

Flood Risk Assessment & Drainage Strategy: Proposed Pipe Factory, Cadeby

Prepared for FP McCann

March 2025



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1 INTRODUCTION

1.1 Background

A full planning application is being prepared by Heatons, on behalf of FP McCann (the Applicant), the operator of a precast concrete and a roof tile manufacturing facility at Brascote Lane, Cadeby, Market Bosworth, Leicestershire, CV13 0BB (see Figure 1). Planning permission was granted in 2023 for the roof tile facility adjoining the precast facility. A new full planning application is being sought to construct a plastic pipe manufacturing facility on land adjoining the existing facilities.

Envireau Water has been commissioned by Heatons, on behalf of FP McCann, to prepare a Flood Risk Assessment and Drainage Strategy (FRADS) to support the planning application for the plastic pipe manufacturing facility ('herein referred to as the 'Site').

This FRADS has been prepared in accordance with the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2012 (Updated 2024)), Planning Practice Guidance (PPG): Flood Risk and Coastal Change (Ministry of Housing, Communities & Local Government, 2016 (Updated 2024)) and all relevant local policies and guidance as indicated in this report.

1.2 Scope of Work

This FRADS assesses the risk of flooding to and from the Proposed Development and presents a sustainable surface water drainage strategy to manage runoff from the development.

The scope of work undertaken for this FRADS includes:

- Description of the local physical and hydrological setting of the Site (Section 2);
- Details of the Proposed Development (Section 3);
- An assessment of sources of flood risk to and from the Proposed Development (Section 4);
- Proposed Surface Water Management Plan (Section 5); and
- Drainage Maintenance and Management Plan (Section 6).

1.3 Sources of Information

The information and assessments in this report are predominantly based on secondary data analysis associated with both the Site itself and the surrounding land area. The main sources of information consulted are:

- Proposed Development layout (Drawing Ref. KD.FPPF.1.D.003 Proposed Site Layout Plan) December 2024;
- Site topographical survey plan produced by Mapmatic;
- Environment Agency Flood Map for Planning (Rivers and Sea);
- Environment Agency Long-Term Flood Risk Information (Surface Water and Reservoir Failure);
- Environment Agency Historic Flood Map and Recorded Flood Outlines;
- British Geological Survey groundwater flooding susceptibility mapping;
- Hinckley and Bosworth Borough Council Strategic Flood Risk Assessment Level 1; and,
- Soils natures national soil type mapping.

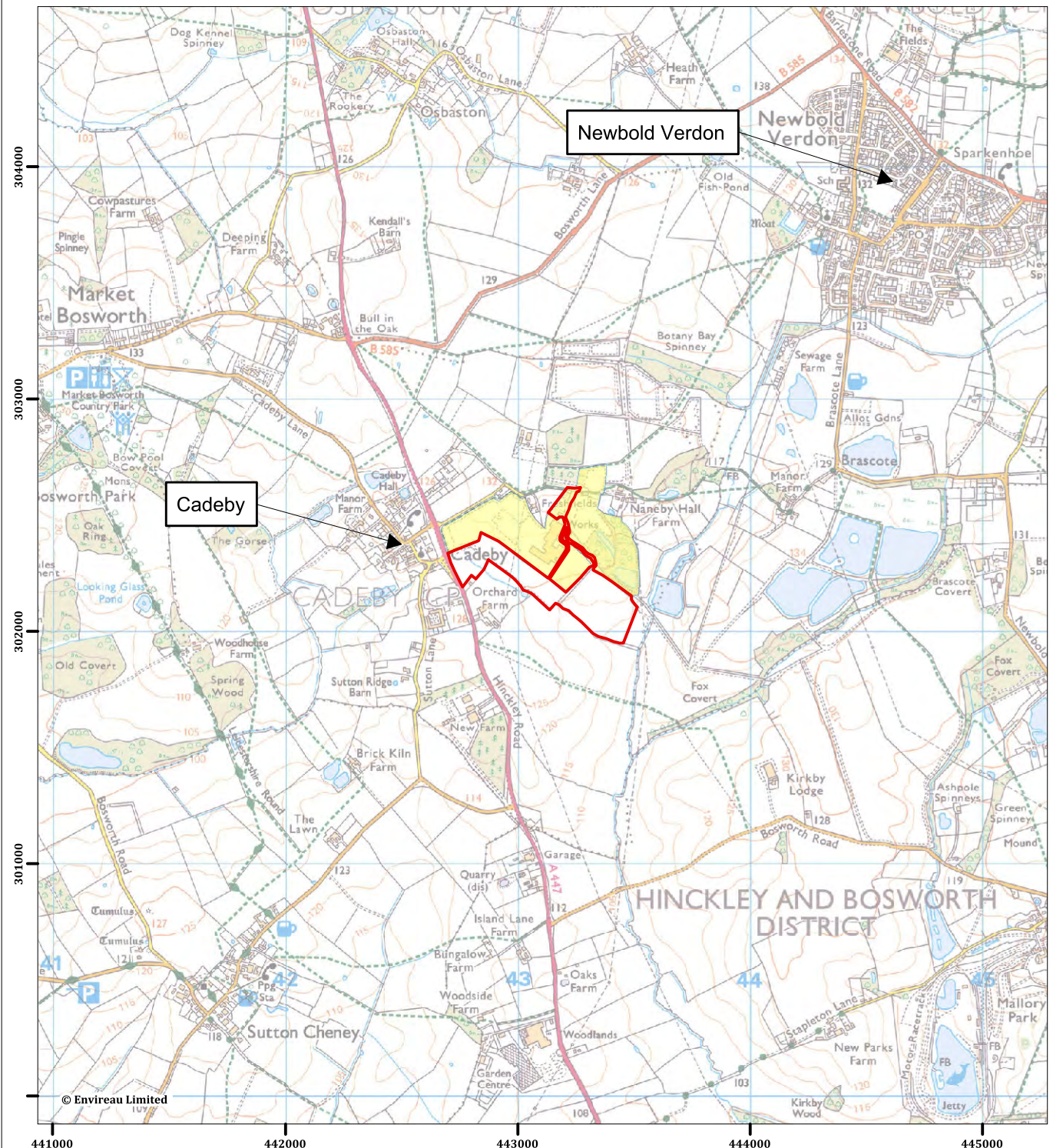


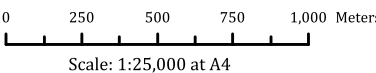
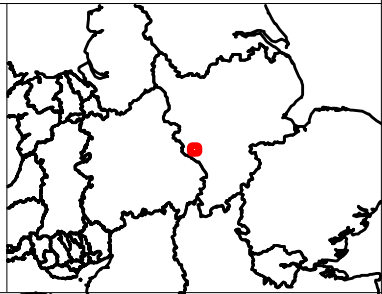
Figure 1: Site Location and Setting

Cadeby, Leicestershire



-  Application Site Boundary
-  Existing FP McCann Concrete Pipe and Roof Tile Manufacturing Facility

Notes:



27 February 2025
NGR: 443,107 E / 302,285 N

Project No. 3491036
Client: FP McCann
Drawn by: MT/LC
Ref: Site Setting and Location



2 SITE DESCRIPTION

2.1 Location and Setting

The FP McCann concrete precast facility, rooftile facility and storage areas are situated in a rural area of Leicestershire approximately 200 m east of Cadeby Village and 1.2 km southwest of Newbold Verdon (see Figure 1 and 2). The National Grid Reference (NGR) for the approximate centre of the existing site is SK 43096 02386 covering an area of approximately 20.7 ha.

The proposed planning application includes the development of a plastic pipe factory facility with associated storage areas on adjacent agricultural land, access to the plastic pipe factory via access roads on existing hardstanding areas, and biodiversity improvements to a previously restored parcel of land. The planning application boundary includes the existing hardstanding car park and office area; however, no alterations are proposed to this area. The plastic pipe factory facility and associated storage areas are centred on NGR SK 43197 02143 and lie adjacent to and to the west of the existing site.

The Site comprises three fields currently used for livestock grazing. For clarity, the fields are herein referred to as the 'Western', 'Central', and 'Eastern' fields (see Figure 2). Two of the three fields within the Site have previously been subject to sand and gravel extraction by Tarmac as part of Cadeby Quarry. The fields were restored to agricultural land in 2011. The aftercare period for both fields ended in 2016, ending their relationship with mineral activities.

2.2 Topography

The Site predominately slopes to the southeast with elevations ranging from 130 m AOD in the far northern corner to 112 m AOD at the southern boundary. The topographical survey plan for the Site is presented in Appendix A.

The Western field where historic quarrying took place and biodiversity improvements are to take place, is a part infilled quarry. Infilling material has generated earth grassed slopes, grading down to what would have been the base of the quarry. The area forms an unnatural topographic low.

2.3 Soils

The natural soil type at the Site has been identified using the Soilsclapes interactive soil type mapping (Cranfield Soil and Agrifood Institute, 2025). The majority of the soils are classified as 'Loamy soils with naturally high groundwater' with roughly 10% of the Site, towards the south, having a natural soil type of 'Slightly acid loamy and clayey soils with impeded drainage'.

2.4 Geology and Hydrogeology

According to British Geological Survey (BGS) 1:50,000 scale mapping (British Geological Survey, 2025), the Site is underlain by bedrock deposits of the Triassic Gunthorpe Member (Mudstone) being part of the Sidmouth Mudstone Formation, which are overlain by superficial deposits of Glaciofluvial sands and gravels.

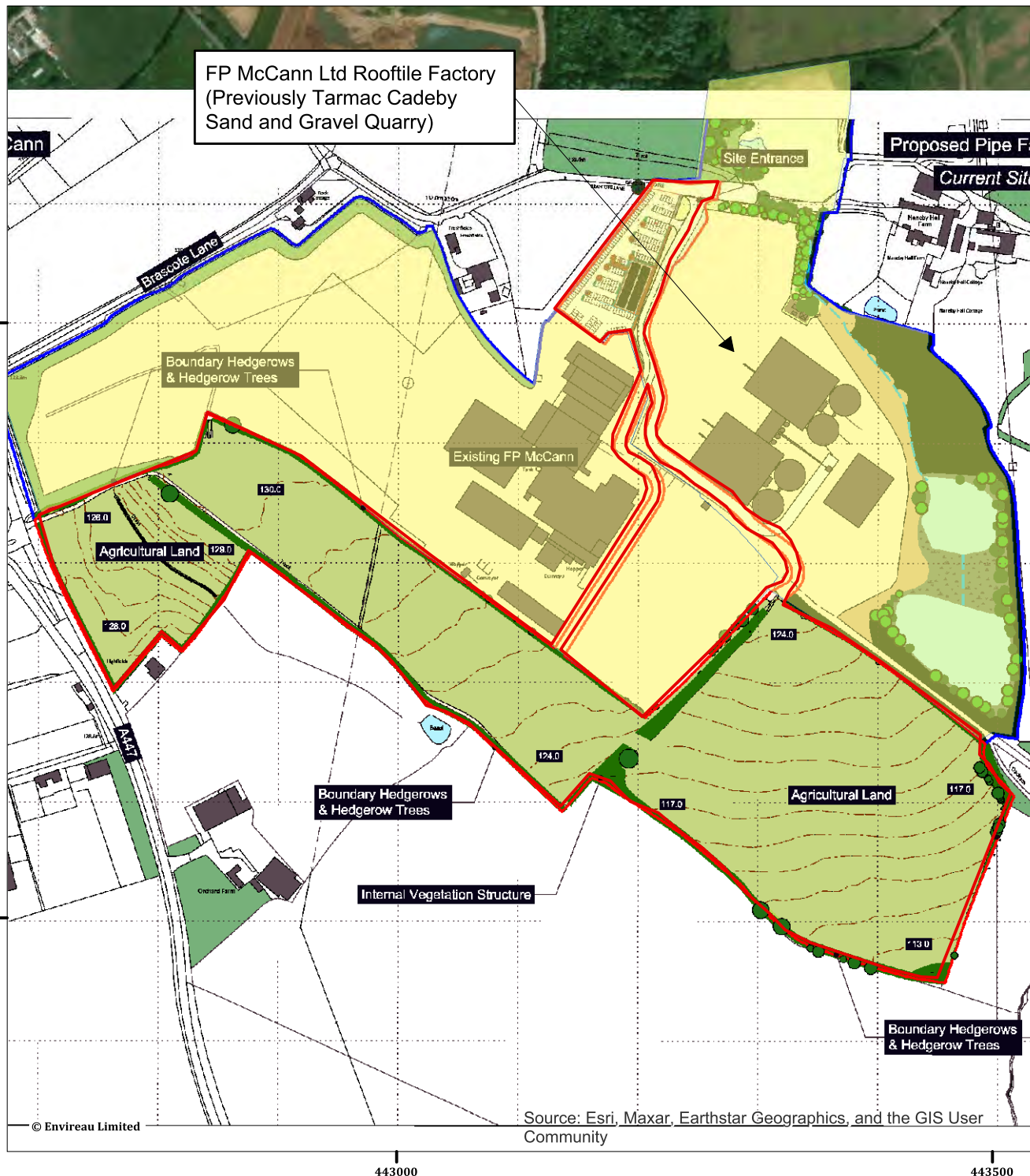


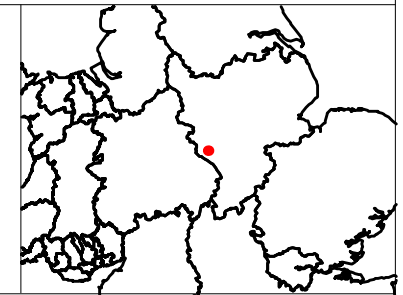
Figure 2: Existing Development

Cadeby, Leicestershire



- Application Site Boundary
- Existing FP McCann Concrete Pipe and Roof Tile Manufacturing Facility

Notes:



0 50 100 150 200 Meters

Scale: 1:5,000 at A4

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Ref: Existing Development

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The Sidmouth Mudstone Formation is classified as a “Secondary B” aquifer which is predominantly lower permeability strata which may in part have the ability to store and yield limited amounts of groundwater by virtue of localised features such as fissures, thin permeable horizons and weathering (Environment Agency, 2025).

The Site is not situated in a Source Protection Zone for groundwater (Natural England, 2025).

2.5 Watercourses and Waterbodies

The Site is located within the headwaters of the Thurlaston Brook catchment (see Figure 3). Thurlaston Brook is shown on Ordnance Survey mapping to originate approximately 2 km northeast of the Site and flows westwards past Newbold Verdon before turning south and flowing past the Site (see Figure 3). Thurlaston Brook joins the River Soar downstream of the Site. Thurlaston Brook is at an elevation of approximately 110 m AOD.

2.6 Existing Drainage

There are small local drainage channels adjacent to or within the Site boundary. One of these channels is located in the Western field and is isolated in a topographic low associated with historic quarry workings (see Figure 3). Given the low topography in relation to neighbouring land, that this was once a quarry site, and that there is no direct source of surface water to the channel, it is considered that this channel is groundwater fed or is a groundwater drain.

The drainage channel in the Western Field drains to a pond located in a localised depression. No outflow can be seen from the pond and there is no natural gradient for water to flow from the pond without water levels being raised by over 1 m. On the downstream edge of the pond is a field ditch. The field ditch bed and water level is at a lower elevation to the pond water level. The ditch also did not seemingly have an obvious outfall. Therefore, it is considered that the pond and the adjacent ditch represents a groundwater level and a groundwater drain and / or that there is a submerged culvert that links to the downstream local drainage channel.

The local drainage channels within or on the boundary of the Site receive attenuated surface water runoff discharged from the existing manufacturing facilities. The discharge outfalls are shown on Figure 3. The upper section of the local drainage channel in the Eastern field could also be acting as a groundwater drain.

The local drainage channel on the boundary of the Eastern field is circa. 2 m wide bank to bank and circa. 1 m. The watercourse drains to Thurlaston Brook.

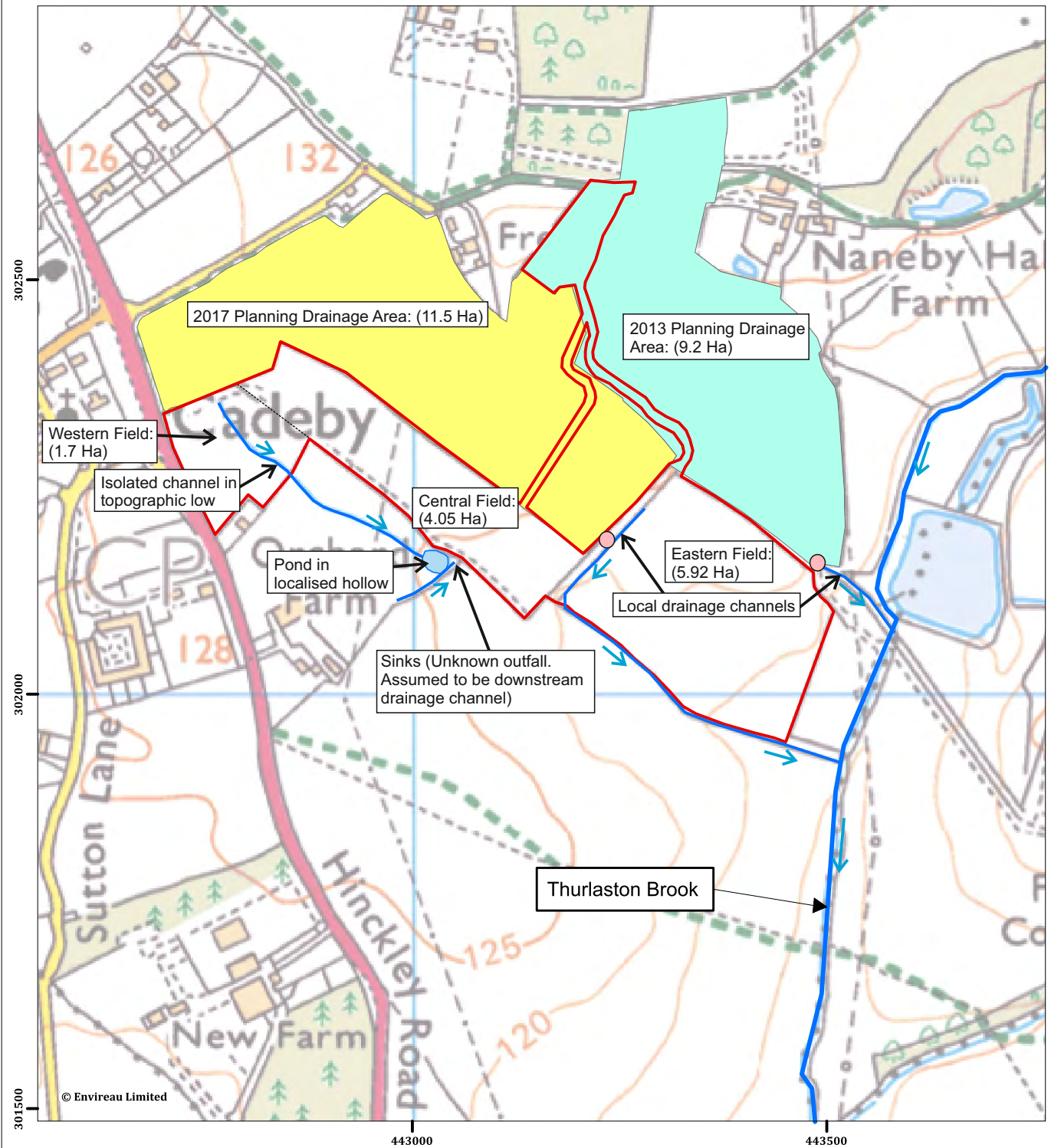


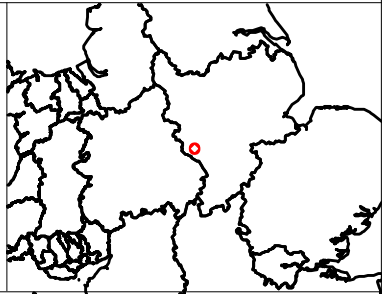
Figure 3: Watercourses

Cadeby, Leicestershire



- Application Site Boundary
- 2017 Planning Drainage Area
- 2023 Planning Drainage Area
- Watercourse
- Drainage Outfalls from Existing Drainage Areas (Attenuated and restricted flows to Qbar GFR)

Notes:



0 70 140 210 280 Meters

Scale: 1:7,000 at A4

26 February 2025

NGR: 443,156 E / 302,158 N

Project No. 3491036

Client: FP McCann

Drawn by: MT/LC

Ref: Watercourses



3 EXISTING DEVELOPMENT

3.1 Existing Site

The existing site covers a total area of ~20.7 ha and currently comprises of the precast concrete facility, rooftile facility, associated hardstanding storage areas, office buildings, car parks, attenuation basins, and biodiversity areas (Figure 2).

The original precast concrete facility occupied the central portion of the existing area and has been established since before 1999. The precast facility expanded in 2017 to include new facilities and storage areas. This was subject to planning which was approved in 2017 (see Figure 3 and 4). The rooftile facility on the eastern portion of the existing site was granted planning permission in April 2023. This site was once the processing area for Tarmac's quarrying operations. The development of the rooftile facility is near full completion.

