CADARN
CONSULTING ENGINEERS

DRAINAGE STRATEGY

PROPOSED RESIDENTIAL DEVELOPMENT AT TRE ANGHARAD, BODEDERN

November 2021
Suitability S1
Revision P01

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SUITABILITY	REV	DATE	DESCRIPTION	Org.	Chk'd	App'd
S1	P01	04.11.21	First Issue.			

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1.0 Introduction

1.1 Project Background

1.1.1 Cadarn Consulting Engineers Ltd have been appointed to provide a drainage strategy, for both surface water and foul, and to assess the flood risk arising from the proposed residential development at Tre Angharad, Bodedern, LL65 3ST. The site for the new development (National Grid Reference **SH332798**) is contained within an area of approximately 1.04 ha; refer to the drawing enclosed in **Appendix A** for the proposed site location plan.

1.1.2 Cadarn Consulting Engineers Ltd reserve the right to undertake further investigation into the adequacy of the proposed drainage strategy based on changes in regulations, if works on site have not commenced within twelve months of the issuing of this report.

1.2 Flood Risk Assessment

1.1.1 Based on Natural Resources Wales's Development Advice Map, the site of the proposed development lies within Flood Zone A, which is considered to be at little or no risk of fluvial or coastal/tidal flooding.

1.1.2 Therefore, as stipulated by the Welsh Government's 'Technical Advice Note 15: Development and Flood Risk' (TAN15), no further assessment into the potential risk of flooding on the site, or the impact that the site may have upon surrounding areas and local infrastructure, is required.

1.3 Scope of Proposed Drainage Strategy

1.3.1 This report aims to provide a suitable drainage strategy for the discharge of surface water and foul effluent generated by the proposed development.

1.3.2 The purpose of the calculations enclosed within this report and accompanying details are to produce a drainage layout that complies with the relevant legislation of the Tan 15, CIRIA C753 '*The SuDS Manual*' and Approved Document H of the Building Regulations 2010.

1.4 Proposed Development

1.4.1 The proposed development involves the construction of 30 no. dwellings with associated car parking and garden spaces, as well as a series of small public amenity areas.

The site will be accessed from Ffordd Llundain / London Road, which, along with nearby existing properties, will form the western boundary of the site. Refer to the drawing enclosed in **Appendix B** for the proposed layout of the development.

1.5 Site Hydrology

1.5.1 The proposed development site generally falls a fairly shallow gradient toward the south-eastern boundary of the site and enters the open land drainage feature. A copy of the above ground flood routing is attached within **Appendix C**.

1.6 Existing Land Drainage Features / Watercourses.

1.6.1 Within the Eastern part of the proposed site is a small ordinary watercourse, which is partly culverted within the site grounds. This watercourse follows the boundary of adjacent fields until it joins a larger watercourse (although still considered to be small) approximately 250m to the South-East of the proposed site. The alignment of the culverted watercourse is indicated on the attached existing topographic survey and drainage layout contained thin **Appendix D.**

1.6 Existing Nearby Drainage

1.6.1 Given that the development is to be located on an undeveloped greenfield site, surface water currently infiltrates naturally to ground. Similarly, there are no foul discharge systems for the site of the proposed development.

1.6.2 Nearby, a Ø100mm water main runs within or parallel to London Road (refer to the drawing enclosed in **Appendix E**). Similarly, a Ø150mm gravity foul sewer and a Ø100mm foul rising main, running in opposite directions, also run within London Road.

2.0 Design Criteria

2.1.1 The following design criteria will apply to the surface water run-off and foul discharge design for the site:

- Approved Document H, Building Regulations.
- BRE Digest 365;
- BS EN 752:2017;
- CIRIA C753 'The SuDS Manual' 2015;
- DEFRA / Environment Agency 'Preliminary Rainfall Runoff Management for Developments' Technical Report;
- Discharge Units from BS EN 12056: Part 2;
- Flood & Water Management Act 2010;
- Highways Act 1991;
- Institute of Hydrology Report (IHR) 124;
- Land Drainage Act 1991;
- Modified Rational Method;
- Sewers for Adoption 7th Edition;
- Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems
- Technical Advice Note (TAN) 15: Development and Flood Risk;
- Wallingford Procedure;
- Water Industries Act 1991.

3.0 Surface Water Drainage Design

3.1 Guiding Principles

3.1.1 The disposal of surface water has been designed in strict accordance with the provision of TAN 15, the Flood and Water Management Act 2010 and other best practice documents, such as CIRIA C753 'SuDS Manual' 2015.

3.2 Method of discharge

3.2.1 In accordance with the SuDS Manual 2015, surface water should be managed and discharged from a new development in line with the following hierarchy:

- Priority level 1: Re-use of water;
- Priority level 2: Infiltration into ground;
- Priority level 3: Discharge to a water body;
- Priority level 4: Discharge to a surface water run-off drain;
- Priority level 5: Discharge to a combined surface water run-off and foul drain.

3.2.2 Re-use of surface water cannot be considered as the soul method of surface water disposal, paragraph G1.1 The Statutory SuDS Guidance for Wales states "As much of the runoff as possible (subject to technical or cost constraints) should be discharged to each destination before a lower priority destination (level) is considered." Therefore, attempts must be made to reuse as much surface water as possible. Therefore, it is proposed to provide above ground water butts at the base on the rainwater pipes to the rear of the properties to allow the residence of the development the ability to water the plants and rear garden area.

3.2.3 Infiltration testing has been undertaken by '*Cadarn*' as part of a phase I & II site investigation (this report is not included as part of this strategy due to the size, however this can be issued upon request). A summary of the report is provided below.

- Porosity testing was undertaken within three trial pits across the site with very little infiltration recorded due to the presence of bedrock being encountered at high level.
- The testing after 4 hours after only draining 200mm, during the first test. BRE 365 requires three tests to be undertaken within each trial hole however due to the slow rate of infiltration recorded this was not possible.

3.2.4 The report concludes that the use of infiltration systems such as soakaways for the disposal of surface water run-off generated from the proposed development is not suitable.

3.2.5 As noted in **Section 1.5** there is a open land drainage feature located on the south-east boundary which currently serves the site, therefore it is proposed to communicate flows to this at a controlled rate.

3.3 Climate Change

3.3.1 TAN 15 states that an allowance for climate change should be provided within the on-site attenuation, without specifying what allowance should be made. The NPPF, which is the English equivalent of TAN 15, does however provide guidance derived from DEFRA FCDPAG3 'Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts' October 2006 (see **Table 1**). This document considers the effects of climate change for different design criteria.

3.3.2 The proposed development will have a design life of 100 years; based on the NPPF's guidance, the development therefore requires an allowance of 30% for climate change to be applied to the peak rainfall intensity.

Table 1. Climate Change Requirements.

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak Rainfall Intensity	+5%	+10%	+20%	**+30%**
Peak River Flow	+10%	+20%		
Offshore Wind Speed	+5%		+10%	
Extreme Wave Height	+5%		+10%	

3.4 Design Philosophy

Based upon existing site information and the details of the proposed development, an assessment of the site run-off has been undertaken utilising the 'Flow' hydraulic modelling package (refer to **Appendix F**). This has enabled the existing greenfield run-off flows to be assessed and quantified, in accordance with IHR 124.

3.4.1 The tables below summarise the existing effective areas with their corresponding run-off coefficients, as per the Wallingford procedure, IHR 124.

Table 2. Existing Greenfield Areas.

Surface	Total Area	Coefficient	Effective Area
Grass	10,108.395 m²	0.35	3,537.938 m²
Tarmac	135.287 m²	0.60	81.172 m²
Gravel Access Track	30.416 m²	0.75	10.646 m²
Surface	10,274.098m²		3,629.756 m²

3.4.2 The areas provided within **Table 2** are provided on the existing greenfield area drawing contained within **Appendix G.** Reference should be made to the attached hydraulic model output calculations containing the run-off rates for the site (**Appendix F**), which are summarised as follows:

Table 3. Greenfield Run-off rates for different return periods.

Reference	1 in 1 Year	1 in 30 Year	1 in 100 Year
Greenfield Rate	4.4 l/s	9.0 l/s	10.8 l/s

The Statutory SuDS guidance for Wales requests all development to be restricted to minim greenfield run-of rates, therefore a vortex flow control device is proposed restricting flow to the following discharge rates:

1:1-year return period – 4.4 l/s
1:30-year return period – 4.9 l/s
1:100-year return period – 5.4 l/s

3.5 Method of Storage

3.5.1 Surface water run-off generated from all proposed hardstanding areas for the 1 in 100-year return period plus an allowance of 30% for climate change is to be attenuated onsite within above ground storage structures including three swales spread across the site and the below ground piped drainage network. Raingardens and porous paving are also included as part of the design however have not been accounted for within the attenuated volume but will help to reduce the rate of flow through the site. This section of the report should be read in conjunction with the proposed on-site drainage arrangement enclosed in **Appendix H**.

3.5.2 The proposed measured hardstanding areas accounted for within each soakaway summarised within **Table 4** and illustrated on the proposed impermeable area plan contained within **Appendix I.**

Table 4. North section of site.

Surface	Total Area	Coefficient	Effective Area
Parking Bays	870.325 m²	1.00	870.325 m²
Road	1,807.205 m²	1.00	1,807.205 m²
Path	1,030.926 m²	1.00	1,030.926 m²
Basin / Swale	587.222 m²	1.00	587.222 m²
Pumping Station	128.319 m²	1.00	128.319 m²
Roofs	1,806.955 m²	1.00	1,806.955 m²
Grass	4,035.101 m²	0.35	1,415.085 m²
Total	1,921.349 m²		1,363.272 m²

* Grassed areas not normally included within attenuation catchments, however planted swale and raingardens are to be included.

3.5.3 Rainwater generated over the site will be attenuated within above ground within a large swale/basin feature within three areas across the site.

3.5.4 The main storage structure of the site is a 1.2m deep basin located within the public open space area to the rear of the site, this provides a total storage of 279.62m^3 when full.

3.5.5 The second SuDS feature is a swale located alongside the first section of the highway which is to mainly act as a conduit however during lower probability storm events the outlet pipe diameter being under designed causes water back up and be stored along the length of the swale. The swale provides a total storage of 28.50m^3.

3.5.6 The third area of the site where storage of the surface water is provided within the site is a shallow (600mm deep) basin located within a public open space area within the centre of the site, this accommodates the surface water run-off from plots 29 – 24. A control flow orifice chamber is used to restrict flows from these properties to 1.0 l/s and cause water to back up into the basin during lower probability storm events.

3.5.7 The 'Flow' hydraulic modelling package output is contained within **Appendix F** which indicates sufficient storge is provided within the site.

3.6 Drainage System Maintenance

3.6.1 The SuDS Manual 2015 requires appropriate measures to be in place for the maintenance of surface water drainage systems and sustainable drainage features.

3.6.2 The maintenance schedule shown in **Tables 5 – 7** have been derived in strict accordance with the SuDS Manual 2015 and from a risk-assessed approach during the design stage. 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 site drainage system.

3.6.3 All surface water drainage located within the highway will be adopted and maintained by the highway authority under section 38 of the Highways Act 1980. The remainder of the drainage network (besides private drainage within an individual property boundary) is to be adopted and maintained by the SAB. The maintenance schedule for each component of the proposed drainage network is contained within **Tables 5 – 7**.

3.6.4 Provided preventive maintenance measures are undertaken in accordance with the frequencies recommended in **Tables 5 – 7**, the need for corrective maintenance should rarely arise.

3.6.5 Maintenance activities should be detailed in the Principal Contractor's Health and Safety Plan and Risk Assessments and should be updated on a regular basis to ensure the continued performance and long-term condition of the drainage system.

Table 5. Operation and maintenance requirements for swales and basins in line with table 17.1 of the CIRIA C753 'The SuDS Manual 2015.

Maintenance Schedule	Required Action	Typical Frequency
Monitoring	Inspect Inlets & Outlets for blockages and clear if required.	Quarterly
	Record rate of sediment accumulation and establish appropriate silt removal frequency/maintenance plan.	Quarterly for first year, then annually or as required.
	Inspection of check dams to ensure they are intact are holding water back effectively	Annually.
Regular Maintenance	Removal of litter and debris.	as required.
	Cutting Grass in and around swale.	as required (Spring – before nesting season and autumn)
	Manage vegetation and removal nuisance plants.	Two monthly for 6 months, then annually.
	Remove sediments from inlets and outlets.	As required.
Occasional Maintenance	Reseed areas of poor vegetation growth.	As required.
Remedial Actions/ Corrective Maintenance	Repair erosion or other damage by reseeding or re-turfing.	As required.
	Repairing check dams if damaged.	As required.
	Repair/rehabilitation of inlets and outlets.	As required.
	Relevel uneven surfaces and reinstate design levels.	As required.

