winter	S2.15	4.003	S2.14	36.9	1.250	0.828	0.1607	
15 minute winter	S2.14	4.004	S2.13	39.3	1.516	0.701	1.4330	
15 minute winter	S2.13	4.005	S2.12	44.4	1.675	0.596	2.0932	
15 minute winter	S2.13	Infiltration		0.0				
2880 minute winter	S2.12	3.011	S2.26	5.7	0.644	0.134	0.3338	
2880 minute winter	S2.12	Infiltration		0.1				
2880 minute winter	S2.12	Infiltration		0.1				

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 98.22%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S2.20	10	28.828	0.065	12.3	0.0936	0.0000	OK
15 minute winter	S2.21	11	27.668	0.077	22.9	0.2740	0.0000	OK
15 minute winter	S2.22	11	25.275	0.075	22.5	0.1609	0.0000	OK
15 minute winter	S2.23	11	23.832	0.100	35.1	0.2767	0.0000	OK
15 minute winter	S2.24	11	22.893	0.090	34.6	0.1292	0.0000	OK
2880 minute winter	S2.25	2700	22.596	0.444	1.6	0.6359	0.0000	SURCHARGED
2880 minute winter	S2.26	2700	22.596	0.906	12.5	30.2766	0.0000	FLOOD RISK
2880 minute winter	S2.39	2700	22.596	1.067	12.5	1.5271	0.0000	FLOOD RISK
2880 minute winter	HB2	2700	22.596	1.156	12.4	560.7000	0.0000	FLOOD RISK
15 minute summer	S2.45	1	21.300	0.000	1.3	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	S2.20	6.000	S2.21	11.9	1.123	0.186	0.8306	
15 minute winter	S2.21	6.001	S2.22	22.5	1.922	0.246	0.9073	
15 minute winter	S2.21	Infiltration		0.0				
15 minute winter	S2.22	6.002	S2.23	22.1	1.559	0.240	0.6746	
15 minute winter	S2.22	Infiltration		0.0				
15 minute winter	S2.23	6.003	S2.24	34.6	2.096	0.376	0.4145	
15 minute winter	S2.23	Infiltration		0.0				
15 minute winter	S2.24	6.004	S2.25	34.4	1.427	0.342	0.4452	
15 minute winter	S2.24	Infiltration		0.0				
2880 minute winter	S2.25	6.005	S2.26	1.6	0.453	0.046	1.4250	
2880 minute winter	S2.26	1.012	S2.39	12.5	0.919	0.180	0.3640	
2880 minute winter	S2.26	Infiltration		0.1				
2880 minute winter	S2.26	Infiltration		0.1				
2880 minute winter	S2.39	1.013	HB2	12.4	0.673	0.139	4.8320	
2880 minute winter	HB2	Hydro-Brake®	S2.45	1.8				312.4
2880 minute winter	HB2	Infiltration		0.0				

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	18.300	Minimum Backdrop Height (m)	1.000
Ratio-R	0.250	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)
S3.1	0.025	5.00	29.615	1350	664588.758	613389.286	0.875
S3.2	0.045	5.00	25.665	1350	664686.074	613413.840	0.875
S3.4			21.283	1350	664779.216	613436.957	0.875
S3.6	0.022	5.00	20.449	1350	664825.844	613438.871	0.875
S3.5			20.815	1350	664798.181	613439.771	1.465
S3.12	0.025	5.00	29.612	1350	664591.312	613381.398	0.875
S3.11	0.028	5.00	26.833	1350	664664.736	613399.788	0.875
S3.10	0.019	5.00	23.159	1350	664738.000	613418.167	0.875
S3.8		5.00	20.337	1350	664825.112	613426.644	1.057
S3.14	0.032	5.00	20.422	1350	664810.416	613429.957	1.272
S3.9			20.910	1200	664794.236	613431.274	1.950
S3.15			20.351		664790.174	613416.892	1.591
S1			20.198	1200	664843.088	613411.074	1.718

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)
1.000	S3.1	S3.2	100.366	0.600	28.740	24.790	3.950	25.4	225	5.64	37.8
1.001	S3.2	S3.4	95.968	0.600	24.790	20.408	4.382	21.9	225	6.21	36.4
1.002	S3.4	S3.5	19.173	0.600	20.408	19.940	0.468	41.0	225	6.37	36.1
2.001	S3.6	S3.5	27.677	0.600	19.574	19.350	0.224	123.6	225	5.39	38.5
1.003	S3.5	S3.9	9.368	0.600	19.350	19.040	0.310	30.2	225	6.43	35.9
3.000	S3.12	S3.11	75.691	0.600	28.737	25.958	2.779	27.2	225	5.50	38.2
3.001	S3.11	S3.10	75.534	0.600	25.958	22.284	3.674	20.6	225	5.94	37.1

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)
1.000	2.606	103.6	2.5	0.650	0.650	0.025	0.0	24	1.107
1.001	2.808	111.6	6.9	0.650	0.650	0.070	0.0	37	1.565
1.002	2.049	81.5	6.8	0.650	0.650	0.070	0.0	44	1.250
2.001	1.175	46.7	2.3	0.650	1.240	0.022	0.0	34	0.613
1.003	2.388	95.0	8.9	1.240	1.645	0.091	0.0	46	1.509
3.000	2.516	100.1	2.6	0.650	0.650	0.025	0.0	25	1.093
3.001	2.898	115.2	5.4	0.650	0.650	0.054	0.0	33	1.497

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)
3.002	S3.10	S3.9	57.743	0.600	22.284	20.035	2.249	25.7	225	6.31	36.2
4.001	S3.8	S3.14	15.065	0.600	19.280	19.150	0.130	115.9	225	5.21	39.0
4.002	S3.14	S3.9	16.233	0.600	19.150	19.040	0.110	147.6	225	5.46	38.3
1.004	S3.9	S3.15	14.944	0.600	18.960	18.760	0.200	74.7	225	6.60	35.5
1.005	S3.15	S1	53.233	0.600	18.760	18.480	0.280	190.1	225	7.54	33.6

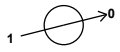
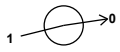
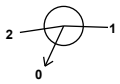
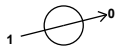
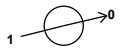
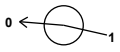
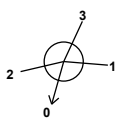
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
3.002	2.592	103.1	7.1	0.650	0.650	0.073	0.0	40	1.505
4.001	1.213	48.2	0.0	0.832	1.047	0.000	0.0	0	0.000
4.002	1.074	42.7	3.4	1.047	1.645	0.032	0.0	43	0.645
1.004	1.514	60.2	18.9	1.725	1.366	0.197	0.0	87	1.345
1.005	0.945	37.6	17.9	1.366	1.493	0.197	0.0	109	0.934

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)
1.000	100.366	25.4	225	Circular	29.615	28.740	0.650	25.665	24.790	0.650
1.001	95.968	21.9	225	Circular	25.665	24.790	0.650	21.283	20.408	0.650
1.002	19.173	41.0	225	Circular	21.283	20.408	0.650	20.815	19.940	0.650
2.001	27.677	123.6	225	Circular	20.449	19.574	0.650	20.815	19.350	1.240
1.003	9.368	30.2	225	Circular	20.815	19.350	1.240	20.910	19.040	1.645
3.000	75.691	27.2	225	Circular	29.612	28.737	0.650	26.833	25.958	0.650
3.001	75.534	20.6	225	Circular	26.833	25.958	0.650	23.159	22.284	0.650
3.002	57.743	25.7	225	Circular	23.159	22.284	0.650	20.910	20.035	0.650
4.001	15.065	115.9	225	Circular	20.337	19.280	0.832	20.422	19.150	1.047
4.002	16.233	147.6	225	Circular	20.422	19.150	1.047	20.910	19.040	1.645
1.004	14.944	74.7	225	Circular	20.910	18.960	1.725	20.351	18.760	1.366
1.005	53.233	190.1	225	Circular	20.351	18.760	1.366	20.198	18.480	1.493

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S3.1	1350	Manhole	Adoptable	S3.2	1350	Manhole	Adoptable
1.001	S3.2	1350	Manhole	Adoptable	S3.4	1350	Manhole	Adoptable
1.002	S3.4	1350	Manhole	Adoptable	S3.5	1350	Manhole	Adoptable
2.001	S3.6	1350	Manhole	Adoptable	S3.5	1350	Manhole	Adoptable
1.003	S3.5	1350	Manhole	Adoptable	S3.9	1200	Manhole	Adoptable
3.000	S3.12	1350	Manhole	Adoptable	S3.11	1350	Manhole	Adoptable
3.001	S3.11	1350	Manhole	Adoptable	S3.10	1350	Manhole	Adoptable
3.002	S3.10	1350	Manhole	Adoptable	S3.9	1200	Manhole	Adoptable
4.001	S3.8	1350	Manhole	Adoptable	S3.14	1350	Manhole	Adoptable
4.002	S3.14	1350	Manhole	Adoptable	S3.9	1200	Manhole	Adoptable
1.004	S3.9	1200	Manhole	Adoptable	S3.15		Junction	
1.005	S3.15		Junction		S1	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S3.1	664588.758	613389.286	29.615	0.875	1350		0	1.000	28.740	225
S3.2	664686.074	613413.840	25.665	0.875	1350		1	1.000	24.790	225
							0	1.001	24.790	225
S3.4	664779.216	613436.957	21.283	0.875	1350		1	1.001	20.408	225
							0	1.002	20.408	225
S3.6	664825.844	613438.871	20.449	0.875	1350		0	2.001	19.574	225
S3.5	664798.181	613439.771	20.815	1.465	1350		1	2.001	19.350	225
							2	1.002	19.940	225
							0	1.003	19.350	225
S3.12	664591.312	613381.398	29.612	0.875	1350		0	3.000	28.737	225
S3.11	664664.736	613399.788	26.833	0.875	1350		1	3.000	25.958	225
							0	3.001	25.958	225
S3.10	664738.000	613418.167	23.159	0.875	1350		1	3.001	22.284	225
							0	3.002	22.284	225
S3.8	664825.112	613426.644	20.337	1.057	1350		0	4.001	19.280	225
S3.14	664810.416	613429.957	20.422	1.272	1350		1	4.001	19.150	225
							0	4.002	19.150	225
S3.9	664794.236	613431.274	20.910	1.950	1200		1	4.002	19.040	225
							2	3.002	20.035	225
							3	1.003	19.040	225
							0	1.004	18.960	225
S3.15	664790.174	613416.892	20.351	1.591			1	1.004	18.760	225
							0	1.005	18.760	225
S1	664843.088	613411.074	20.198	1.718	1200		1	1.005	18.480	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	18.300	Drain Down Time (mins)	1000
Ratio-R	0.250	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160
30	120	240	480	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	10	0	0
100	20	0	0

Node S3.15 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.005	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0032-5000-1000-5000
Invert Level (m)	18.760	Min Outlet Diameter (m)	0.075
Design Depth (m)	1.000	Min Node Diameter (mm)	1200
Design Flow (l/s)	0.5		

Node S3.2 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.000
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	24.790	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S3.11 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.000
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	25.958	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S3.10 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	22.284	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S3.4 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	20.408	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S3.9 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	3.002
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	20.035	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S3.5 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.002
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	19.940	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	720	Diameter (mm)	1000

Node S3.5 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	2.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	19.350	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	1000

Node S3.9 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	4.002
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	19.040	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	1000

Node S3.14 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	4.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	19.150	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	1000