3.2 Existing Drainage

For clarity, the existing drainage areas have been split into two areas, the 2017 and 2023 planning drainage areas. These two drainage areas act independently and have two separate discharge locations to local drainage channels, as shown on Figure 3.

The 2017 planning drainage area is that associated with the precast concrete facility covering an area of ~11.5 Ha. The 2017 approved planning included new swales, weir systems and attenuation features for new hardstanding areas and improved drainage in the pre-existing facility, including new return pumps for harvesting water, new drainage runs and sumps, and a hydrobrake restricting outflow to 15 l/s (~1.3 l/s/ha). This is below the current calculated Qbar (2.12 l/s/ha) for the Site based on FEH22 data.

The 2023 planning drainage area is that associated with the existing offices, car park and roof tile facility, covering an area of ~9.2 ha. The 2023 approved planning included concrete capture swales, new drainage runs, new boundary swales and enhancements to existing pond / basin areas to provide storm attenuation features. Outfall from the 2023 planning drainage area is restricted to Qbar and discharges to a local drainage channel feeding directly to Thurlaston Brook.

4 PROPOSED DEVELOPMENT

4.1 Description

The Site comprises of access road; the Western field; Central field and Eastern field. The total Application Site Boundary equates to 12.1 Ha. The development layout plan is shown in B.

The office area and car park are currently all hardstanding and will be reconfigured to provide an upgraded office facility and more ergonomic parking. The access roads to the new proposed area are a reconfiguration of existing access roads and hardstanding areas, allowing safer and more efficient access and egress to the new development area and existing areas. This portion of the Application Site Boundary equates to an area of 0.43 Ha.

The Western field covers an area of circa. 1.7 Ha and will remain as a greenfield area but will include biodiversity enhancements. This will include enhancements to ditches, grassland and hedgerows. No changes to the topography of the land are proposed and the drainage from this area will remain independent to the proposed new building and hardstanding area.

The Central field will comprise of storage areas for the plastic pipe facility along with a through road from the plastic pipe facility to the exit access road. No changes to land gradients are proposed, although some small landforming will be required on the southern boundary.

The Eastern field is the proposed location for the plastic pipe facility. This will be the main building and will include a new access road and plastic pipe storage areas. Regrading of the Eastern field will be required to facilitate the development. This is proposed to be a "neutral" cut and fill regrading and will not include importing fill material.

The Central and Eastern fields will be positively drained, covering an area of ~9.97 ha, which will be attenuated on-site with a restricted outflow to the local drainage channel at the Qbar greenfield runoff rate.

5 FLOOD RISK ASSESSMENT

5.1 Introduction

This FRA identifies and assesses the risks of all forms of flooding to and from the Proposed Development and demonstrates how these flood risks will be managed so that the development remains safe throughout its lifetime, taking account of climate change.

In line with the requirements of NPPF, all potential sources of flooding have been considered, these are: fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial waterbodies (reservoirs, canals and lakes).

5.2 Flood Risk Zones

An extract of the Environment Agency (EA) Flood Map for Planning (Rivers and the Sea) for the Site and surrounding area is presented in Figure 4.

The Site is shown to be situated wholly within Flood Zone 1 (Low probability of flooding from rivers).

5.3 Flood Risk Vulnerability Classification

Annex 3 of the NPPF refers to vulnerability classifications, which are based on the sensitivity of different forms of development. In accordance with the NPPF, the Proposed Development is classed as '**Less Vulnerable**' development.

Less Vulnerable development is appropriate within Flood Zone 1 as shown by the flood risk vulnerability classification matrix in Table 1.

Table 1 Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	x	Exception Test required	✓	✓
Zone 3b	Exception Test required	x	x	x	✓

Key:

✓ Development is appropriate

x Development should not be permitted.

5.4 Sequential and Exception Tests

The Sequential and Exception Tests are applied in specific cases defined by UK Government policy. Their purpose is to drive development to areas of low flood risk and to support developments which improve flood risk for developments in areas at risk of flooding.

5.4.1 Sequential Test

The Sequential Test compares a proposed development site with other available sites to find out which has the lowest flood risk. The Proposed Development is an acceptable development type in Flood Zone 1.

5.4.2 Exception Test

The Exception Test is applied to sites based on the Flood Zone and the vulnerability of the development to flooding. The Flood Risk Vulnerability Classification table, provided in Table 1 shows which vulnerabilities are appropriate in each Flood Zone.

The Proposed Development ('Less Vulnerable' development) is not located within Flood Zone 1 and therefore the Exception Test is not required.

5.5 Flood Risk Consideration

5.5.1 Tidal

The Site is inland and local watercourses are not tidally influenced. Therefore, the development is at **No Risk** from tidal flooding.

5.5.2 Rivers and Streams

The Site is wholly located within Flood Zone 1 and is therefore at Very Low risk of flooding from fluvial sources (less than a 0.1% or 1 in 1,000 annual chance of flooding). This classification is consistent with the elevated topographical position of the Site in relation to local watercourses.

The SFRA contains no records of fluvial flooding at the Site or in the Cadeby area.

Based on the above, the risk of fluvial flooding to the Proposed Development is considered to be **Very Low**.

5.5.3 Surface Water

The Environment Agency classifies the risk from surface water flooding using the following categories:

- High – Greater than a 3.3% (1 in 30) chance in any given year;
- Medium – Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year; and
- Low – Less than 1% (1 in 100) chance in any given year.

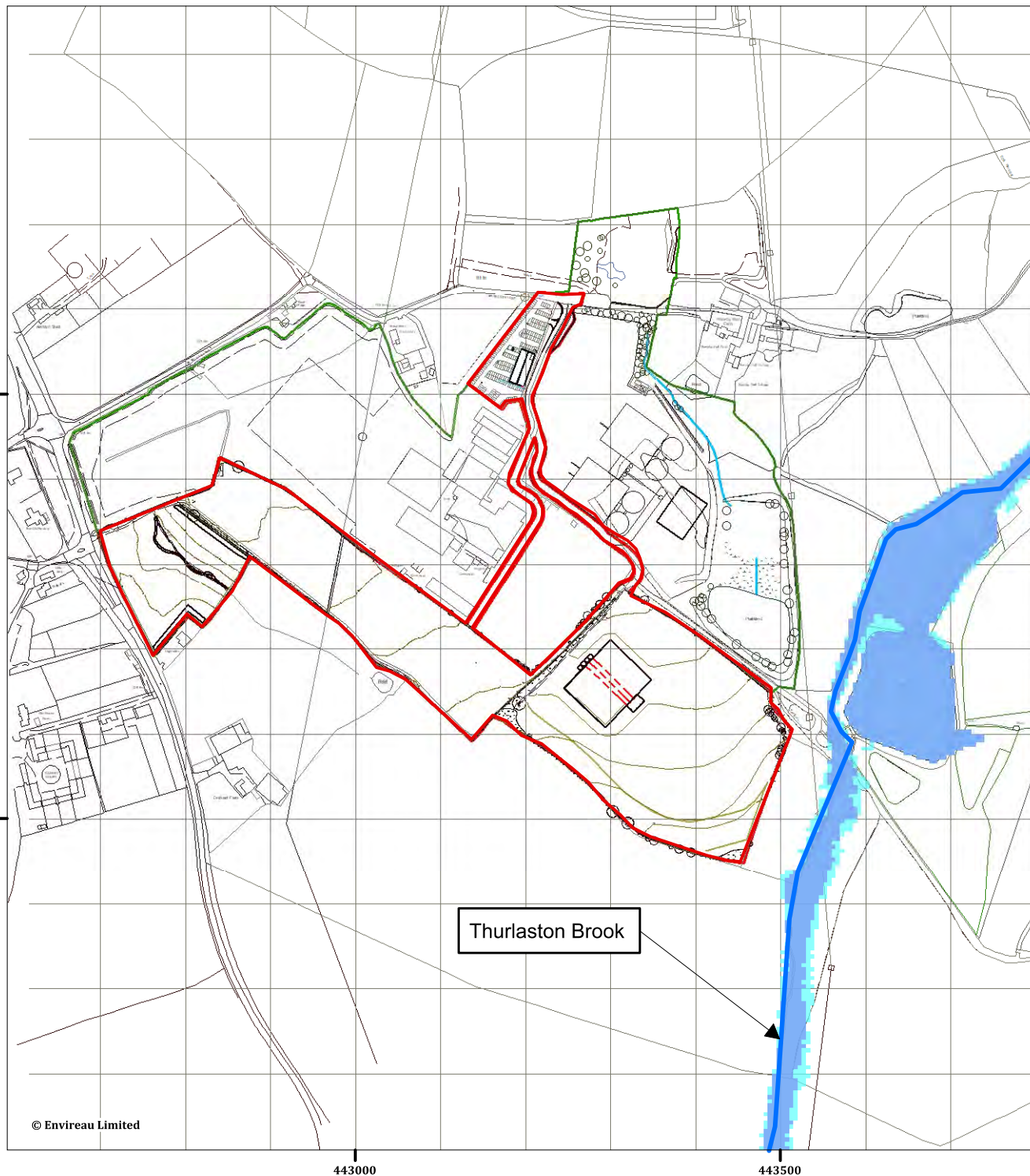


Figure 4: Environment Agency Flood Zones

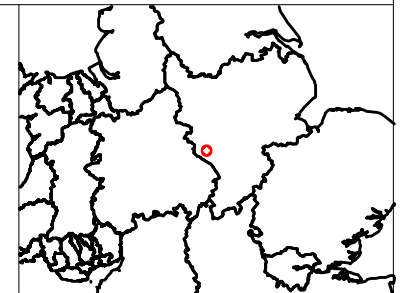
Cadeby, Leicestershire



- Application Site Boundary
- Flood Zone 3
- Flood Zone 2
- Watercourse

Notes:

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Environment Agency and database right 2025.



0 70 140 210 280 Meters

Scale: 1:7,000 at A4

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NGR: 443,199 E / 302,284 N

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Drawn by: MT/LC

Ref: EA Flood Map

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The Risk of Flooding from Surface Water (RoFSW) map presents the risk which takes account of the following climate change allowances based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5: - the 'Central' allowance for the 2050s epoch (2040-2060) for risk of flooding from surface water. These allowances include anticipated changes to peak rainfall intensity.

An extract of the RoFSW map covering the Site and local vicinity is presented on Figure 5. The risk of surface water flooding at the Site is shown to be Low.

The surface water flood map has been assessed in relation to the existing development. Points A to F on Figure 5 provide discussion points below:

Point A: This area of flooding represents the topographic low present due to historic quarrying activities and is considered to be accurate.

Point B: This area of flooding no longer reflects the development that is now in situ. Rather it reflects a scenario prior to the development occurring. The drainage system has been designed to accommodate 1 in 100 year + 40% climate change events and therefore, it is considered that this surface water flooding would not occur.

Point C: Similarly to Point B, this area of flooding no longer reflects the development in place in regard to the drainage system which has been designed to accommodate the 1 in 100 year plus climate change event. Therefore, it is considered that this surface water flooding would not occur.

Point D: Given that these surface water flood flows appear to generate from Point C, it is considered that these flows would not occur for this category event. However, the flow pathways would reflect exceedance routes from Point C. These flow pathways would be captured by the new proposed drainage system.

Point E: These flows imply that runoff from the 2017 planning drainage area is free flowing and unrestricted. However, the drainage system now incorporates a restricted outflow to below Qbar for the 1 in 100 year plus climate change event. Therefore, it is considered that this surface water flooding would not occur.

Point F: The flooding at point F would be dependent on the flood flows from Points D and E and overland runoff from the Eastern field. On the basis that it is considered that no surface water flooding would occur at Points D and E and overland runoff from the Eastern field will be captured by the proposed drainage system, it is also considered that there would be no flooding at Point F.

The SFRA contains no records of reported surface water flooding at the Site. A new surface water drainage system is proposed for the development as described in Section 6.2. This will ensure that runoff generated up to and including the 1 in 100 year plus climate change storm event is attenuated on-site.

Based on the above, the overall risk of surface water flooding to and from the proposed development is considered to be **Very Low**.

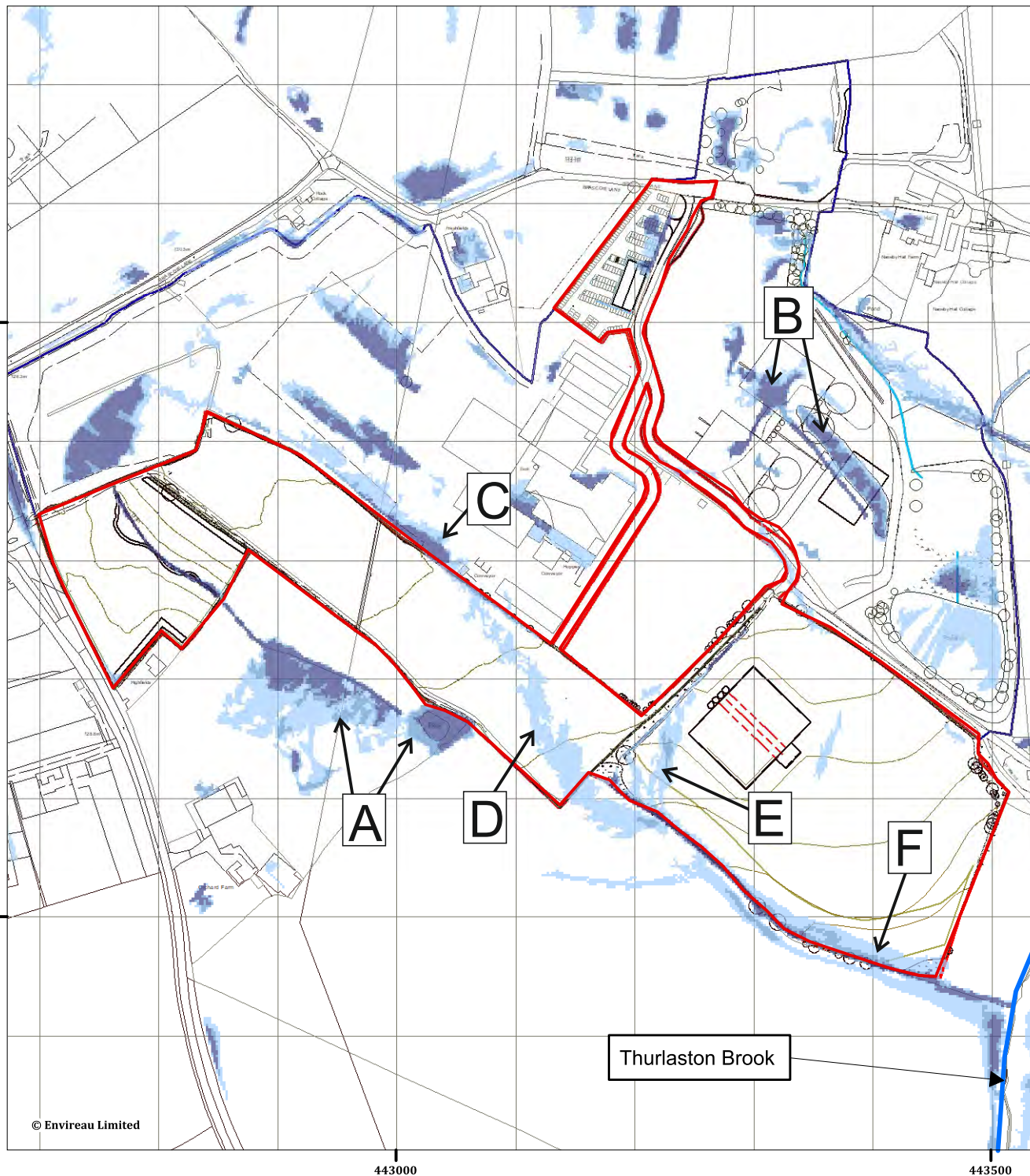


Figure 5: Surface Water Flood Risk

Cadeby, Leicestershire



Application Site Boundary

Watercourse

:

Flood Likelihood Category

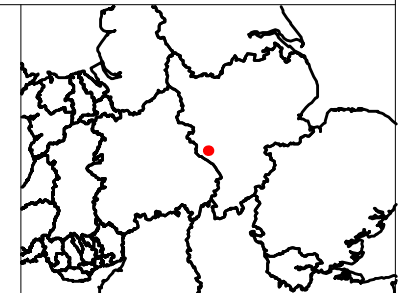
High

Medium

Low

Notes:

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0 50 100 150 200 Meters

Scale: 1:5,000 at A4

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Ref: Surface Water Flood Risk

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5.5.4 Groundwater

The BGS Susceptibility of Groundwater Flooding Map indicates that the Central field and majority of the Eastern field are categorised as Classification A: 'Limited Potential for Groundwater Flooding to Occur'.

The south-eastern corner of the Eastern field is categorised as Classification B 'Potential for Groundwater Flooding of Property Situated Below Ground Level'. Groundwater is expected to be shallower in this area given its topographically the lowest part of the Site and is closest to Thurlaston Brook.

Based on the above, the risk of groundwater flooding to the Proposed Development is considered to be **Low**.

5.5.5 Artificial Waterbodies

There are no artificial waterbodies (reservoirs, lakes or canals) located upgradient of the proposed development. Two attenuation basins are located to the northeast of the site within the FP McCann Rooftile factory land (2023 Planning Drainage Area), levels within these are controlled with the drainage systems designed for that site and in the unlikely event of overspill, flows would to the east towards Thurlaston Brook.

The Site does not lie within the Environment Agency Flood Risk from Reservoirs maximum extent of flooding mapping.

Based on the above, there is considered to be **No Risk** of flooding from artificial waterbodies to the Proposed Development.

5.5.6 Sewers

There are no sewers upstream of the Site other than those associated with the 2017 and 2023 planning drainage areas. These drainage for these areas has been designed for the 1 in 100 year plus climate change event and therefore, the risk of flooding from these features is considered as No Risk.

5.6 Flood Risk Summary

A summary of the potential flood risk to and from the Proposed Development assessed in the previous sections is provided in Table 2.

Table 2 Flood Risk Summary

Flood Source	Risk of Flooding				
	No Risk	Very Low	Low	Medium	High
Sea (Tidal)	✓				
Rivers and Streams (Fluvial)		✓			
Surface Water (Pluvial)		✓			
Groundwater			✓		
Sewers	✓				
Artificial Waterbodies	✓				

6 SURFACE WATER MANAGEMENT PLAN

6.1 Introduction

A surface water drainage strategy with sustainable drainage systems (SuDS) components has been developed in line with the relevant planning policies and guidance, including the Defra Non-Statutory Technical SuDS Standards (DEFRA, 2015), Building Regulations Part H (HM Government, 2010) and The SuDS Manual (C753) (Woods Ballard, et al., 2015).

6.2 SuDS Drainage Hierarchy Assessment

Surface water runoff not collected for use must be discharged to one or more of the following in the following order of priority:

- Infiltration to ground (most preferred);
- Discharge to a surface water body;
- Discharge to a public surface water sewer; and
- Discharge to a combined public sewer (least preferred).

6.2.1 Infiltration to ground

Due to the natural soils at the Site, the permeability of the soils is likely to be low and unsuitable for infiltration-based discharge methods such as soakaways and infiltration basins. On this basis, the specific use of infiltration e.g. soakaways has been discounted as a viable method of discharging runoff from the development. However, in open and landscaping areas of the Site, infiltration is expected to take place albeit at a low rate.

6.2.2 Discharge to a surface water body

The local drainage channel circumventing the Eastern field area receives restricted runoff from the 2017 planning drainage area and is considered suitable for receiving surface water from the proposed development. This watercourse discharges to Thurlaston Brook some 65 m downstream of the Site boundary.

6.2.3 Discharge to a public surface water sewer

There are no public surface water sewers at the Site or in the surrounding area and therefore this option has not been considered further.

6.2.4 Discharge to a combined sewer

There are no combined sewers at the Site or in the surrounding area and therefore this option has not been considered further.

6.2.5 Proposed discharge method

Based on the assessment above, the proposal is to attenuate surface water runoff on-site and discharge at the greenfield runoff rate to Thurlaston Brook.

6.3 Runoff Rates

Site-specific Greenfield Runoff Rates for the proposed development have been calculated using FEH22 data and modelling software, Causeway Flow+ (v12.0). The calculation is based on the application Site boundary area of 9.97 Ha (Central and Eastern field area). The greenfield runoff rates and proposed discharge rate are provided in C.

It is proposed that flows discharged are controlled to a rate equal to or less than the Qbar greenfield runoff rate in order to provide flood risk betterment downstream during storms greater than the Qbar storm event.

Table 3 Greenfield Runoff and Proposed Discharge Rate

	QBAR storm	1 in 30 yr storm	1 in 100 yr storm
	L/s		
Greenfield runoff rate	21.1	41.2	52.4
Proposed discharge rate	21.1		
Difference (proposed-existing)	+/- 0.0	-20.1	-31.3

6.4 Proposed Surface Water Drainage Strategy

The proposed drainage strategy for the Site is presented in Figure 6.

No changes are proposed to the Western Field drainage, and this will be independent of the Central field and Eastern field drainage system. No runoff from the Central field will enter into the Western field.

The Central and Eastern fields will be positively drained, covering an area of ~9.97 ha.