Table 6. Operation and maintenance requirements for porous paving in line with table 20.15 of the CIRIA C753 'The SuDS Manual 2015.

Maintenance Schedule	Required Action	Typical Frequency
Monitoring	Initial inspection	Monthly for first 3 months
	Inspect for evidence of poor operation and/or weed growth and take appropriate action if required.	Annually or as required.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
Regular Maintenance	Brushing and vacuuming over whole surface, (standard cosmetic sweep over whole surface).	Annually after autumn leaf fall, or reduce frequency as required based on site-specific observations of clogging or manufacturers recommendations – pay close attenuation to areas where water runs onto porous areas from adjacent impervious areas as this is most likely to collect the most sediments.
Occasional Maintenance	Removal of weeds or management using glyphospate applied directly into weeds by an applicator rather than spraying.	As required.
	Stabilise and mow contributing and adjacent areas.	As required.
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised within 50mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users and replace lost jointing material.	As required.
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to clogging)

Table 7. Operation and maintenance requirements for pipework & chambers.

Maintenance Schedule	Required Action	Typical Frequency
Monitoring	Inspect using CCTV drain surveys to ensure they are in good condition and operating as designed.	Every 5 years (or as required)
	Inspect chambers to ensure they are in good condition and that accumulation of sediment, debris etc. is not preventing them from operating as designed.	Annually
Regular Maintenance	Remove any accumulation of silt, sediment, leaves, debris etc.	Bi-annually
Occasional Maintenance	High-pressure water jet for removal of silt builds up and avoid blockages, particularly at bends or changes in direction.	Every 5 years (or as required)
Remedial Actions/ Corrective Maintenance	High-pressure water jet to remove blockages.	As Required.

*Hydrobrake flow control device to be maintained in accordance with hydro internationals recommendations.
*controflow orifice chamber to be maintained in accordance with hydro internationals recommendations.

3.7 Surface Water Treatment

3.7.1 In accordance with the SuDS Manual 2015, Table 26.2, residential developments are classified as having a 'low / very low' pollution hazard level. **Table 8** shows the pollution hazard indices for the land use.

Table 8. Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Soils (PMI_{TSS})	Hydrocarbons (PMI_{HM})	Heavy Metals (PMI_{PAH})
Residential Roofs	Very Low	0.2	0.05	0.2
Low Traffic Roads / Residential Car Parks	Low	0.5	0.4	0.4

3.7.2 The SuDS Manual 2015 also provides pollution mitigation indices for different SuDS drainage features, as detailed in **Table 9**. The increase in surface water pollution resulting from the hardstanding areas during normal conditions is likely to be negligible. However, this risk increases during rainfall events of greater intensity. As previous noted the proposed design includes shallow planted swales, attenuation basins, and porous paved parking areas and sections of the access road. All surface water run-off from the site passing through at least two of these systems.

Table 9. Pollution Mitigation Indices

SuDS Component	Pollution Mitigation Indices		
	Total Suspended Soils (PMI_{TSS})	Hydrocarbons (PMI_{HM})	Heavy Metals (PMI_{PAH})
Filter Strip	0.9	0.8	0.7
Filter Drain	0.6	0.8	0.7
Swale	**0.7**	**0.6**	**0.4**
Bioretention System	0.8	0.8	0.8
Porous Paving	**0.2**	**0.3**	**0.3**
Infiltration Basin	0.05	0.05	0.05
Detention Basin	**0.7**	**0.7**	**0.6**
Pond	0.7	0.7	0.5
Wet Land	0.8	0.8	0.8
Proprietary Treatment Systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1-year return period event, for inflow concentrations relevant to the contributing drainage.		

3.7.3 The sum of the highlighted mitigation values (Bold) with in each column of **Table 8** surpass the hazard values within **Table 9**, therefore suitable treatment of the surface water run-off from the site is provided, as indicated within **Table 10**.

Table 10. Pollution Mitigation vs Hazard Indices

Land Use – Low traffic roads & residential roofs	Total Suspended Soils (PMI_{TSS})	Hydrocarbons (PMI_{HM})	Heavy Metals (PMI_{PAH})
Pollution Hazard Indices	0.70	0.45	0.60
Pollution Mitigation Indices	1.6 (>0.70)	1.6 (>0.45)	1.3 (>0.60)

4.0 Foul Drainage Design

4.1 Method of Discharge

4.1.1 Design of the foul sewers included within the proposal has been carried out in accordance with BS EN 12056 Part 2, Approved Document H of the Building Regulations 2010 and other best practice documents, such as the 'Sewers for Adoption' 7th edition. In accordance with Approved Document H, the preference in terms of the priority for discharging foul effluent is to discharge into a public foul sewerage system.

4.1.2 As previously detailed, a Ø150mm gravity foul sewer is located within London Road, which partly bounds the proposed development to the West. The hierarchy outlined in Approved Document H of the Building Regulations 2010 can therefore be satisfied by connecting into this sewer. Due to the natural contours of the site, this shall be achieved by conveying the foul arising from the new properties into a common sewer laid within the site's highway, which will then drain under gravity into a foul receiving chamber located to the East of the site. The foul will then be pumped under pressure from the chamber to the foul sewer within London Road via a rising main.

4.1.3 Where the foul effluent is to be drained under gravity (i.e. upstream of the foul pumping station), it shall be accommodated within Ø150mm pipework designed to a minimum gradient of 1:80. This design is suitable for foul effluent drained under gravity from more than ten properties.

4.1.4 Document H of the Building Regulations 2010 states that "where foul drainage from a building is to be pumped, the effluent receiving chamber should be sized to contain 24 hour inflow to allow for disruption in service". The design flow rate for foul from each property is based on an average daily consumption of 150 litres/head/day. Conservatively assuming that 3 persons occupy each property (equating to 87 persons), the total volume of flow from the site is 13 m^3/day.

4.1.5 The receiving chamber shall therefore be sized to receive a minimum foul volume of 13 m^3. The receiving chamber proposed for the site is the 15,000-litre capacity (= 15 m^3) *XL T-T Planet Range* package pumping station, which satisfies the required adoptable standards and quality requirements of each of

the UK's Local Water Companies, including Dŵr Cymru / Welsh Water (which is a requirement for drainage systems that connect into a Water Company's existing utilities). Equally approved receiving chambers are also available for installation as part of the site's drainage system.

4.1.6 The rising main will be designed, in accordance with the supplier's technical standards and quality requirements, to discharge the foul arising from the site into the combined sewer within a velocity range of 0.75–1.8 m/s.

4.1.7 The design of the foul drainage system, along with the surface water system, for the proposed development is illustrated in the drawing enclosed in **Appendix F**.

4.2 Drainage System Maintenance

4.2.1 The site's foul drainage system shall be adopted by the Local Water Company, Dŵr Cymru / Welsh Water, who shall be responsible for maintaining the system in strict accordance with their own standards and any relevant codes and regulations.

5.0 Conclusion & Recommendations

5.1.1 This drainage strategy report provides a suitable drainage strategy for the discharge of surface water and foul effluent generated at the proposed residential development in Wirral View, Hawarden.

5.2.2 Attenuation will be provided for all rainfall events up to an extreme event, within an above ground attenuation swale. Surface water will be restricted to a 4.4 l/s which mimics greenfield run-off rates for the 1 in 1 year return period.

5.2.3 All foul generated from the development will be discharged into the existing foul sewerage network located within the highway fronting the site via an onsite adopted pumping facility.

APPENDICES

APPENDIX A
Site Location Plan

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS IN METRES UNLESS NOTED OTHERWISE ON DRAWING.
3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

KEY

DENOTES PROPOSED SITE BOUNDARY.

SUITABILITY	REV	DATE	DESCRIPTION	Org.	Chk'd	App'd	Auth'd
S1	P01	14.10.21	FIRST ISSUE				

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

SITE LOCATION PLAN

DRAWING No.:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
004221	CCE	V1	XX	40:40:01	C

CLASSIFICATION	No.	SUITABILITY	REVISION
50:30	0001	S1	P01

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	14.10.2021	1:1250	A4

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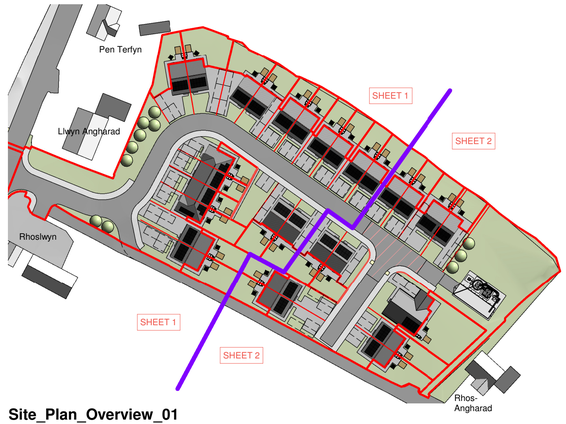
APPENDIX B
Proposed Site Layout

1 Site_Plan_Proposed_01
Scale: 1 : 200



Site_Plan_Overview_01

0m 4m 8m 12m 16m A1

VISUAL SCALE 1:200 @ A1

This drawing must be printed in colour to be read correctly

Notes

Figured dimensions are to be used in all case.
Dimensions should not be scaled from drawing
All existing dimensions should be checked on site before commencement of the work.
Any discrepancies in dimensions should be clarified with the Architect prior to commencement of the work.
No deviation from this drawing will be permitted without the prior written consent of the Architect.
This drawing is to be read in conjunction with all the relevant Mechanical and Electrical drawings.
This drawing is to be read in conjunction with the relevant Structural Engineer's drawings, structural calculations and recommendations.
This drawing is to be read in conjunction with the relevant Fire Safety Strategy drawings

This drawing must be read in conjunction with LMA drawing 7500_Strategy_DesignersRiskAssessment which indicates all current and active designers risks that have been identified by Lovelock Mitchell Architects in accordance with the CDM Regulations 2015.

This drawing is copyright and to be returned to the architect on completion of the contract.

Legend_Site_Items

Parking spaces 4.8m x 2.4m

V1 & V2 Visitors car spaces.

Tactile paving for pedestrian crossings.

Garden shed, located to the rear of property 2.4m x 1.8m (to accommodate an adult bicycle)

Green bin (garden waste) 240 litre
Black bin (general waste) 240 litre
Trolley box:-
Top Red Box- Paper and textiles.
Middle Blue Box- Plastic, cans and foil.
Bottom Orange Box- Glass and cardboard.
Food Waste Bin and White Pouch (Batteries, ink and mobiles).

Per dwelling (exact details to be agreed with Isle of Anglesey) Based upon information from IOA recycling website

Rotary dryer with paved access

All dwellings are provided with the following:

- Access to the garden from the kitchen.
- External drying space.
- Rear gardens have an minimum area of 40m2 including a 3m x 3m paved area
- Minimum 900mm wide paths.
- 1.2m x 1.2m level landing at front door.
- Roof canopy above entrance door.
- 1.8m high timber panel fence to all private garden areas.

Boundary extent line.

Rev.	Revision description	Drawn	Checked	Date
P3	Drawings issued for PAC	DP	NM	05-11-21
P2	Issue to update design teams comments.	DP	NM	25-10-21
P1	First Issue of Drawing, drawing issued for information and comments	DP	NM	21-10-21

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Project
Clwyd Alyn
Tre Angharad, Bodedern, Anglesey

Title
Site_Plan_Proposed_01

LMA Project	Drawing number								Rev.
	Project	Originator	Zone	Level	Type	Role	Drawingnumber		
1816	CAA	LMA	01	XX	DR	A	1200		P3

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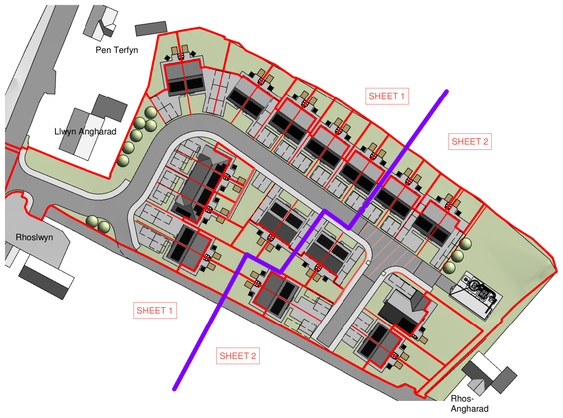

Site_Plan_Overview_02

SEE SHEET 1250 FOR
OTHER HALF OF SITE

PLOT 11
Garden area
79.79 m²

PLOT 12
Garden area
77.64 m²

PLOT 13
Garden area
87.81 m²

PLOT 14
Garden area
94.06 m²

PLOT 15
Garden area
291.91 m²

PLOT 16
Garden area
118.22 m²

PLOT 17
Garden area
122.52 m²

PLOT 18
Garden area
93.65 m²

PLOT 19
Garden area
71.24 m²

PLOT 20
Garden area
83.50 m²

PLOT 21
Garden area
81.14 m²

+23500
+23200
+23050
+22800
+22600

Proposed
Turning
Head

Proposed tactile
paving crossing.