Node S3.15 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	18.760	Depth (m)	1.050
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	10.500	Number Required	1
Porosity	0.95	Pit Length (m)	10.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S3.1	11	28.764	0.024	2.7	0.0350	0.0000	OK
15 minute winter	S3.2	11	24.829	0.039	7.5	0.0723	0.0000	OK
15 minute winter	S3.4	12	20.454	0.046	7.2	0.0850	0.0000	OK
15 minute winter	S3.6	10	19.608	0.034	2.4	0.0489	0.0000	OK
15 minute winter	S3.5	12	19.399	0.049	9.1	0.2022	0.0000	OK
15 minute winter	S3.12	10	28.762	0.025	2.8	0.0364	0.0000	OK
15 minute winter	S3.11	11	25.992	0.034	5.8	0.0620	0.0000	OK
15 minute winter	S3.10	11	22.325	0.041	7.6	0.0731	0.0000	OK
15 minute summer	S3.8	1	19.280	0.000	0.0	0.0000	0.0000	OK
2880 minute winter	S3.14	2160	19.239	0.089	0.2	0.5156	0.0000	OK
2880 minute winter	S3.9	2160	19.239	0.279	1.4	2.2388	0.0000	SURCHARGED
2880 minute winter	S3.15	2160	19.239	0.479	1.4	47.8282	0.0000	SURCHARGED
15 minute summer	S1	1	18.480	0.000	0.3	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	S3.1	1.000	S3.2	2.6	0.768	0.025	0.3442	
15 minute winter	S3.2	1.001	S3.4	7.2	1.455	0.065	0.4873	
15 minute winter	S3.2	Infiltration		0.0				
15 minute winter	S3.4	1.002	S3.5	7.0	1.245	0.086	0.1080	
15 minute winter	S3.4	Infiltration		0.0				
15 minute winter	S3.6	2.001	S3.5	2.3	0.546	0.050	0.1379	
15 minute winter	S3.5	1.003	S3.9	9.1	1.466	0.096	0.0582	
15 minute winter	S3.5	Infiltration		0.0				
15 minute winter	S3.5	Infiltration		0.0				
15 minute winter	S3.12	3.000	S3.11	2.7	0.892	0.027	0.2327	
15 minute winter	S3.11	3.001	S3.10	5.6	1.326	0.049	0.3238	
15 minute winter	S3.11	Infiltration		0.0				
15 minute winter	S3.10	3.002	S3.9	7.3	1.502	0.071	0.2797	
15 minute winter	S3.10	Infiltration		0.0				
15 minute summer	S3.8	4.001	S3.14	0.0	0.000	0.000	0.0389	
2880 minute winter	S3.14	4.002	S3.9	0.2	0.277	0.005	0.4216	
2880 minute winter	S3.14	Infiltration		0.0				
2880 minute winter	S3.9	1.004	S3.15	1.4	0.493	0.023	0.5943	
2880 minute winter	S3.9	Infiltration		0.0				
2880 minute winter	S3.9	Infiltration		0.0				
2880 minute winter	S3.15	Hydro-Brake®	S1	0.4				63.3

Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S3.1	10	28.779	0.039	7.2	0.0565	0.0000	OK
15 minute winter	S3.2	11	24.854	0.064	20.3	0.1352	0.0000	OK
15 minute winter	S3.4	11	20.486	0.078	19.7	0.1668	0.0000	OK
2160 minute winter	S3.6	2040	19.705	0.131	0.4	0.1870	0.0000	OK
2160 minute winter	S3.5	2040	19.705	0.355	1.6	6.3467	0.0000	SURCHARGED
15 minute winter	S3.12	10	28.778	0.041	7.4	0.0585	0.0000	OK
15 minute winter	S3.11	11	26.013	0.055	15.6	0.1146	0.0000	OK
15 minute winter	S3.10	11	22.353	0.069	20.6	0.1394	0.0000	OK
2160 minute winter	S3.8	2040	19.705	0.425	0.1	0.6077	0.0000	SURCHARGED
2160 minute winter	S3.14	2040	19.705	0.555	0.6	7.5695	0.0000	SURCHARGED
2160 minute winter	S3.9	2040	19.705	0.745	2.9	10.0970	0.0000	SURCHARGED
2160 minute winter	S3.15	2040	19.705	0.945	2.5	94.2320	0.0000	SURCHARGED
15 minute summer	S1	1	18.480	0.000	0.3	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	S3.1	1.000	S3.2	7.0	1.030	0.067	0.6956	
15 minute winter	S3.2	1.001	S3.4	19.7	1.884	0.176	1.0242	
15 minute winter	S3.2	Infiltration		0.0				
15 minute winter	S3.4	1.002	S3.5	19.2	1.638	0.236	0.2251	
15 minute winter	S3.4	Infiltration		0.0				
2160 minute winter	S3.6	2.001	S3.5	0.4	0.280	0.009	0.8813	
2160 minute winter	S3.5	1.003	S3.9	1.6	0.769	0.017	0.3726	
2160 minute winter	S3.5	Infiltration		0.0				
2160 minute winter	S3.5	Infiltration		0.1				
15 minute winter	S3.12	3.000	S3.11	7.2	1.181	0.072	0.4679	
15 minute winter	S3.11	3.001	S3.10	15.3	1.746	0.132	0.6700	
15 minute winter	S3.11	Infiltration		0.0				
15 minute winter	S3.10	3.002	S3.9	20.4	2.015	0.198	0.5842	
15 minute winter	S3.10	Infiltration		0.0				
2160 minute winter	S3.8	4.001	S3.14	-0.1	-0.003	-0.001	0.5992	
2160 minute winter	S3.14	4.002	S3.9	0.4	0.315	0.009	0.6456	
2160 minute winter	S3.14	Infiltration		0.0				
2160 minute winter	S3.9	1.004	S3.15	2.5	0.644	0.042	0.5943	
2160 minute winter	S3.9	Infiltration		0.0				
2160 minute winter	S3.9	Infiltration		0.0				
2160 minute winter	S3.15	Hydro-Brake®	S1	0.5				76.7

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.28%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S3.1	10	28.787	0.047	10.2	0.0671	0.0000	OK
15 minute winter	S3.2	11	24.866	0.076	28.6	0.1713	0.0000	OK
15 minute winter	S3.4	11	20.503	0.095	27.8	0.2174	0.0000	OK
2880 minute winter	S3.6	2220	20.179	0.605	0.4	0.8664	0.0000	FLOOD RISK
2880 minute winter	S3.5	2220	20.179	0.829	1.7	20.9215	0.0000	SURCHARGED
15 minute winter	S3.12	10	28.785	0.048	10.4	0.0692	0.0000	OK
15 minute winter	S3.11	11	26.023	0.065	22.0	0.1435	0.0000	OK
15 minute winter	S3.10	11	22.367	0.083	29.1	0.1771	0.0000	OK
2880 minute winter	S3.8	2220	20.179	0.899	0.1	1.2871	0.0000	FLOOD RISK
2880 minute winter	S3.14	2220	20.179	1.029	0.6	15.4041	0.0000	FLOOD RISK
2880 minute winter	S3.9	2220	20.179	1.219	4.2	18.5541	0.0000	SURCHARGED
2880 minute winter	S3.15	2220	20.179	1.419	2.4	104.7874	0.0000	FLOOD RISK
15 minute summer	S1	1	18.480	0.000	0.3	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	S3.1	1.000	S3.2	9.9	1.139	0.096	0.8902	
15 minute winter	S3.2	1.001	S3.4	27.8	2.054	0.249	1.3283	
15 minute winter	S3.2	Infiltration		0.0				
15 minute winter	S3.4	1.002	S3.5	27.4	1.793	0.336	0.2926	
15 minute winter	S3.4	Infiltration		0.0				
2880 minute winter	S3.6	2.001	S3.5	0.4	0.259	0.009	1.1007	
2880 minute winter	S3.5	1.003	S3.9	2.2	0.721	0.023	0.3726	
2880 minute winter	S3.5	Infiltration		0.0				
2880 minute winter	S3.5	Infiltration		0.1				
15 minute winter	S3.12	3.000	S3.11	10.2	1.301	0.102	0.5955	
15 minute winter	S3.11	3.001	S3.10	21.4	1.914	0.186	0.8602	
15 minute winter	S3.11	Infiltration		0.0				
15 minute winter	S3.10	3.002	S3.9	28.9	2.217	0.280	0.7526	
15 minute winter	S3.10	Infiltration		0.0				
2880 minute winter	S3.8	4.001	S3.14	-0.1	-0.003	-0.001	0.5992	
2880 minute winter	S3.14	4.002	S3.9	0.9	0.314	0.022	0.6456	
2880 minute winter	S3.14	Infiltration		0.1				
2880 minute winter	S3.9	1.004	S3.15	2.4	0.603	0.040	0.5943	
2880 minute winter	S3.9	Infiltration		0.0				
2880 minute winter	S3.9	Infiltration		0.1				
2880 minute winter	S3.15	Hydro-Brake®	S1	0.6				105.6

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.300	Minimum Backdrop Height (m)	1.000
Ratio-R	0.250	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)
S1.1	0.015	5.00	33.960	1350	663885.746	613146.912	1.425
S1.15			33.650	1350	663872.613	613143.492	1.460
S1.2	0.020	5.00	32.883	1350	663844.846	613136.387	1.425
S1.3			32.224	1350	663829.902	613131.796	1.624
S1.4	0.023	5.00	28.889	1350	663784.244	613111.459	1.689
S1.5			28.180	1350	663775.259	613107.320	1.440
S1.6			26.119	1350	663749.325	613095.389	1.689
S1.7			25.471	1350	663741.431	613091.818	1.441
S1.8			24.720	1350	663728.189	613089.333	1.625
S1.14	0.012	5.00	33.948	1350	663887.030	613139.752	0.875
S1.13	0.018	5.00	32.661	1350	663841.135	613128.131	1.661
S1.12	0.025	5.00	28.883	1350	663787.161	613104.650	1.874
S1.17			25.610	1350	663745.631	613086.112	1.010
S1.11			24.747	1200	663731.301	613079.324	1.805
S1.16			23.943		663734.329	613073.100	1.147
S1.18			22.800	1350	663710.818	613063.020	0.175

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)
1.000	S1.1	S1.15	13.571	0.600	32.535	32.190	0.345	39.3	225	5.11	42.5
1.001	S1.15	S1.2	28.661	0.600	32.190	31.960	0.230	124.6	225	5.52	41.4
1.002	S1.2	S1.3	15.633	0.600	31.458	30.800	0.658	23.8	225	5.61	41.1
1.003	S1.3	S1.4	49.983	0.600	30.600	28.014	2.586	19.3	225	5.89	40.4
1.004	S1.4	S1.5	9.893	0.600	27.200	26.740	0.460	21.5	225	5.95	40.3
1.005	S1.5	S1.6	28.546	0.600	26.740	25.327	1.413	20.2	225	6.11	39.9
1.006	S1.6	S1.7	8.664	0.600	24.430	24.030	0.400	21.7	225	6.16	39.7
1.007	S1.7	S1.8	13.474	0.600	24.030	23.955	0.075	179.7	225	6.39	39.2

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)
1.000	2.092	83.2	1.7	1.200	1.235	0.015	0.0	22	0.845
1.001	1.170	46.5	1.6	1.235	0.698	0.015	0.0	29	0.549
1.002	2.695	107.2	3.8	1.200	1.199	0.034	0.0	29	1.273
1.003	2.990	118.9	3.8	1.399	0.650	0.034	0.0	28	1.385
1.004	2.833	112.7	6.2	1.464	1.215	0.057	0.0	36	1.534
1.005	2.924	116.3	6.2	1.215	0.567	0.057	0.0	35	1.559
1.006	2.823	112.3	6.1	1.464	1.216	0.057	0.0	36	1.528
1.007	0.972	38.7	6.1	1.216	0.540	0.057	0.0	60	0.713