The Central field drainage system will comprise a boundary swale system. The swale system will increase in size along the boundary commensurate with the estimated runoff rates. The swale depths will start at 0.3 m, progressively increasing to a depth of 1 m. To maximise rainfall storage and hold back flows, the swales will have flow restrictors in the form of weirs at key locations and two new attenuation basins are proposed in the southern portion of the Central field.

The second (final) Central field attenuation basin will require some minor land forming on the southern boundary to form the southern rim of the basin to a level of 122.91m AOD, a rise ranging from 0.3 to 1.0 m. The outflow from the final attenuation basin will be to a traditional piped drainage system that will feed into the Eastern field drainage. The sizing of the piped drainage provides the necessary restriction to maximise storage in the basin. Pipe drainage sizes are provided in modelling results provided in Appendix C.

The Eastern field drainage will consist of a concrete capture channel to the northeast and northwest of the new building to prevent the ingress of runoff. The concrete channel will feed into a piped drainage system that discharges to a series of cascading attenuation basins.

The cascading basins will be interconnected via pipes and will run adjacent to the southwestern field boundary, feeding into a final attenuation basin in the southern section of the Eastern field area. The basins have been sized and designed to have a minimum 4 m standoff from the existing local drainage channel that runs along the boundary.

It is proposed that the new drainage is completely independent of the local drainage channel other than where the Site drainage discharges to it in the southern corner of the Site. The outfall to the watercourse will be via a shallow headwall oriented at an angle to allow flow into the watercourse in line with the flow direction. The watercourse is relatively shallow at the discharge location being ~1 m from bed to top of bank level, with the lowest slope elevation of ~112.0m AOD. The outfall from the final basin will be restricted to 21.1 l/s (Qbar) via a 0.077 m orifice plate.

To facilitate access from the Eastern field to the Central field, a new access road will need to be incorporated that crosses the local drainage channel. It is proposed that the local drainage channel is culverted, and this will be commensurate with the dimensions and capacity of the channel. In relation to expected flows the watercourse receives, this will provide an oversized culvert. The access road will also encompass the drainage pipe run from the Central field to the Eastern field.

Runoff from hardstanding areas in the Eastern field that is not captured by the new building drainage will be captured by a new swale on the eastern boundary, sized accordingly to cumulative runoff area or direct to the cascading and final basin system.

To provide the required storage capacity for attenuation of storm events, landforming will be required for the final attenuation basin. The base of the basin has been set at circa. 111.4m AOD, approximately 0.4m above the bed of the adjacent watercourse. The northern rim of the basin will be formed from natural ground cover, whereas the southern rim will require raising to 114.70m AOD, a rise of up to 2.7m. This will provide ~7,500 m³ of storage (excluding 300 m freeboard storage: total of ~8,750 m³ when including freeboard), of which ~6,650 m³ will be above ground storage behind an artificial bank.

The majority of storm events will not require this volume; however, because the final basin provides a restricted outflow and a drain down point for the whole drainage system, the 7 day duration event becomes the critical storm for volume within the final basin. Whereas for short duration events such as the 15 minute and 30 minute events, the drainage attenuation system has been designed to spread the storage requirement and restrict flows via compartmentalisation across the site.

In line with CIRIA SuDS Manual (C753) (Woods Ballard, et al., 2015), all swales and basins will have 1 : 3 slopes and all basins will provide a 300 mm freeboard. Swales and basins will be seeded and grassed, providing a pollution treatment chain for on-site runoff.

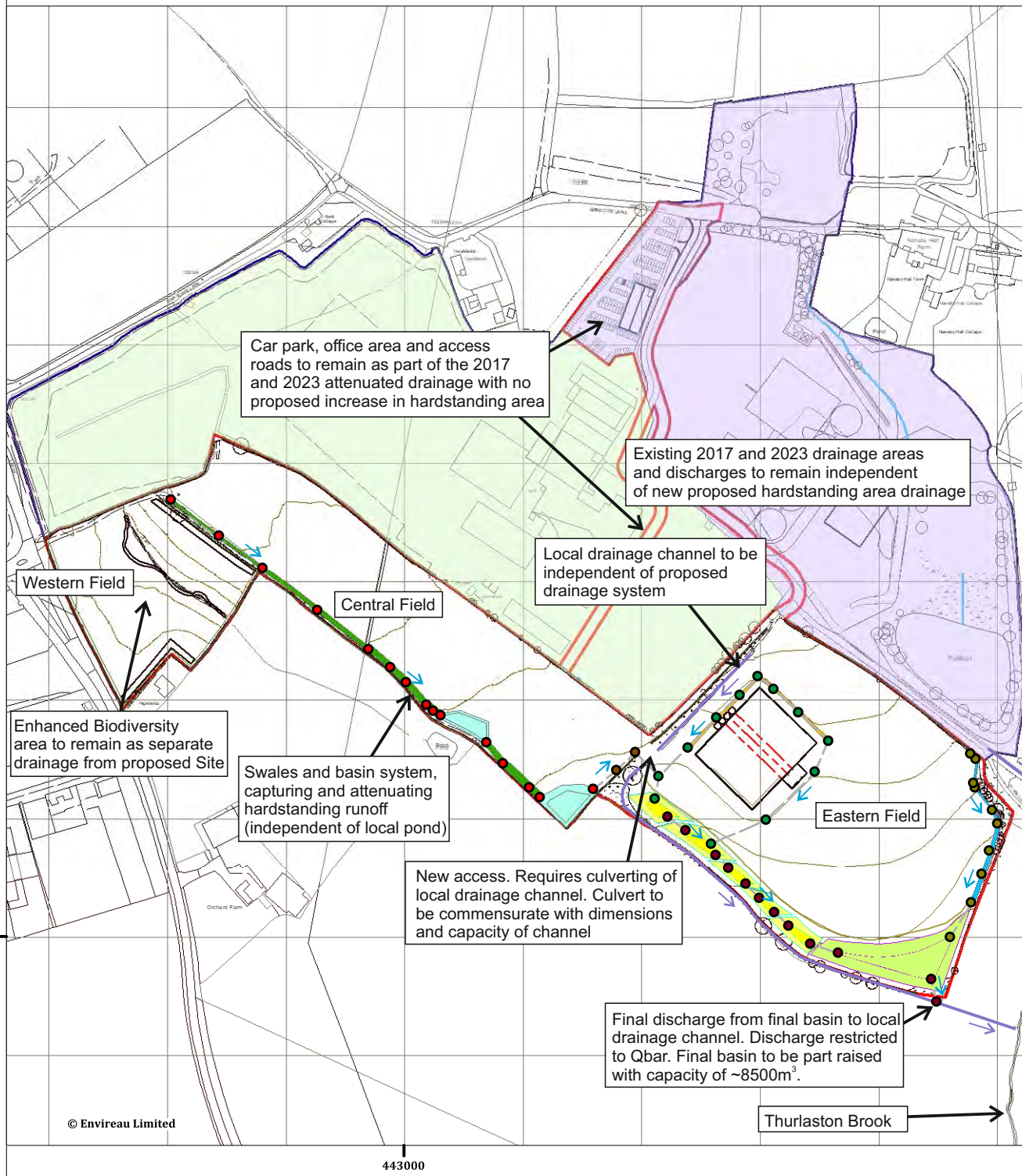


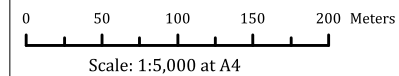
Figure 6: Proposed Drainage Outline

Cadeby, Leicestershire



- 2023 Planning Drainage Area
- 2017 Drainage Area
- Final Attenuation Basin (Eastern Field)
- Lower Cascading Attenuation Basin (Eastern Field)
- Upper Attenuation Basin (Central Field)
- Surface Water Concrete Channel
- Eastern Boundary Swale
- Western Boundary Swale
- Western Swale Node
- Eastern Swale Nodes
- Factory Drainage Nodes
- Basin Cascade Nodes
- Inter nodes
- Pipe Drainage Links

Notes:



26 February 2025
NGR: 443,099 E / 302,305 N

Project No. 3491036
Client: FP McCann
Drawn by: LC
Ref: Proposed Development

envireau
WATER

6.5 Hydraulic Calculations

The proposed drainage strategy has been modelled using Causeway Flow+ (v12.0) drainage software. The calculations presented represent the key components of the drainage strategy such as the proposed swales, drainage pipes and attenuation basins in order to demonstrate that there is sufficient storage capacity to attenuate the 1 in 100 year plus 40% climate change storm event without increasing flood risk at the Site or elsewhere.

Calculations for the proposed drainage strategy are presented in Appendix B. The calculations have been undertaken for the 1 in 2, 1 in 30, 1 in 100 year and the 1 in 100-year plus 40% climate change allowance storm event for all storm durations (i.e. 15 minutes up to and including 10,080 minutes i.e. a 7 day storm).

A climate change allowance factor of 40% has been applied to the 1 in 100-year storm to account for predicted future increases in peak rainfall intensity, in line with the latest Environment Agency climate change allowances. This value is representative of the expected lifetime of the proposed development.

The total area to be positively drained and attenuated within the proposed attenuation basin is 9.97ha. This area has been split across the drainage model nodes presented in Appendix B. The model assumes that the proportion of rainfall to runoff from the development is 100% and a Cv value of 1.0 has been applied.

For all storm events up to and including the 1 in 100 year plus 40% climate change storm, the hydraulic calculations show that the discharge from the proposed attenuation basin is not greater than the Qbar greenfield runoff rate and that 300 mm freeboard is provided in basins for the critical storm events.

7 SUDS MANAGEMENT AND MAINTENANCE PLAN

7.1.1 Responsibilities

The proposed surface water drainage system will be managed and maintained by FP McCann. As part of the active management of the development surface water drainage system, a maintenance and monitoring schedule is required to ensure that the system remains functional.

7.1.2 Maintenance Schedule

This section outlines the general maintenance and management schedules for proposed SuDS elements of the proposed surface water drainage strategy. The schedules have been formulated in line with guidelines contained within the CIRIA SuDS Manual (C753) (Woods Ballard, et al., 2015).

There are three categories of maintenance activities (including inspections and monitoring) referred to in this report:

- **Regular maintenance** (including inspections and monitoring) – tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.
- **Occasional maintenance** - tasks which are required to be undertaken periodically, typically at intervals of 3 months or more.
- **Remedial maintenance** – tasks which are not required on a regular basis but are done when necessary.

This section is intended to give an overview of the operation and maintenance for the range of drainage features included within the surface water drainage strategy and in relation to typical/standard details only.

Maintenance schedules for the proposed SuDS features are provided in Tables 3 to 7. These schedules are not exhaustive and should be reassessed at regular intervals to determine if any additional maintenance requirements are required to preserve the performance and condition of the drainage system.

7.2 Pipes and Manholes

Table 4 Pipes and Manholes Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove any accumulation of silt, sediment, leaves and debris etc.	Monthly, or as required
Occasional maintenance	High pressure water jet removal of silt build-up and avoid blockages, particularly at bends or changes in direction.	Six monthly, or as required
	Remove or control tree roots where they are encroaching pipe runs, using recommended methods	As required
Remedial actions	Clear pipework and gully grates of blockages	As required
	Replace any damaged or failed pipes, gullies or manholes	As required

7.3 Swale Weirs

Table 5 Swale Weir Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect for evidence of poor operation	Monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly
	Remove litter debris and sediment build ups	Monthly
Occasional maintenance	High pressure water jet removal of silt build-up.	Six monthly, or as required
Remedial actions	Clear swale and weir of blockages	As required
	Replace any damaged or failed weirs	As required

7.4 Attenuation Basins

Table 6 Attenuation Basin Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly or as required
	Cut grass – to retain height within specified design range (75-150mm)	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets and outlet for blockages and clear if required	Monthly
	Inspect banksides, structures, pipework for evidence of physical damage	Monthly
	Inspect inlets and surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Remove sediment from inlets, outlets and basin	Annually (or as required)
	Tidy all dead growth before start of growing season	Annually
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Remove sediment from inlet, outlets and basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing and re-armouring	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

7.5 Swales

Table 7 Swale Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range (75-150mm)	Monthly (during growing season), or as required.
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets and outlet for blockages and clear if required	Monthly
	Inspect base of swale for ponding, compaction, silt accumulation, record areas where water is ponding for >48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect banksides for evidence of physical damage	Monthly
	Inspect inlets, outlets and swale surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then half yearly, or as required
	Remove sediment from inlets and outlets base of swale	Annually (or as required)
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale area
	Remove sediment from inlet, outlets and swale surface when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing and re-armouring	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

7.6 Flow Controls

Table 8 Flow Controls Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove any accumulation of silt, sediment, leaves and debris etc.	Monthly, or as required
Occasional maintenance	High pressure water jet removal of silt build-up and avoid blockages.	Six monthly, or as required
Remedial actions	Replace the orifice if it becomes damaged	As required.
	Clear orifice of blockages	As required.

8 CONCLUSIONS

This FRADS concludes the following:

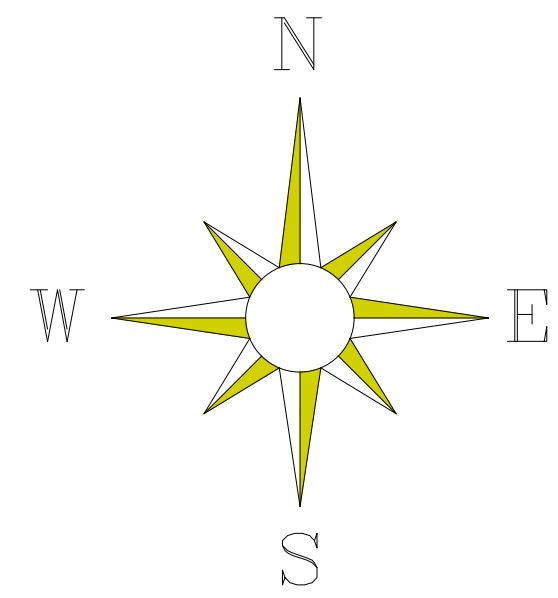
- The Site is situated wholly within Environment Agency Flood Zone 1 (very low risk of fluvial and tidal flooding).
- The overall risk of flooding from all other potential sources to and from the Site is assessed as being Very Low or no No Risk.
- A surface water drainage strategy based on Sustainable Drainage Systems (SuDS) principles has been formulated for the proposed development to accommodate the 1 in 100 year plus 40% climate change allowance storm event. The drainage strategy has been hydraulically modelled using Causeway Flow drainage design software.
- Surface water runoff from the Proposed Development will be managed by a drainage system which will discharge from an attenuation basin into a local drainage channel. The outflow from the attenuation basin will be a throttled discharge via a orifice flow control to the Qbar greenfield runoff rate (21.1 l/s).
- The proposed surface water drainage system will be managed and maintained by FP McCann.
- This assessment demonstrates that the proposed development will not reduce floodplain storage nor impede flood flows; will not increase surface water or flood flows beyond the current scenario; and will not increase the risk of flooding at the Site or elsewhere.

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APPENDICES

Appendix A Topographical Survey Plan



Key:

FL:	Floor level	SHL:	Sill height level
CL:	Ceiling level	HWL:	Head height level
SUSCL:	Suspended ceiling level	SPR:	Spring Point
U/S:	Underside level	Arch:	Arch level
DP:	Down pipe	P.Arch:	Pointed Arch level
WP:	Waste pipe		

	Door / sliding door		Building line
	Inspection cover		Beam
			Window
			Dimension

Bv	Air valve	G:	Grill occurrence	5v	Stop valve
Bg	Back gully	Gy	Gully	Tr	Telephone call
Bh	Borehole	Hg	Height	TLT:	Top lead line
Bj	Borehole	IC	Inspection cover	Th:	Threshold tank
Bk	Bottle	IFL	Interflow level	TL:	Threshold tank
Bs	Box step	IL	Invert level	TL:	Traffic light
BT	British Telecom	L	Letter box	Th:	Threshold tank
Bv	Back gully	Ld	Landfill	Tp	Trenching
Cl	Cover level	LS	Level	Ts	Traffic sign
CBK	Cable cover	MH	Manhole	T:	Tactile paving
CPS	Cables joining box	M	Man	TLT:	Top of lead line
CPT	Cable TV pipe	NVP	Non vent pipe	UW:	Under to lift
Cv	Cover	NS	Noise	W:	Water
Ed	Electricity post	Pb	Pipe	Wm:	Water meter
Er	Earth rod	R	Radiation	W:	Wash out
F	Fire hydrant	Sg	Shower		
F:	Flagpost	S:	Stop		
Fl	Flow		Flow Grass		
Rd	Road		Verge		
Rd	Road Kerb		Verge		
V	Verge Traffic		Verge		
V	Verge Concrete		Bottoms		

Ordinance Survey information is provided for a guide only.

— OS BUILDING OUTLINE
 — OS DETAIL

Station	Easting (m)	Northing (m)	Level (m)
M1	443309.507	302265.834	125.610
M2	443208.152	302169.765	124.358
M3	442828.595	302343.679	129.862
M4	442698.329	302331.244	127.596

REV	DATE	DESCRIPTION OF WORK	SURVEYOR	CHECKED BY
-----	------	---------------------	----------	------------



Mapmatic, Unit 14, Prime Parkway, Derby, DE1 3QB
Tel: 01332 650 580 www.mapmatic.com Email: info@mapmatic.com

CLIENT

FP McCann

PROJECT

Brascote Lane, Cadeby,
Leicestershire, CV13 0BB

TITLE Topographical
Survey

Scale	1: 500@A0	Date	05.11.2024
Drawn	JS	Checked	RP
Level datum	GNSS	Grid orientation	GNS
Job number	7302	Revision	0
Drawing no.	0001	Sheet	2 of 2

Notes:

All critical requirements should be checked on site prior to design. Its liability will be taken for this step if passed onto 3rd parties. Trees and other survey data may be omitted due to dense vegetation. Some information may have been omitted due to parked vehicles and vegetation. Please note the drainage information has been ascertained by visual inspection from the surface and therefore values are estimated.

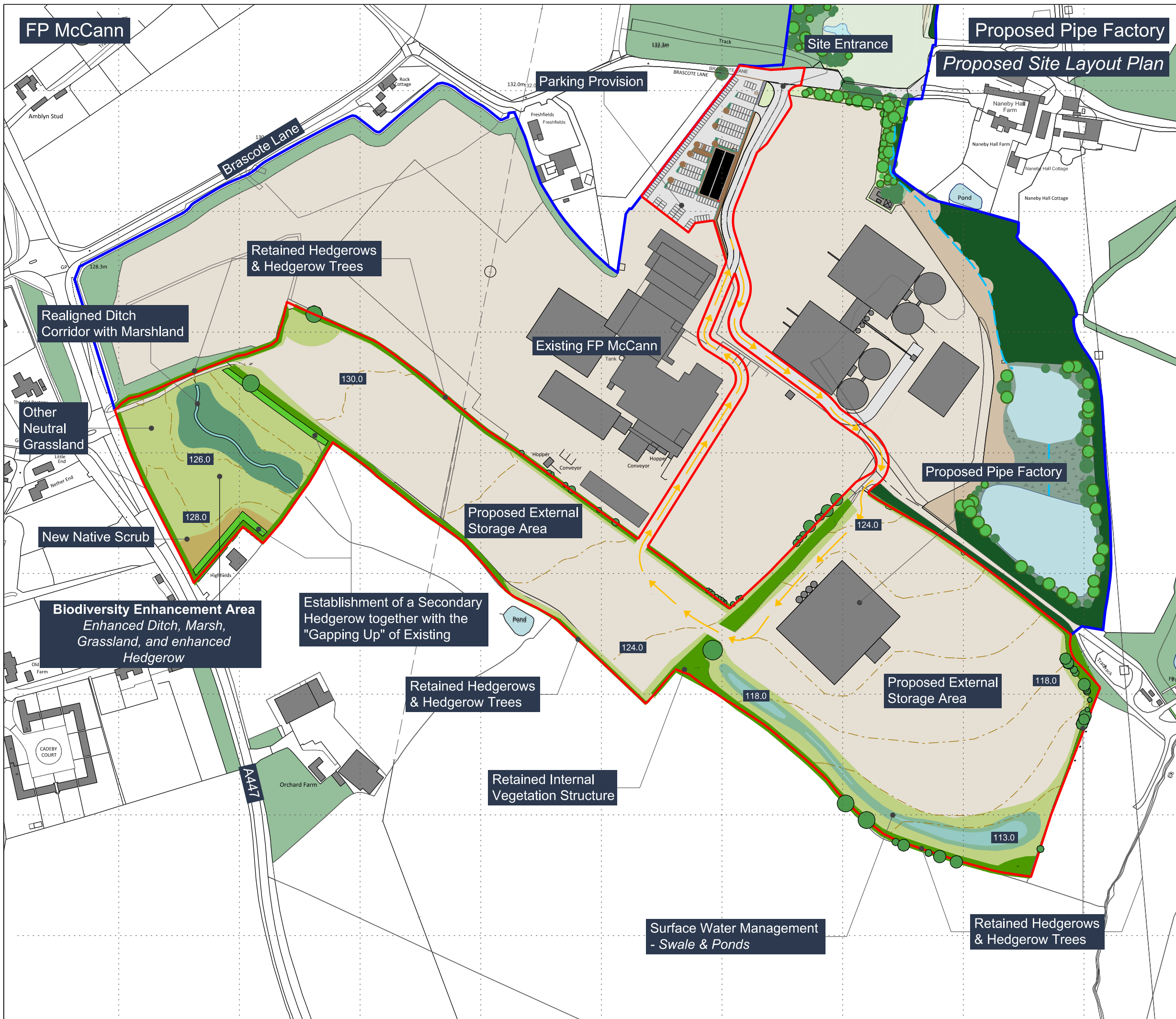
This survey has been orientated to the Ordnance Survey (OS) national grid and is a Global Navigation Satellite System (GNSS) and the OS Active Network (OS ANET) 1 or 2008 Ordnance Grid has been established from the site centre via a transformation using the OSTN15 & OSGB25 transformation models. The survey has been carried out to this point and a further four or more OSGB25 points established to create a true OS bearing for angle orientation. Its scale factor has been applied to the survey therefore the resulting values are more accurate than the OS grid values.