19 m

3000

3058

Existing hedgerow
to be retained.

Soft landscaping to
the pumping station
area to landscape
architects design
and details

R 16500

Public Open Space

Adoptable foul
only pumping
station.

Type 3
pumping
station

Red hatch indicates
Existing open ditch

Existing
hedgerow.

Existing
concrete
drainage

Existing concrete
block wall retained.

Existing EP

Existing overhead power
line running across the
site is to be diverted.

Shared surface
section
of highway to
remain private.

Access Track

Rhos-
Angharad

2 Site_Plan_Proposed_02
Scale: 1 : 200

0m 4m 8m 12m 16m A1

VISUAL SCALE 1:200 @ A1

This drawing must be printed in colour to be read correctly

Notes

Figured dimensions are to be used in all case.
Dimensions should not be scaled from drawing
All existing dimensions should be checked on site before commencement of the work.
Any discrepancies in dimensions should be clarified with the Architect prior to commencement of the work.
No deviation from this drawing will be permitted without the prior written consent of the Architect.
This drawing is to be read in conjunction with all the relevant Mechanical and Electrical drawings.
This drawing is to be read in conjunction with the relevant Structural Engineer's drawings, structural calculations and recommendations.
This drawing is to be read in conjunction with the relevant Fire Safety Strategy drawings

This drawing must be read in conjunction with LMA drawing 7500_Strategy_DesignersRiskAssessment which indicates all current and active designers risks that have been identified by Lovelock Mitchell Architects in accordance with the CDM Regulations 2015.

This drawing is copyright and to be returned to the architect on completion of the contract.

Legend_Site_Items

Parking spaces
4.8m x 2.4m

V1 & V2 Visitors car spaces.

Tactile paving for
pedestrian crossings.

Garden shed, located to the rear of property
2.4m x 1.8m (to accommodate an adult bicycle)

Green bin (garden waste) 240 litre
Black bin (general waste) 240 litre
Trolley box-
Top Red Box- Paper and textiles.
Middle Blue Box- Plastic, cans and foil.
Bottom Orange Box- Glass and cardboard.
Food Waste Bin and White Pouch (Batteries, ink and mobiles).

Per dwelling (exact details to be agreed with Isle of Anglesey)
Based upon information from IOA recycling website

Rotary dryer with paved access

All dwellings are provided with the following:

- Access to the garden from the kitchen.
- External drying space.
- Rear gardens have an minimum area of 40m2 including a 3m x 3m paved area
- Minimum 900mm wide paths.
- 1.2m x 1.2m level landing at front door.
- Roof canopy above entrance door.
- 1.8m high timber panel fence to all private garden areas.

Boundary extent line.

Rev.	Revision description	Drawn	Checked	Date
P3	Drawings issued for PAC	DP	NM	05-11-21
P2	Issue to update design teams comments.	DP	NM	25-10-21
P1	First Issue of Drawing, drawing issued for information and comments	DP	NM	21-10-21

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Project
Clwyd Alyn
Tre Angharad, Bodedern, Anglesey

Title
Site_Plan_Proposed_02

LMA Project	Drawing number								Rev.
	Project	Originator	Zone	Level	Type	Role	DrawingNumber		
1816	CAA	LMA	02	XX	DR	A	1201		P3

C:\Revit Local\CAA-LMA-00-XX-M3-A-0001_SiteModel_dan.pickard.rvt

APPENDIX C

Existing Above Ground Surface Water Flood Routing

NOTES

1. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.
2. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

KEY

DENOTES DIRECTION OF EXISTING ABOVE GROUND SURFACE WATER FLOOD ROUTING.

DENOTES PROPOSED SITE BOUNDARY

S1	P01	15.10.21	FIRST ISSUE					
SUITABILITY	REV	DATE	DESCRIPTION	Org.	CM/E	Appd	Auth.	

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

EXISTING FLOOD ROUTING

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
015721	CCE	V1	XX	40:40:01	C

CLASSIFICATION	No.	SUITABILITY	REVISION
50:30	0005	S1	P01

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	15.10.2021	1:250	A1

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APPENDIX D

Topographic Survey and Drainage Layout

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS IN METRES UNLESS NOTED OTHERWISE ON DRAWING.
3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

KEY

- DENOTES PROPOSED SITE BOUNDARY
- EXISTING CULVERT WATERCOURSE.
- EXISTING DCWW FOUL SEWER.
- EXISTING RISING MAIN SEWER.

SUITABILITY	REV	DATE	DESCRIPTION	Org.	Ch'd	App'd	Auth.
S1	P01	14.10.21	FIRST ISSUE				

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

EXISTING TOPOGRAPHIC SURVEY AND DRAINAGE

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
015721	CCE	V1	XX	40:40:01	C

CLASSIFICATION	No.	SUITABILITY	REVISION
50:30	0002	S1	P01

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	14.10.2021	1:500	A1

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APPENDIX E

Dŵr Cymru / Welsh Water Apparatus Map

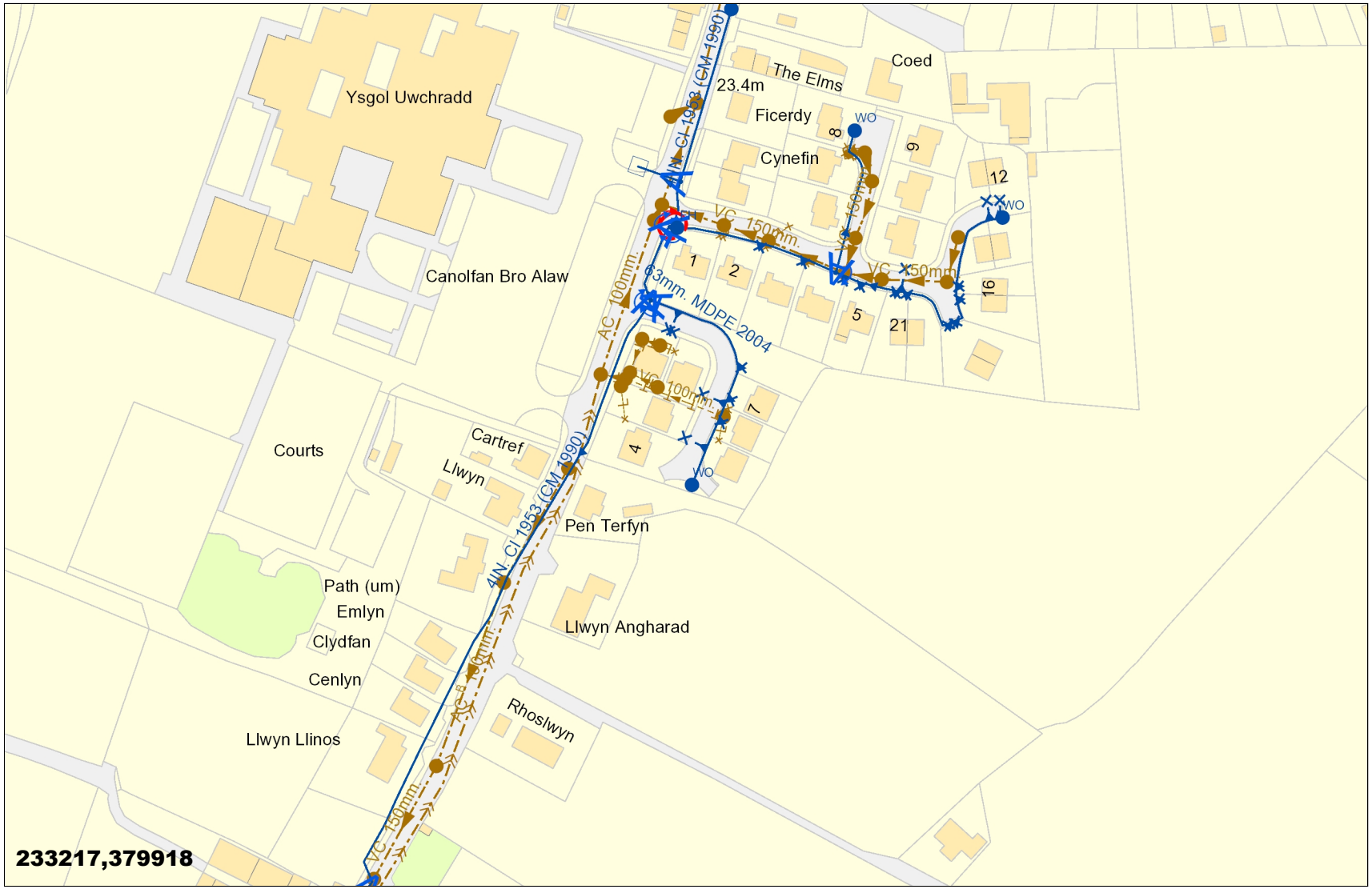
Dŵr Cymru
Welsh Water

Tre Angharad Drainage Strategy

07/06/2019

N
W E
S

Scale: 1: 2067



LEGEND

Clean Water

- Sluice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

Sewerage External

- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon In the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 f the water industry Act 1991 based upon the best Information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclosure the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information us entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE

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Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

APPENDIX F

'Causeway Flow' Brownfield Run-off calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	30	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	1.000
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S88	0.031	5.00	22.968	1350	233292.055	379814.060	1.199
S12			23.791	1200	233217.538	379867.077	1.412
S7	0.075	5.00	23.200		233200.830	379864.000	0.553
S92			22.953	1350	233295.699	379809.167	1.225
S93			22.428	1200	233310.778	379798.444	0.822
S79	0.034	5.00	22.941	1200	233260.728	379799.603	0.858
S84	0.013	5.00	23.263	1200	233278.085	379823.999	1.380
S32			23.850	320	233221.421	379827.814	0.907
S30			23.850	320	233215.351	379816.459	0.696
S29	0.009	5.00	23.850	150	233205.018	379821.982	0.550
S31	0.010	5.00	23.850	150	233211.082	379833.340	0.711
S37			23.900	320	233234.531	379832.558	1.038
S36	0.012	5.00	23.900	150	233241.081	379841.764	0.423
S35			23.900	320	233245.271	379824.927	0.824
S34	0.012	5.00	23.900	150	233252.062	379834.471	0.677
S27			24.000	320	233216.190	379832.027	0.888
S26		5.00	24.000	150	233207.000	379836.939	0.695
S25	0.032	5.00	24.000	320	233228.117	379854.339	0.661
S24		5.00	24.000	150	233218.537	379859.460	0.480
S1	0.005	5.00	23.927	150	233203.093	379825.159	0.794
S2	0.017	5.00	23.641	320	233199.570	379837.357	0.667
S3			23.619	320	233209.954	379857.063	0.923
S9	0.017	5.00	23.491		233209.787	379865.910	0.906
S39			23.907	460	233235.970	379844.409	1.245
S40			23.844		233240.438	379850.784	1.653
S53		5.00	23.900	150	233246.812	379823.833	0.590
S55			23.583		233257.401	379838.715	1.530
S56	0.012	5.00	23.600	150	233248.051	379822.952	0.540
S58			23.564		233258.639	379837.834	1.521
S65	0.012	5.00	23.600	150	233260.944	379813.793	0.600
S66			23.367		233271.526	379828.666	1.430
S70			23.150	320	233267.165	379790.624	0.772
S69	0.009	5.00	23.150	150	233275.599	379784.624	0.592
S68	0.009	5.00	23.126	320	233274.831	379801.400	0.576
S67		5.00	23.149	150	233283.266	379795.400	0.426
S74			23.147	320	233243.894	379800.868	0.642
S73	0.009	5.00	23.150	150	233232.555	379807.528	0.431
S76			23.159	320	233250.415	379811.969	0.656
S75	0.009	5.00	23.150	150	233239.076	379818.630	0.433
S90		5.00	23.150	150	233286.988	379796.924	0.470
S91			23.150	320	233292.213	379804.268	0.971