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)
1.008	S1.8	S1.11	10.482	0.600	23.095	23.022	0.073	143.6	225	6.56	38.8
2.000	S1.14	S1.13	47.343	0.600	33.073	31.786	1.287	36.8	225	5.36	41.8
2.001	S1.13	S1.12	58.860	0.600	31.000	28.008	2.992	19.7	225	5.70	40.9
2.002	S1.12	S1.17	45.479	0.600	27.009	24.735	2.274	20.0	225	5.95	40.2
2.003	S1.17	S1.11	15.857	0.600	24.600	23.872	0.728	21.8	225	6.05	40.0
1.009	S1.11	S1.16	6.922	0.600	22.942	22.796	0.146	47.4	225	6.62	38.7
1.010	S1.16	S1.18	25.580	0.600	22.796	22.625	0.171	149.6	150	7.14	37.5

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)
1.008	1.089	43.3	6.0	1.400	1.500	0.057	0.0	57	0.772
2.000	2.163	86.0	1.4	0.650	0.650	0.012	0.0	20	0.806
2.001	2.963	117.8	3.4	1.436	0.650	0.031	0.0	26	1.317
2.002	2.939	116.8	6.1	1.649	0.650	0.056	0.0	35	1.567
2.003	2.815	111.9	6.1	0.785	0.650	0.056	0.0	36	1.524
1.009	1.904	75.7	11.8	1.580	0.922	0.113	0.0	60	1.399
1.010	0.819	14.5	11.5	0.997	0.025	0.113	0.0	101	0.907

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)
1.000	13.571	39.3	225	Circular	33.960	32.535	1.200	33.650	32.190	1.235
1.001	28.661	124.6	225	Circular	33.650	32.190	1.235	32.883	31.960	0.698
1.002	15.633	23.8	225	Circular	32.883	31.458	1.200	32.224	30.800	1.199
1.003	49.983	19.3	225	Circular	32.224	30.600	1.399	28.889	28.014	0.650
1.004	9.893	21.5	225	Circular	28.889	27.200	1.464	28.180	26.740	1.215
1.005	28.546	20.2	225	Circular	28.180	26.740	1.215	26.119	25.327	0.567
1.006	8.664	21.7	225	Circular	26.119	24.430	1.464	25.471	24.030	1.216
1.007	13.474	179.7	225	Circular	25.471	24.030	1.216	24.720	23.955	0.540
1.008	10.482	143.6	225	Circular	24.720	23.095	1.400	24.747	23.022	1.500
2.000	47.343	36.8	225	Circular	33.948	33.073	0.650	32.661	31.786	0.650
2.001	58.860	19.7	225	Circular	32.661	31.000	1.436	28.883	28.008	0.650
2.002	45.479	20.0	225	Circular	28.883	27.009	1.649	25.610	24.735	0.650
2.003	15.857	21.8	225	Circular	25.610	24.600	0.785	24.747	23.872	0.650

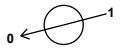
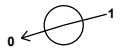
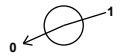
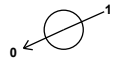
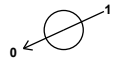
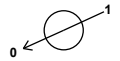
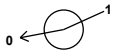
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1.1	1350	Manhole	Adoptable	S1.15	1350	Manhole	Adoptable
1.001	S1.15	1350	Manhole	Adoptable	S1.2	1350	Manhole	Adoptable
1.002	S1.2	1350	Manhole	Adoptable	S1.3	1350	Manhole	Adoptable
1.003	S1.3	1350	Manhole	Adoptable	S1.4	1350	Manhole	Adoptable
1.004	S1.4	1350	Manhole	Adoptable	S1.5	1350	Manhole	Adoptable
1.005	S1.5	1350	Manhole	Adoptable	S1.6	1350	Manhole	Adoptable
1.006	S1.6	1350	Manhole	Adoptable	S1.7	1350	Manhole	Adoptable
1.007	S1.7	1350	Manhole	Adoptable	S1.8	1350	Manhole	Adoptable
1.008	S1.8	1350	Manhole	Adoptable	S1.11	1200	Manhole	Adoptable
2.000	S1.14	1350	Manhole	Adoptable	S1.13	1350	Manhole	Adoptable
2.001	S1.13	1350	Manhole	Adoptable	S1.12	1350	Manhole	Adoptable
2.002	S1.12	1350	Manhole	Adoptable	S1.17	1350	Manhole	Adoptable
2.003	S1.17	1350	Manhole	Adoptable	S1.11	1200	Manhole	Adoptable

Pipeline Schedule

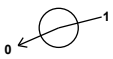
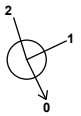
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.009	6.922	47.4	225	Circular	24.747	22.942	1.580	23.943	22.796	0.922
1.010	25.580	149.6	150	Circular	23.943	22.796	0.997	22.800	22.625	0.025

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.009	S1.11	1200	Manhole	Adoptable	S1.16		Junction	
1.010	S1.16		Junction		S1.18	1350	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1.1	663885.746	613146.912	33.960	1.425	1350				
						0	1.000	32.535	225
S1.15	663872.613	613143.492	33.650	1.460	1350	1	1.000	32.190	225
									
						0	1.001	32.190	225
S1.2	663844.846	613136.387	32.883	1.425	1350	1	1.001	31.960	225
									
						0	1.002	31.458	225
S1.3	663829.902	613131.796	32.224	1.624	1350	1	1.002	30.800	225
									
						0	1.003	30.600	225
S1.4	663784.244	613111.459	28.889	1.689	1350	1	1.003	28.014	225
									
						0	1.004	27.200	225
S1.5	663775.259	613107.320	28.180	1.440	1350	1	1.004	26.740	225
									
						0	1.005	26.740	225
S1.6	663749.325	613095.389	26.119	1.689	1350	1	1.005	25.327	225
									
						0	1.006	24.430	225
S1.7	663741.431	613091.818	25.471	1.441	1350	1	1.006	24.030	225
									
						0	1.007	24.030	225
S1.8	663728.189	613089.333	24.720	1.625	1350	1	1.007	23.955	225
									
						0	1.008	23.095	225
S1.14	663887.030	613139.752	33.948	0.875	1350				
						0	2.000	33.073	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1.13	663841.135	613128.131	32.661	1.661	1350		1	2.000	31.786	225
							0	2.001	31.000	225
S1.12	663787.161	613104.650	28.883	1.874	1350		1	2.001	28.008	225
							0	2.002	27.009	225
S1.17	663745.631	613086.112	25.610	1.010	1350		1	2.002	24.735	225
							0	2.003	24.600	225
S1.11	663731.301	613079.324	24.747	1.805	1200		1	2.003	23.872	225
							2	1.008	23.022	225
							0	1.009	22.942	225
S1.16	663734.329	613073.100	23.943	1.147			1	1.009	22.796	225
							0	1.010	22.796	150
S1.18	663710.818	613063.020	22.800	0.175	1350		1	1.010	22.625	150

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	18.300	Drain Down Time (mins)	2880
Ratio-R	0.250	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160
30	120	240	480	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	10	0	0
100	20	0	0

Node S1.16 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.010	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0032-5000-1000-5000
Invert Level (m)	22.796	Min Outlet Diameter (m)	0.075
Design Depth (m)	1.000	Min Node Diameter (mm)	1200
Design Flow (l/s)	0.5		

Node S1.13 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	2.000
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	31.786	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S1.4 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.003
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	28.014	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S1.2 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	31.960	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S1.12 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	2.001
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	28.008	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S1.6 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	1.005
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	25.327	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S1.17 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Porosity	1.00	Link	2.002
Side Inf Coefficient (m/hr)	0.01000	Invert Level (m)	24.735	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	1000

Node S1.16 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.01000	Invert Level (m)	22.796	Depth (m)	0.700
Side Inf Coefficient (m/hr)	0.01000	Time to half empty (mins)	1410	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	9.600	Number Required	1
Porosity	0.95	Pit Length (m)	12.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.1	10	32.557	0.022	1.6	0.0308	0.0000	OK
15 minute winter	S1.15	11	32.218	0.028	1.6	0.0399	0.0000	OK
15 minute winter	S1.2	11	31.487	0.029	3.6	0.0411	0.0000	OK
15 minute winter	S1.3	11	30.627	0.027	3.6	0.0384	0.0000	OK
15 minute winter	S1.4	11	27.236	0.036	5.8	0.0516	0.0000	OK
15 minute winter	S1.5	11	26.775	0.035	5.8	0.0495	0.0000	OK
15 minute winter	S1.6	11	24.465	0.035	5.8	0.0496	0.0000	OK
15 minute winter	S1.7	12	24.091	0.061	5.8	0.0867	0.0000	OK
15 minute winter	S1.8	12	23.153	0.058	5.8	0.0828	0.0000	OK
15 minute winter	S1.14	11	33.093	0.020	1.4	0.0280	0.0000	OK
15 minute winter	S1.13	11	31.026	0.026	3.3	0.0368	0.0000	OK
15 minute winter	S1.12	11	27.043	0.034	5.8	0.0492	0.0000	OK
15 minute winter	S1.17	11	24.636	0.036	5.8	0.0509	0.0000	OK
15 minute winter	S1.11	11	23.008	0.066	11.4	0.0741	0.0000	OK
960 minute winter	S1.16	720	22.961	0.165	1.6	18.0247	0.0000	SURCHARGED
15 minute summer	S1.18	1	22.625	0.000	0.2	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	S1.1	1.000	S1.15	1.6	0.720	0.019	0.0318	
15 minute winter	S1.15	1.001	S1.2	1.5	0.537	0.032	0.0799	
15 minute winter	S1.2	1.002	S1.3	3.6	1.241	0.034	0.0454	
15 minute winter	S1.2	Infiltration		0.0				
15 minute winter	S1.3	1.003	S1.4	3.5	1.337	0.030	0.1322	
15 minute winter	S1.4	1.004	S1.5	5.8	1.472	0.052	0.0393	
15 minute winter	S1.4	Infiltration		0.0				
15 minute winter	S1.5	1.005	S1.6	5.8	1.523	0.050	0.1088	
15 minute winter	S1.6	1.006	S1.7	5.8	0.956	0.052	0.0537	
15 minute winter	S1.6	Infiltration		0.0				
15 minute winter	S1.7	1.007	S1.8	5.8	0.689	0.149	0.1127	
15 minute winter	S1.8	1.008	S1.11	5.8	0.740	0.133	0.0816	
15 minute winter	S1.14	2.000	S1.13	1.3	0.796	0.015	0.0785	
15 minute winter	S1.13	2.001	S1.12	3.2	1.293	0.027	0.1463	
15 minute winter	S1.13	Infiltration		0.0				
15 minute winter	S1.12	2.002	S1.17	5.8	1.536	0.050	0.1725	
15 minute winter	S1.12	Infiltration		0.0				
15 minute winter	S1.17	2.003	S1.11	5.8	1.473	0.052	0.0626	
15 minute winter	S1.17	Infiltration		0.0				
15 minute winter	S1.11	1.009	S1.16	11.4	2.317	0.151	0.0400	
960 minute winter	S1.16	Hydro-Brake®	S1.18	0.3				22.4
960 minute winter	S1.16	Infiltration		0.2				