Please refer to the survey station table to enable establishment of the on-site grid.



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Appendix B Proposed Development Layout



LEGEND

- Application Site Boundary
- Other Land Under the Control of the Applicant
- Contours & Spot Heights
- Internal Access Routing
- Proposed Biodiversity Enhancement Area
 - Proposed Other Neutral Grassland
 - Proposed Native Scrub
 - Proposed Realigned Ditch Corridor with Peripheral Marshy Vegetation
 - Proposed Secondary Native Hedgerow Planting together with the "Gapping Up" of Existing



PROJECT:
FP McCann: Proposed Pipe Factory

TITLE:
Proposed Site Layout Plan

REF NO:
KD.FPPF.1.D.003

DATE: December 2024 SCALE: 1:3,000 @ A3

STATUS:
DRAFT



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Appendix C Drainage Modelling

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	1.000	Connection Type	Level Inverts		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	499	1350	749	1500	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Swale Link Type

Shape	Open User Defined	Auto Increment (mm)	75	Follow Ground	✓	ks (mm) / n	0.030
Barrels	1	Steep Slope (1:X)	3	Velocity	Manning		

Available Diameters (mm)

7000

Width / Total	Depth / Total	Width / Total	Depth / Total	Width / Total	Depth / Total	Width / Total	Depth / Total
0.000	1.000	3.000	0.000	4.000	0.000	7.000	1.000

Circular Link Type

Shape	Circular	Auto Increment (mm)	75	Velocity	Manning
Barrels	1	Follow Ground	x	ks (mm) / n	0.010

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.129	5.00	129.891		442880.000	302311.000	0.250
S0	0.087	5.00	129.900		442844.000	302339.000	0.250
S3	0.228	5.00	127.888		442970.000	302243.000	0.500
S2	0.164	5.00	129.148		442927.000	302275.000	0.500
S4			127.204		442989.000	302228.000	0.750
S5			126.705		443002.000	302215.000	0.750
S6			126.079		443019.000	302196.000	1.000
S7			125.935		443025.000	302191.000	1.000
S8	0.578	5.00	125.828		443031.000	302187.000	1.583
S12	0.637	5.00	125.500		443069.000	302164.000	1.295
S13	0.312	5.00	124.944		443084.000	302147.000	1.000
S14	0.211	5.00	123.993		443106.000	302126.000	1.000
S15	0.334	5.00	123.071		443122.498	302111.931	1.537
S18	0.699	5.00	123.071	1500	443160.000	302124.000	1.575
C0	0.148	5.00	118.000		443222.000	302101.000	1.600
C1			117.800		443238.000	302090.000	2.367
C2	0.220	5.00	117.000		443263.000	302069.000	1.600
C3			116.758		443274.000	302058.000	2.339
C4	0.097	5.00	116.000		443288.000	302045.000	1.600
C5			115.544		443300.000	302032.000	2.126
C6	0.185	5.00	115.000		443313.000	302021.000	1.600
C7			114.700		443325.000	302009.000	2.277
C8	0.333	5.00	114.700		443343.000	301994.000	2.300
C9			114.650		443364.000	301985.000	3.166
C10	1.717	5.00	114.650		443445.000	301962.000	3.250
C11			112.000		443449.000	301945.000	0.650
ES0			114.650		443463.000	302002.840	3.166
ES1	0.273	5.00	114.650		443479.000	302029.000	1.107
ES2	0.143	5.00	115.104		443488.000	302053.000	0.750
ES3	0.151	5.00	115.660		443494.000	302073.000	0.500

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
ES4	0.080	5.00	116.252		443501.000	302094.637	0.500
ES5	0.056	5.00	116.873		443496.000	302107.000	0.250
ES6	0.019	5.00	118.143		443482.000	302126.000	0.250
ES7	0.119	5.00	118.398		443481.000	302130.000	0.250
ES8			118.923		443483.000	302150.000	0.250
ES9	0.056	5.00	119.122		443478.000	302154.000	0.250
F6	0.015	5.00	123.580	1200	443299.000	302220.000	1.500
F0	0.077	5.00	123.364	1200	443312.000	302209.000	1.517
F2	0.218	5.00	121.700	1350	443358.000	302165.000	1.725
F3	0.081	5.00	120.140	1350	443347.000	302139.000	1.740
F4	0.265	5.00	120.000	1350	443306.000	302099.000	2.900
F5			117.750		443260.000	302079.000	2.317
F7	0.069	5.00	123.092	1200	443283.000	302204.000	1.422
F1	0.199	5.00	122.812	1200	443333.000	302190.000	1.353
F8	0.149	5.00	121.913	1350	443264.000	302185.000	1.413
F9	0.189	5.00	120.489	1350	443240.000	302160.000	1.489
F10	0.090	5.00	120.000	1350	443215.000	302135.000	2.000
F11			118.717		443212.000	302117.000	2.277
I0	0.089	5.00	123.488	1350	443179.000	302141.000	2.341
I1	0.019	5.00	123.837	1350	443196.000	302155.941	3.192
S-1		5.00	130.000		442803.167	302369.403	0.250

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)
1.001	S0	S1	45.607	0.030	129.650	129.641	0.009	5067.4	250	13.29	50.0
1.002	S1	S2	59.203	0.030	129.641	128.898	0.743	79.7	250	14.29	50.0
1.003	S2	S3	53.600	0.030	128.648	127.388	1.260	42.5	500	14.70	50.0
1.004	S3	S4	24.207	0.030	127.388	126.704	0.684	35.4	500	14.87	50.0
1.005	S4	S5	18.385	0.030	126.454	125.955	0.499	36.8	750	14.97	50.0
1.006	S5	S6	25.495	0.030	125.955	125.329	0.626	40.7	750	15.12	50.0
1.007	S6	S7	7.810	0.030	125.079	124.935	0.144	54.2	1000	15.16	50.0
1.008	S7	S8	7.211	0.030	124.935	124.828	0.107	67.4	1000	15.21	50.0
6.000	S12	S13	22.672	0.030	124.205	123.944	0.261	86.9	1000	5.16	50.0
6.001	S13	S14	30.414	0.030	123.944	122.993	0.951	32.0	1000	5.29	50.0
6.002	S14	S15	21.682	0.030	122.993	121.972	1.021	21.2	1000	5.36	50.0
5.001	I0	I1	22.633	0.010	121.147	120.645	0.502	45.1	375	5.30	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	0.124	31.0	15.7	0.000	0.000	0.087	0.0	186	0.104
1.002	0.990	247.5	39.0	0.000	0.000	0.216	0.0	109	0.615
1.003	2.151	2151.0	68.6	0.000	0.000	0.380	0.0	99	0.869
1.004	2.358	2358.3	109.9	0.000	0.000	0.608	0.0	121	1.060
1.005	3.029	6814.6	109.9	0.000	0.000	0.608	0.0	104	1.005
1.006	2.881	6481.6	109.9	0.000	0.000	0.608	0.0	106	0.967
1.007	3.024	12096.0	109.9	0.000	0.000	0.608	0.0	100	0.838
1.008	2.713	10851.3	109.9	0.000	0.000	0.608	0.0	107	0.780
6.000	2.390	9558.1	115.1	0.295	0.000	0.637	0.0	118	0.725
6.001	3.938	15752.4	171.5	0.000	0.000	0.949	0.0	111	1.156
6.002	4.833	19330.9	209.6	0.000	0.099	1.160	0.0	111	1.418
5.001	3.073	339.5	142.4	1.966	2.817	0.788	0.0	170	2.940

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)
5.000	S18	I0	25.495	0.010	121.496	121.147	0.349	73.1	375	5.18	50.0
4.000	F6	F7	22.627	0.010	122.080	121.670	0.410	55.2	300	5.16	50.0
4.001	F7	F8	26.870	0.010	121.670	120.500	1.170	23.0	300	5.28	50.0
4.002	F8	F9	34.655	0.010	120.500	119.000	1.500	23.1	375	5.41	50.0
4.003	F9	F10	35.355	0.010	119.000	118.000	1.000	35.4	375	5.58	50.0
4.004	F10	F11	18.248	0.010	118.000	116.900	1.100	16.6	375	5.64	50.0
2.000	F6	F0	17.029	0.010	122.080	121.847	0.233	73.1	300	5.14	50.0
2.001	F0	F1	28.320	0.010	121.847	121.459	0.388	73.0	300	5.36	50.0
2.002	F1	F2	35.355	0.010	121.459	119.975	1.484	23.8	300	5.52	50.0
2.003	F2	F3	28.231	0.010	119.975	118.400	1.575	17.9	375	5.62	50.0
2.004	F3	F4	57.280	0.010	118.400	117.100	1.300	44.1	450	5.89	50.0
2.005	F4	F5	50.160	0.010	117.100	115.600	1.500	33.4	450	6.10	50.0
8.000	C0	C1	19.416	0.010	116.400	115.600	0.800	24.3	450	5.07	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
5.000	2.415	266.7	126.4	1.200	1.966	0.699	0.0	182	2.384
4.000	2.394	169.2	2.7	1.200	1.122	0.015	0.0	27	0.891
4.001	3.711	262.3	15.1	1.122	1.113	0.084	0.0	49	2.019
4.002	4.293	474.2	42.1	1.038	1.114	0.233	0.0	76	2.658
4.003	3.471	383.3	76.3	1.114	1.625	0.422	0.0	113	2.702
4.004	5.067	559.6	238.5	1.625	1.442	1.320	0.0	171	4.865
2.000	2.080	147.0	0.0	1.200	1.217	0.000	0.0	0	0.000
2.001	2.082	147.1	13.8	1.217	1.053	0.077	0.0	62	1.310
2.002	3.644	257.6	49.8	1.053	1.425	0.276	0.0	89	2.817
2.003	4.874	538.4	89.2	1.350	1.365	0.493	0.0	103	3.601
2.004	3.511	558.4	103.8	1.290	2.450	0.574	0.0	131	2.685
2.005	4.030	640.9	151.6	2.450	1.700	0.839	0.0	149	3.299
8.000	4.730	752.3	26.7	1.150	1.750	0.148	0.0	58	2.215

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)
12.000	C2	C3	15.556	0.010	115.400	114.600	0.800	19.4	375	5.06	50.0
9.000	C4	C5	17.692	0.010	114.400	113.600	0.800	22.1	375	5.07	50.0
11.000	C6	C7	16.971	0.010	113.400	112.600	0.800	21.2	375	5.06	50.0
7.000	C8	C9	22.847	0.010	112.400	111.600	0.800	28.6	450	5.09	50.0
3.000	ES9	ES8	6.403	0.030	118.872	118.673	0.199	32.2	250	5.07	50.0
3.001	ES8	ES7	20.100	0.030	118.673	118.148	0.525	38.3	250	5.30	50.0
3.002	ES7	ES6	4.123	0.030	118.148	117.893	0.255	16.2	250	5.33	50.0
3.003	ES6	ES5	23.601	0.030	117.893	116.623	1.270	18.6	250	5.53	50.0
3.004	ES5	ES4	13.336	0.030	116.623	116.002	0.621	21.5	250	5.64	50.0
3.005	ES4	ES3	22.741	0.030	115.752	115.160	0.592	38.4	500	5.81	50.0
3.006	ES3	ES2	20.881	0.030	115.160	114.604	0.556	37.6	500	5.96	50.0
3.007	ES2	ES1	25.632	0.030	114.354	113.543	0.811	31.6	750	6.09	50.0
3.008	ES1	ES0	30.665	0.010	113.543	112.000	1.543	19.9	450	6.19	50.0
10.000	C10	C11	17.464	0.010	111.400	111.350	0.050	349.3	150	5.49	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
12.000	4.680	516.9	39.8	1.225	1.783	0.220	0.0	71	2.778
9.000	4.388	484.7	17.5	1.225	1.569	0.097	0.0	49	2.075
11.000	4.481	494.9	33.4	1.225	1.725	0.185	0.0	66	2.559
7.000	4.361	693.5	60.2	1.850	2.600	0.333	0.0	89	2.668
3.000	1.558	389.5	10.2	0.000	0.000	0.056	0.0	44	0.593
3.001	1.428	357.1	10.2	0.000	0.000	0.056	0.0	46	0.557
3.002	2.198	549.5	31.7	0.000	0.000	0.176	0.0	67	1.046
3.003	2.050	512.5	35.1	0.000	0.000	0.194	0.0	73	1.021
3.004	1.907	476.8	45.2	0.000	0.000	0.250	0.0	85	1.037
3.005	2.264	2263.6	59.7	0.000	0.000	0.330	0.0	89	0.864
3.006	2.289	2289.3	87.0	0.000	0.000	0.482	0.0	109	0.974
3.007	3.270	7357.7	112.8	0.000	0.357	0.624	0.0	101	1.068
3.008	5.228	831.4	162.1	0.657	2.200	0.897	0.0	135	4.056
10.000	0.599	10.6	310.2	3.100	0.500	1.717	0.0	150	0.611

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	S-1	S0	50.909	0.030	129.750	129.650	0.100	509.1	250	7.17	50.0
5.002	I1	F10	28.276	0.010	120.720	118.000	2.720	10.4	375	5.37	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.392	97.9	0.0	0.000	0.000	0.000	0.0	0	0.000
5.002	6.401	706.9	145.8	2.742	1.625	0.807	0.0	115	5.036

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)
1.001	45.607	5067.4	250	Swale	129.900	129.650	0.000	129.891	129.641	0.000
1.002	59.203	79.7	250	Swale	129.891	129.641	0.000	129.148	128.898	0.000
1.003	53.600	42.5	500	Swale	129.148	128.648	0.000	127.888	127.388	0.000
1.004	24.207	35.4	500	Swale	127.888	127.388	0.000	127.204	126.704	0.000
1.005	18.385	36.8	750	Swale	127.204	126.454	0.000	126.705	125.955	0.000
1.006	25.495	40.7	750	Swale	126.705	125.955	0.000	126.079	125.329	0.000
1.007	7.810	54.2	1000	Swale	126.079	125.079	0.000	125.935	124.935	0.000
1.008	7.211	67.4	1000	Swale	125.935	124.935	0.000	125.828	124.828	0.000

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	S0		Junction		S1		Junction	
1.002	S1		Junction		S2		Junction	
1.003	S2		Junction		S3		Junction	
1.004	S3		Junction		S4		Junction	
1.005	S4		Junction		S5		Junction	
1.006	S5		Junction		S6		Junction	
1.007	S6		Junction		S7		Junction	
1.008	S7		Junction		S8		Junction	

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)
6.000	22.672	86.9	1000	Swale	125.500	124.205	0.295	124.944	123.944	0.000
6.001	30.414	32.0	1000	Swale	124.944	123.944	0.000	123.993	122.993	0.000
6.002	21.682	21.2	1000	Swale	123.993	122.993	0.000	123.071	121.972	0.099
5.001	22.633	45.1	375	Circular	123.488	121.147	1.966	123.837	120.645	2.817
5.000	25.495	73.1	375	Circular	123.071	121.496	1.200	123.488	121.147	1.966
4.000	22.627	55.2	300	Circular	123.580	122.080	1.200	123.092	121.670	1.122
4.001	26.870	23.0	300	Circular	123.092	121.670	1.122	121.913	120.500	1.113
4.002	34.655	23.1	375	Circular	121.913	120.500	1.038	120.489	119.000	1.114
4.003	35.355	35.4	375	Circular	120.489	119.000	1.114	120.000	118.000	1.625
4.004	18.248	16.6	375	Circular	120.000	118.000	1.625	118.717	116.900	1.442
2.000	17.029	73.1	300	Circular	123.580	122.080	1.200	123.364	121.847	1.217
2.001	28.320	73.0	300	Circular	123.364	121.847	1.217	122.812	121.459	1.053

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
6.000	S12		Junction		S13		Junction	
6.001	S13		Junction		S14		Junction	
6.002	S14		Junction		S15		Junction	
5.001	I0	1350	Manhole	Adoptable	I1	1350	Manhole	Adoptable
5.000	S18	1500	Manhole	Adoptable	I0	1350	Manhole	Adoptable
4.000	F6	1200	Manhole	Adoptable	F7	1200	Manhole	Adoptable
4.001	F7	1200	Manhole	Adoptable	F8	1350	Manhole	Adoptable
4.002	F8	1350	Manhole	Adoptable	F9	1350	Manhole	Adoptable
4.003	F9	1350	Manhole	Adoptable	F10	1350	Manhole	Adoptable
4.004	F10	1350	Manhole	Adoptable	F11		Junction	
2.000	F6	1200	Manhole	Adoptable	F0	1200	Manhole	Adoptable
2.001	F0	1200	Manhole	Adoptable	F1	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)
2.002	35.355	23.8	300	Circular	122.812	121.459	1.053	121.700	119.975	1.425
2.003	28.231	17.9	375	Circular	121.700	119.975	1.350	120.140	118.400	1.365
2.004	57.280	44.1	450	Circular	120.140	118.400	1.290	120.000	117.100	2.450
2.005	50.160	33.4	450	Circular	120.000	117.100	2.450	117.750	115.600	1.700
8.000	19.416	24.3	450	Circular	118.000	116.400	1.150	117.800	115.600	1.750
12.000	15.556	19.4	375	Circular	117.000	115.400	1.225	116.758	114.600	1.783
9.000	17.692	22.1	375	Circular	116.000	114.400	1.225	115.544	113.600	1.569
11.000	16.971	21.2	375	Circular	115.000	113.400	1.225	114.700	112.600	1.725
7.000	22.847	28.6	450	Circular	114.700	112.400	1.850	114.650	111.600	2.600
3.000	6.403	32.2	250	Swale	119.122	118.872	0.000	118.923	118.673	0.000
3.001	20.100	38.3	250	Swale	118.923	118.673	0.000	118.398	118.148	0.000
3.002	4.123	16.2	250	Swale	118.398	118.148	0.000	118.143	117.893	0.000
3.003	23.601	18.6	250	Swale	118.143	117.893	0.000	116.873	116.623	0.000
3.004	13.336	21.5	250	Swale	116.873	116.623	0.000	116.252	116.002	0.000
3.005	22.741	38.4	500	Swale	116.252	115.752	0.000	115.660	115.160	0.000

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.002	F1	1200	Manhole	Adoptable	F2	1350	Manhole	Adoptable
2.003	F2	1350	Manhole	Adoptable	F3	1350	Manhole	Adoptable
2.004	F3	1350	Manhole	Adoptable	F4	1350	Manhole	Adoptable
2.005	F4	1350	Manhole	Adoptable	F5		Junction	
8.000	C0		Junction		C1		Junction	
12.000	C2		Junction		C3		Junction	
9.000	C4		Junction		C5		Junction	
11.000	C6		Junction		C7		Junction	
7.000	C8		Junction		C9		Junction	
3.000	ES9		Junction		ES8		Junction	
3.001	ES8		Junction		ES7		Junction	
3.002	ES7		Junction		ES6		Junction	
3.003	ES6		Junction		ES5		Junction	
3.004	ES5		Junction		ES4		Junction	
3.005	ES4		Junction		ES3		Junction	

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)
3.006	20.881	37.6	500	Swale	115.660	115.160	0.000	115.104	114.604	0.000
3.007	25.632	31.6	750	Swale	115.104	114.354	0.000	114.650	113.543	0.357
3.008	30.665	19.9	450	Circular	114.650	113.543	0.657	114.650	112.000	2.200
10.000	17.464	349.3	150	Circular	114.650	111.400	3.100	112.000	111.350	0.500
1.000	50.909	509.1	250	Swale	130.000	129.750	0.000	129.900	129.650	0.000
5.002	28.276	10.4	375	Circular	123.837	120.720	2.742	120.000	118.000	1.625

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.006	ES3		Junction		ES2		Junction	
3.007	ES2		Junction		ES1		Junction	
3.008	ES1		Junction		ES0		Junction	
10.000	C10		Junction		C11		Junction	
1.000	S-1		Junction		S0		Junction	
5.002	I1	1350	Manhole	Adoptable	F10	1350	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	442880.000	302311.000	129.891	0.250		1	1.001	129.641	250
						0	1.002	129.641	250
S0	442844.000	302339.000	129.900	0.250		1	1.000	129.650	250
						0	1.001	129.650	250
S3	442970.000	302243.000	127.888	0.500		1	1.003	127.388	500
						0	1.004	127.388	500