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Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S89	0.022	5.00	23.258	150	233280.459	379812.630	0.548
S87	0.039	5.00	23.000		233306.838	379821.295	1.121
S23	0.010	5.00	23.891		233237.316	379853.005	1.674
S86			22.965	320	233293.964	379819.728	0.772
S85	0.013	5.00	23.250	150	233303.819	379833.580	0.490
S80	0.013	5.00	23.250	150	233292.270	379841.797	0.583
S82	0.011	5.00	23.600	150	233289.283	379841.847	0.642
S62	0.011	5.00	23.600	150	233279.192	379849.874	0.761
S63			23.454	320	233270.497	379837.651	0.990
S64			23.442		233266.598	379832.172	1.464
S59	0.011	5.00	23.750	150	233277.950	379850.758	0.901
S60			23.508	320	233269.254	379838.535	1.034
S61	0.014	5.00	23.461		233265.355	379833.056	1.473
S50	0.011	5.00	23.750	150	233267.683	379858.062	0.756
S51			23.573	320	233258.408	379845.025	0.779
S52			23.619		233255.089	379840.360	1.547
S47	0.011	5.00	23.850	150	233266.563	379858.859	0.727
S48			23.608	320	233257.287	379845.822	0.805
S49			23.636		233253.968	379841.157	1.555
S44	0.011	5.00	23.850	150	233256.174	379866.251	0.756
S45			23.733	320	233246.898	379853.214	0.839
S46	0.015	5.00	23.795		233243.580	379848.549	1.629
S41	0.012	5.00	24.000	150	233255.279	379867.624	0.686
S43			23.814		233242.337	379849.433	1.638
S20	0.012	5.00	24.000	150	233245.012	379874.928	0.600
S22			23.972		233232.070	379856.737	1.712
S21			23.899	320	233235.389	379861.402	0.706
S42			23.769	320	233245.656	379854.098	0.870
S17	0.012	5.00	24.000	150	233242.443	379874.119	0.650
S18			23.918	320	233234.065	379862.344	0.749
S19			23.992		233230.746	379857.680	1.721
S13	0.009	5.00	24.000	150	233230.831	379882.380	0.550
S15			23.934	320	233222.454	379870.605	0.846
S16			23.881		233219.135	379865.940	1.515
S38	0.011	5.00	23.900		233230.033	379835.753	1.107
S14	0.004	5.00	24.000	150	233224.873	379881.039	0.644
S11	0.004	5.00	24.000	320	233219.226	379874.429	0.968
S10	0.010	5.00	24.000	150	233216.990	379887.687	0.520
S6	0.014	5.00	23.549	320	233207.177	379868.450	0.929
S4		5.00	24.000	150	233204.295	379885.547	0.513
S8			23.401		233207.681	379865.461	0.801
S5		5.00	23.966	150	233201.762	379873.349	0.737
S33			23.896	320	233228.043	379832.300	1.053
S54			23.730	320	233255.154	379835.558	1.140
S57			23.660	320	233256.393	379834.677	1.080
S83			23.227	320	233280.118	379828.965	1.060
S81			23.162	320	233282.125	379827.537	0.933
S72			23.025	460	233262.683	379793.813	0.716
S71	0.007	5.00	23.026	320	233266.633	379799.364	0.581
S77	0.011	5.00	23.284	320	233247.195	379806.488	0.860
S78			22.980	320	233255.303	379801.725	0.674
S28			24.000	320	233218.938	379837.167	0.986

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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)
S1-S2	S1	S2	12.697	0.600	23.133	22.974	0.159	79.9	150	5.19	50.0
S2-S3	S2	S3	22.275	0.600	22.975	22.697	0.278	80.1	150	5.52	50.0
S3-S9	S3	S9	8.848	0.600	22.696	22.585	0.111	79.7	150	5.65	50.0
S4-S6	S4	S6	17.338	0.600	23.487	22.620	0.867	20.0	150	5.13	50.0
S5-S6	S5	S6	7.303	0.600	23.229	22.620	0.609	12.0	150	5.04	50.0
S6-S8	S6	S8	3.031	0.600	22.620	22.600	0.020	151.6	150	5.19	50.0
S7-S8	S7	S8	7.005	0.600	22.647	22.600	0.047	149.0	150	5.14	50.0
S8-S9	S8	S9	2.153	0.600	22.600	22.586	0.014	153.8	150	5.23	50.0
S9-S12	S9	S12	7.838	0.600	22.586	22.534	0.052	150.7	150	5.81	50.0
S10-S11	S10	S11	13.445	0.600	23.480	23.032	0.448	30.0	150	5.12	50.0
S11-S12	S11	S12	7.544	0.600	23.032	22.529	0.503	15.0	150	5.17	50.0
S12-S16	S12	S16	1.961	0.600	22.379	22.366	0.013	150.8	300	5.83	50.0
S13-S15	S13	S15	14.451	0.600	23.450	23.089	0.361	40.0	150	5.15	50.0
S14-S15	S14	S15	10.710	0.600	23.356	23.088	0.268	40.0	150	5.11	50.0
S15-S16	S15	S16	5.725	0.600	23.088	22.516	0.572	10.0	150	5.18	50.0
S16-S19	S16	S19	14.249	0.600	22.366	22.271	0.095	150.0	300	6.02	50.0
S17-S18	S17	S18	14.451	0.600	23.350	23.169	0.181	79.8	150	5.21	50.0
S18-S19	S18	S19	5.725	0.600	23.169	22.425	0.744	7.7	150	5.24	50.0
S19-S22	S19	S22	1.626	0.600	22.271	22.260	0.011	147.8	300	6.04	50.0
S20-S21	S20	S21	16.600	0.600	23.400	23.193	0.207	80.2	150	5.25	50.0
S21-S22	S21	S22	5.725	0.600	23.193	22.409	0.784	7.3	150	5.27	50.0
S22-S23	S22	S23	6.437	0.600	22.260	22.217	0.043	149.7	300	6.12	50.0
S23-S40	S23	S40	3.833	0.600	22.217	22.191	0.026	147.4	300	6.17	50.0
S24-S25	S24	S25	10.862	0.600	23.520	23.339	0.181	60.0	150	5.14	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)
S1-S2	1.125	19.9	0.9	0.644	0.517	0.005	0.0	21	0.562
S2-S3	1.124	19.9	3.9	0.516	0.772	0.022	0.0	45	0.873
S3-S9	1.127	19.9	3.9	0.773	0.756	0.022	0.0	45	0.875
S4-S6	2.262	40.0	0.0	0.363	0.779	0.000	0.0	0	0.000
S5-S6	2.924	51.7	0.0	0.587	0.779	0.000	0.0	0	0.000
S6-S8	0.814	14.4	2.5	0.779	0.651	0.014	0.0	42	0.608
S7-S8	0.821	14.5	13.2	0.403	0.651	0.075	0.0	113	0.928
S8-S9	0.808	14.3	15.7	0.651	0.755	0.089	0.0	150	0.823
S9-S12	0.816	14.4	22.6	0.755	1.107	0.128	0.0	150	0.831
S10-S11	1.845	32.6	1.8	0.370	0.818	0.010	0.0	24	0.987
S11-S12	2.614	46.2	2.5	0.818	1.112	0.014	0.0	24	1.402
S12-S16	1.278	90.3	25.0	1.112	1.215	0.142	0.0	108	1.097
S13-S15	1.596	28.2	1.6	0.400	0.695	0.009	0.0	24	0.867
S14-S15	1.596	28.2	0.7	0.494	0.696	0.004	0.0	16	0.666
S15-S16	3.204	56.6	2.3	0.696	1.215	0.013	0.0	21	1.584
S16-S19	1.281	90.6	27.3	1.215	1.421	0.155	0.0	113	1.126
S17-S18	1.126	19.9	2.1	0.500	0.599	0.012	0.0	33	0.736
S18-S19	3.654	64.6	2.1	0.599	1.417	0.012	0.0	18	1.675
S19-S22	1.291	91.2	29.4	1.421	1.412	0.167	0.0	117	1.155
S20-S21	1.123	19.8	2.1	0.450	0.556	0.012	0.0	33	0.734
S21-S22	3.753	66.3	2.1	0.556	1.413	0.012	0.0	18	1.720
S22-S23	1.282	90.7	31.5	1.412	1.374	0.179	0.0	122	1.169
S23-S40	1.293	91.4	33.3	1.374	1.353	0.189	0.0	125	1.194
S24-S25	1.301	23.0	0.0	0.330	0.511	0.000	0.0	0	0.000

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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)
S25-S28	S25	S28	19.471	0.600	23.339	23.014	0.325	59.9	150	5.39	50.0
S26-S27	S26	S27	10.420	0.600	23.305	23.162	0.143	72.9	100	5.19	50.0
S27-S28	S27	S28	5.829	0.600	23.112	23.015	0.097	60.1	150	5.27	50.0
S28-S33	S28	S33	10.325	0.600	23.015	22.843	0.172	60.0	150	5.52	50.0
S29-S30	S29	S30	11.717	0.600	23.300	23.154	0.146	80.3	100	5.23	50.0
S30-S32	S30	S32	12.875	0.600	23.154	22.993	0.161	80.0	100	5.48	50.0
S31-S32	S31	S32	11.722	0.600	23.139	22.993	0.146	80.3	100	5.23	50.0
S32-S33	S32	S33	7.999	0.600	22.943	22.843	0.100	80.0	150	5.60	50.0
S33-S38	S33	S38	3.985	0.600	22.843	22.793	0.050	79.7	150	5.65	50.0
S34-S35	S34	S35	11.713	0.600	23.223	23.077	0.146	80.2	100	5.23	50.0
S35-S37	S35	S37	13.175	0.600	23.076	22.911	0.165	79.8	100	5.48	50.0
S36-S37	S36	S37	11.299	0.600	23.477	22.912	0.565	20.0	100	5.11	50.0
S37-S38	S37	S38	5.517	0.600	22.862	22.793	0.069	80.0	150	5.56	50.0
S38-S39	S38	S39	10.497	0.600	22.793	22.662	0.131	80.1	150	5.81	50.0
S39-S40	S39	S40	7.784	0.600	22.662	22.392	0.270	28.8	100	5.90	50.0
S40-S43	S40	S43	2.330	0.600	22.192	22.176	0.016	145.6	300	6.20	50.0
S41-S42	S41	S42	16.600	0.600	23.314	22.899	0.415	40.0	150	5.17	50.0
S42-S43	S42	S43	5.725	0.600	22.899	22.327	0.572	10.0	150	5.20	50.0
S43-S46	S43	S46	1.525	0.600	22.176	22.166	0.010	152.5	300	6.22	50.0
S44-S45	S44	S45	16.000	0.600	23.094	22.894	0.200	80.0	150	5.24	50.0
S45-S46	S45	S46	5.725	0.600	22.894	22.322	0.572	10.0	150	5.27	50.0
S46-S49	S46	S49	12.750	0.600	22.166	22.081	0.085	150.0	300	6.39	50.0
S47-S48	S47	S48	16.000	0.600	23.123	22.803	0.320	50.0	150	5.19	50.0
S48-S49	S48	S49	5.725	0.600	22.803	22.231	0.572	10.0	150	5.22	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)
S25-S28	1.302	23.0	5.6	0.511	0.836	0.032	0.0	51	1.080
S26-S27	0.902	7.1	0.0	0.595	0.738	0.000	0.0	0	0.000
S27-S28	1.299	23.0	0.0	0.738	0.835	0.000	0.0	0	0.000
S28-S33	1.301	23.0	5.6	0.835	0.903	0.032	0.0	51	1.079
S29-S30	0.859	6.7	1.6	0.450	0.596	0.009	0.0	33	0.704
S30-S32	0.861	6.8	1.6	0.596	0.757	0.009	0.0	33	0.705
S31-S32	0.859	6.7	1.8	0.611	0.757	0.010	0.0	35	0.721
S32-S33	1.125	19.9	3.3	0.757	0.903	0.019	0.0	41	0.835
S33-S38	1.127	19.9	9.0	0.903	0.957	0.051	0.0	71	1.098
S34-S35	0.860	6.8	2.1	0.577	0.723	0.012	0.0	39	0.763
S35-S37	0.862	6.8	2.1	0.724	0.889	0.012	0.0	39	0.765
S36-S37	1.734	13.6	2.1	0.323	0.888	0.012	0.0	27	1.268
S37-S38	1.125	19.9	4.2	0.888	0.957	0.024	0.0	47	0.898
S38-S39	1.124	19.9	15.2	0.957	1.095	0.086	0.0	98	1.235
S39-S40	1.442	11.3	15.2	1.145	1.352	0.086	0.0	100	1.481
S40-S43	1.301	91.9	48.5	1.352	1.338	0.275	0.0	155	1.318
S41-S42	1.596	28.2	2.1	0.536	0.720	0.012	0.0	28	0.942
S42-S43	3.204	56.6	2.1	0.720	1.337	0.012	0.0	20	1.527
S43-S46	1.271	89.8	50.6	1.338	1.329	0.287	0.0	161	1.308
S44-S45	1.125	19.9	1.9	0.606	0.689	0.011	0.0	31	0.712
S45-S46	3.204	56.6	1.9	0.689	1.323	0.011	0.0	19	1.498
S46-S49	1.281	90.6	55.1	1.329	1.255	0.313	0.0	169	1.341
S47-S48	1.426	25.2	1.9	0.577	0.655	0.011	0.0	28	0.841
S48-S49	3.204	56.6	1.9	0.655	1.255	0.011	0.0	19	1.498