Results for 30 year +10% CC Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.1	10	32.570	0.035	4.3	0.0494	0.0000	OK
15 minute winter	S1.15	11	32.236	0.046	4.2	0.0655	0.0000	OK
15 minute winter	S1.2	10	31.505	0.047	9.8	0.0674	0.0000	OK
15 minute winter	S1.3	11	30.644	0.044	9.7	0.0628	0.0000	OK
15 minute winter	S1.4	11	27.261	0.061	16.0	0.0872	0.0000	OK
15 minute winter	S1.5	11	26.798	0.058	16.1	0.0827	0.0000	OK
15 minute winter	S1.6	11	24.487	0.057	16.1	0.0822	0.0000	OK
15 minute winter	S1.7	11	24.137	0.107	16.1	0.1532	0.0000	OK
1440 minute winter	S1.8	1320	23.279	0.184	1.3	0.2628	0.0000	OK
15 minute winter	S1.14	11	33.104	0.031	3.7	0.0449	0.0000	OK
15 minute winter	S1.13	11	31.042	0.042	8.9	0.0595	0.0000	OK
15 minute winter	S1.12	11	27.066	0.057	16.0	0.0810	0.0000	OK
15 minute winter	S1.17	11	24.660	0.060	15.9	0.0852	0.0000	OK
1440 minute winter	S1.11	1320	23.279	0.337	3.9	0.3808	0.0000	SURCHARGED
1440 minute winter	S1.16	1320	23.279	0.483	3.8	52.8219	0.0000	SURCHARGED
15 minute summer	S1.18	1	22.625	0.000	0.3	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	S1.1	1.000	S1.15	4.2	0.907	0.051	0.0643	
15 minute winter	S1.15	1.001	S1.2	4.1	0.724	0.089	0.1635	
15 minute winter	S1.2	1.002	S1.3	9.7	1.652	0.091	0.0918	
15 minute winter	S1.2	Infiltration		0.0				
15 minute winter	S1.3	1.003	S1.4	9.7	1.807	0.082	0.2696	
15 minute winter	S1.4	1.004	S1.5	16.1	1.928	0.143	0.0826	
15 minute winter	S1.4	Infiltration		0.0				
15 minute winter	S1.5	1.005	S1.6	16.1	2.041	0.139	0.2258	
15 minute winter	S1.6	1.006	S1.7	16.1	1.234	0.144	0.1152	
15 minute winter	S1.6	Infiltration		0.0				
15 minute winter	S1.7	1.007	S1.8	16.0	0.899	0.414	0.2400	
1440 minute winter	S1.8	1.008	S1.11	1.3	0.474	0.030	0.3904	
15 minute winter	S1.14	2.000	S1.13	3.6	1.072	0.042	0.1577	
15 minute winter	S1.13	2.001	S1.12	8.7	1.739	0.074	0.2948	
15 minute winter	S1.13	Infiltration		0.0				
15 minute winter	S1.12	2.002	S1.17	15.9	2.052	0.136	0.3520	
15 minute winter	S1.12	Infiltration		0.0				
15 minute winter	S1.17	2.003	S1.11	15.9	1.955	0.142	0.1293	
15 minute winter	S1.17	Infiltration		0.0				
1440 minute winter	S1.11	1.009	S1.16	3.8	0.744	0.050	0.2753	
1440 minute winter	S1.16	Hydro-Brake®	S1.18	0.4				59.2
1440 minute winter	S1.16	Infiltration		0.2				

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.1	10	32.576	0.041	6.0	0.0582	0.0000	OK
15 minute winter	S1.15	11	32.245	0.055	6.0	0.0780	0.0000	OK
15 minute winter	S1.2	10	31.514	0.056	13.8	0.0806	0.0000	OK
15 minute winter	S1.3	11	30.652	0.052	13.6	0.0745	0.0000	OK
15 minute winter	S1.4	10	27.274	0.073	22.5	0.1052	0.0000	OK
15 minute winter	S1.5	11	26.809	0.069	22.6	0.0988	0.0000	OK
15 minute winter	S1.6	11	24.498	0.068	22.7	0.0978	0.0000	OK
15 minute winter	S1.7	11	24.163	0.133	22.7	0.1900	0.0000	OK
1440 minute winter	S1.8	1170	23.493	0.398	1.7	0.5694	0.0000	SURCHARGED
15 minute winter	S1.14	11	33.110	0.037	5.2	0.0530	0.0000	OK
15 minute winter	S1.13	11	31.049	0.049	12.5	0.0706	0.0000	OK
15 minute winter	S1.12	11	27.077	0.068	22.5	0.0968	0.0000	OK
15 minute winter	S1.17	11	24.672	0.072	22.4	0.1025	0.0000	OK
1440 minute winter	S1.11	1170	23.493	0.551	3.9	0.6231	0.0000	SURCHARGED
1440 minute winter	S1.16	1170	23.493	0.697	3.4	76.2673	0.0000	SURCHARGED
15 minute summer	S1.18	1	22.625	0.000	0.3	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	S1.1	1.000	S1.15	6.0	0.999	0.072	0.0824	
15 minute winter	S1.15	1.001	S1.2	5.8	0.798	0.125	0.2094	
15 minute winter	S1.2	1.002	S1.3	13.6	1.814	0.127	0.1178	
15 minute winter	S1.2	Infiltration		0.0				
15 minute winter	S1.3	1.003	S1.4	13.7	1.994	0.115	0.3437	
15 minute winter	S1.4	1.004	S1.5	22.6	2.100	0.200	0.1066	
15 minute winter	S1.4	Infiltration		0.0				
15 minute winter	S1.5	1.005	S1.6	22.7	2.243	0.195	0.2888	
15 minute winter	S1.6	1.006	S1.7	22.7	1.334	0.202	0.1496	
15 minute winter	S1.6	Infiltration		0.0				
15 minute winter	S1.7	1.007	S1.8	22.6	0.975	0.586	0.3128	
1440 minute winter	S1.8	1.008	S1.11	1.7	0.504	0.039	0.4169	
15 minute winter	S1.14	2.000	S1.13	5.0	1.185	0.058	0.2004	
15 minute winter	S1.13	2.001	S1.12	12.3	1.923	0.104	0.3756	
15 minute winter	S1.13	Infiltration		0.0				
15 minute winter	S1.12	2.002	S1.17	22.4	2.259	0.191	0.4504	
15 minute winter	S1.12	Infiltration		0.0				
15 minute winter	S1.17	2.003	S1.11	22.4	2.142	0.201	0.1662	
15 minute winter	S1.17	Infiltration		0.0				
1440 minute winter	S1.11	1.009	S1.16	3.4	0.875	0.045	0.2753	
1440 minute winter	S1.16	Hydro-Brake®	S1.18	0.4				78.2
1440 minute winter	S1.16	Infiltration		0.2				

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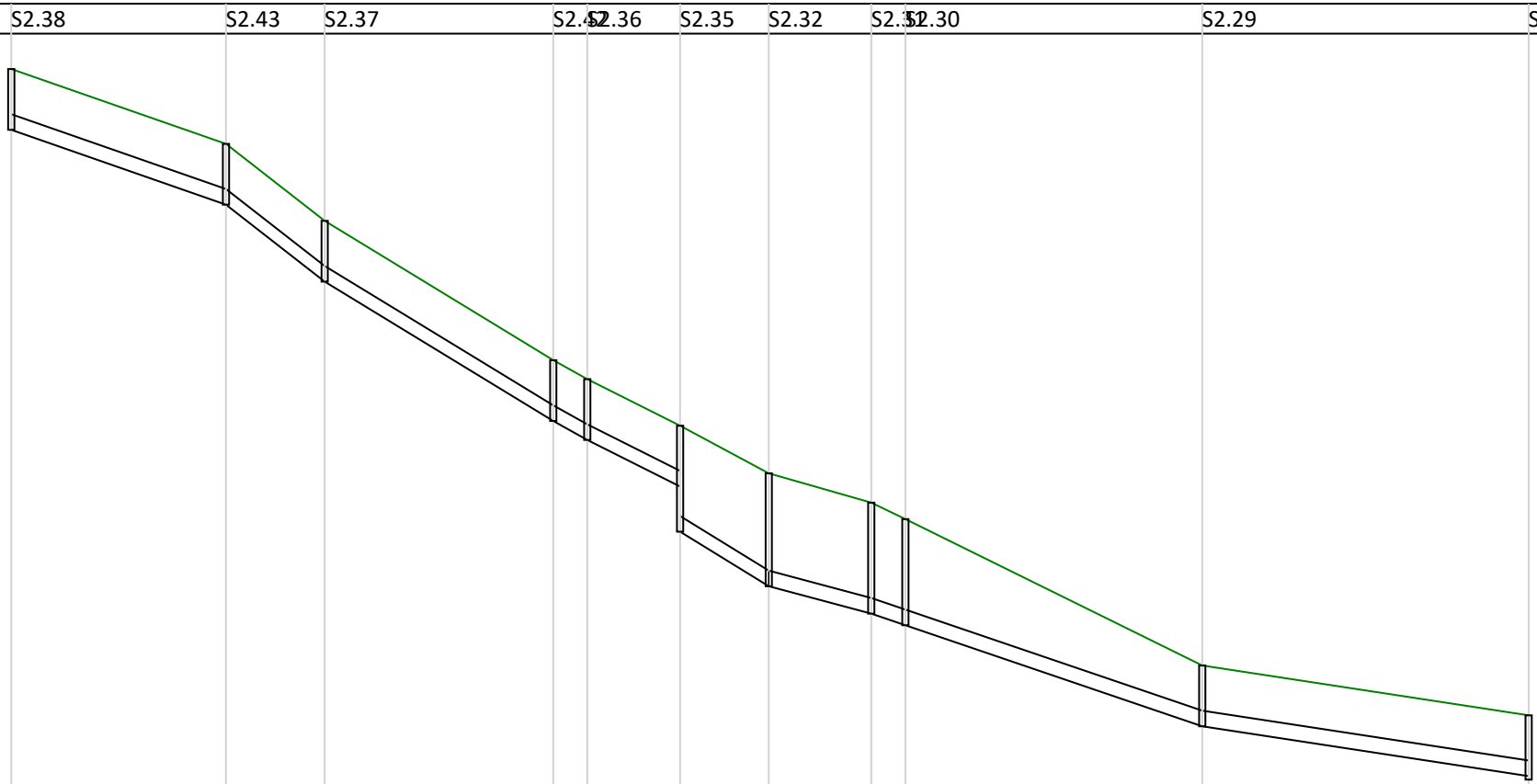
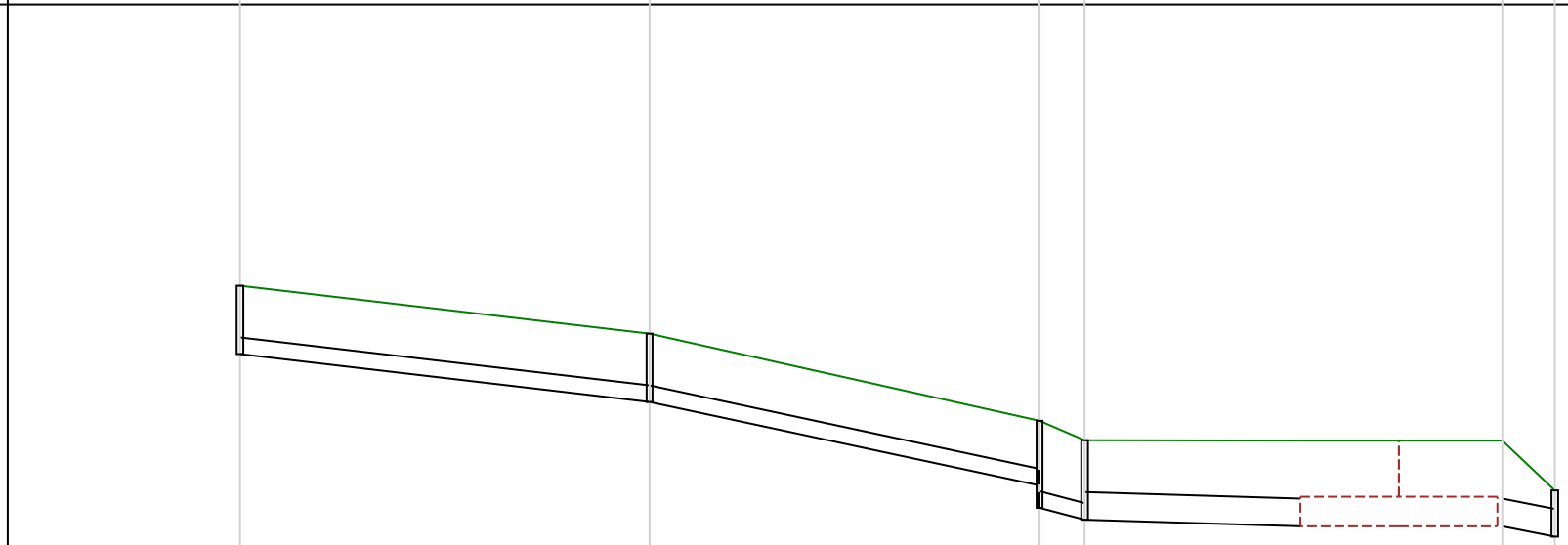