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S2	442927.000	302275.000	129.148	0.500		1	1.002	128.898	250
						0	1.003	128.648	500
S4	442989.000	302228.000	127.204	0.750		1	1.004	126.704	500
						0	1.005	126.454	750
S5	443002.000	302215.000	126.705	0.750		1	1.005	125.955	750
						0	1.006	125.955	750
S6	443019.000	302196.000	126.079	1.000		1	1.006	125.329	750
						0	1.007	125.079	1000
S7	443025.000	302191.000	125.935	1.000		1	1.007	124.935	1000
						0	1.008	124.935	1000
S8	443031.000	302187.000	125.828	1.583		1	1.008	124.828	1000
S12	443069.000	302164.000	125.500	1.295					
						0	6.000	124.205	1000
S13	443084.000	302147.000	124.944	1.000		1	6.000	123.944	1000
						0	6.001	123.944	1000

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S14	443106.000	302126.000	123.993	1.000		 1	6.001	122.993	1000
S15	443122.498	302111.931	123.071	1.537		 1	6.002	122.993	1000
S18	443160.000	302124.000	123.071	1.575	1500	 0	5.000	121.496	375
C0	443222.000	302101.000	118.000	1.600		 0	8.000	116.400	450
C1	443238.000	302090.000	117.800	2.367		 1	8.000	115.600	450
C2	443263.000	302069.000	117.000	1.600		 0	12.000	115.400	375
C3	443274.000	302058.000	116.758	2.339		 1	12.000	114.600	375
C4	443288.000	302045.000	116.000	1.600		 0	9.000	114.400	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
C5	443300.000	302032.000	115.544	2.126		1	1	9.000	113.600	375
C6	443313.000	302021.000	115.000	1.600		0	0	11.000	113.400	375
C7	443325.000	302009.000	114.700	2.277		1	1	11.000	112.600	375
C8	443343.000	301994.000	114.700	2.300		0	0	7.000	112.400	450
C9	443364.000	301985.000	114.650	3.166		1	1	7.000	111.600	450
C10	443445.000	301962.000	114.650	3.250		0	0	10.000	111.400	150
C11	443449.000	301945.000	112.000	0.650		1	1	10.000	111.350	150
ES0	443463.000	302002.840	114.650	3.166		1	1	3.008	112.000	450

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
ES1	443479.000	302029.000	114.650	1.107			1	3.007	113.543	750
							0	3.008	113.543	450
ES2	443488.000	302053.000	115.104	0.750			1	3.006	114.604	500
							0	3.007	114.354	750
ES3	443494.000	302073.000	115.660	0.500			1	3.005	115.160	500
							0	3.006	115.160	500
ES4	443501.000	302094.637	116.252	0.500			1	3.004	116.002	250
							0	3.005	115.752	500
ES5	443496.000	302107.000	116.873	0.250			1	3.003	116.623	250
							0	3.004	116.623	250
ES6	443482.000	302126.000	118.143	0.250			1	3.002	117.893	250
							0	3.003	117.893	250
ES7	443481.000	302130.000	118.398	0.250			1	3.001	118.148	250
							0	3.002	118.148	250
ES8	443483.000	302150.000	118.923	0.250			1	3.000	118.673	250
							0	3.001	118.673	250

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
ES9	443478.000	302154.000	119.122	0.250		 0	3.000	118.872	250
F6	443299.000	302220.000	123.580	1.500	1200	 0-1 0-2	4.000 2.000	122.080 122.080	300 300
F0	443312.000	302209.000	123.364	1.517	1200	 1 0	2.000 2.001	121.847 121.847	300 300
F2	443358.000	302165.000	121.700	1.725	1350	 1 0	2.002 2.003	119.975 119.975	300 375
F3	443347.000	302139.000	120.140	1.740	1350	 1 0	2.003 2.004	118.400 118.400	375 450
F4	443306.000	302099.000	120.000	2.900	1350	 1 0	2.004 2.005	117.100 117.100	450 450
F5	443260.000	302079.000	117.750	2.317		 1	2.005	115.600	450
F7	443283.000	302204.000	123.092	1.422	1200	 1 0	4.000 4.001	121.670 121.670	300 300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F1	443333.000	302190.000	122.812	1.353	1200		1 2.001	121.459	300
F8	443264.000	302185.000	121.913	1.413	1350		1 4.001	120.500	300
F9	443240.000	302160.000	120.489	1.489	1350		1 4.002	119.000	375
F10	443215.000	302135.000	120.000	2.000	1350		1 5.002 2 4.003	118.000	375
F11	443212.000	302117.000	118.717	2.277			1 4.004	116.900	375
I0	443179.000	302141.000	123.488	2.341	1350		1 5.000	121.147	375
I1	443196.000	302155.941	123.837	3.192	1350		1 5.001	120.645	375
S-1	442803.167	302369.403	130.000	0.250			0 1.000	129.750	250

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)		100 year (l/s)	52.4
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	✓	Check Discharge Volume	x
Summer CV	1.000	Drain Down Time (mins)	240	2 year (l/s)	19.0		
Winter CV	1.000	Additional Storage (m³/ha)	20.0	30 year (l/s)	41.2		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

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

Pre-development Discharge Rate

Site Makeup	Greenfield	BFIHost	0.562	Growth Factor 100 year	2.48	Q 30 year (l/s)	41.2
Greenfield Method	FEH	Region	1	Betterment (%)	0	Q 100 year (l/s)	52.4
Positively Drained Area (ha)	9.970	QBar/QMed conversion factor	1.111	QMed	19.0		
SAAR (mm)	645	Growth Factor 2 year	0.90	QBar	21.1		
Host	1	Growth Factor 30 year	1.95	Q 2 year (l/s)	19.0		

Node S2 Online Weir Control

Flap Valve	x	Invert Level (m)	128.648	Design Flow (l/s)	25.0	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Depth (m)	0.100	Width (m)	0.428		

Node S3 Online Weir Control

Flap Valve	x	Invert Level (m)	127.388	Design Flow (l/s)	40.0	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Depth (m)	0.100	Width (m)	0.685		

Node S8 Online Weir Control

Flap Valve	x	Invert Level (m)	124.245	Design Flow (l/s)	25.0	Discharge Coefficient	0.590
Replaces Downstream Link	x	Design Depth (m)	0.100	Width (m)	0.428		

Node F5 Online Weir Control

Flap Valve	✓	Invert Level (m)	115.433	Design Flow (l/s)	1675.0	Discharge Coefficient	0.590
Replaces Downstream Link	x	Design Depth (m)	1.600	Width (m)	0.448		

Node C9 Online Orifice Control

Flap Valve	✓	Invert Level (m)	111.484	Design Flow (l/s)	575.0	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Depth (m)	2.000	Diameter (m)	0.454		

Node C1 Online Orifice Control

Flap Valve	✓	Invert Level (m)	115.433	Design Flow (l/s)	385.0	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Depth (m)	1.600	Diameter (m)	0.394		

Node ES0 Online Orifice Control

Flap Valve	✓	Invert Level (m)	111.484	Design Flow (l/s)	600.0	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Depth (m)	2.500	Diameter (m)	0.436		

Node C10 Online Orifice Control

Flap Valve	x	Invert Level (m)	111.400	Design Flow (l/s)	21.1	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	2.900	Diameter (m)	0.077		

Node C0 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	40.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	116.400	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)	42	Main Channel n	0.030

Inlets

F11

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	183.0	0.0	1.600	670.0	0.0

Node C2 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	32.650
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	115.400	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)	20	Main Channel n	0.030

Inlets

C1 | F5

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	220.0	0.0	1.600	786.0	0.0

Node C4 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	19.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	114.400	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)	16	Main Channel n	0.030

Inlets

C3

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	113.0	0.0	1.600	445.0	0.0

Node C6 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	17.700
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	113.400	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)	36	Main Channel n	0.030

Inlets

C5

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	65.0	0.0	1.600	401.0	0.0

Node C8 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	23.400
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	112.400	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.030

Inlets

C7

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	163.0	0.0	1.600	691.0	0.0

Node C10 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	84.200
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	111.400	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.030

Inlets

C9 | E50

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	1128.8	0.0	3.250	4255.0	0.0

Node S12 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	40.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	124.205	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)	16	Main Channel n	0.030

Inlets S8

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	133.9	0.0	1.000	597.4	0.0

Node S18 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	38.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	121.496	Main Channel Slope (1:X)	999.0
Safety Factor	2.0	Time to half empty (mins)	27	Main Channel n	0.030

Inlets S15

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	183.0	0.0	1.415	685.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	112.641	31.873	2 year 7200 minute summer	1.792	0.457
2 year 15 minute winter	79.046	31.873	2 year 7200 minute winter	1.156	0.457
2 year 30 minute summer	72.577	20.537	2 year 8640 minute summer	1.615	0.412
2 year 30 minute winter	50.931	20.537	2 year 8640 minute winter	1.042	0.412
2 year 60 minute summer	47.937	12.668	2 year 10080 minute summer	1.489	0.380
2 year 60 minute winter	31.848	12.668	2 year 10080 minute winter	0.961	0.380
2 year 120 minute summer	34.335	9.074	30 year 15 minute summer	277.261	78.455
2 year 120 minute winter	22.811	9.074	30 year 15 minute winter	194.569	78.455
2 year 180 minute summer	27.760	7.143	30 year 30 minute summer	180.218	50.995
2 year 180 minute winter	18.044	7.143	30 year 30 minute winter	126.469	50.995
2 year 240 minute summer	22.427	5.927	30 year 60 minute summer	119.759	31.649
2 year 240 minute winter	14.900	5.927	30 year 60 minute winter	79.565	31.649
2 year 360 minute summer	17.297	4.451	30 year 120 minute summer	75.344	19.911
2 year 360 minute winter	11.244	4.451	30 year 120 minute winter	50.057	19.911
2 year 480 minute summer	13.539	3.578	30 year 180 minute summer	57.884	14.896
2 year 480 minute winter	8.995	3.578	30 year 180 minute winter	37.626	14.896
2 year 600 minute summer	10.983	3.004	30 year 240 minute summer	45.451	12.011
2 year 600 minute winter	7.504	3.004	30 year 240 minute winter	30.196	12.011
2 year 720 minute summer	9.691	2.597	30 year 360 minute summer	33.971	8.742
2 year 720 minute winter	6.513	2.597	30 year 360 minute winter	22.082	8.742
2 year 960 minute summer	7.814	2.058	30 year 480 minute summer	26.175	6.917
2 year 960 minute winter	5.176	2.058	30 year 480 minute winter	17.390	6.917
2 year 1440 minute summer	5.505	1.475	30 year 600 minute summer	21.019	5.749
2 year 1440 minute winter	3.699	1.475	30 year 600 minute winter	14.361	5.749
2 year 2160 minute summer	3.854	1.065	30 year 720 minute summer	18.410	4.934
2 year 2160 minute winter	2.656	1.065	30 year 720 minute winter	12.373	4.934
2 year 2880 minute summer	3.181	0.853	30 year 960 minute summer	14.687	3.868
2 year 2880 minute winter	2.138	0.853	30 year 960 minute winter	9.729	3.868
2 year 4320 minute summer	2.431	0.636	30 year 1440 minute summer	10.226	2.741
2 year 4320 minute winter	1.601	0.636	30 year 1440 minute winter	6.872	2.741
2 year 5760 minute summer	2.048	0.524	30 year 2160 minute summer	7.089	1.959
2 year 5760 minute winter	1.325	0.524	30 year 2160 minute winter	4.885	1.959

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 2880 minute summer	5.812	1.558	100 year 960 minute summer	18.111	4.769
30 year 2880 minute winter	3.906	1.558	100 year 960 minute winter	11.997	4.769
30 year 4320 minute summer	4.394	1.149	100 year 1440 minute summer	12.532	3.359
30 year 4320 minute winter	2.894	1.149	100 year 1440 minute winter	8.422	3.359
30 year 5760 minute summer	3.674	0.940	100 year 2160 minute summer	8.614	2.381
30 year 5760 minute winter	2.378	0.940	100 year 2160 minute winter	5.935	2.381
30 year 7200 minute summer	3.195	0.815	100 year 2880 minute summer	7.013	1.879
30 year 7200 minute winter	2.062	0.815	100 year 2880 minute winter	4.713	1.879
30 year 8640 minute summer	2.867	0.731	100 year 4320 minute summer	5.246	1.372
30 year 8640 minute winter	1.851	0.731	100 year 4320 minute winter	3.455	1.372
30 year 10080 minute summer	2.634	0.672	100 year 5760 minute summer	4.352	1.114
30 year 10080 minute winter	1.700	0.672	100 year 5760 minute winter	2.817	1.114
100 year 15 minute summer	347.397	98.301	100 year 7200 minute summer	3.764	0.960
100 year 15 minute winter	243.787	98.301	100 year 7200 minute winter	2.429	0.960
100 year 30 minute summer	228.458	64.646	100 year 8640 minute summer	3.363	0.858
100 year 30 minute winter	160.321	64.646	100 year 8640 minute winter	2.171	0.858
100 year 60 minute summer	152.960	40.423	100 year 10080 minute summer	3.080	0.786
100 year 60 minute winter	101.623	40.423	100 year 10080 minute winter	1.988	0.786
100 year 120 minute summer	94.617	25.004	100 year +40% CC 15 minute summer	486.355	137.622
100 year 120 minute winter	62.861	25.004	100 year +40% CC 15 minute winter	341.302	137.622
100 year 180 minute summer	72.217	18.584	100 year +40% CC 30 minute summer	319.841	90.504
100 year 180 minute winter	46.943	18.584	100 year +40% CC 30 minute winter	224.450	90.504
100 year 240 minute summer	56.529	14.939	100 year +40% CC 60 minute summer	214.144	56.592
100 year 240 minute winter	37.556	14.939	100 year +40% CC 60 minute winter	142.272	56.592
100 year 360 minute summer	42.160	10.849	100 year +40% CC 120 minute summer	132.464	35.006
100 year 360 minute winter	27.405	10.849	100 year +40% CC 120 minute winter	88.006	35.006
100 year 480 minute summer	32.431	8.571	100 year +40% CC 180 minute summer	101.103	26.017
100 year 480 minute winter	21.547	8.571	100 year +40% CC 180 minute winter	65.720	26.017
100 year 600 minute summer	26.006	7.113	100 year +40% CC 240 minute summer	79.140	20.914
100 year 600 minute winter	17.769	7.113	100 year +40% CC 240 minute winter	52.579	20.914
100 year 720 minute summer	22.750	6.097	100 year +40% CC 360 minute summer	59.024	15.189
100 year 720 minute winter	15.289	6.097	100 year +40% CC 360 minute winter	38.367	15.189

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 480 minute summer	45.404	11.999	100 year +40% CC 2880 minute summer	9.818	2.631
100 year +40% CC 480 minute winter	30.165	11.999	100 year +40% CC 2880 minute winter	6.598	2.631
100 year +40% CC 600 minute summer	36.409	9.959	100 year +40% CC 4320 minute summer	7.345	1.920
100 year +40% CC 600 minute winter	24.877	9.959	100 year +40% CC 4320 minute winter	4.837	1.920
100 year +40% CC 720 minute summer	31.849	8.536	100 year +40% CC 5760 minute summer	6.093	1.560
100 year +40% CC 720 minute winter	21.405	8.536	100 year +40% CC 5760 minute winter	3.944	1.560
100 year +40% CC 960 minute summer	25.356	6.677	100 year +40% CC 7200 minute summer	5.270	1.344
100 year +40% CC 960 minute winter	16.796	6.677	100 year +40% CC 7200 minute winter	3.401	1.344
100 year +40% CC 1440 minute summer	17.544	4.702	100 year +40% CC 8640 minute summer	4.709	1.201
100 year +40% CC 1440 minute winter	11.791	4.702	100 year +40% CC 8640 minute winter	3.039	1.201
100 year +40% CC 2160 minute summer	12.060	3.333	100 year +40% CC 10080 minute summer	4.312	1.100
100 year +40% CC 2160 minute winter	8.310	3.333	100 year +40% CC 10080 minute winter	2.783	1.100