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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)
S49-S52	S49	S52	1.375	0.600	22.081	22.072	0.009	152.8	300	6.41	50.0
S50-S51	S50	S51	16.000	0.600	22.994	22.794	0.200	80.0	150	5.24	50.0
S51-S52	S51	S52	5.725	0.600	22.794	22.222	0.572	10.0	150	5.27	50.0
S52-S55	S52	S55	2.837	0.600	22.072	22.053	0.019	149.3	300	6.44	50.0
S53-S54	S53	S54	14.390	0.600	23.310	22.590	0.720	20.0	150	5.11	50.0
S54-S55	S54	S55	3.875	0.600	22.590	22.202	0.388	10.0	150	5.13	50.0
S55-S58	S55	S58	1.520	0.600	22.053	22.043	0.010	152.0	300	6.46	50.0
S56-S57	S56	S57	14.389	0.600	23.060	22.580	0.480	30.0	150	5.13	50.0
S57-S58	S57	S58	3.875	0.600	22.580	22.192	0.388	10.0	150	5.15	50.0
S58-S61	S58	S61	8.243	0.600	22.043	21.988	0.055	149.9	300	6.57	50.0
S59-S60	S59	S60	15.000	0.600	22.849	22.474	0.375	40.0	150	5.16	50.0
S60-S61	S60	S61	6.725	0.600	22.474	22.138	0.336	20.0	150	5.21	50.0
S61-S64	S61	S64	1.525	0.600	21.988	21.978	0.010	152.5	300	6.59	50.0
S62-S63	S62	S63	15.000	0.600	22.839	22.464	0.375	40.0	150	5.16	50.0
S63-S64	S63	S64	6.725	0.600	22.464	22.128	0.336	20.0	150	5.21	50.0
S64-S66	S64	S66	6.047	0.600	21.978	21.938	0.040	151.2	300	6.67	50.0
S65-S66	S65	S66	18.253	0.600	23.000	22.087	0.913	20.0	150	5.13	50.0
S66-S84	S66	S84	8.050	0.600	21.937	21.883	0.054	149.1	300	6.78	50.0
S67-S68	S67	S68	10.351	0.600	22.723	22.600	0.123	84.2	100	5.21	50.0
S68-S70	S68	S70	13.225	0.600	22.550	22.385	0.165	80.2	150	5.40	50.0
S69-S70	S69	S70	10.351	0.600	22.558	22.429	0.129	80.2	100	5.20	50.0
S70-S72	S70	S72	5.500	0.600	22.378	22.309	0.069	79.7	150	5.48	50.0
S71-S72	S71	S72	6.813	0.600	22.445	22.360	0.085	80.1	100	5.13	50.0
S72-S79	S72	S79	6.112	0.600	22.310	22.234	0.076	80.4	150	5.57	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)
S49-S52	1.269	89.7	57.1	1.255	1.247	0.324	0.0	174	1.343
S50-S51	1.125	19.9	1.9	0.606	0.629	0.011	0.0	31	0.712
S51-S52	3.204	56.6	1.9	0.629	1.247	0.011	0.0	19	1.498
S52-S55	1.284	90.8	59.0	1.247	1.230	0.335	0.0	177	1.365
S53-S54	2.262	40.0	0.0	0.440	0.990	0.000	0.0	0	0.000
S54-S55	3.204	56.6	0.0	0.990	1.231	0.000	0.0	0	0.000
S55-S58	1.273	90.0	59.0	1.230	1.221	0.335	0.0	178	1.355
S56-S57	1.845	32.6	2.1	0.390	0.930	0.012	0.0	26	1.047
S57-S58	3.204	56.6	2.1	0.930	1.222	0.012	0.0	20	1.527
S58-S61	1.282	90.6	61.1	1.221	1.173	0.347	0.0	181	1.372
S59-S60	1.596	28.2	1.9	0.751	0.884	0.011	0.0	27	0.917
S60-S61	2.262	40.0	1.9	0.884	1.173	0.011	0.0	23	1.175
S61-S64	1.271	89.8	65.5	1.173	1.164	0.372	0.0	191	1.382
S62-S63	1.596	28.2	1.9	0.611	0.840	0.011	0.0	27	0.917
S63-S64	2.262	40.0	1.9	0.840	1.164	0.011	0.0	23	1.175
S64-S66	1.276	90.2	67.5	1.164	1.129	0.383	0.0	194	1.396
S65-S66	2.262	40.0	2.1	0.450	1.130	0.012	0.0	23	1.194
S66-S84	1.285	90.8	69.6	1.130	1.080	0.395	0.0	197	1.411
S67-S68	0.839	6.6	0.0	0.326	0.426	0.000	0.0	0	0.000
S68-S70	1.123	19.8	1.6	0.426	0.615	0.009	0.0	28	0.670
S69-S70	0.860	6.8	1.6	0.492	0.621	0.009	0.0	33	0.704
S70-S72	1.127	19.9	3.2	0.622	0.566	0.018	0.0	40	0.823
S71-S72	0.860	6.8	1.2	0.481	0.565	0.007	0.0	29	0.658
S72-S79	1.122	19.8	4.4	0.565	0.557	0.025	0.0	48	0.902

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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)
S73-S74	S73	S74	13.150	0.600	22.719	22.555	0.164	80.2	100	5.25	50.0
S74-S77	S74	S77	6.518	0.600	22.505	22.424	0.081	80.5	150	5.35	50.0
S75-S76	S75	S76	13.150	0.600	22.717	22.553	0.164	80.2	100	5.25	50.0
S76-S77	S76	S77	6.357	0.600	22.503	22.424	0.079	80.5	150	5.35	50.0
S77-S78	S77	S78	9.404	0.600	22.424	22.306	0.118	79.7	150	5.49	50.0
S78-S79	S78	S79	5.825	0.600	22.306	22.233	0.073	79.8	150	5.58	50.0
S79-S84	S79	S84	29.940	0.600	22.083	21.883	0.200	149.7	300	5.97	50.0
S80-S81	S80	S81	17.500	0.600	22.667	22.229	0.438	40.0	150	5.18	50.0
S81-S83	S81	S83	2.463	0.600	22.229	22.167	0.062	39.7	150	5.21	50.0
S82-S83	S82	S83	15.809	0.600	22.958	22.168	0.790	20.0	150	5.12	50.0
S83-S84	S83	S84	5.366	0.600	22.168	22.034	0.134	40.0	150	5.26	50.0
S84-S88	S84	S88	17.145	0.600	21.884	21.770	0.114	150.4	375	6.97	50.0
S85-S86	S85	S86	17.000	0.600	22.760	22.193	0.567	30.0	150	5.15	50.0
S86-S88	S86	S88	5.981	0.600	22.194	21.995	0.199	30.1	150	5.21	50.0
S87-S88	S87	S88	16.459	0.600	21.879	21.769	0.110	149.6	375	5.19	50.0
S88-S92	S88	S92	6.100	0.600	21.769	21.728	0.041	148.8	375	7.04	50.0
S89-S91	S89	S91	14.426	0.600	22.710	22.229	0.481	30.0	100	5.17	50.0
S90-S91	S90	S91	9.012	0.600	22.680	22.229	0.451	20.0	100	5.09	50.0
S91-S92	S91	S92	6.013	0.600	22.179	21.953	0.226	26.6	150	5.22	50.0
S92-S93	S92	S93	18.503	0.600	21.729	21.606	0.123	150.4	150	7.42	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)
S73-S74	0.860	6.8	1.6	0.331	0.492	0.009	0.0	33	0.704
S74-S77	1.121	19.8	1.6	0.492	0.710	0.009	0.0	28	0.669
S75-S76	0.860	6.8	1.6	0.333	0.506	0.009	0.0	33	0.704
S76-S77	1.121	19.8	1.6	0.506	0.710	0.009	0.0	28	0.669
S77-S78	1.127	19.9	5.1	0.710	0.524	0.029	0.0	52	0.946
S78-S79	1.126	19.9	5.1	0.524	0.558	0.029	0.0	52	0.945
S79-S84	1.282	90.7	15.5	0.558	1.080	0.088	0.0	83	0.964
S80-S81	1.596	28.2	2.3	0.433	0.783	0.013	0.0	29	0.965
S81-S83	1.602	28.3	2.3	0.783	0.910	0.013	0.0	29	0.969
S82-S83	2.262	40.0	1.9	0.492	0.909	0.011	0.0	23	1.175
S83-S84	1.596	28.2	4.2	0.909	1.079	0.024	0.0	39	1.148
S84-S88	1.475	162.9	91.6	1.004	0.823	0.520	0.0	201	1.516
S85-S86	1.845	32.6	2.3	0.340	0.622	0.013	0.0	27	1.061
S86-S88	1.841	32.5	2.3	0.621	0.823	0.013	0.0	27	1.059
S87-S88	1.479	163.3	6.9	0.746	0.824	0.039	0.0	52	0.741
S88-S92	1.483	163.8	106.2	0.824	0.850	0.603	0.0	220	1.573
S89-S91	1.414	11.1	3.9	0.448	0.821	0.022	0.0	41	1.292
S90-S91	1.734	13.6	0.0	0.370	0.821	0.000	0.0	0	0.000
S91-S92	1.960	34.6	3.9	0.821	0.850	0.022	0.0	34	1.297
S92-S93	0.817	14.4	110.1	1.074	0.672	0.625	0.0	150	0.832

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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)
S1-S2	12.697	79.9	150	Circular	23.927	23.133	0.644	23.641	22.974	0.517
S2-S3	22.275	80.1	150	Circular	23.641	22.975	0.516	23.619	22.697	0.772
S3-S9	8.848	79.7	150	Circular	23.619	22.696	0.773	23.491	22.585	0.756
S4-S6	17.338	20.0	150	Circular	24.000	23.487	0.363	23.549	22.620	0.779
S5-S6	7.303	12.0	150	Circular	23.966	23.229	0.587	23.549	22.620	0.779
S6-S8	3.031	151.6	150	Circular	23.549	22.620	0.779	23.401	22.600	0.651
S7-S8	7.005	149.0	150	Circular	23.200	22.647	0.403	23.401	22.600	0.651
S8-S9	2.153	153.8	150	Circular	23.401	22.600	0.651	23.491	22.586	0.755
S9-S12	7.838	150.7	150	Circular	23.491	22.586	0.755	23.791	22.534	1.107
S10-S11	13.445	30.0	150	Circular	24.000	23.480	0.370	24.000	23.032	0.818
S11-S12	7.544	15.0	150	Circular	24.000	23.032	0.818	23.791	22.529	1.112
S12-S16	1.961	150.8	300	Circular	23.791	22.379	1.112	23.881	22.366	1.215
S13-S15	14.451	40.0	150	Circular	24.000	23.450	0.400	23.934	23.089	0.695
S14-S15	10.710	40.0	150	Circular	24.000	23.356	0.494	23.934	23.088	0.696
S15-S16	5.725	10.0	150	Circular	23.934	23.088	0.696	23.881	22.516	1.215
S16-S19	14.249	150.0	300	Circular	23.881	22.366	1.215	23.992	22.271	1.421
S17-S18	14.451	79.8	150	Circular	24.000	23.350	0.500	23.918	23.169	0.599
S18-S19	5.725	7.7	150	Circular	23.918	23.169	0.599	23.992	22.425	1.417
S19-S22	1.626	147.8	300	Circular	23.992	22.271	1.421	23.972	22.260	1.412
S20-S21	16.600	80.2	150	Circular	24.000	23.400	0.450	23.899	23.193	0.556
S21-S22	5.725	7.3	150	Circular	23.899	23.193	0.556	23.972	22.409	1.413
S22-S23	6.437	149.7	300	Circular	23.972	22.260	1.412	23.891	22.217	1.374
S23-S40	3.833	147.4	300	Circular	23.891	22.217	1.374	23.844	22.191	1.353
S24-S25	10.862	60.0	150	Circular	24.000	23.520	0.330	24.000	23.339	0.511
S25-S28	19.471	59.9	150	Circular	24.000	23.339	0.511	24.000	23.014	0.836