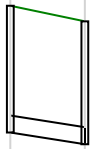
Node Name	S2.38		S2.43		S2.37		S2.42	S2.36	S2.35	S2.32	S2.31	S2.30		S2.29		S2.28
Link Name	1.000		1.001		1.002		1.0	1.004	1.005	1.006	1.0	1.008		1.009		
Section Type	225mm		225mm		225mm		225	225mm	225mm	225mm	225	225mm		225mm		
Slope (1:X)	43.0		19.2		24.6		26.9	29.9	24.4	56.1	44.	44.1		98.2		
Cover Level (m)	33.996		32.919		31.812		29.807	29.534	28.864	28.179	27.757	27.520		25.414		24.697
Invert Level (m)	33.121	32.044	32.044	30.937	30.937	28.932	28.659	27.989	27.339	26.554	26.160	25.993	24.539	24.539	23.822	
Length (m)	46.329		21.294		49.324		7.3	20.032	19.133	22.117	7.3	64.055		70.427		

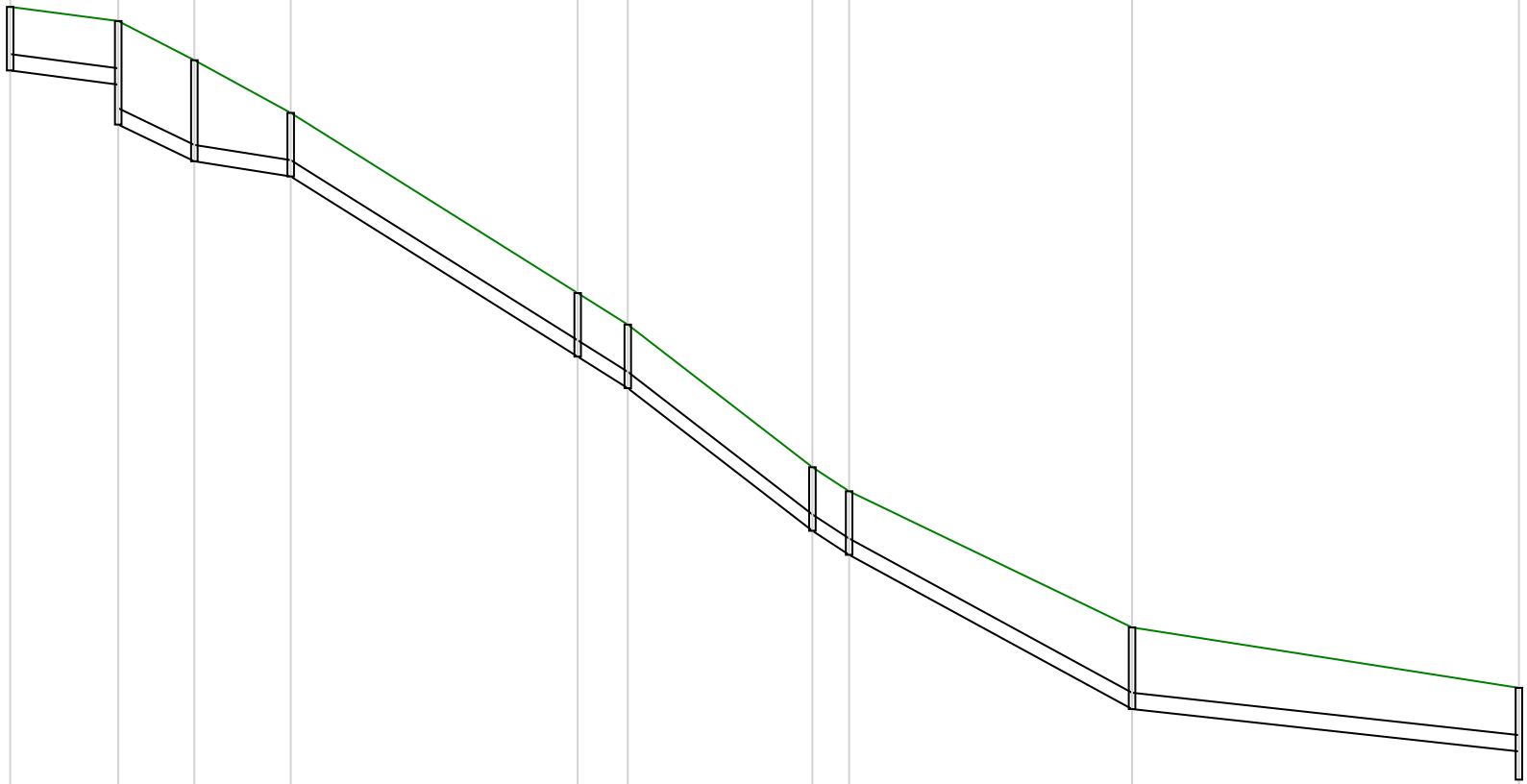
A4 drawing

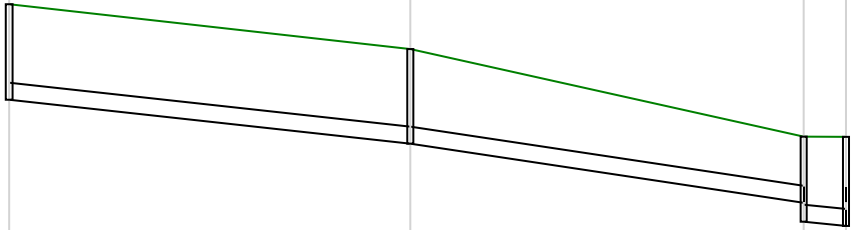
Hor Scale 1500
Ver Scale 100

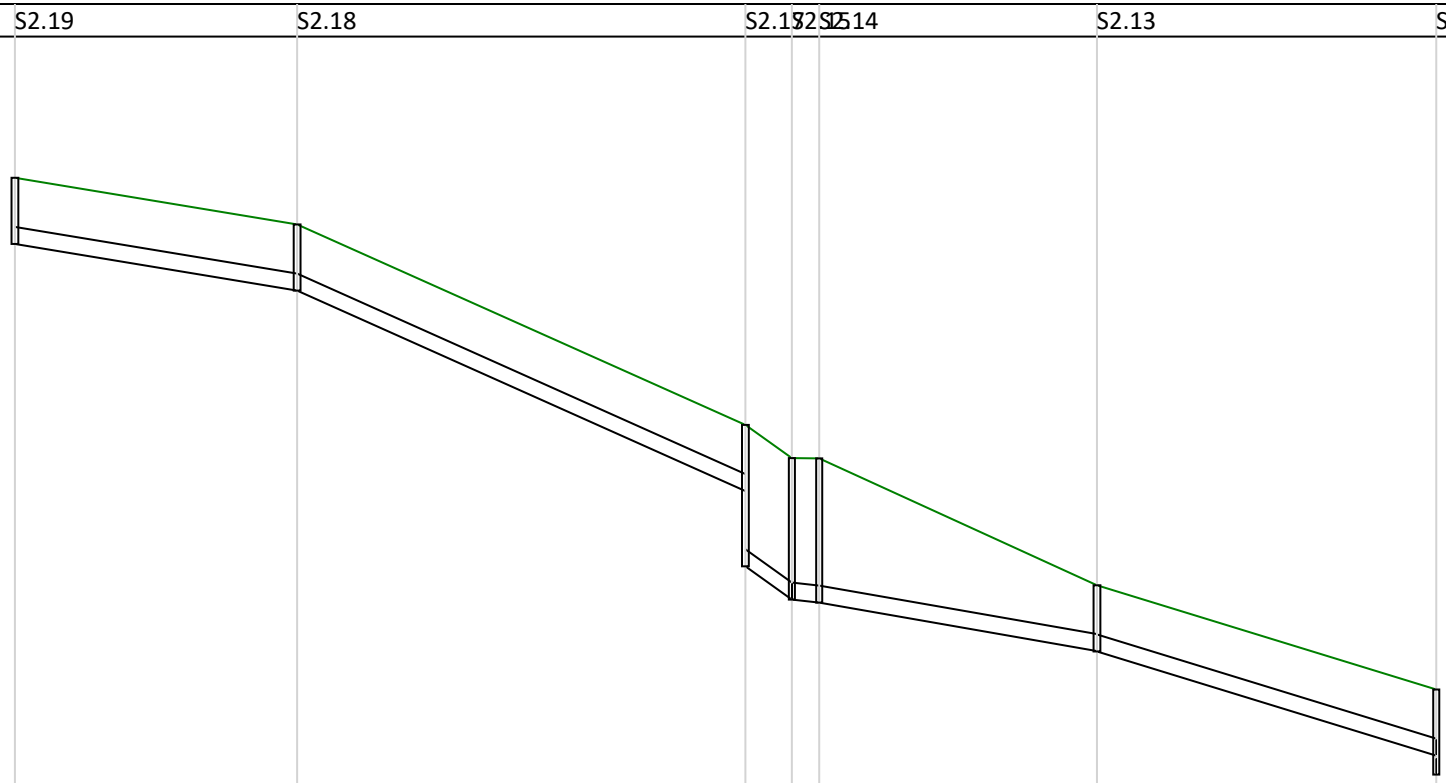
Datum (m) 23.000

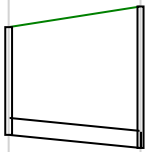
Node Name	S2.28	S2.27	S2.26	S2.39	HB2	S2.45
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 17.000						
Link Name	1.010	1.011	1.01	1.013	1.01	
Section Type	225mm	225mm	225	375mm	375n	
Slope (1:X)	128.1	70.1	56.8	492.2	76.2	
Cover Level (m)	24.697	24.048	22.868	22.605	22.600	21.926
Invert Level (m)	23.772	23.123 / 23.123	21.993	21.690 / 21.529 / 21.440	21.440 / 21.300	
Length (m)	83.156	79.179	9.15	43.809	10.66	