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	S1	20	129.733	0.092	27.9	0.9485	0.0000	OK
30 minute summer	S0	20	129.767	0.117	14.1	0.8167	0.0000	OK
15 minute summer	S3	11	127.558	0.170	88.7	1.5504	0.0000	OK
15 minute summer	S2	11	128.804	0.156	49.2	1.0216	0.0000	OK
15 minute summer	S4	11	126.588	0.134	88.5	0.0000	0.0000	OK
15 minute summer	S5	11	126.091	0.136	88.3	0.0000	0.0000	OK
15 minute summer	S6	12	125.224	0.145	86.5	0.0000	0.0000	OK
15 minute summer	S7	12	125.087	0.152	86.5	0.0000	0.0000	OK
15 minute summer	S8	11	124.668	0.423	186.6	3.0908	0.0000	OK
15 minute summer	S12	13	124.458	0.253	255.6	2.4878	0.0000	OK
15 minute summer	S13	12	124.161	0.217	276.2	1.3540	0.0000	OK
15 minute summer	S14	12	123.198	0.205	305.1	0.8640	0.0000	OK
30 minute summer	S15	23	121.924	0.390	336.3	1.6942	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)
30 minute summer	S1	1.002	S2	23.7	0.579	0.096	2.4412	
30 minute summer	S0	1.001	S1	8.6	0.146	0.276	2.7187	
15 minute summer	S3	Weir	S4	88.5				
15 minute summer	S2	Weir	S3	48.6				
15 minute summer	S4	1.005	S5	88.3	1.002	0.013	1.6223	
15 minute summer	S5	1.006	S6	86.5	0.971	0.013	2.2743	
15 minute summer	S6	1.007	S7	86.5	0.841	0.007	0.8068	
15 minute summer	S7	1.008	S8	87.2	0.865	0.008	0.7280	
15 minute summer	S8	Flow through pond	S12	161.0	0.144	0.012	44.7851	
15 minute summer	S12	6.000	S13	232.4	1.062	0.024	5.0491	
15 minute summer	S13	6.001	S14	274.7	1.476	0.017	5.6643	
15 minute summer	S14	6.002	S15	300.6	1.700	0.016	3.8350	
30 minute summer	S15	Flow through pond	S18	255.1	0.121	0.020	104.6101	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	S18	23	121.924	0.428	342.2	4.5525	0.0000	SURCHARGED
30 minute summer	C0	24	116.643	0.243	315.3	0.4479	0.0000	OK
30 minute summer	C1	24	116.418	0.985	284.2	0.0000	0.0000	OK
30 minute summer	C2	22	115.639	0.239	388.7	0.6581	0.0000	OK
30 minute summer	C3	23	114.655	0.236	378.4	0.0000	0.0000	OK
30 minute summer	C4	23	114.649	0.249	378.5	0.3018	0.0000	OK
30 minute summer	C5	24	113.660	0.243	376.8	0.0000	0.0000	OK
30 minute summer	C6	24	113.648	0.248	383.0	0.5727	0.0000	OK
120 minute summer	C7	82	112.772	0.349	364.6	0.0000	0.0000	OK
120 minute summer	C8	82	112.771	0.371	358.9	1.0735	0.0000	OK
960 minute winter	C9	915	112.686	1.202	83.4	0.0000	0.0000	OK
960 minute winter	C10	945	112.686	1.286	67.7	13.5916	0.0000	SURCHARGED
15 minute summer	C11	1	111.350	0.000	8.4	0.0000	0.0000	OK
960 minute winter	ES0	945	112.686	1.201	13.0	0.0000	0.0000	OK
15 minute summer	ES1	11	113.676	0.133	157.2	0.6566	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)
30 minute summer	S18	5.000	I0	249.2	2.456	0.935	2.5939	
30 minute summer	C0	8.000	C1	284.2	2.832	0.378	2.3853	
30 minute summer	C1	Flow through pond	C2	365.4	0.212	0.009	59.2329	
30 minute summer	C2	12.000	C3	378.4	5.110	0.732	1.1519	
30 minute summer	C3	Flow through pond	C4	372.3	0.215	0.010	33.6679	
30 minute summer	C4	9.000	C5	376.8	4.847	0.777	1.3754	
30 minute summer	C5	Flow through pond	C6	374.1	0.297	0.013	22.3692	
30 minute summer	C6	11.000	C7	382.4	4.945	0.773	1.3125	
120 minute summer	C7	Flow through pond	C8	341.4	0.165	0.007	80.1462	
120 minute summer	C8	7.000	C9	336.2	2.593	0.485	3.4063	
960 minute winter	C9	Flow through pond	C10	43.6	0.027	0.000	2150.2646	
960 minute winter	C10	Orifice	C11	13.8				713.3
960 minute winter	ES0	Flow through pond	C10	43.6	0.027	0.000	2150.2646	
15 minute summer	ES1	3.008	ES0	156.9	4.013	0.189	1.1996	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ES2	11	114.498	0.144	109.6	0.5481	0.0000	OK
15 minute summer	ES3	11	115.292	0.132	85.3	0.7971	0.0000	OK
15 minute summer	ES4	11	115.864	0.112	58.8	0.3581	0.0000	OK
15 minute summer	ES5	11	116.709	0.085	44.6	0.3832	0.0000	OK
15 minute summer	ES6	11	117.966	0.073	34.8	0.1095	0.0000	OK
15 minute summer	ES7	11	118.215	0.067	31.9	0.6366	0.0000	OK
15 minute summer	ES8	11	118.720	0.047	10.3	0.0000	0.0000	OK
15 minute summer	ES9	10	118.917	0.045	10.4	0.2025	0.0000	OK
15 minute summer	F6	10	122.100	0.020	2.8	0.0269	0.0000	OK
15 minute summer	F0	10	121.912	0.065	15.4	0.1398	0.0000	OK
15 minute summer	F2	10	120.081	0.106	91.2	0.4175	0.0000	OK
15 minute summer	F3	10	118.535	0.135	105.5	0.3185	0.0000	OK
15 minute summer	F4	10	117.250	0.150	152.8	0.4895	0.0000	OK
15 minute summer	F5	11	115.794	0.362	153.2	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 summer	ES2	3.007	ES1	109.3	1.184	0.015	2.3682	
15 minute summer	ES3	3.006	ES2	84.7	0.994	0.037	1.7779	
15 minute summer	ES4	3.005	ES3	58.9	0.784	0.026	1.7143	
15 minute summer	ES5	3.004	ES4	44.8	1.035	0.094	0.5776	
15 minute summer	ES6	3.003	ES5	34.9	0.907	0.068	0.9144	
15 minute summer	ES7	3.002	ES6	31.4	0.982	0.057	0.1324	
15 minute summer	ES8	3.001	ES7	10.1	0.426	0.028	0.4852	
15 minute summer	ES9	3.000	ES8	10.3	0.581	0.026	0.1133	
15 minute summer	F6	4.000	F7	1.5	0.340	0.009	0.1028	
15 minute summer	F6	2.000	F0	1.3	0.208	0.009	0.1132	
15 minute summer	F0	2.001	F1	15.1	1.028	0.103	0.4200	
15 minute summer	F2	2.003	F3	90.6	2.976	0.168	0.8617	
15 minute summer	F3	2.004	F4	104.5	2.437	0.187	2.4701	
15 minute summer	F4	2.005	F5	153.2	3.050	0.239	2.8036	
15 minute summer	F5	Flow through pond	C2	348.8	0.218	0.008	56.5263	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	F7	10	121.717	0.047	14.1	0.0990	0.0000	OK
15 minute summer	F1	10	121.551	0.092	51.7	0.3759	0.0000	OK
15 minute summer	F8	10	120.575	0.075	41.4	0.2654	0.0000	OK
15 minute summer	F9	10	119.113	0.113	75.9	0.4491	0.0000	OK
30 minute summer	F10	20	118.227	0.227	322.4	0.5303	0.0000	OK
30 minute summer	F11	24	116.658	0.217	324.1	0.0000	0.0000	OK
30 minute summer	I0	20	121.443	0.296	254.6	0.6481	0.0000	OK
30 minute summer	I1	24	120.882	0.237	257.9	0.3680	0.0000	OK
30 minute summer	S-1	22	129.768	0.018	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 summer	F7	4.001	F8	13.9	1.358	0.053	0.2794	
15 minute summer	F1	2.002	F2	51.2	2.532	0.199	0.7158	
15 minute summer	F8	4.002	F9	41.0	1.905	0.087	0.7540	
15 minute summer	F9	4.003	F10	75.1	1.988	0.196	1.6459	
30 minute summer	F10	4.004	F11	324.1	4.928	0.579	1.1999	
30 minute summer	F11	Flow through pond	C0	297.8	0.287	0.011	50.3042	
30 minute summer	I0	5.001	I1	255.7	3.061	0.753	1.8812	
30 minute summer	I1	5.002	F10	257.9	4.786	0.365	1.6241	
30 minute summer	S-1	1.000	S0	-1.3	-0.049	-0.013	1.9128	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	12	129.788	0.147	76.6	1.5154	0.0000	OK
30 minute summer	S0	20	129.826	0.176	35.1	1.2231	0.0000	OK
15 minute summer	S3	11	127.710	0.322	231.3	2.9398	0.0000	OK
15 minute summer	S2	11	128.952	0.304	133.6	1.9943	0.0000	OK
15 minute summer	S4	11	126.660	0.206	231.0	0.0000	0.0000	OK
15 minute summer	S5	11	126.164	0.209	230.8	0.0000	0.0000	OK
15 minute summer	S6	11	125.302	0.223	228.5	0.0000	0.0000	OK
15 minute summer	S7	11	125.166	0.231	228.1	0.0000	0.0000	OK
15 minute summer	S8	11	125.052	0.807	476.4	5.8949	0.0000	OK
30 minute summer	S12	22	124.798	0.593	519.1	5.8294	0.0000	OK
15 minute summer	S13	13	124.288	0.344	434.4	2.1458	0.0000	OK
15 minute summer	S14	12	123.259	0.266	490.9	1.1221	0.0000	OK
60 minute summer	S15	48	122.525	0.991	547.5	4.3035	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 summer	S1	1.002	S2	67.5	0.758	0.273	5.3002	
30 minute summer	S0	1.001	S1	23.2	0.207	0.748	5.3712	
15 minute summer	S3	Weir	S4	231.0				
15 minute summer	S2	Weir	S3	132.6				
15 minute summer	S4	1.005	S5	230.8	1.275	0.034	3.3288	
15 minute summer	S5	1.006	S6	228.5	1.244	0.035	4.6852	
15 minute summer	S6	1.007	S7	228.1	1.076	0.019	1.6557	
15 minute summer	S7	1.008	S8	226.8	1.081	0.021	1.5307	
15 minute summer	S8	Flow through pond	S12	271.5	0.148	0.020	149.4197	
30 minute summer	S12	6.000	S13	345.3	1.386	0.036	5.6686	
15 minute summer	S13	6.001	S14	407.9	1.647	0.026	7.6043	
15 minute summer	S14	6.002	S15	482.0	1.928	0.025	5.4211	
60 minute summer	S15	Flow through pond	S18	349.8	0.109	0.027	366.0850	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S18	48	122.526	1.030	524.3	10.9637	0.0000	SURCHARGED
60 minute summer	C0	54	117.024	0.624	412.8	1.1515	0.0000	SURCHARGED
60 minute summer	C1	54	116.834	1.401	350.0	0.0000	0.0000	OK
30 minute summer	C2	22	115.827	0.427	650.3	1.1774	0.0000	SURCHARGED
60 minute summer	C3	42	114.900	0.481	553.8	0.0000	0.0000	OK
60 minute summer	C4	42	114.900	0.500	549.1	0.6049	0.0000	SURCHARGED
180 minute summer	C5	144	114.042	0.625	482.6	0.0000	0.0000	OK
180 minute summer	C6	144	114.042	0.642	491.0	1.4831	0.0000	SURCHARGED
180 minute summer	C7	152	113.623	1.199	481.7	0.0000	0.0000	OK
180 minute summer	C8	152	113.622	1.222	427.3	3.5383	0.0000	SURCHARGED
240 minute summer	C9	180	113.456	1.972	320.3	0.0000	0.0000	OK
960 minute winter	C10	960	113.429	2.029	107.0	21.4370	0.0000	SURCHARGED
15 minute summer	C11	1	111.350	0.000	12.3	0.0000	0.0000	OK
960 minute winter	ES0	960	113.429	1.944	24.3	0.0000	0.0000	OK
15 minute summer	ES1	11	113.762	0.218	392.3	1.0781	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)
60 minute summer	S18	5.000	I0	327.4	2.969	1.228	2.8120	
60 minute summer	C0	8.000	C1	350.0	2.885	0.465	3.0763	
60 minute summer	C1	Flow through pond	C2	525.6	0.209	0.012	97.6811	
30 minute summer	C2	12.000	C3	549.8	5.338	1.064	1.7158	
60 minute summer	C3	Flow through pond	C4	522.3	0.215	0.013	80.5490	
60 minute summer	C4	9.000	C5	517.9	4.957	1.069	1.9514	
180 minute summer	C5	Flow through pond	C6	463.3	0.291	0.016	83.3134	
180 minute summer	C6	11.000	C7	481.7	5.048	0.973	1.8719	
180 minute summer	C7	Flow through pond	C8	377.5	0.153	0.008	439.3914	
180 minute summer	C8	7.000	C9	332.4	2.545	0.479	3.6200	
240 minute summer	C9	Flow through pond	C10	157.3	0.051	0.001	3560.2571	
960 minute winter	C10	Orifice	C11	17.5				918.2
960 minute winter	ES0	Flow through pond	C10	65.2	0.033	0.001	4142.6777	
15 minute summer	ES1	3.008	ES0	393.4	4.364	0.473	3.5994	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ES2	11	114.568	0.214	273.9	0.8152	0.0000	OK
15 minute summer	ES3	11	115.359	0.199	211.8	1.2030	0.0000	OK
15 minute summer	ES4	11	115.922	0.170	145.3	0.5425	0.0000	OK
15 minute summer	ES5	11	116.754	0.131	111.3	0.5877	0.0000	OK
15 minute summer	ES6	10	118.006	0.113	86.6	0.1694	0.0000	OK
15 minute summer	ES7	10	118.252	0.104	79.0	0.9947	0.0000	OK
15 minute summer	ES8	10	118.747	0.074	25.3	0.0000	0.0000	OK
15 minute summer	ES9	10	118.943	0.071	25.5	0.3216	0.0000	OK
15 minute summer	F6	10	122.111	0.031	6.8	0.0407	0.0000	OK
15 minute summer	F0	10	121.952	0.105	37.8	0.2250	0.0000	OK
15 minute summer	F2	10	120.154	0.179	225.1	0.7065	0.0000	OK
15 minute summer	F3	10	118.628	0.228	260.4	0.5389	0.0000	OK
15 minute summer	F4	10	117.348	0.248	378.5	0.8088	0.0000	OK
15 minute summer	F5	11	116.101	0.668	375.3	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 summer	ES2	3.007	ES1	274.4	1.410	0.037	4.9902	
15 minute summer	ES3	3.006	ES2	212.3	1.259	0.093	3.5219	
15 minute summer	ES4	3.005	ES3	146.0	0.988	0.064	3.3799	
15 minute summer	ES5	3.004	ES4	110.8	1.312	0.232	1.1256	
15 minute summer	ES6	3.003	ES5	85.9	1.149	0.168	1.7758	
15 minute summer	ES7	3.002	ES6	78.1	1.251	0.142	0.2578	
15 minute summer	ES8	3.001	ES7	25.0	0.543	0.070	0.9414	
15 minute summer	ES9	3.000	ES8	25.3	0.745	0.065	0.2179	
15 minute summer	F6	4.000	F7	3.6	0.441	0.021	0.1943	
15 minute summer	F6	2.000	F0	3.1	0.263	0.021	0.2191	
15 minute summer	F0	2.001	F1	37.4	1.280	0.254	0.8334	
15 minute summer	F2	2.003	F3	223.8	3.668	0.416	1.7215	
15 minute summer	F3	2.004	F4	258.7	3.042	0.463	4.8805	
15 minute summer	F4	2.005	F5	375.3	3.081	0.585	6.2237	
15 minute summer	F5	Flow through pond	C2	570.8	0.249	0.013	112.8134	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	F7	10	121.744	0.074	34.7	0.1547	0.0000	OK
15 minute summer	F1	10	121.615	0.156	127.5	0.6336	0.0000	OK
15 minute summer	F8	10	120.618	0.118	102.1	0.4188	0.0000	OK
15 minute summer	F9	10	119.188	0.188	187.2	0.7482	0.0000	OK
15 minute summer	F10	12	118.503	0.503	527.2	1.1740	0.0000	SURCHARGED
60 minute summer	F11	54	117.025	0.585	458.9	0.0000	0.0000	OK
60 minute summer	I0	48	121.727	0.580	331.5	1.2698	0.0000	SURCHARGED
60 minute summer	I1	49	120.912	0.267	332.4	0.4145	0.0000	OK
15 minute summer	S-1	13	129.830	0.080	7.2	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 summer	F7	4.001	F8	34.5	1.776	0.131	0.5266	
15 minute summer	F1	2.002	F2	126.6	3.142	0.491	1.4248	
15 minute summer	F8	4.002	F9	101.4	2.398	0.214	1.4735	
15 minute summer	F9	4.003	F10	185.8	2.251	0.485	2.9247	
15 minute summer	F10	4.004	F11	515.0	5.294	0.920	1.8224	
60 minute summer	F11	Flow through pond	C0	368.8	0.279	0.014	166.5408	
60 minute summer	I0	5.001	I1	331.5	3.154	0.976	2.1997	
60 minute summer	I1	5.002	F10	332.3	5.026	0.470	2.0528	
15 minute summer	S-1	1.000	S0	-7.2	-0.117	-0.073	4.4036	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	12	129.805	0.164	96.8	1.6900	0.0000	OK
30 minute summer	S0	20	129.846	0.196	44.5	1.3616	0.0000	OK
15 minute summer	S3	11	127.765	0.377	293.1	3.4438	0.0000	OK
15 minute summer	S2	11	129.006	0.358	170.6	2.3489	0.0000	OK
15 minute summer	S4	11	126.682	0.228	292.9	0.0000	0.0000	OK
15 minute summer	S5	11	126.187	0.232	292.7	0.0000	0.0000	OK
15 minute summer	S6	12	125.438	0.359	290.5	0.0000	0.0000	OK
15 minute summer	S7	12	125.309	0.374	284.2	0.0000	0.0000	OK
15 minute summer	S8	12	125.187	0.942	581.2	6.8835	0.0000	OK
30 minute summer	S12	23	124.966	0.761	607.3	7.4895	0.0000	OK
30 minute summer	S13	21	124.440	0.496	463.5	3.0970	0.0000	OK
30 minute summer	S14	22	123.398	0.405	515.4	1.7088	0.0000	OK
60 minute summer	S15	54	122.755	1.221	599.8	5.3021	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 summer	S1	1.002	S2	86.8	0.808	0.351	6.3883	
30 minute summer	S0	1.001	S1	30.7	0.227	0.989	6.4427	
15 minute summer	S3	Weir	S4	292.9				
15 minute summer	S2	Weir	S3	169.5				
15 minute summer	S4	1.005	S5	292.7	1.353	0.043	3.9788	
15 minute summer	S5	1.006	S6	290.5	1.322	0.045	5.6053	
15 minute summer	S6	1.007	S7	284.2	1.137	0.023	1.9527	
15 minute summer	S7	1.008	S8	286.5	1.146	0.026	1.8030	
15 minute summer	S8	Flow through pond	S12	318.9	0.151	0.023	211.9827	
30 minute summer	S12	6.000	S13	350.2	1.401	0.037	5.6686	
30 minute summer	S13	6.001	S14	410.7	1.643	0.026	7.6043	
30 minute summer	S14	6.002	S15	482.3	1.929	0.025	5.4211	
60 minute summer	S15	Flow through pond	S18	363.9	0.107	0.028	499.7215	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S18	54	122.755	1.259	575.3	13.4042	0.0000	SURCHARGED
60 minute summer	C0	61	117.218	0.817	448.3	1.5074	0.0000	SURCHARGED
60 minute summer	C1	61	117.002	1.569	372.6	0.0000	0.0000	OK
30 minute summer	C2	22	115.930	0.530	697.2	1.4609	0.0000	SURCHARGED
60 minute summer	C3	53	115.017	0.598	553.5	0.0000	0.0000	OK
60 minute summer	C4	53	115.016	0.616	556.4	0.7464	0.0000	SURCHARGED
180 minute summer	C5	164	114.346	0.928	514.3	0.0000	0.0000	OK
180 minute summer	C6	164	114.346	0.946	503.3	2.1852	0.0000	SURCHARGED
180 minute summer	C7	172	113.919	1.496	486.6	0.0000	0.0000	OK
180 minute summer	C8	172	113.919	1.519	434.1	4.3973	0.0000	SURCHARGED
240 minute summer	C9	200	113.756	2.272	323.8	0.0000	0.0000	OK
960 minute winter	C10	960	113.726	2.326	130.3	24.5812	0.0000	SURCHARGED
15 minute summer	C11	1	111.350	0.000	13.3	0.0000	0.0000	OK
960 minute winter	ES0	960	113.726	2.242	30.0	0.0000	0.0000	OK
15 minute summer	ES1	11	113.842	0.299	491.4	1.4765	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)
60 minute summer	S18	5.000	I0	350.3	3.176	1.314	2.8120	
60 minute summer	C0	8.000	C1	372.6	2.895	0.495	3.0763	
60 minute summer	C1	Flow through pond	C2	550.3	0.209	0.013	143.2260	
30 minute summer	C2	12.000	C3	552.2	5.174	1.068	1.7158	
60 minute summer	C3	Flow through pond	C4	519.5	0.215	0.013	106.9754	
60 minute summer	C4	9.000	C5	517.9	4.947	1.068	1.9514	
180 minute summer	C5	Flow through pond	C6	468.8	0.291	0.017	153.2339	
180 minute summer	C6	11.000	C7	486.6	4.974	0.983	1.8719	
180 minute summer	C7	Flow through pond	C8	371.9	0.155	0.008	620.7397	
180 minute summer	C8	7.000	C9	331.0	2.533	0.477	3.6200	
240 minute summer	C9	Flow through pond	C10	156.9	0.053	0.001	4393.7017	
960 minute winter	C10	Orifice	C11	18.7				991.6
960 minute winter	ES0	Flow through pond	C10	73.4	0.037	0.001	5089.6865	
15 minute summer	ES1	3.008	ES0	478.9	4.632	0.576	4.1456	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ES2	11	114.592	0.238	343.6	0.9052	0.0000	OK
15 minute summer	ES3	11	115.380	0.220	266.4	1.3277	0.0000	OK
15 minute summer	ES4	11	115.939	0.187	182.6	0.5994	0.0000	OK
15 minute summer	ES5	11	116.768	0.145	139.7	0.6514	0.0000	OK
15 minute summer	ES6	10	118.018	0.125	108.7	0.1884	0.0000	OK
15 minute summer	ES7	10	118.264	0.116	99.0	1.1068	0.0000	OK
15 minute summer	ES8	10	118.756	0.083	31.8	0.0000	0.0000	OK
15 minute summer	ES9	10	118.952	0.080	32.0	0.3600	0.0000	OK
15 minute summer	F6	10	122.114	0.034	8.5	0.0453	0.0000	OK
15 minute summer	F0	10	121.967	0.120	47.4	0.2577	0.0000	OK
15 minute summer	F2	10	120.183	0.208	282.0	0.8208	0.0000	OK
15 minute summer	F3	10	118.663	0.263	326.3	0.6205	0.0000	OK
15 minute summer	F4	10	117.403	0.303	474.6	0.9875	0.0000	OK
15 minute summer	F5	11	116.213	0.780	469.9	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 summer	ES2	3.007	ES1	343.7	1.434	0.047	6.1457	
15 minute summer	ES3	3.006	ES2	266.4	1.334	0.116	4.1713	
15 minute summer	ES4	3.005	ES3	182.8	1.046	0.081	4.0004	
15 minute summer	ES5	3.004	ES4	138.7	1.391	0.291	1.3301	
15 minute summer	ES6	3.003	ES5	107.9	1.219	0.211	2.0976	
15 minute summer	ES7	3.002	ES6	98.0	1.327	0.178	0.3050	
15 minute summer	ES8	3.001	ES7	31.4	0.576	0.088	1.1126	
15 minute summer	ES9	3.000	ES8	31.8	0.792	0.082	0.2572	
15 minute summer	F6	4.000	F7	4.5	0.469	0.027	0.2280	
15 minute summer	F6	2.000	F0	3.9	0.274	0.027	0.2621	
15 minute summer	F0	2.001	F1	46.9	1.331	0.319	1.0018	
15 minute summer	F2	2.003	F3	280.4	3.855	0.521	2.0478	
15 minute summer	F3	2.004	F4	324.5	3.095	0.581	6.0076	
15 minute summer	F4	2.005	F5	469.9	3.163	0.733	6.8239	
15 minute summer	F5	Flow through pond	C2	606.1	0.250	0.014	147.5148	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	F7	10	121.753	0.083	43.5	0.1734	0.0000	OK
15 minute summer	F1	10	121.640	0.181	159.8	0.7362	0.0000	OK
15 minute summer	F8	10	120.633	0.133	127.9	0.4715	0.0000	OK
15 minute summer	F9	11	119.299	0.299	234.6	1.1869	0.0000	OK
15 minute summer	F10	11	118.902	0.902	593.8	2.1069	0.0000	SURCHARGED
60 minute summer	F11	61	117.217	0.777	516.1	0.0000	0.0000	OK
60 minute winter	I0	53	121.841	0.694	354.5	1.5197	0.0000	SURCHARGED
60 minute summer	I1	55	120.922	0.277	355.2	0.4293	0.0000	OK
15 minute summer	S-1	13	129.851	0.101	9.8	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 summer	F7	4.001	F8	43.2	1.898	0.165	0.6170	
15 minute summer	F1	2.002	F2	158.5	3.291	0.616	1.7030	
15 minute summer	F8	4.002	F9	127.2	2.440	0.268	2.2228	
15 minute summer	F9	4.003	F10	221.9	2.310	0.579	3.6130	
15 minute summer	F10	4.004	F11	586.4	5.333	1.048	2.0126	
60 minute summer	F11	Flow through pond	C0	413.3	0.274	0.015	242.9980	
60 minute winter	I0	5.001	I1	354.4	3.341	1.044	2.2348	
60 minute summer	I1	5.002	F10	355.2	5.228	0.502	2.3184	
15 minute summer	S-1	1.000	S0	-9.8	-0.134	-0.100	5.4618	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	129.831	0.190	136.7	1.9555	0.0000	OK
30 minute summer	S0	20	129.878	0.228	62.3	1.5857	0.0000	OK
15 minute summer	S3	11	127.864	0.476	415.5	4.3447	0.0000	OK
15 minute summer	S2	11	129.103	0.455	254.8	2.9823	0.0000	OK
15 minute summer	S4	12	126.906	0.452	415.0	0.0000	0.0000	OK
15 minute summer	S5	13	126.382	0.427	386.5	0.0000	0.0000	OK
15 minute summer	S6	13	125.735	0.656	350.9	0.0000	0.0000	OK
30 minute summer	S7	21	125.545	0.610	338.1	0.0000	0.0000	OK
15 minute summer	S8	12	125.383	1.138	750.2	8.3118	0.0000	OK
30 minute summer	S12	25	125.260	1.055	753.3	10.3747	0.0000	FLOOD RISK
30 minute summer	S13	22	124.741	0.797	516.7	4.9774	0.0000	OK
60 minute summer	S14	41	123.700	0.707	518.1	2.9813	0.0000	OK
60 minute winter	S15	62	123.062	1.528	575.0	6.6316	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 summer	S1	1.002	S2	130.7	0.849	0.528	9.8502	
30 minute summer	S0	1.001	S1	46.3	0.263	1.491	8.2282	
15 minute summer	S3	Weir	S4	415.0				
15 minute summer	S2	Weir	S3	242.7				
15 minute summer	S4	1.005	S5	386.5	1.546	0.057	4.5968	
15 minute summer	S5	1.006	S6	350.9	1.404	0.054	6.3745	
15 minute summer	S6	1.007	S7	354.6	1.419	0.029	1.9527	
30 minute summer	S7	1.008	S8	338.9	1.356	0.031	1.8030	
15 minute summer	S8	Flow through pond	S12	349.2	0.145	0.026	351.1758	
30 minute summer	S12	6.000	S13	354.0	1.416	0.037	5.6686	
30 minute summer	S13	6.001	S14	415.8	1.663	0.026	7.6043	
60 minute summer	S14	6.002	S15	468.6	1.902	0.024	5.4211	
60 minute winter	S15	Flow through pond	S18	371.7	0.108	0.029	703.9365	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	S18	61	123.062	1.566	584.2	16.6688	0.0000	FLOOD RISK
120 minute summer	C0	112	117.570	1.170	449.6	2.1577	0.0000	SURCHARGED
120 minute summer	C1	112	117.333	1.901	390.5	0.0000	0.0000	OK
30 minute summer	C2	23	116.115	0.715	823.1	1.9715	0.0000	SURCHARGED
240 minute summer	C3	228	115.345	0.926	550.8	0.0000	0.0000	OK
240 minute summer	C4	228	115.345	0.945	522.5	1.1443	0.0000	SURCHARGED
240 minute summer	C5	232	114.845	1.427	511.1	0.0000	0.0000	OK
240 minute summer	C6	232	114.845	1.445	491.2	3.3362	0.0000	FLOOD RISK
240 minute summer	C7	244	114.443	2.020	452.5	0.0000	0.0000	OK
240 minute summer	C8	244	114.443	2.043	409.8	5.9135	0.0000	FLOOD RISK
10080 minute summer	C9	6660	114.313	2.828	56.8	0.0000	0.0000	OK
10080 minute summer	C10	6840	114.326	2.926	54.1	30.9193	0.0000	SURCHARGED
15 minute summer	C11	1	111.350	0.000	15.0	0.0000	0.0000	OK
10080 minute summer	ES0	6840	114.325	2.840	14.9	0.0000	0.0000	OK
10080 minute summer	ES1	6840	114.324	0.781	10.8	3.8542	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)
60 minute winter	S18	5.000	I0	380.3	3.449	1.426	2.8120	
120 minute summer	C0	8.000	C1	390.5	2.826	0.519	3.0763	
120 minute summer	C1	Flow through pond	C2	544.9	0.204	0.013	182.6695	
30 minute summer	C2	12.000	C3	602.5	5.463	1.166	1.7158	
240 minute summer	C3	Flow through pond	C4	502.6	0.211	0.013	196.7082	
240 minute summer	C4	9.000	C5	511.1	4.975	1.054	1.9514	
240 minute summer	C5	Flow through pond	C6	453.3	0.292	0.016	309.7211	
240 minute summer	C6	11.000	C7	452.5	4.942	0.914	1.8719	
240 minute summer	C7	Flow through pond	C8	350.4	0.151	0.008	981.1068	
240 minute summer	C8	7.000	C9	315.1	2.365	0.454	3.6200	
10080 minute summer	C9	Flow through pond	C10	42.2	0.017	0.000	7259.0630	
10080 minute summer	C10	Orifice	C11	21.0				9132.0
10080 minute summer	ES0	Flow through pond	C10	42.2	0.017	0.000	7259.0630	
10080 minute summer	ES1	3.008	ES0	14.9	1.062	0.018	4.8587	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	ES2	13	115.033	0.679	473.5	2.5832	0.0000	OK
15 minute summer	ES3	12	115.461	0.301	374.5	1.8164	0.0000	OK
15 minute summer	ES4	11	115.969	0.217	256.7	0.6940	0.0000	OK
15 minute summer	ES5	10	116.792	0.169	196.0	0.7573	0.0000	OK
15 minute summer	ES6	10	118.039	0.146	152.5	0.2201	0.0000	OK
15 minute summer	ES7	10	118.284	0.136	138.7	1.2949	0.0000	OK
15 minute summer	ES8	10	118.771	0.098	44.5	0.0000	0.0000	OK
15 minute summer	ES9	10	118.966	0.094	44.8	0.4240	0.0000	OK
15 minute summer	F6	10	122.120	0.040	11.9	0.0531	0.0000	OK
15 minute summer	F0	10	121.997	0.150	66.3	0.3219	0.0000	OK
15 minute summer	F2	11	120.289	0.314	394.2	1.2413	0.0000	OK
15 minute summer	F3	11	119.247	0.847	456.3	1.9993	0.0000	SURCHARGED
15 minute summer	F4	11	118.186	1.086	634.2	3.5373	0.0000	SURCHARGED
15 minute summer	F5	12	116.403	0.971	628.4	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 summer	ES2	3.007	ES1	380.2	1.521	0.052	6.4087	
15 minute summer	ES3	3.006	ES2	360.3	1.441	0.157	5.2208	
15 minute summer	ES4	3.005	ES3	255.7	1.153	0.113	5.0646	
15 minute summer	ES5	3.004	ES4	194.0	1.516	0.407	1.7065	
15 minute summer	ES6	3.003	ES5	151.5	1.328	0.296	2.7011	
15 minute summer	ES7	3.002	ES6	137.6	1.448	0.250	0.3922	
15 minute summer	ES8	3.001	ES7	44.1	0.629	0.123	1.4290	
15 minute summer	ES9	3.000	ES8	44.5	0.866	0.114	0.3296	
15 minute summer	F6	4.000	F7	6.3	0.517	0.037	0.2897	
15 minute summer	F6	2.000	F0	5.5	0.288	0.037	0.3478	
15 minute summer	F0	2.001	F1	65.6	1.404	0.446	1.3508	
15 minute summer	F2	2.003	F3	392.0	4.029	0.728	2.9479	
15 minute summer	F3	2.004	F4	433.9	3.012	0.777	9.0756	
15 minute summer	F4	2.005	F5	628.4	3.967	0.980	7.9475	
15 minute summer	F5	Flow through pond	C2	680.1	0.248	0.016	220.0747	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	F7	10	121.768	0.098	60.8	0.2063	0.0000	OK
15 minute summer	F1	10	121.698	0.239	223.6	0.9719	0.0000	OK
15 minute summer	F8	11	120.717	0.217	179.0	0.7677	0.0000	OK
15 minute summer	F9	12	120.408	1.408	318.1	5.5978	0.0000	FLOOD RISK
15 minute summer	F10	12	119.643	1.643	706.6	3.8361	0.0000	SURCHARGED
120 minute summer	F11	112	117.570	1.130	528.6	0.0000	0.0000	OK
60 minute winter	I0	59	121.992	0.845	382.8	1.8502	0.0000	SURCHARGED
15 minute summer	I1	12	120.971	0.326	359.8	0.5059	0.0000	OK
15 minute summer	S-1	13	129.881	0.131	14.5	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 summer	F7	4.001	F8	60.5	2.049	0.231	0.9949	
15 minute summer	F1	2.002	F2	221.3	3.501	0.859	2.2593	
15 minute summer	F8	4.002	F9	167.7	2.461	0.354	3.0535	
15 minute summer	F9	4.003	F10	286.4	2.597	0.747	3.8996	
15 minute summer	F10	4.004	F11	704.3	6.386	1.258	2.0037	
120 minute summer	F11	Flow through pond	C0	412.3	0.267	0.015	412.1722	
60 minute winter	I0	5.001	I1	382.8	3.591	1.128	2.2583	
15 minute summer	I1	5.002	F10	359.9	5.279	0.509	2.6695	
15 minute summer	S-1	1.000	S0	-14.5	-0.154	-0.148	7.4692	