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S1-S2	S1	150	Manhole	Adoptable	S2	320	Manhole	Adoptable
S2-S3	S2	320	Manhole	Adoptable	S3	320	Manhole	Adoptable
S3-S9	S3	320	Manhole	Adoptable	S9		Junction	
S4-S6	S4	150	Manhole	Adoptable	S6	320	Manhole	Adoptable
S5-S6	S5	150	Manhole	Adoptable	S6	320	Manhole	Adoptable
S6-S8	S6	320	Manhole	Adoptable	S8		Junction	
S7-S8	S7		Junction		S8		Junction	
S8-S9	S8		Junction		S9		Junction	
S9-S12	S9		Junction		S12	1200	Manhole	Adoptable
S10-S11	S10	150	Manhole	Adoptable	S11	320	Manhole	Adoptable
S11-S12	S11	320	Manhole	Adoptable	S12	1200	Manhole	Adoptable
S12-S16	S12	1200	Manhole	Adoptable	S16		Junction	
S13-S15	S13	150	Manhole	Adoptable	S15	320	Manhole	Adoptable
S14-S15	S14	150	Manhole	Adoptable	S15	320	Manhole	Adoptable
S15-S16	S15	320	Manhole	Adoptable	S16		Junction	
S16-S19	S16		Junction		S19		Junction	
S17-S18	S17	150	Manhole	Adoptable	S18	320	Manhole	Adoptable
S18-S19	S18	320	Manhole	Adoptable	S19		Junction	
S19-S22	S19		Junction		S22		Junction	
S20-S21	S20	150	Manhole	Adoptable	S21	320	Manhole	Adoptable
S21-S22	S21	320	Manhole	Adoptable	S22		Junction	
S22-S23	S22		Junction		S23		Junction	
S23-S40	S23		Junction		S40		Junction	
S24-S25	S24	150	Manhole	Adoptable	S25	320	Manhole	Adoptable
S25-S28	S25	320	Manhole	Adoptable	S28	320	Manhole	Adoptable

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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)
S26-S27	10.420	72.9	100	Circular	24.000	23.305	0.595	24.000	23.162	0.738
S27-S28	5.829	60.1	150	Circular	24.000	23.112	0.738	24.000	23.015	0.835
S28-S33	10.325	60.0	150	Circular	24.000	23.015	0.835	23.896	22.843	0.903
S29-S30	11.717	80.3	100	Circular	23.850	23.300	0.450	23.850	23.154	0.596
S30-S32	12.875	80.0	100	Circular	23.850	23.154	0.596	23.850	22.993	0.757
S31-S32	11.722	80.3	100	Circular	23.850	23.139	0.611	23.850	22.993	0.757
S32-S33	7.999	80.0	150	Circular	23.850	22.943	0.757	23.896	22.843	0.903
S33-S38	3.985	79.7	150	Circular	23.896	22.843	0.903	23.900	22.793	0.957
S34-S35	11.713	80.2	100	Circular	23.900	23.223	0.577	23.900	23.077	0.723
S35-S37	13.175	79.8	100	Circular	23.900	23.076	0.724	23.900	22.911	0.889
S36-S37	11.299	20.0	100	Circular	23.900	23.477	0.323	23.900	22.912	0.888
S37-S38	5.517	80.0	150	Circular	23.900	22.862	0.888	23.900	22.793	0.957
S38-S39	10.497	80.1	150	Circular	23.900	22.793	0.957	23.907	22.662	1.095
S39-S40	7.784	28.8	100	Circular	23.907	22.662	1.145	23.844	22.392	1.352
S40-S43	2.330	145.6	300	Circular	23.844	22.192	1.352	23.814	22.176	1.338
S41-S42	16.600	40.0	150	Circular	24.000	23.314	0.536	23.769	22.899	0.720
S42-S43	5.725	10.0	150	Circular	23.769	22.899	0.720	23.814	22.327	1.337
S43-S46	1.525	152.5	300	Circular	23.814	22.176	1.338	23.795	22.166	1.329
S44-S45	16.000	80.0	150	Circular	23.850	23.094	0.606	23.733	22.894	0.689
S45-S46	5.725	10.0	150	Circular	23.733	22.894	0.689	23.795	22.322	1.323
S46-S49	12.750	150.0	300	Circular	23.795	22.166	1.329	23.636	22.081	1.255
S47-S48	16.000	50.0	150	Circular	23.850	23.123	0.577	23.608	22.803	0.655
S48-S49	5.725	10.0	150	Circular	23.608	22.803	0.655	23.636	22.231	1.255
S49-S52	1.375	152.8	300	Circular	23.636	22.081	1.255	23.619	22.072	1.247
S50-S51	16.000	80.0	150	Circular	23.750	22.994	0.606	23.573	22.794	0.629

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S26-S27	S26	150	Manhole	Adoptable	S27	320	Manhole	Adoptable
S27-S28	S27	320	Manhole	Adoptable	S28	320	Manhole	Adoptable
S28-S33	S28	320	Manhole	Adoptable	S33	320	Manhole	Adoptable
S29-S30	S29	150	Manhole	Adoptable	S30	320	Manhole	Adoptable
S30-S32	S30	320	Manhole	Adoptable	S32	320	Manhole	Adoptable
S31-S32	S31	150	Manhole	Adoptable	S32	320	Manhole	Adoptable
S32-S33	S32	320	Manhole	Adoptable	S33	320	Manhole	Adoptable
S33-S38	S33	320	Manhole	Adoptable	S38		Junction	
S34-S35	S34	150	Manhole	Adoptable	S35	320	Manhole	Adoptable
S35-S37	S35	320	Manhole	Adoptable	S37	320	Manhole	Adoptable
S36-S37	S36	150	Manhole	Adoptable	S37	320	Manhole	Adoptable
S37-S38	S37	320	Manhole	Adoptable	S38		Junction	
S38-S39	S38		Junction		S39	460	Manhole	Adoptable
S39-S40	S39	460	Manhole	Adoptable	S40		Junction	
S40-S43	S40		Junction		S43		Junction	
S41-S42	S41	150	Manhole	Adoptable	S42	320	Manhole	Adoptable
S42-S43	S42	320	Manhole	Adoptable	S43		Junction	
S43-S46	S43		Junction		S46		Junction	
S44-S45	S44	150	Manhole	Adoptable	S45	320	Manhole	Adoptable
S45-S46	S45	320	Manhole	Adoptable	S46		Junction	
S46-S49	S46		Junction		S49		Junction	
S47-S48	S47	150	Manhole	Adoptable	S48	320	Manhole	Adoptable
S48-S49	S48	320	Manhole	Adoptable	S49		Junction	
S49-S52	S49		Junction		S52		Junction	
S50-S51	S50	150	Manhole	Adoptable	S51	320	Manhole	Adoptable

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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)
S51-S52	5.725	10.0	150	Circular	23.573	22.794	0.629	23.619	22.222	1.247
S52-S55	2.837	149.3	300	Circular	23.619	22.072	1.247	23.583	22.053	1.230
S53-S54	14.390	20.0	150	Circular	23.900	23.310	0.440	23.730	22.590	0.990
S54-S55	3.875	10.0	150	Circular	23.730	22.590	0.990	23.583	22.202	1.231
S55-S58	1.520	152.0	300	Circular	23.583	22.053	1.230	23.564	22.043	1.221
S56-S57	14.389	30.0	150	Circular	23.600	23.060	0.390	23.660	22.580	0.930
S57-S58	3.875	10.0	150	Circular	23.660	22.580	0.930	23.564	22.192	1.222
S58-S61	8.243	149.9	300	Circular	23.564	22.043	1.221	23.461	21.988	1.173
S59-S60	15.000	40.0	150	Circular	23.750	22.849	0.751	23.508	22.474	0.884
S60-S61	6.725	20.0	150	Circular	23.508	22.474	0.884	23.461	22.138	1.173
S61-S64	1.525	152.5	300	Circular	23.461	21.988	1.173	23.442	21.978	1.164
S62-S63	15.000	40.0	150	Circular	23.600	22.839	0.611	23.454	22.464	0.840
S63-S64	6.725	20.0	150	Circular	23.454	22.464	0.840	23.442	22.128	1.164
S64-S66	6.047	151.2	300	Circular	23.442	21.978	1.164	23.367	21.938	1.129
S65-S66	18.253	20.0	150	Circular	23.600	23.000	0.450	23.367	22.087	1.130
S66-S84	8.050	149.1	300	Circular	23.367	21.937	1.130	23.263	21.883	1.080
S67-S68	10.351	84.2	100	Circular	23.149	22.723	0.326	23.126	22.600	0.426
S68-S70	13.225	80.2	150	Circular	23.126	22.550	0.426	23.150	22.385	0.615
S69-S70	10.351	80.2	100	Circular	23.150	22.558	0.492	23.150	22.429	0.621
S70-S72	5.500	79.7	150	Circular	23.150	22.378	0.622	23.025	22.309	0.566
S71-S72	6.813	80.1	100	Circular	23.026	22.445	0.481	23.025	22.360	0.565
S72-S79	6.112	80.4	150	Circular	23.025	22.310	0.565	22.941	22.234	0.557
S73-S74	13.150	80.2	100	Circular	23.150	22.719	0.331	23.147	22.555	0.492
S74-S77	6.518	80.5	150	Circular	23.147	22.505	0.492	23.284	22.424	0.710
S75-S76	13.150	80.2	100	Circular	23.150	22.717	0.333	23.159	22.553	0.506

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S51-S52	S51	320	Manhole	Adoptable	S52		Junction	
S52-S55	S52		Junction		S55		Junction	
S53-S54	S53	150	Manhole	Adoptable	S54	320	Manhole	Adoptable
S54-S55	S54	320	Manhole	Adoptable	S55		Junction	
S55-S58	S55		Junction		S58		Junction	
S56-S57	S56	150	Manhole	Adoptable	S57	320	Manhole	Adoptable
S57-S58	S57	320	Manhole	Adoptable	S58		Junction	
S58-S61	S58		Junction		S61		Junction	
S59-S60	S59	150	Manhole	Adoptable	S60	320	Manhole	Adoptable
S60-S61	S60	320	Manhole	Adoptable	S61		Junction	
S61-S64	S61		Junction		S64		Junction	
S62-S63	S62	150	Manhole	Adoptable	S63	320	Manhole	Adoptable
S63-S64	S63	320	Manhole	Adoptable	S64		Junction	
S64-S66	S64		Junction		S66		Junction	
S65-S66	S65	150	Manhole	Adoptable	S66		Junction	
S66-S84	S66		Junction		S84	1200	Manhole	Adoptable
S67-S68	S67	150	Manhole	Adoptable	S68	320	Manhole	Adoptable
S68-S70	S68	320	Manhole	Adoptable	S70	320	Manhole	Adoptable
S69-S70	S69	150	Manhole	Adoptable	S70	320	Manhole	Adoptable
S70-S72	S70	320	Manhole	Adoptable	S72	460	Manhole	Adoptable
S71-S72	S71	320	Manhole	Adoptable	S72	460	Manhole	Adoptable
S72-S79	S72	460	Manhole	Adoptable	S79	1200	Manhole	Adoptable
S73-S74	S73	150	Manhole	Adoptable	S74	320	Manhole	Adoptable
S74-S77	S74	320	Manhole	Adoptable	S77	320	Manhole	Adoptable
S75-S76	S75	150	Manhole	Adoptable	S76	320	Manhole	Adoptable

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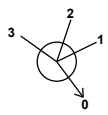
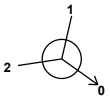
Pipeline Schedule

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)
S76-S77	6.357	80.5	150	Circular	23.159	22.503	0.506	23.284	22.424	0.710
S77-S78	9.404	79.7	150	Circular	23.284	22.424	0.710	22.980	22.306	0.524
S78-S79	5.825	79.8	150	Circular	22.980	22.306	0.524	22.941	22.233	0.558
S79-S84	29.940	149.7	300	Circular	22.941	22.083	0.558	23.263	21.883	1.080
S80-S81	17.500	40.0	150	Circular	23.250	22.667	0.433	23.162	22.229	0.783
S81-S83	2.463	39.7	150	Circular	23.162	22.229	0.783	23.227	22.167	0.910
S82-S83	15.809	20.0	150	Circular	23.600	22.958	0.492	23.227	22.168	0.909
S83-S84	5.366	40.0	150	Circular	23.227	22.168	0.909	23.263	22.034	1.079
S84-S88	17.145	150.4	375	Circular	23.263	21.884	1.004	22.968	21.770	0.823
S85-S86	17.000	30.0	150	Circular	23.250	22.760	0.340	22.965	22.193	0.622
S86-S88	5.981	30.1	150	Circular	22.965	22.194	0.621	22.968	21.995	0.823
S87-S88	16.459	149.6	375	Circular	23.000	21.879	0.746	22.968	21.769	0.824
S88-S92	6.100	148.8	375	Circular	22.968	21.769	0.824	22.953	21.728	0.850
S89-S91	14.426	30.0	100	Circular	23.258	22.710	0.448	23.150	22.229	0.821
S90-S91	9.012	20.0	100	Circular	23.150	22.680	0.370	23.150	22.229	0.821
S91-S92	6.013	26.6	150	Circular	23.150	22.179	0.821	22.953	21.953	0.850
S92-S93	18.503	150.4	150	Circular	22.953	21.729	1.074	22.428	21.606	0.672