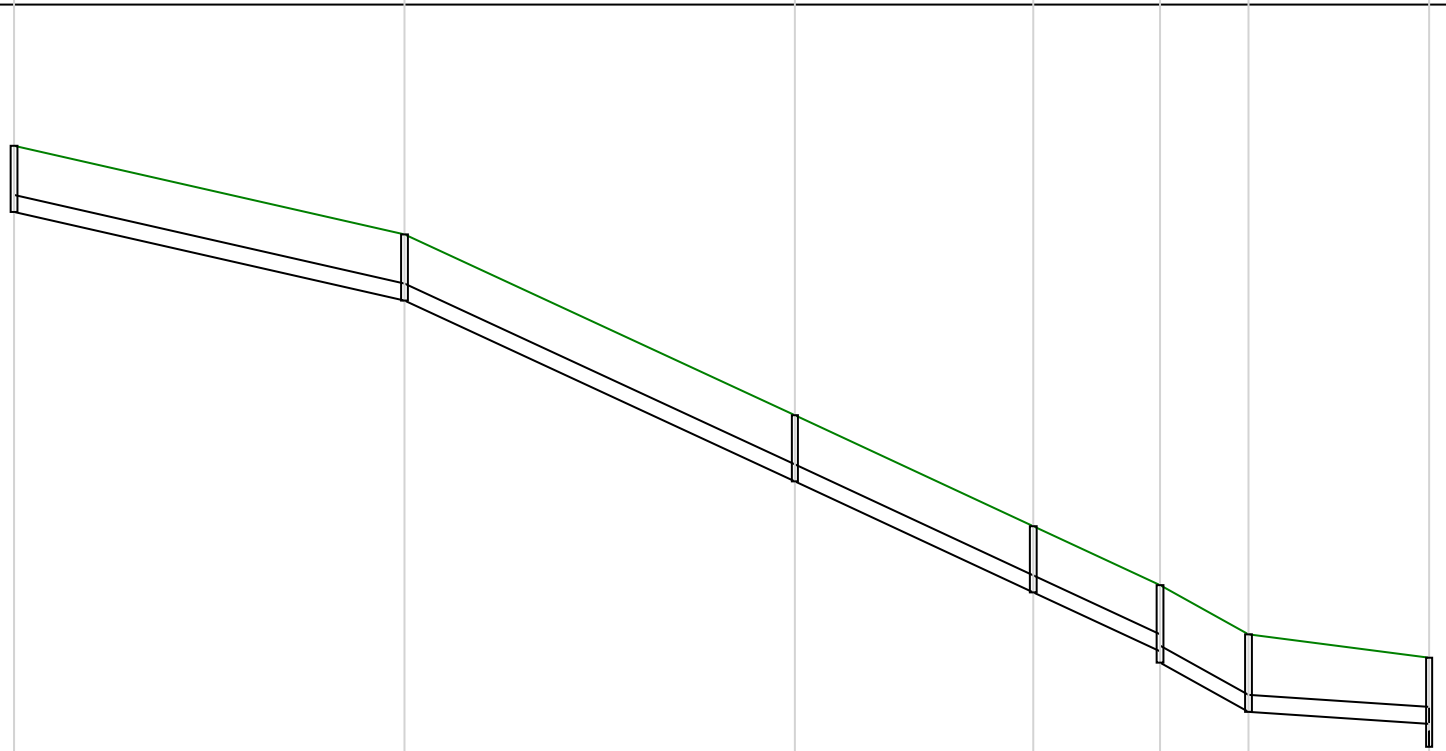
Node Name	S2.33	S2.32
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 22.000		
Link Name	2.000	
Section Type	225mn	
Slope (1:X)	95.4	
Cover Level (m)	28.385	28.179
Invert Level (m)	26.709	26.554
Length (m)	14.784	

Node Name	S2.1	S2.40	S2.2	S2.3	S2.4	S2.41	S2.6	S2.7	S2.8	S2.9
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 23.000										
Link Name	3.000	3.001	3.002	3.003	3.004	3.005	3.006	3.007	3.008	
Section Type	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	
Slope (1:X)	114.4	31.1	95.2	23.9	23.8	19.4	22.9	27.5	137.0	
Cover Level (m)	33.995	33.800	33.261	32.536	30.056	29.622	27.659	27.328	25.454	24.622
Invert Level (m)	33.120 / 32.925	32.375 / 31.870	31.870 / 31.661	31.661	29.181	29.181 / 28.747	28.747 / 26.784	26.784 / 26.493	26.453 / 24.330	24.330 / 23.747
Length (m)	22.311	15.709	19.888	59.231	10.34	38.105	7.58	58.398	79.853	

Node Name		S2.9		S2.11		S2.15	S2.26
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 17.000							
Link Name		3.009		3.010		3.01	
Section Type		225mm		225mm		225	
Slope (1:X)		136.9		99.8		149	
Cover Level (m)		24.622		24.029		22.871	22.868
Invert Level (m)		23.359	22.778	22.778	21.996	21.746	21.690
Length (m)		79.566		78.025		8.39	

Node Name	S2.19	S2.18	S2.17	S2.15	S2.14	S2.13	S2.12
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 20.000							
Link Name	4.000	4.001	4.00	4.0	4.004	4.005	
Section Type	225mm	225mm	225	22	225mm	225mm	
Slope (1:X)	90.7	33.5	20.9	13	86.0	48.8	
Cover Level (m)	29.638	29.021	26.370	25.931	25.927	24.249	22.871
Invert Level (m)	28.763	28.146	28.146	25.495	24.500 24.000	24.020	23.379 23.374 21.996
Length (m)	55.975	88.918	9.2	15.4	55.095	67.297	

Node Name	S2.16	S2.15
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 19.000		
Link Name	5.000	
Section Type	225mm	
Slope (1:X)	151.2	
Cover Level (m)	25.658	25.931
Invert Level (m)	24.233	24.060
Length (m)	26.155	

Node Name	S2.20	S2.21	S2.22	S2.23	S2.24	S2.25	S2.26
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 20.000							
Link Name	6.000	6.001	6.002	6.003	6.004	6.005	
Section Type	225mm	225mm	225mm	225mm	225mm	225mm	
Slope (1:X)	66.1	32.4	32.2	32.3	27.0	225.4	
Cover Level (m)	29.638	28.466	26.075	24.607	23.828	23.177	22.868
Invert Level (m)	28.763	27.591 / 27.591	25.200 / 25.200	23.732 / 23.732	22.953 / 22.803	22.152 / 22.152	21.993
Length (m)	77.447	77.436	47.284	25.144	17.545	35.831	

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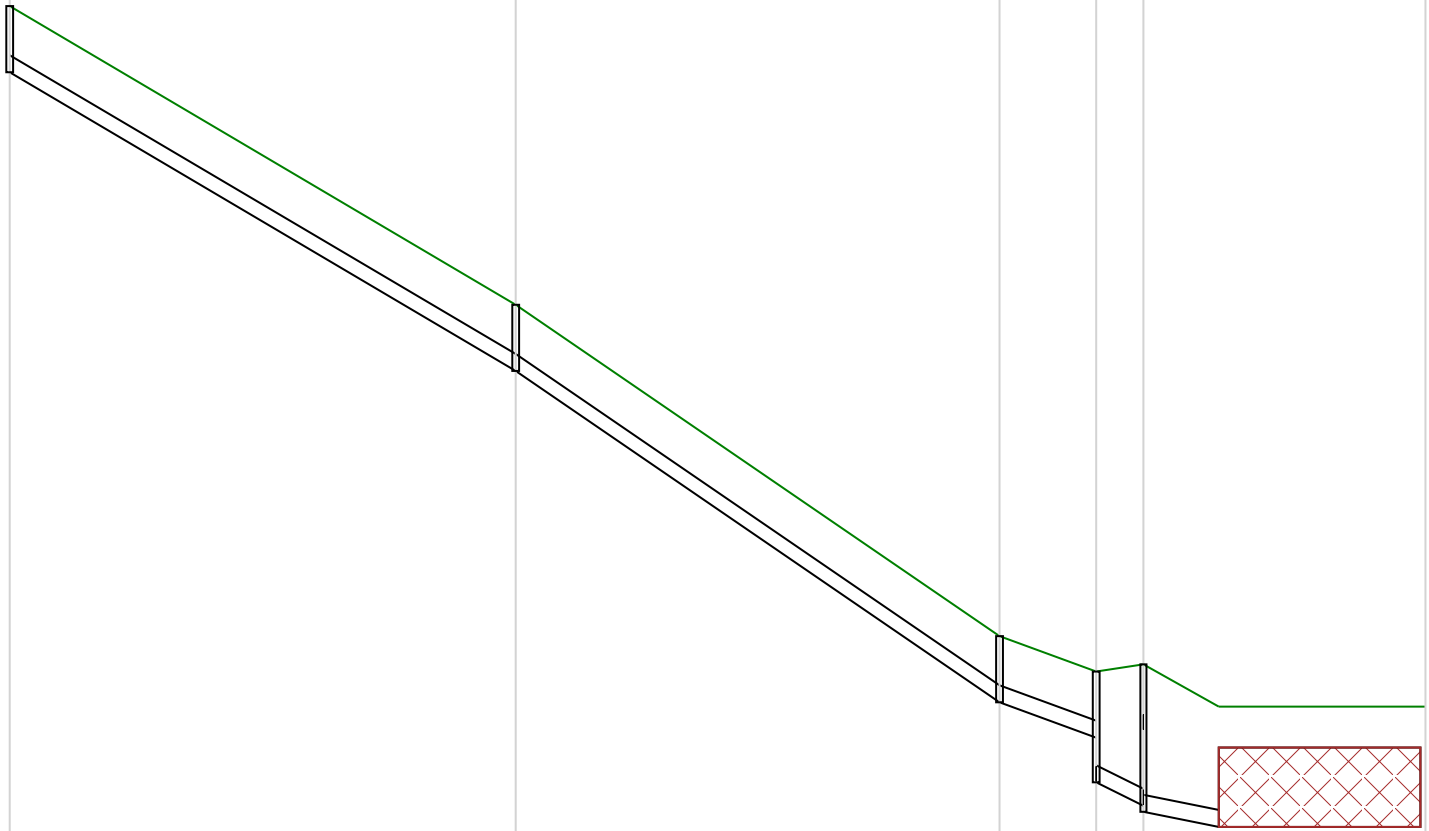
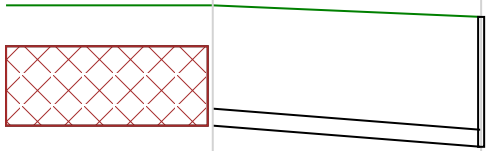
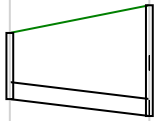
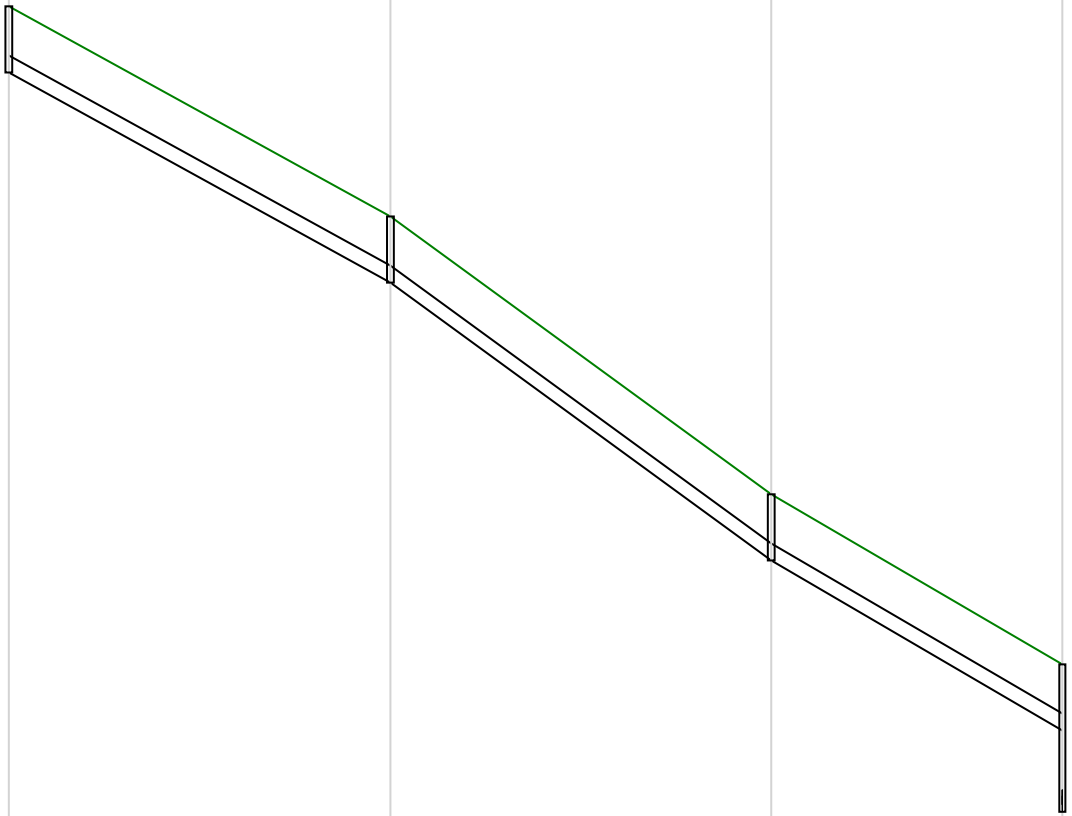
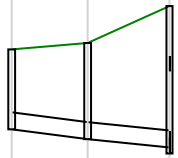
Node Name	S3.1		S3.2		S3.4		S3.5	S3.9	S3.15
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 18.500									
Link Name	1.000		1.001		1.002		1.00	1.004	
Section Type	225mm		225mm		225mm		225r	225mn	
Slope (1:X)	25.4		21.9		41.0		30.2	74.7	
Cover Level (m)	29.615		25.665		21.283		20.815	20.910	20.351
Invert Level (m)	28.740	24.790	24.790		20.408	20.408	19.940	19.350 19.040	18.960	18.760
Length (m)	100.366		95.968		19.173		9.361	14.944	