Water Quality

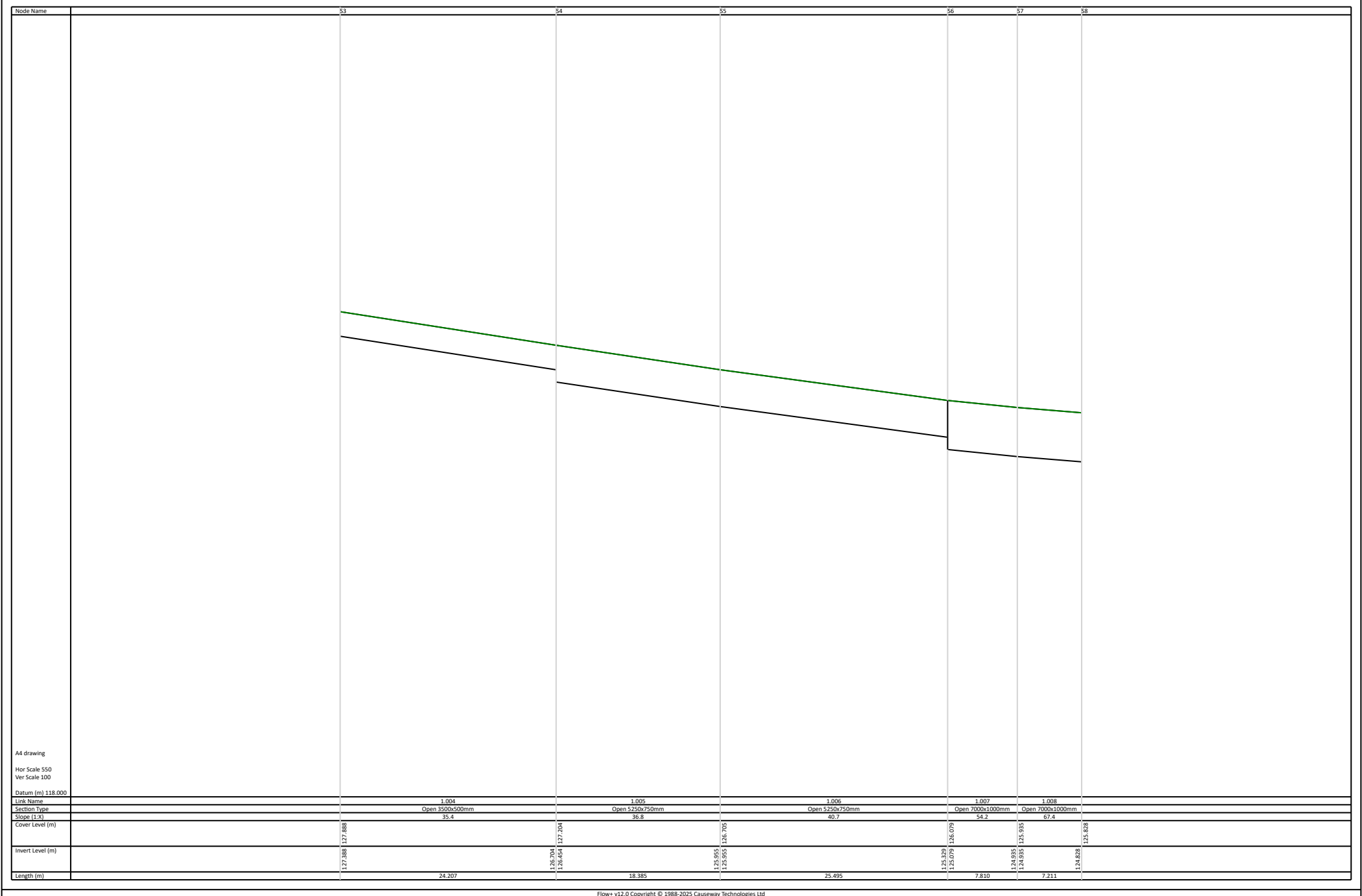
Area (ha)	Intended Land Use	Entering via Node or Link	Name	SuDS Component	Pollution hazard indices			Pollution mitigation indices			Cumulative pollution hazard indices		
					TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons
		Link	3.000	Swale				0.5	0.6	0.6			
		Link	3.001	Swale				0.25	0.3	0.3			
		Link	3.002	Swale				0.25	0.3	0.3			
		Link	3.003	Swale				0.25	0.3	0.3			
		Link	3.004	Swale				0.25	0.3	0.3			
		Link	3.005	Swale				0.25	0.3	0.3			
		Link	3.006	Swale				0.25	0.3	0.3			
		Link	3.007	Swale				0.25	0.3	0.3			
		Link	1.000	Swale				0.5	0.6	0.6			
		Link	1.001	Swale				0.25	0.3	0.3			
		Link	1.002	Swale				0.25	0.3	0.3			
		Link	1.003	Swale				0.25	0.3	0.3			
		Link	1.004	Swale				0.25	0.3	0.3			
		Link	1.005	Swale				0.25	0.3	0.3			
		Link	1.006	Swale				0.25	0.3	0.3			
		Link	1.007	Swale				0.25	0.3	0.3			
		Link	1.008	Swale				0.25	0.3	0.3			
		Node	S12	Detention Basin				0.25	0.25	0.3			
		Link	6.000	Swale				0.25	0.3	0.3			
		Link	6.001	Swale				0.25	0.3	0.3			
		Link	6.002	Swale				0.25	0.3	0.3			
		Node	C0	Detention Basin				0.25	0.25	0.3			
		Node	C2	Detention Basin				0.25	0.25	0.3			
		Node	C4	Detention Basin				0.25	0.25	0.3			
		Node	C6	Detention Basin				0.25	0.25	0.3			
		Node	C8	Detention Basin				0.25	0.25	0.3			
		Node	C10	Detention Basin				0.25	0.25	0.3			
		Node	C11	Detention Basin									
											Sufficient	Sufficient	Sufficient

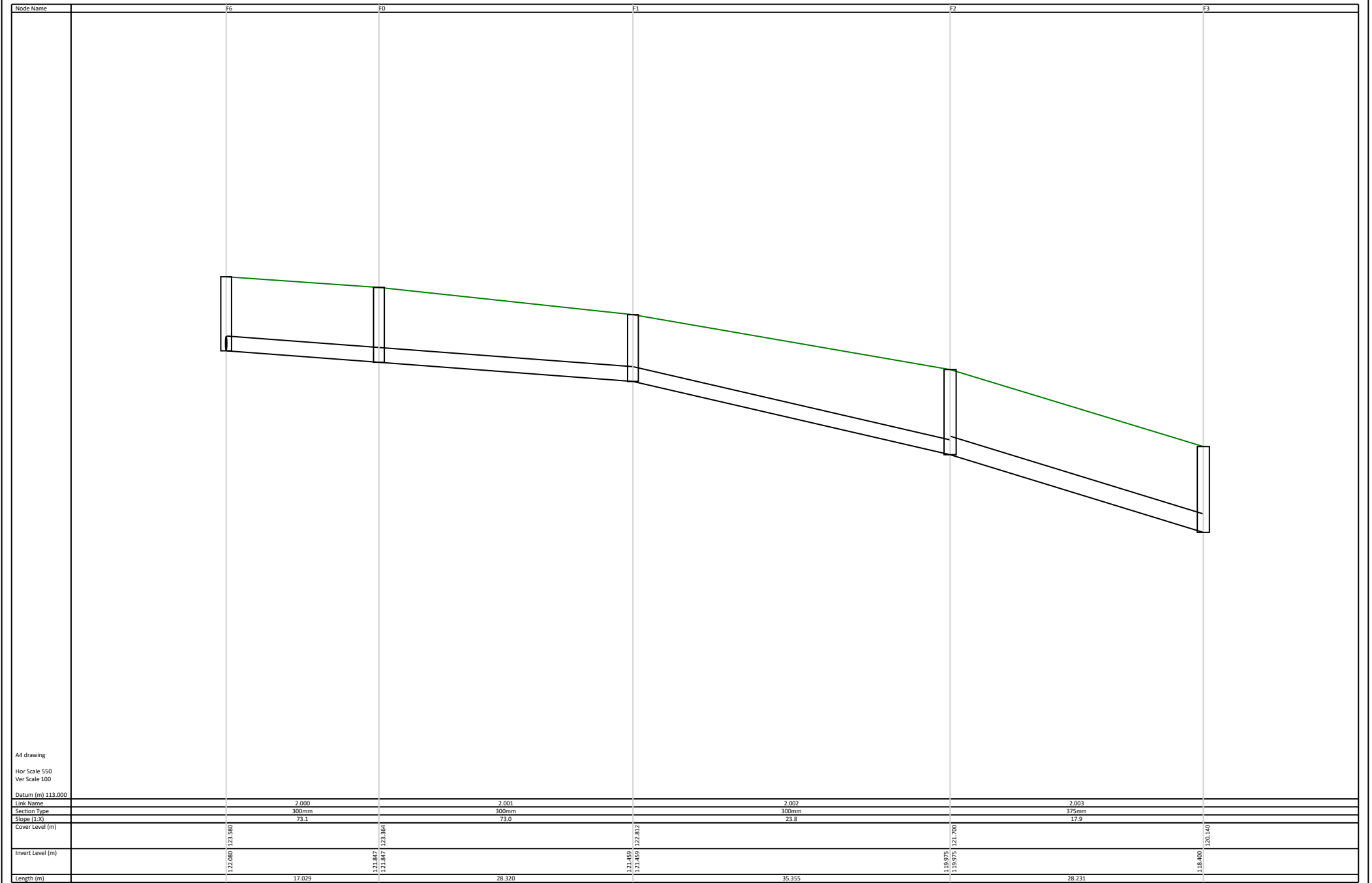
Water Quality

Area (ha)	Intended Land Use	Entering via Node or Link	Name	SuDS Component	Pollution hazard indices			Pollution mitigation indices			Cumulative pollution hazard indices		
					TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons