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S76-S77	S76	320	Manhole	Adoptable	S77	320	Manhole	Adoptable
S77-S78	S77	320	Manhole	Adoptable	S78	320	Manhole	Adoptable
S78-S79	S78	320	Manhole	Adoptable	S79	1200	Manhole	Adoptable
S79-S84	S79	1200	Manhole	Adoptable	S84	1200	Manhole	Adoptable
S80-S81	S80	150	Manhole	Adoptable	S81	320	Manhole	Adoptable
S81-S83	S81	320	Manhole	Adoptable	S83	320	Manhole	Adoptable
S82-S83	S82	150	Manhole	Adoptable	S83	320	Manhole	Adoptable
S83-S84	S83	320	Manhole	Adoptable	S84	1200	Manhole	Adoptable
S84-S88	S84	1200	Manhole	Adoptable	S88	1350	Manhole	Adoptable
S85-S86	S85	150	Manhole	Adoptable	S86	320	Manhole	Adoptable
S86-S88	S86	320	Manhole	Adoptable	S88	1350	Manhole	Adoptable
S87-S88	S87		Junction		S88	1350	Manhole	Adoptable
S88-S92	S88	1350	Manhole	Adoptable	S92	1350	Manhole	Adoptable
S89-S91	S89	150	Manhole	Adoptable	S91	320	Manhole	Adoptable
S90-S91	S90	150	Manhole	Adoptable	S91	320	Manhole	Adoptable
S91-S92	S91	320	Manhole	Adoptable	S92	1350	Manhole	Adoptable
S92-S93	S92	1350	Manhole	Adoptable	S93	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
S88	233292.055	379814.060	22.968	1.199	1350		1	S87-S88	21.769	375
							2	S86-S88	21.995	150
							3	S84-S88	21.770	375
							0	S88-S92	21.769	375
S12	233217.538	379867.077	23.791	1.412	1200		1	S11-S12	22.529	150
							2	S9-S12	22.534	150
							0	S12-S16	22.379	300

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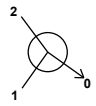
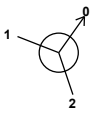
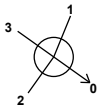
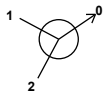
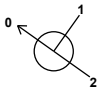
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S7	233200.830	379864.000	23.200	0.553					
						0	S7-S8	22.647	150
S92	233295.699	379809.167	22.953	1.225	1350				
						1	S91-S92	21.953	150
						2	S88-S92	21.728	375
						0	S92-S93	21.729	150
S93	233310.778	379798.444	22.428	0.822	1200				
						1	S92-S93	21.606	150
S79	233260.728	379799.603	22.941	0.858	1200				
						1	S78-S79	22.233	150
						2	S72-S79	22.234	150
						0	S79-S84	22.083	300
S84	233278.085	379823.999	23.263	1.380	1200				
						1	S83-S84	22.034	150
						2	S79-S84	21.883	300
						3	S66-S84	21.883	300
						0	S84-S88	21.884	375
S32	233221.421	379827.814	23.850	0.907	320				
						1	S31-S32	22.993	100
						2	S30-S32	22.993	100
						0	S32-S33	22.943	150
S30	233215.351	379816.459	23.850	0.696	320				
						1	S29-S30	23.154	100
						0	S30-S32	23.154	100
S29	233205.018	379821.982	23.850	0.550	150				
						0	S29-S30	23.300	100
S31	233211.082	379833.340	23.850	0.711	150				
						0	S31-S32	23.139	100
S37	233234.531	379832.558	23.900	1.038	320				
						1	S36-S37	22.912	100
						2	S35-S37	22.911	100
						0	S37-S38	22.862	150
S36	233241.081	379841.764	23.900	0.423	150				
						0	S36-S37	23.477	100
S35	233245.271	379824.927	23.900	0.824	320				
						1	S34-S35	23.077	100
						0	S35-S37	23.076	100
S34	233252.062	379834.471	23.900	0.677	150				
						0	S34-S35	23.223	100

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S27	233216.190	379832.027	24.000	0.888	320	1	S26-S27	23.162	100
						0	S27-S28	23.112	150
S26	233207.000	379836.939	24.000	0.695	150	0	S26-S27	23.305	100
S25	233228.117	379854.339	24.000	0.661	320	1	S24-S25	23.339	150
						0	S25-S28	23.339	150
S24	233218.537	379859.460	24.000	0.480	150	0	S24-S25	23.520	150
S1	233203.093	379825.159	23.927	0.794	150	0	S1-S2	23.133	150
S2	233199.570	379837.357	23.641	0.667	320	1	S1-S2	22.974	150
						0	S2-S3	22.975	150
S3	233209.954	379857.063	23.619	0.923	320	1	S2-S3	22.697	150
						0	S3-S9	22.696	150
S9	233209.787	379865.910	23.491	0.906		1	S8-S9	22.586	150
						2	S3-S9	22.585	150
						0	S9-S12	22.586	150
S39	233235.970	379844.409	23.907	1.245	460	1	S38-S39	22.662	150
						0	S39-S40	22.662	100
S40	233240.438	379850.784	23.844	1.653		1	S39-S40	22.392	100
						2	S23-S40	22.191	300
						0	S40-S43	22.192	300
S53	233246.812	379823.833	23.900	0.590	150	0	S53-S54	23.310	150
S55	233257.401	379838.715	23.583	1.530		1	S54-S55	22.202	150
						2	S52-S55	22.053	300
						0	S55-S58	22.053	300
S56	233248.051	379822.952	23.600	0.540	150	0	S56-S57	23.060	150

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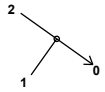
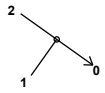
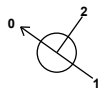
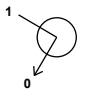
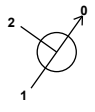
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S58	233258.639	379837.834	23.564	1.521			1 S57-S58	22.192	150
							2 S55-S58	22.043	300
							0 S58-S61	22.043	300
S65	233260.944	379813.793	23.600	0.600	150		0 S65-S66	23.000	150
S66	233271.526	379828.666	23.367	1.430			1 S65-S66	22.087	150
							2 S64-S66	21.938	300
							0 S66-S84	21.937	300
S70	233267.165	379790.624	23.150	0.772	320		1 S69-S70	22.429	100
							2 S68-S70	22.385	150
							0 S70-S72	22.378	150
S69	233275.599	379784.624	23.150	0.592	150		0 S69-S70	22.558	100
S68	233274.831	379801.400	23.126	0.576	320		1 S67-S68	22.600	100
							0 S68-S70	22.550	150
S67	233283.266	379795.400	23.149	0.426	150		0 S67-S68	22.723	100
S74	233243.894	379800.868	23.147	0.642	320		1 S73-S74	22.555	100
							0 S74-S77	22.505	150
S73	233232.555	379807.528	23.150	0.431	150		0 S73-S74	22.719	100
S76	233250.415	379811.969	23.159	0.656	320		1 S75-S76	22.553	100
							0 S76-S77	22.503	150
S75	233239.076	379818.630	23.150	0.433	150		0 S75-S76	22.717	100
S90	233286.988	379796.924	23.150	0.470	150		0 S90-S91	22.680	100
S91	233292.213	379804.268	23.150	0.971	320		1 S90-S91	22.229	100
							2 S89-S91	22.229	100
							0 S91-S92	22.179	150

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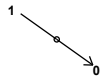
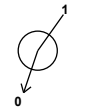
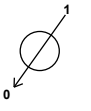
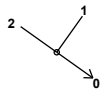
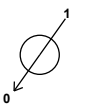
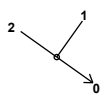
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S89	233280.459	379812.630	23.258	0.548	150	0	S89-S91	22.710	100
S87	233306.838	379821.295	23.000	1.121		0	S87-S88	21.879	375
S23	233237.316	379853.005	23.891	1.674		 1	S22-S23	22.217	300
						0	S23-S40	22.217	300
S86	233293.964	379819.728	22.965	0.772	320	 1	S85-S86	22.193	150
						0	S86-S88	22.194	150
S85	233303.819	379833.580	23.250	0.490	150	0	S85-S86	22.760	150
S80	233292.270	379841.797	23.250	0.583	150	0	S80-S81	22.667	150
S82	233289.283	379841.847	23.600	0.642	150	0	S82-S83	22.958	150
S62	233279.192	379849.874	23.600	0.761	150	0	S62-S63	22.839	150
S63	233270.497	379837.651	23.454	0.990	320	 1	S62-S63	22.464	150
						0	S63-S64	22.464	150
S64	233266.598	379832.172	23.442	1.464		 1	S63-S64	22.128	150
						2	S61-S64	21.978	300
						0	S64-S66	21.978	300
S59	233277.950	379850.758	23.750	0.901	150	0	S59-S60	22.849	150
S60	233269.254	379838.535	23.508	1.034	320	 1	S59-S60	22.474	150
						0	S60-S61	22.474	150
S61	233265.355	379833.056	23.461	1.473		 1	S60-S61	22.138	150
						2	S58-S61	21.988	300
						0	S61-S64	21.988	300

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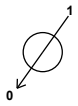
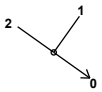
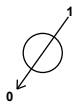
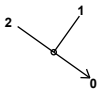
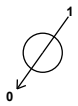
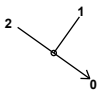
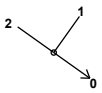
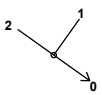
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S50	233267.683	379858.062	23.750	0.756	150	0	S50-S51	22.994	150
S51	233258.408	379845.025	23.573	0.779	320	 1 0	S50-S51 S51-S52	22.794 22.794	150 150
S52	233255.089	379840.360	23.619	1.547		 1 2 0	S51-S52 S49-S52 S52-S55	22.222 22.072 22.072	150 300 300
S47	233266.563	379858.859	23.850	0.727	150	0	S47-S48	23.123	150
S48	233257.287	379845.822	23.608	0.805	320	 1 0	S47-S48 S48-S49	22.803 22.803	150 150
S49	233253.968	379841.157	23.636	1.555		 1 2 0	S48-S49 S46-S49 S49-S52	22.231 22.081 22.081	150 300 300
S44	233256.174	379866.251	23.850	0.756	150	0	S44-S45	23.094	150
S45	233246.898	379853.214	23.733	0.839	320	 1 0	S44-S45 S45-S46	22.894 22.894	150 150
S46	233243.580	379848.549	23.795	1.629		 1 2 0	S45-S46 S43-S46 S46-S49	22.322 22.166 22.166	150 300 300
S41	233255.279	379867.624	24.000	0.686	150	0	S41-S42	23.314	150
S43	233242.337	379849.433	23.814	1.638		 1 2 0	S42-S43 S40-S43 S43-S46	22.327 22.176 22.176	150 300 300
S20	233245.012	379874.928	24.000	0.600	150	0	S20-S21	23.400	150
S22	233232.070	379856.737	23.972	1.712		 1 2 0	S21-S22 S19-S22 S22-S23	22.409 22.260 22.260	150 300 300

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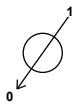
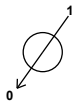
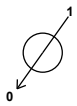
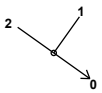
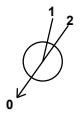
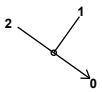
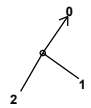
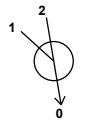
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S21	233235.389	379861.402	23.899	0.706	320	 1	S20-S21	23.193	150
						0	S21-S22	23.193	150
S42	233245.656	379854.098	23.769	0.870	320	 1	S41-S42	22.899	150
						0	S42-S43	22.899	150
S17	233242.443	379874.119	24.000	0.650	150	0	S17-S18	23.350	150
S18	233234.065	379862.344	23.918	0.749	320	 1	S17-S18	23.169	150
						0	S18-S19	23.169	150
S19	233230.746	379857.680	23.992	1.721		 1	S18-S19	22.425	150
						2	S16-S19	22.271	300
						0	S19-S22	22.271	300
S13	233230.831	379882.380	24.000	0.550	150	0	S13-S15	23.450	150
S15	233222.454	379870.605	23.934	0.846	320	 1	S14-S15	23.088	150
						2	S13-S15	23.089	150
						0	S15-S16	23.088	150
S16	233219.135	379865.940	23.881	1.515		 1	S15-S16	22.516	150
						2	S12-S16	22.366	300
						0	S16-S19	22.366	300
S38	233230.033	379835.753	23.900	1.107		 1	S37-S38	22.793	150
						2	S33-S38	22.793	150
						0	S38-S39	22.793	150
S14	233224.873	379881.039	24.000	0.644	150	0	S14-S15	23.356	150
S11	233219.226	379874.429	24.000	0.968	320	1	S10-S11	23.032	150
						0	S11-S12	23.032	150
S10	233216.990	379887.687	24.000	0.520	150	0	S10-S11	23.480	150
S6	233207.177	379868.450	23.549	0.929	320	 1	S5-S6	22.620	150
						2	S4-S6	22.620	150
						0	S6-S8	22.620	150