Node Name		S3.15	S1
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 14.000			
Link Name		1.005	
Section Type		225mm	
Slope (1:X)		190.1	
Cover Level (m)		20.351	20.198
Invert Level (m)		18.760	18.480
Length (m)		53.233	

Node Name		S3.6	S3.5
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 14.000			
Link Name		2.001	
Section Type		225mm	
Slope (1:X)		123.6	
Cover Level (m)		20.449	20.815
Invert Level (m)		19.574	19.350
Length (m)		27.677	

Node Name	S3.12		S3.11		S3.10		S3.9
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 18.500							
Link Name		3.000		3.001		3.002	
Section Type		225mm		225mm		225mm	
Slope (1:X)		27.2		20.6		25.7	
Cover Level (m)	29.612		26.833		23.159		20.910
Invert Level (m)	28.737	25.958	25.958	22.284	22.284	20.035	
Length (m)		75.691		75.534		57.743	

Node Name		S3.8	S3.14	S3.9
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 14.000				
Link Name		4.001	4.002	
Section Type		225mm	225mm	
Slope (1:X)		115.9	147.6	
Cover Level (m)		20.337	20.422	20.910
Invert Level (m)		19.280 19.150	19.150 19.040	
Length (m)		15.065	16.233	

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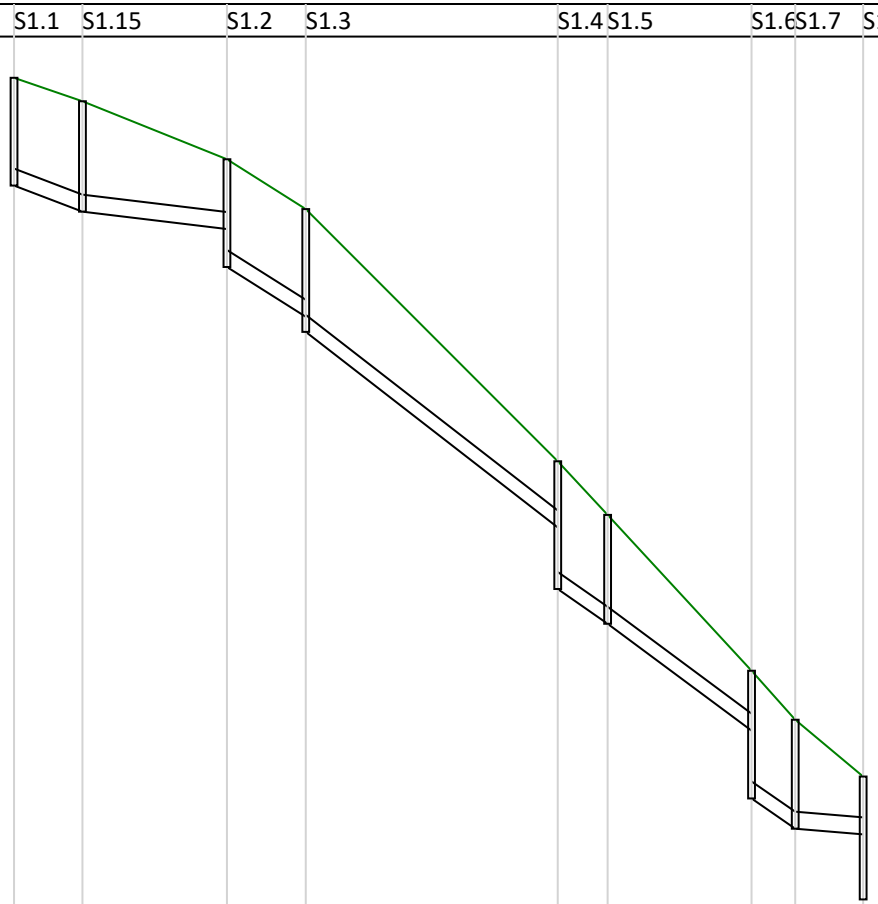
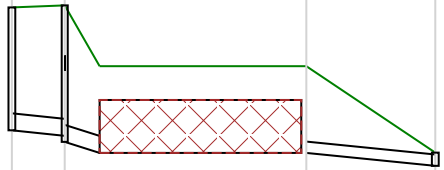
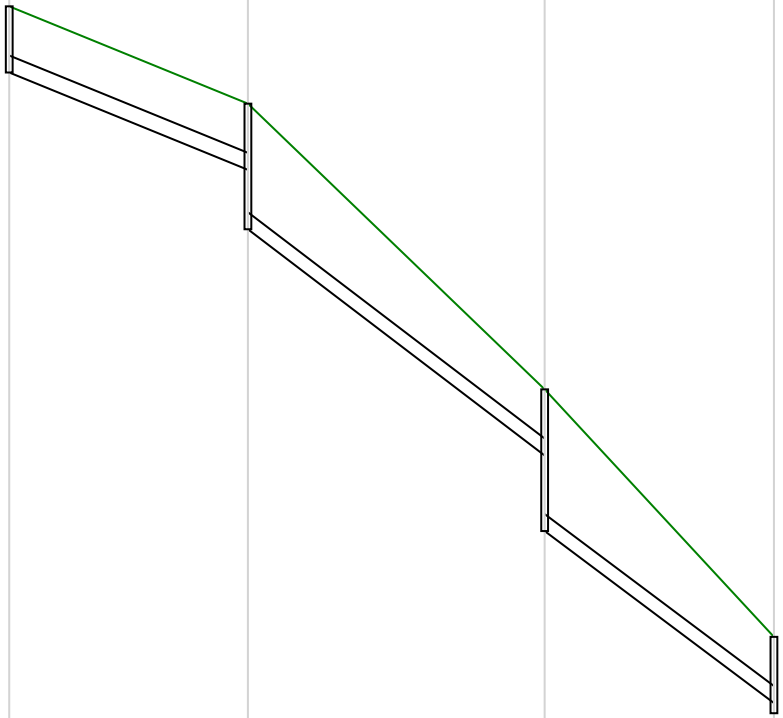
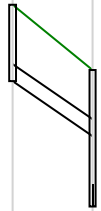
Node Name	S1.1	S1.15	S1.2	S1.3	S1.4	S1.5	S1.6	S1.7	S1.8
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 23.000									
Link Name	1.000	1.001	1.002	1.003	1.004	1.005	1.006	1.007	
Section Type	225mm	225mm	225mm	225mm	225mm	225mm	225mm	225mm	
Slope (1:X)	39.3	124.6	23.8	19.3	21.5	20.2	21.7	179.7	
Cover Level (m)	33.960	33.650	32.883	32.224	28.889	28.180	26.119	25.471	24.720
Invert Level (m)	32.535	32.190	32.190	31.960	31.458	30.800	30.600	28.014	27.200 26.740	26.740	25.327	24.430 24.030	24.030	23.955	
Length (m)	13.571	28.661	15.633	49.983	9.89	28.546	8.661	13.474	

Node Name		S1.8	S1.11	S1.16	S1.18
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 18.000					
Link Name		1.008	1.0	1.010	
Section Type		225m	225	150mm	
Slope (1:X)		143.	47.	149.6	
Cover Level (m)		24.720	24.747	23.943	22.800
Invert Level (m)		23.095 23.022	22.998	22.796	22.625
Length (m)		10.48	6.9	25.580	

Node Name	S1.14	S1.13	S1.12	S1.17
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 24.000				
Link Name	2.000	2.001	2.002	
Section Type	225mm	225mm	225mm	
Slope (1:X)	36.8	19.7	20.0	
Cover Level (m)	33.948	32.661	28.883	25.610
Invert Level (m)	33.073	31.786 / 31.000	28.008 / 27.009	24.735
Length (m)	47.343	58.860	45.479	

Node Name		S1.17	S1.11
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 19.000			
Link Name		2.003	
Section Type		225mm	
Slope (1:X)		21.8	
Cover Level (m)		25.610	24.747
Invert Level (m)		24.600	23.872
Length (m)		15.857	

Appendix C TYPICAL PETROL INTERCEPTOR BROCHURE

Water Management Solutions

Klargester AquaOil Bypass MDPE and GRP / Full retention MDPE and GRP separator range

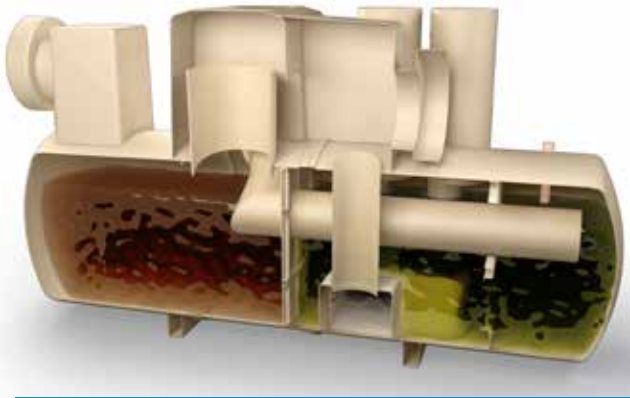
HVO ready**

170 – 69,444m²
Available to cover flow rates up to 285 litres per second

Why choose an AquaOil fuel and oil separator?

- Total peace of mind offered through SmartServ Pro remote monitoring system, for early fault detection and in line with Kingspan's Planet Passionate programme
- Total flexibility, with deep invert options available
- Range tested against full flow
- Easily utilised as part of SuDS Management Train
- Full range of bypass and full retention separators available

3 YR WARRANTY PERIOD*



Our range has been tested against full flow - why is this important?

Our units have been tested at their maximum flow rate (10l/s), unlike some products which have been tested based on bypass and therefore only 10% of the flow. This ensures total accuracy of our silt retention results, by replicating the full effect of the silt wash through.

As part of our Planet Passionate programme, Kingspan are dedicated to delivering innovative surface water management technologies, developed on the back of 70 years' experience.