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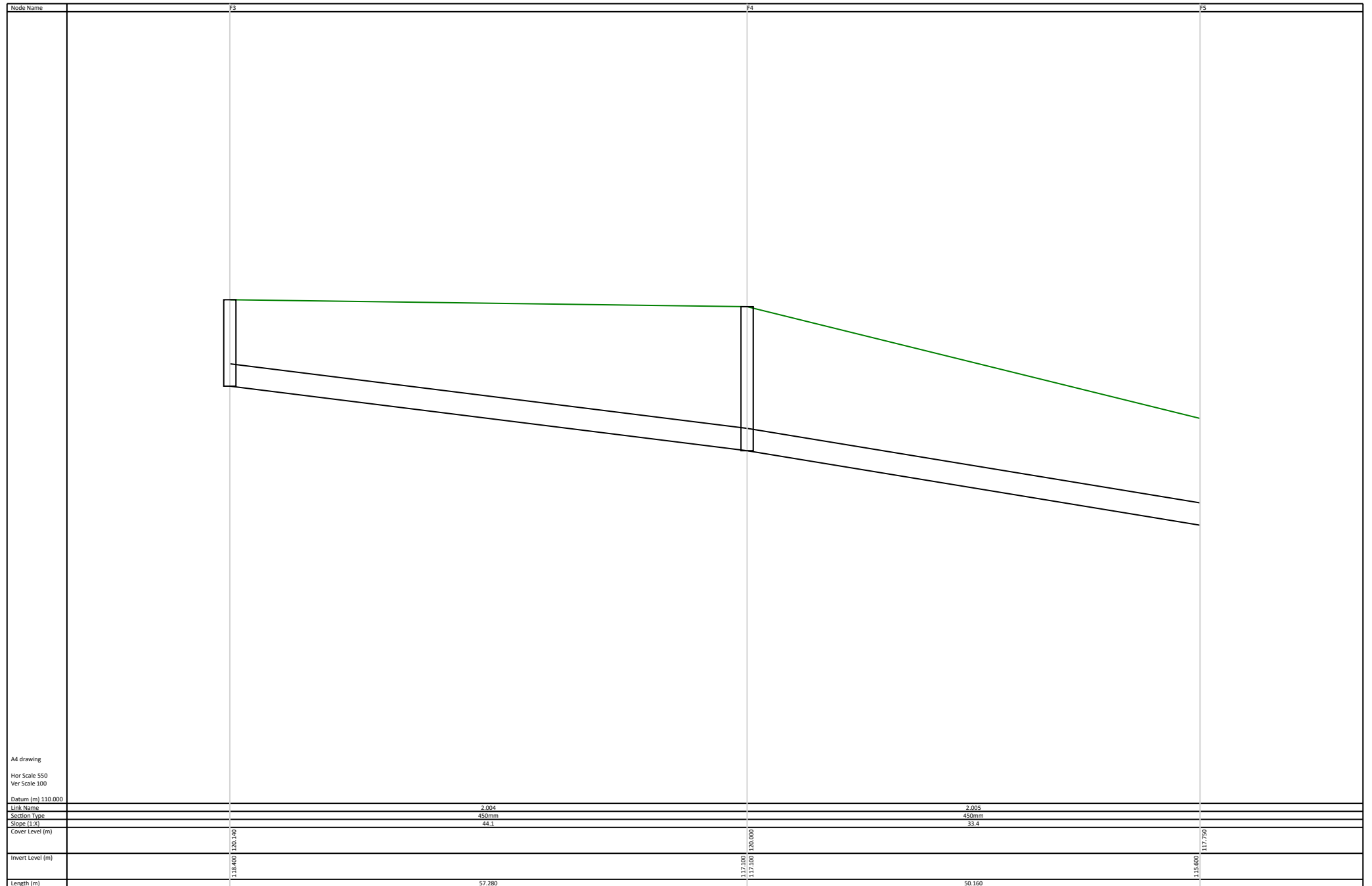
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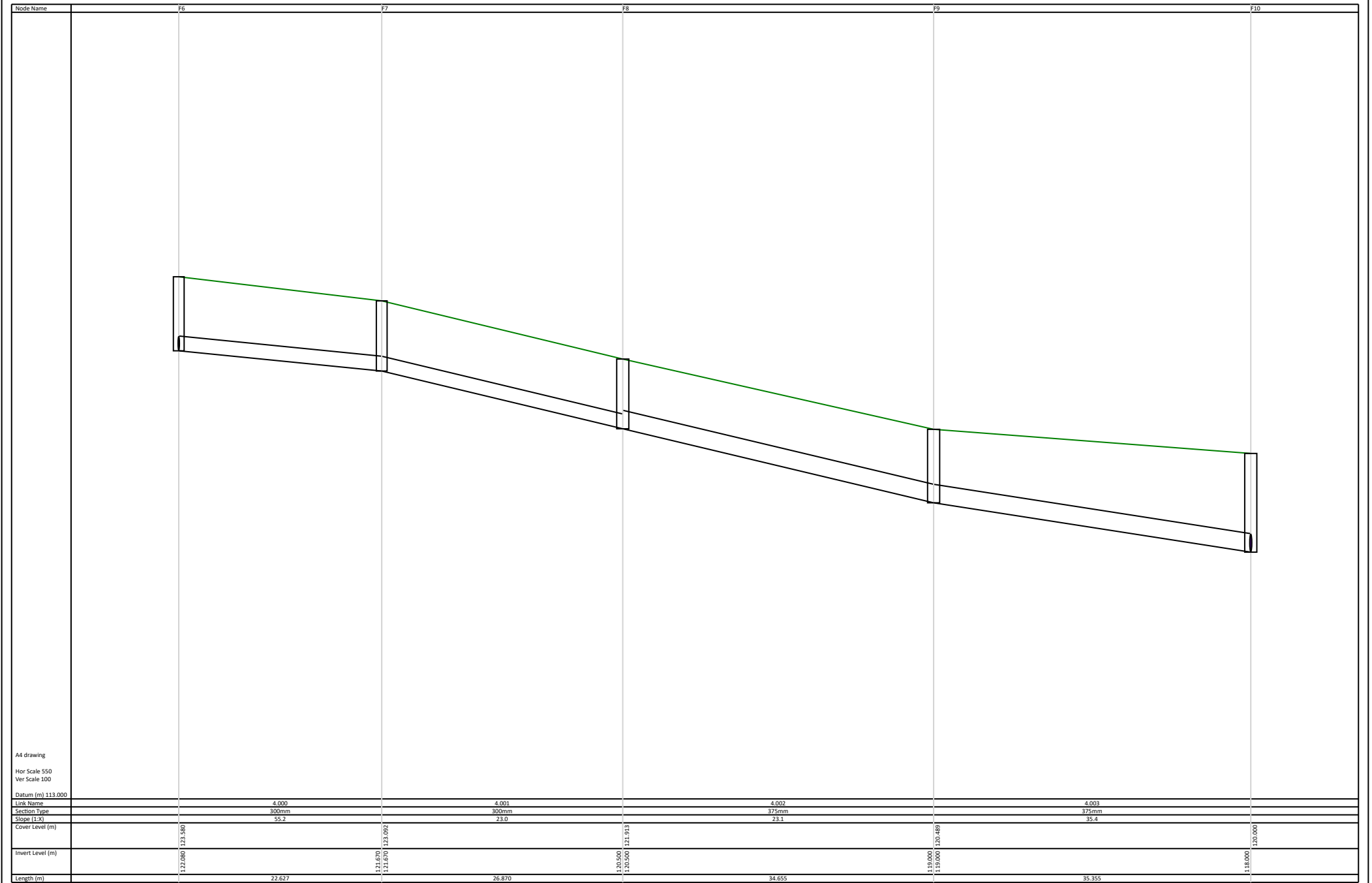
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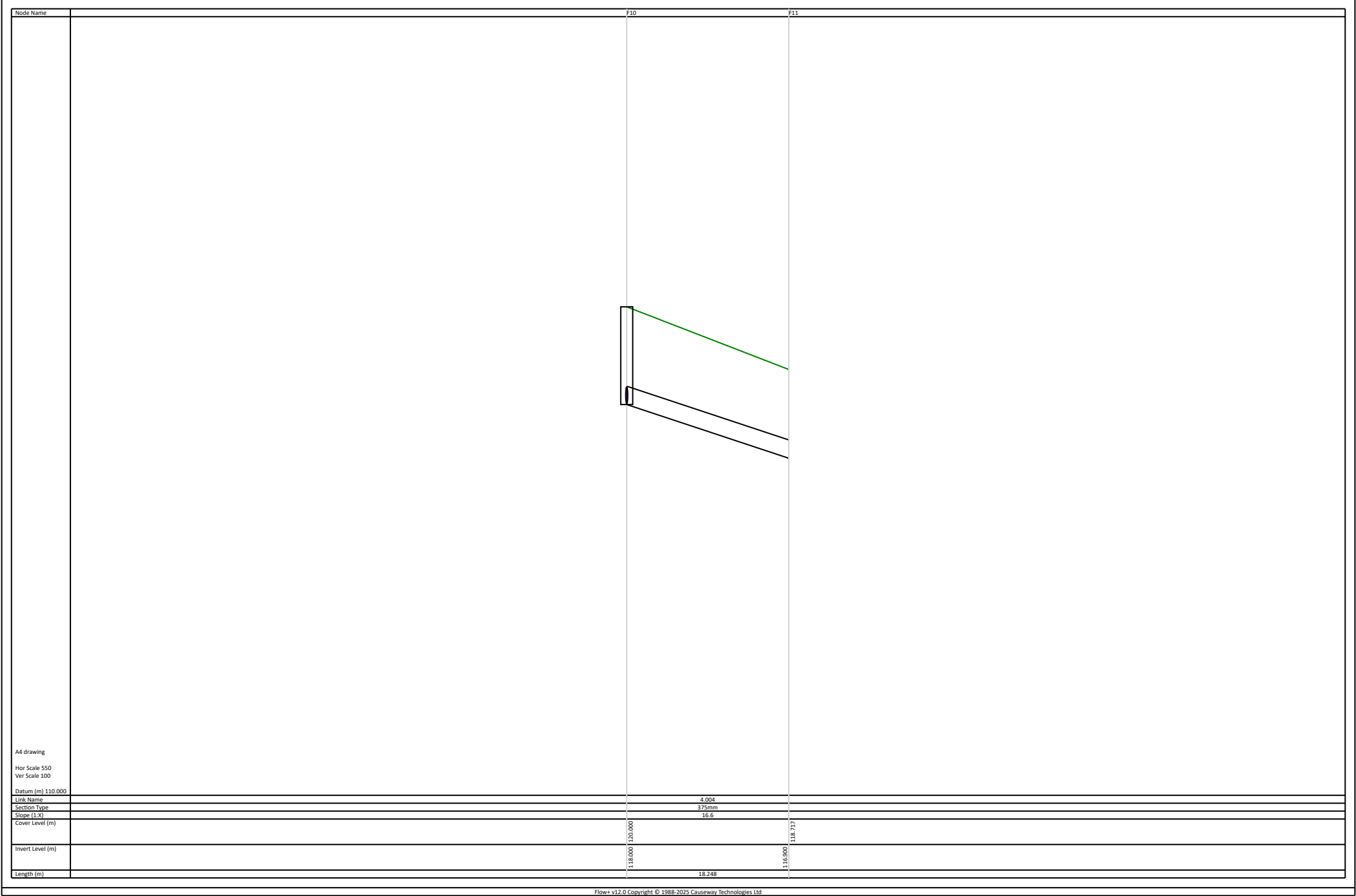
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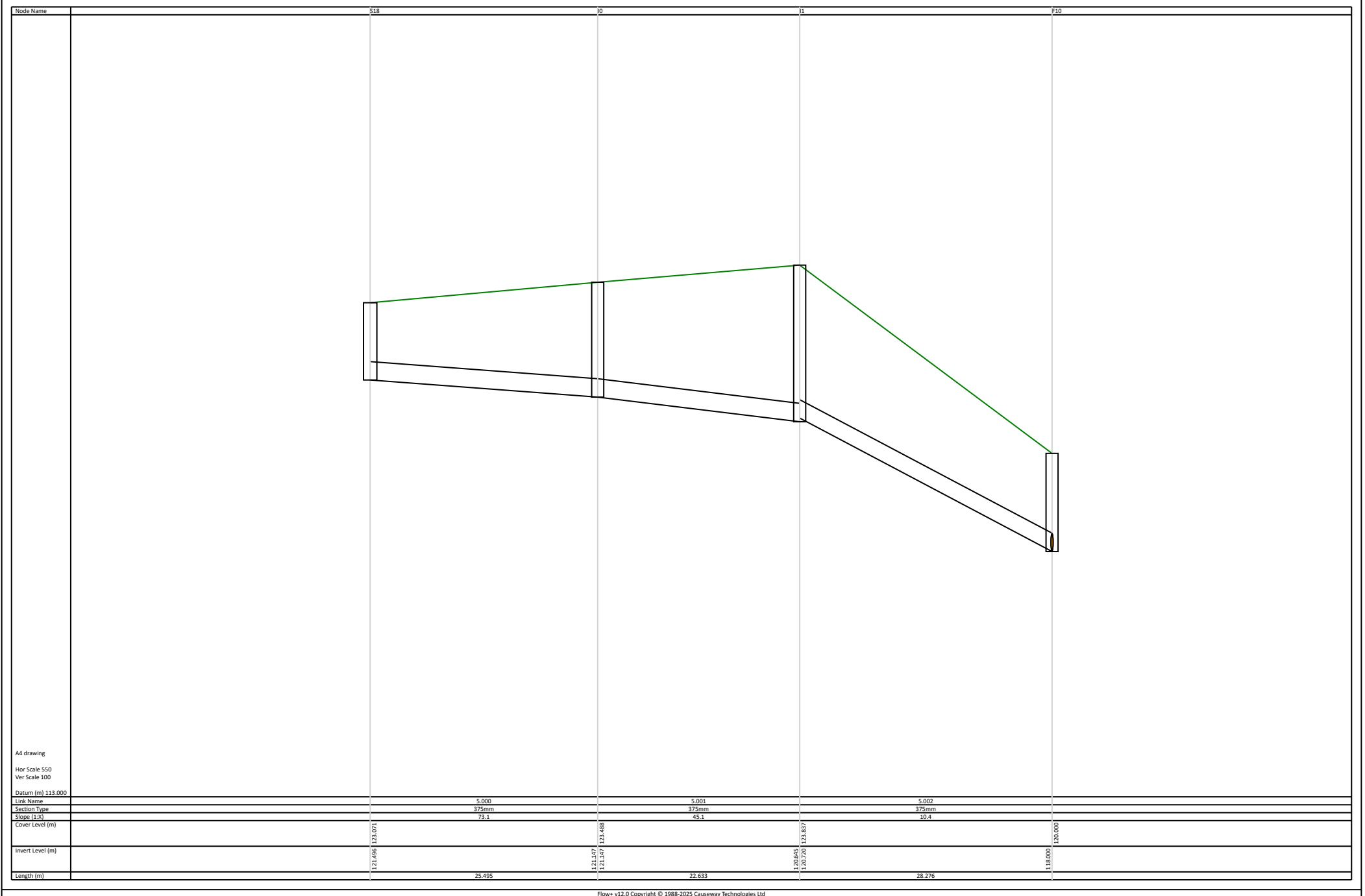


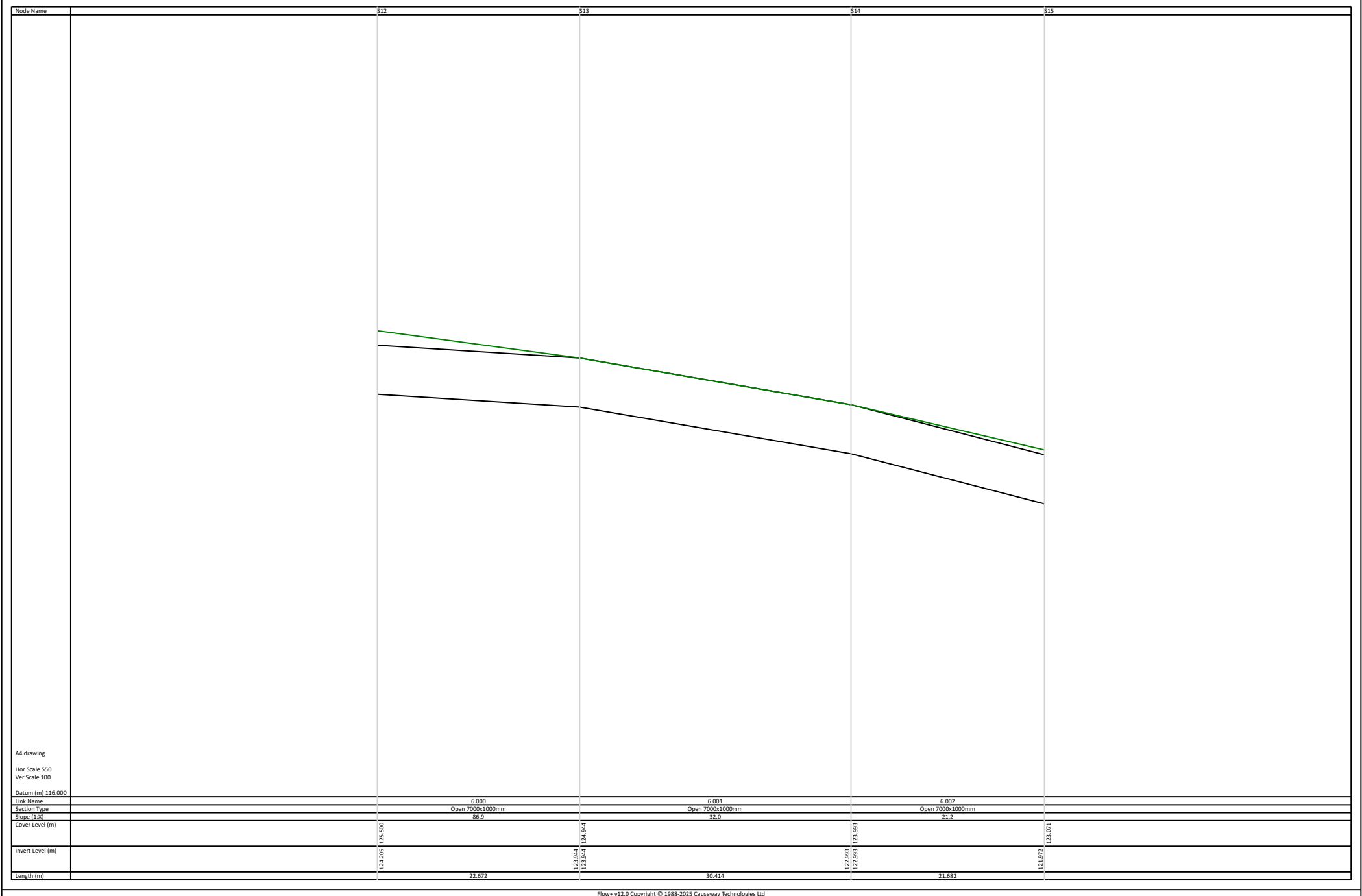


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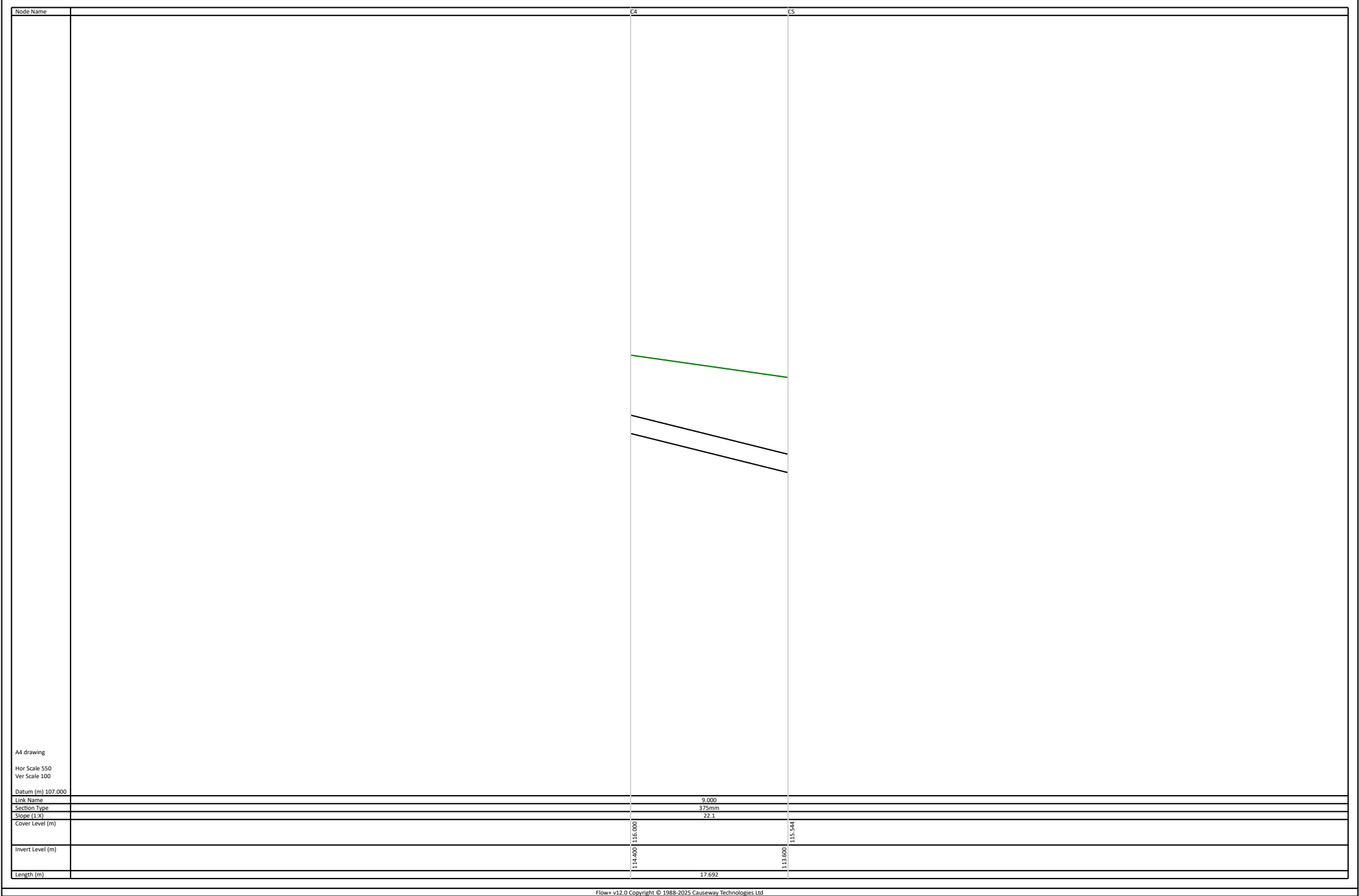






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Node Name		C2	C3
A4 drawing Hor Scale 550 Ver Scale 100 Datum (m) 108.000			
		12.000	
		375mm	
		19.4	
		Cover Level (m)	
		115.400	116.750
		Invert Level (m)	
		115.400	114.600
		Length (m)	15.556