*Terms and conditions apply. View online at https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms

**Also suitable for Midel Oil

Kingspan

WE ARE PLANET PASSIONATE

Product Code	Flow (l/s)	Drainage Area (m^2)	Silt Capacity (ltrs)	Oil Capacity (ltrs)	Length (mm)	Diameter (mm)	Manhole Cover Dimensions (mm)	Base to Inlet Invert (mm)	Base to Inlet Invert (mm)	Min. Inlet Invert (mm)	Std Pipework Diameter (mm)
Polyethylene Chamber Construction											
NSFP003	3	170	300	30	1700	1350	600	1410	1335	550	160
NSFP006	6	335	600	60	1700	1350	600	1410	1335	550	160
GRP Chamber Construction											
NSFA010	10	555	1000	100	2610	1225	600	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	600	1050	1000	500	200
NSFA020	20	1115	2000	200	3230	2010	600	1810	1760	1000	315
NSFA030	30	1670	3000	300	3960	2010	600	1810	1760	1000	315
NSFA040	40	2225	4000	400	4750	2010	600	1810	1760	1000	315
NSFA050	50	2780	5000	500	5790	2010	600	1810	1760	1000	315
NSFA065	65	3610	6500	650	7360	2010	600	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	600	2500	2450	1000	315
NSFA100	100	5560	10000	1000	6200	2820	600	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	600	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	600	2550	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	600	2550	2450	1000	525
NSFA200	200	11110	20000	2000	11280	2820	600	2550	2450	1000	600
NSFA210	210	11667	21000	2100	11994	2820	600	2550	2450	1000	600
NSFA225	225	12500	22500	2250	12766	2820	600	2550	2450	1000	600
NSFA240	240	13333	24000	2400	13528	2820	600	2550	2450	1000	600
NSFA255	255	14167	25500	2550	14300	2820	600	2550	2450	1000	600
NSFA270	270	15000	27000	2700	15071	2820	600	2550	2450	1000	600
NSFA285	285	15833	28500	2850	15833	2820	600	2550	2450	1000	600

Forecourt Separator Range Technical Specifications

Sepaator Class	Backfill Type	Total Capacity (Ltrs)	Darinage Area (m^2)	Peak Flow Rate (l/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)
1	Concrete	10000	720	15	3915	2020	600	2180	2130	50
1	Concrete	10000	115	20	3915	2020	600	2180	2130	50

Bypass Separator Range Technical Specifications

Model Reference	Flow (l/s)	Peak Flow Rate (l/s)	Drainage Area (m^2) Based on UK rainwater flow	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Access Shaft Diameter* (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)**
				Silt	Oil								
Polyethylene Chamber Construction													
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
GRP Chamber Construction													
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5941	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

*Some units have more than one access shaft - diameter of largest shown | **Large pipework available on request.

For more information on any of our products: **T:** +44 (0)28 3026 6799
E: klargesterinfo@kingspan.com or visit **klargester.ie**

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Water Management Solutions

Klargester AquaOil Bypass MDPE and GRP / Full retention MDPE and GRP separator range

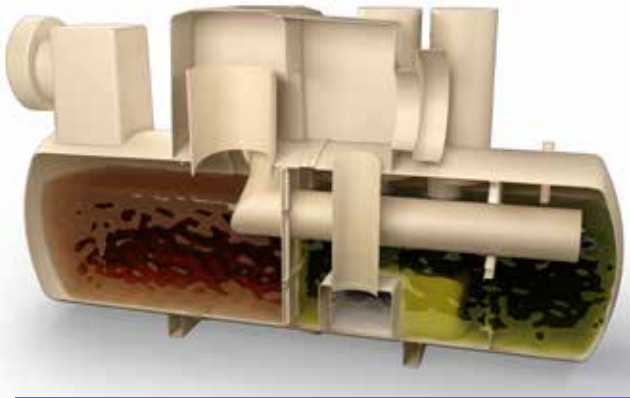
HVO ready**

170 – 69,444m²
Available to cover flow rates up to 285 litres per second

Why choose an AquaOil fuel and oil separator?

- Total peace of mind offered through SmartServ Pro remote monitoring system, for early fault detection and in line with Kingspan's Planet Passionate programme
- Total flexibility, with deep invert options available
- Range tested against full flow
- Easily utilised as part of SuDS Management Train
- Full range of bypass and full retention separators available

3 YR WARRANTY PERIOD*



Our range has been tested against full flow - why is this important?

Our units have been tested at their maximum flow rate (10l/s), unlike some products which have been tested based on bypass and therefore only 10% of the flow. This ensures total accuracy of our silt retention results, by replicating the full effect of the silt wash through.

As part of our Planet Passionate programme, Kingspan are dedicated to delivering innovative surface water management technologies, developed on the back of 70 years' experience.

*Terms and conditions apply. View online at https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms

**Also suitable for Midel Oil

Kingspan

WE ARE PLANET PASSIONATE

Product Code	Flow (l/s)	Drainage Area (m^2)	Silt Capacity (ltrs)	Oil Capacity (ltrs)	Length (mm)	Diameter (mm)	Manhole Cover Dimensions (mm)	Base to Inlet Invert (mm)	Base to Inlet Invert (mm)	Min. Inlet Invert (mm)	Std Pipework Diameter (mm)
Polyethylene Chamber Construction											
NSFP003	3	170	300	30	1700	1350	600	1410	1335	550	160
NSFP006	6	335	600	60	1700	1350	600	1410	1335	550	160
GRP Chamber Construction											
NSFA010	10	555	1000	100	2610	1225	600	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	600	1050	1000	500	200
NSFA020	20	1115	2000	200	3230	2010	600	1810	1760	1000	315
NSFA030	30	1670	3000	300	3960	2010	600	1810	1760	1000	315
NSFA040	40	2225	4000	400	4750	2010	600	1810	1760	1000	315
NSFA050	50	2780	5000	500	5790	2010	600	1810	1760	1000	315
NSFA065	65	3610	6500	650	7360	2010	600	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	600	2500	2450	1000	315
NSFA100	100	5560	10000	1000	6200	2820	600	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	600	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	600	2550	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	600	2550	2450	1000	525
NSFA200	200	11110	20000	2000	11280	2820	600	2550	2450	1000	600
NSFA210	210	11667	21000	2100	11994	2820	600	2550	2450	1000	600
NSFA225	225	12500	22500	2250	12766	2820	600	2550	2450	1000	600
NSFA240	240	13333	24000	2400	13528	2820	600	2550	2450	1000	600
NSFA255	255	14167	25500	2550	14300	2820	600	2550	2450	1000	600
NSFA270	270	15000	27000	2700	15071	2820	600	2550	2450	1000	600
NSFA285	285	15833	28500	2850	15833	2820	600	2550	2450	1000	600

Forecourt Separator Range Technical Specifications

Sepaator Class	Backfill Type	Total Capacity (Ltrs)	Darinage Area (m^2)	Peak Flow Rate (l/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)
1	Concrete	10000	720	15	3915	2020	600	2180	2130	50
1	Concrete	10000	115	20	3915	2020	600	2180	2130	50

Bypass Separator Range Technical Specifications

Model Reference	Flow (l/s)	Peak Flow Rate (l/s)	Drainage Area (m^2) Based on UK rainwater flow	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Access Shaft Diameter* (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)**
				Silt	Oil								
Polyethylene Chamber Construction													
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
GRP Chamber Construction													
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5941	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

*Some units have more than one access shaft - diameter of largest shown | **Large pipework available on request.

For more information on any of our products: **T:** +44 (0)28 3026 6799
E: klargesterinfo@kingspan.com or visit **klargester.ie**

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Appendix D CONFIRMATION OF FEASIBILITY

CONFIRMATION OF FEASIBILITY

Anna Orzechowcka

Tobin Fairgreen house
Fairgreen road
Galway
Co.Galway
H91AXK8
Ireland

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

9 July 2025

Our Ref: CDS25001970 Pre-Connection Enquiry
Kilmurry Land Bank, Belview, Kilkenny, Co. Kilkenny

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Business Connection of 1 unit(s) at Kilmurry Land Bank, Belview, Kilkenny, Co. Kilkenny, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Uisce Éireann
- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

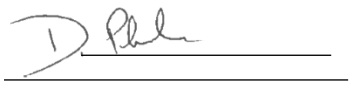
Where can you find more information?

- **Section A -** What is important to know?

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit **www.water.ie/connections, email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,

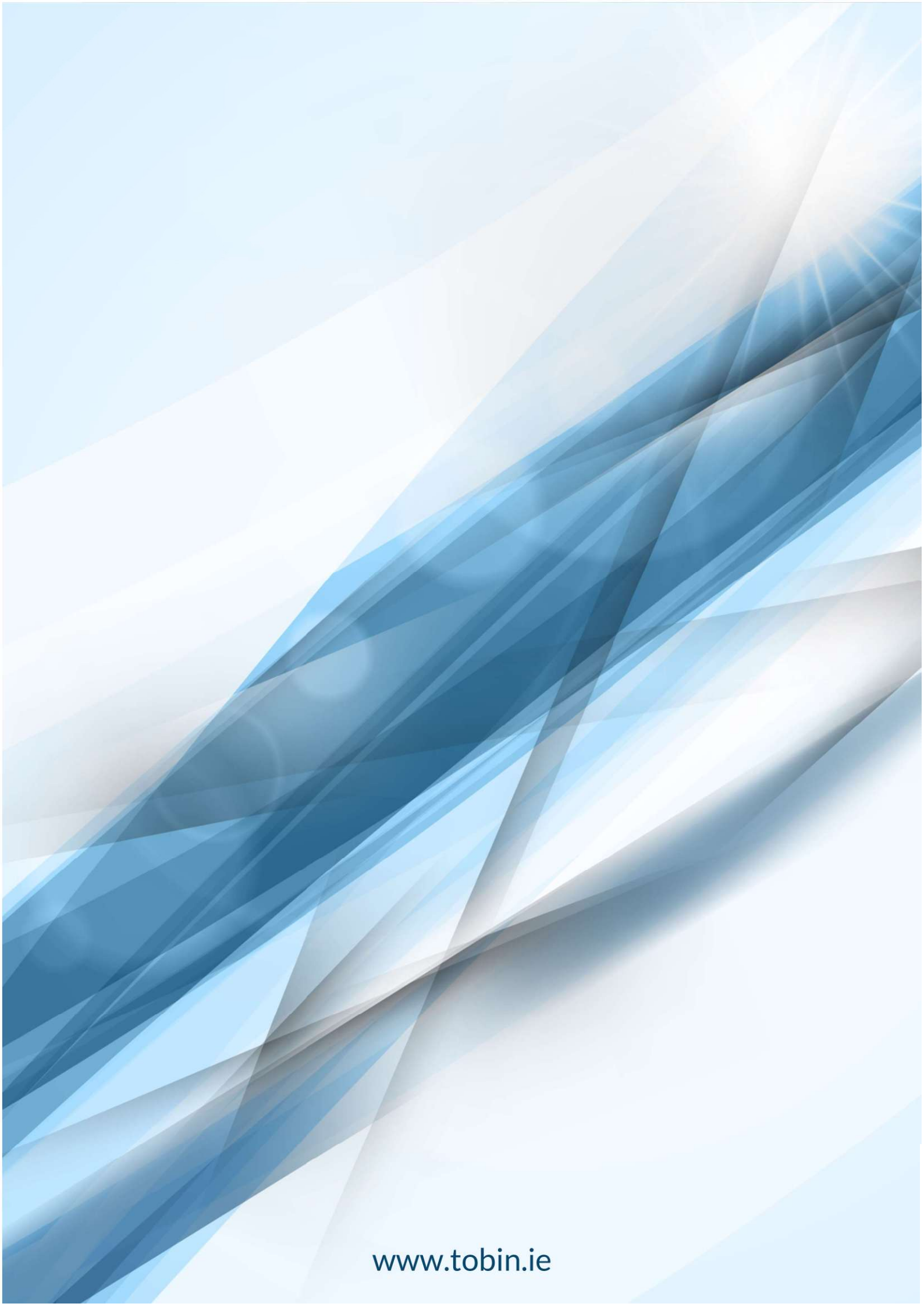


Dermot Phelan
Connections Delivery Manager

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)


www.tobin.ie