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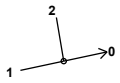
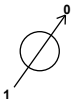
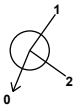
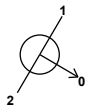
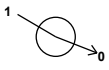
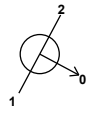
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S4	233204.295	379885.547	24.000	0.513	150	0	S4-S6	23.487	150
S8	233207.681	379865.461	23.401	0.801		 1 2 0	S7-S8 S6-S8 S8-S9	22.600 22.600 22.600	150 150 150
S5	233201.762	379873.349	23.966	0.737	150	0	S5-S6	23.229	150
S33	233228.043	379832.300	23.896	1.053	320	1 2 0	S32-S33 S28-S33 S33-S38	22.843 22.843 22.843	150 150 150
S54	233255.154	379835.558	23.730	1.140	320	1 0	S53-S54 S54-S55	22.590 22.590	150 150
S57	233256.393	379834.677	23.660	1.080	320	 1 0	S56-S57 S57-S58	22.580 22.580	150 150
S83	233280.118	379828.965	23.227	1.060	320	 1 2 0	S82-S83 S81-S83 S83-S84	22.168 22.167 22.168	150 150 150
S81	233282.125	379827.537	23.162	0.933	320	1 0	S80-S81 S81-S83	22.229 22.229	150 150
S72	233262.683	379793.813	23.025	0.716	460	1 2 0	S71-S72 S70-S72 S72-S79	22.360 22.309 22.310	100 150 150
S71	233266.633	379799.364	23.026	0.581	320	0	S71-S72	22.445	100
S77	233247.195	379806.488	23.284	0.860	320	 1 2 0	S76-S77 S74-S77 S77-S78	22.424 22.424 22.424	150 150 150
S78	233255.303	379801.725	22.980	0.674	320	 1 0	S77-S78 S78-S79	22.306 22.306	150 150
S28	233218.938	379837.167	24.000	0.986	320	 1 2 0	S27-S28 S25-S28 S28-S33	23.015 23.014 23.015	150 150 150

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Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Check Discharge Rate(s)	✓
Ratio-R	0.300	1 year (l/s)	4.4
Summer CV	0.750	30 year (l/s)	9.0
Winter CV	0.840	100 year (l/s)	10.8
Analysis Speed	Detailed	Check Discharge Volume	x
Skip Steady State	x		

Storm Durations

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

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

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.80
Greenfield Method	IH124	Growth Factor 100 year	2.18
Positively Drained Area (ha)	1.037	Betterment (%)	0
SAAR (mm)	939	QBar	5.0
Soil Index	3	Q 1 year (l/s)	4.4
SPR	0.40	Q 30 year (l/s)	9.0
Region	9	Q 100 year (l/s)	10.8
Growth Factor 1 year	0.88		

Node S92 Online StormBrake™ Control

Flap Valve	x	Design Flow (l/s)	4.4
Replaces Downstream Link	✓	Product Code	FPM-SB1-00700-00440-1100
Invert Level (m)	21.729	Min Outlet Diameter (m)	0.150
Design Depth (m)	0.700	Min Node Diameter (mm)	1200

Node S39 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.1		
Invert Level (m)	22.662	Diameter (m)	0.024		

Node S87 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	21.879
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	159.6	0.0	0.401	230.1	0.0	0.801	314.2	0.0	1.121	391.2	0.0
0.101	175.9	0.0	0.501	249.9	0.0	0.901	337.3	0.0			
0.201	193.2	0.0	0.601	270.5	0.0	1.001	361.3	0.0			
0.301	211.2	0.0	0.701	291.9	0.0	1.101	386.1	0.0			

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Node S38 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	22.793
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	0.0	0.0	0.506	0.0	0.0	0.507	21.8	0.0	1.107	72.9	0.0

Node S7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	22.647
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	7

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	0.0	0.0	0.201	16.1	0.0	0.401	59.5	0.0	0.553	106.3	0.0
0.101	4.2	0.0	0.301	34.0	0.0	0.501	90.1	0.0			

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Results for 1 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S88	232	22.177	0.408	16.6	0.7957	0.0000	SURCHARGED
15 minute winter	S12	11	22.479	0.100	18.0	0.1136	0.0000	OK
15 minute winter	S7	11	22.748	0.101	10.6	0.4866	0.0000	OK
240 minute winter	S92	232	22.177	0.449	6.8	0.6430	0.0000	SURCHARGED
15 minute summer	S93	1	21.606	0.000	4.4	0.0000	0.0000	OK
240 minute winter	S79	232	22.177	0.094	3.0	0.1814	0.0000	OK
360 minute winter	S84	296	22.178	0.295	12.2	0.3894	0.0000	OK
180 minute winter	S32	136	23.373	0.430	0.7	0.0344	0.0000	SURCHARGED
180 minute winter	S30	136	23.373	0.219	0.6	0.0175	0.0000	SURCHARGED
180 minute winter	S29	136	23.373	0.073	0.4	0.0252	0.0000	OK
180 minute winter	S31	136	23.373	0.234	0.5	0.0700	0.0000	SURCHARGED
180 minute winter	S37	136	23.373	0.511	0.8	0.0409	0.0000	SURCHARGED
15 minute winter	S36	10	23.501	0.024	1.7	0.0139	0.0000	OK
180 minute winter	S35	136	23.373	0.297	0.6	0.0238	0.0000	SURCHARGED
180 minute winter	S34	132	23.373	0.150	0.5	0.0558	0.0000	SURCHARGED
180 minute winter	S27	136	23.373	0.261	0.4	0.0209	0.0000	SURCHARGED
180 minute winter	S26	136	23.373	0.068	0.2	0.0012	0.0000	OK
15 minute winter	S25	10	23.385	0.046	4.5	0.0479	0.0000	OK
15 minute summer	S24	1	23.520	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S1	11	23.152	0.019	0.7	0.0028	0.0000	OK
15 minute winter	S2	11	23.015	0.041	3.1	0.0244	0.0000	OK
15 minute winter	S3	11	22.736	0.040	3.0	0.0032	0.0000	OK
15 minute winter	S9	11	22.731	0.146	16.3	0.0546	0.0000	OK
180 minute winter	S39	136	23.373	0.711	1.2	0.1179	0.0000	SURCHARGED
15 minute winter	S40	11	22.306	0.115	25.1	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)
240 minute winter	S88	S88-S92	S92	6.7	0.256	0.041	0.6728	
15 minute winter	S12	S12-S16	S16	18.0	0.908	0.199	0.0390	
15 minute winter	S7	S7-S8	S8	9.7	0.724	0.667	0.1030	
240 minute winter	S92	StormBrake™	S93	4.4				115.9
240 minute winter	S79	S79-S84	S84	3.0	0.287	0.033	1.3337	
360 minute winter	S84	S84-S88	S88	11.8	0.517	0.072	1.7409	
180 minute winter	S32	S32-S33	S33	0.6	0.280	0.032	0.1408	
180 minute winter	S30	S30-S32	S32	0.3	0.382	0.051	0.1007	
180 minute winter	S29	S29-S30	S30	0.4	0.434	0.059	0.0818	
180 minute winter	S31	S31-S32	S32	0.4	0.382	0.057	0.0917	
180 minute winter	S37	S37-S38	S38	0.7	0.226	0.038	0.0971	
15 minute winter	S36	S36-S37	S37	1.7	1.059	0.123	0.0523	
180 minute winter	S35	S35-S37	S37	0.4	0.359	0.055	0.1031	
180 minute winter	S34	S34-S35	S35	0.5	0.463	0.074	0.0916	
180 minute winter	S27	S27-S28	S28	-0.4	-0.025	-0.015	0.1026	
180 minute winter	S26	S26-S27	S27	-0.2	-0.032	-0.021	0.0704	
15 minute winter	S25	S25-S28	S28	4.4	0.979	0.192	0.2088	
15 minute summer	S24	S24-S25	S25	0.0	0.000	0.000	0.0238	
15 minute winter	S1	S1-S2	S2	0.7	0.280	0.035	0.0333	
15 minute winter	S2	S2-S3	S3	3.0	0.808	0.153	0.0836	
15 minute winter	S3	S3-S9	S9	3.0	0.279	0.153	0.0936	
15 minute winter	S9	S9-S12	S12	16.1	0.990	1.118	0.1262	
180 minute winter	S39	Orifice	S40	1.0				
15 minute winter	S40	S40-S43	S43	25.0	1.011	0.272	0.0584	

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Results for 1 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S53	1	23.310	0.000	0.0	0.0000	0.0000	OK
360 minute winter	S55	264	22.199	0.146	13.6	0.0000	0.0000	OK
15 minute winter	S56	10	23.085	0.025	1.7	0.0114	0.0000	OK
240 minute winter	S58	228	22.188	0.145	14.6	0.0000	0.0000	OK
15 minute winter	S65	10	23.021	0.021	1.7	0.0088	0.0000	OK
360 minute winter	S66	288	22.182	0.245	10.6	0.0000	0.0000	OK
15 minute winter	S70	10	22.416	0.038	2.5	0.0030	0.0000	OK
15 minute winter	S69	10	22.588	0.030	1.3	0.0097	0.0000	OK
15 minute winter	S68	10	22.576	0.026	1.3	0.0101	0.0000	OK
15 minute summer	S67	1	22.723	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S74	11	22.531	0.026	1.2	0.0020	0.0000	OK
15 minute winter	S73	10	22.749	0.030	1.3	0.0130	0.0000	OK
15 minute winter	S76	11	22.529	0.026	1.2	0.0020	0.0000	OK
15 minute winter	S75	10	22.747	0.030	1.3	0.0129	0.0000	OK
15 minute summer	S90	1	22.680	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S91	10	22.209	0.030	3.0	0.0024	0.0000	OK
15 minute winter	S89	10	22.747	0.037	3.1	0.0302	0.0000	OK
240 minute winter	S87	232	22.177	0.298	13.5	55.2713	0.0000	OK
15 minute winter	S23	11	22.327	0.110	24.3	0.0131	0.0000	OK
15 minute winter	S86	10	22.218	0.025	1.8	0.0020	0.0000	OK
15 minute winter	S85	10	22.784	0.024	1.8	0.0131	0.0000	OK
15 minute winter	S80	10	22.693	0.026	1.8	0.0119	0.0000	OK
15 minute winter	S82	10	22.978	0.020	1.6	0.0074	0.0000	OK
15 minute winter	S62	10	22.864	0.025	1.6	0.0078	0.0000	OK
15 minute winter	S63	10	22.485	0.021	1.6	0.0016	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	S53	S53-S54	S54	0.0	0.000	0.000	0.0000	
360 minute winter	S55	S55-S58	S58	12.5	0.767	0.139	0.0466	
15 minute winter	S56	S56-S57	S57	1.7	1.096	0.052	0.0222	
240 minute winter	S58	S58-S61	S61	9.8	0.805	0.109	0.3348	
15 minute winter	S65	S65-S66	S66	1.7	1.115	0.042	0.0273	
360 minute winter	S66	S66-S84	S84	8.9	0.684	0.098	0.5292	
15 minute winter	S70	S70-S72	S72	2.5	0.626	0.125	0.0221	
15 minute winter	S69	S69-S70	S70	1.3	0.648	0.186	0.0201	
15 minute winter	S68	S68-S70	S70	1.3	0.558	0.064	0.0303	
15 minute summer	S67	S67-S68	S68	0.0	0.000	0.000	0.0000	
15 minute winter	S74	S74-S77	S77	1.3	0.377	0.063	0.0221	
15 minute winter	S73	S73-S74	S74	1.2	0.650	0.185	0.0253	
15 minute winter	S76	S76-S77	S77	1.3	0.377	0.063	0.0216	
15 minute winter	S75	S75-S76	S76	1.2	0.650	0.185	0.0253	
15 minute summer	S90	S90-S91	S91	0.0	0.000	0.000	0.0000	
15 minute winter	S91	S91-S92	S92	3.0	1.054	0.087	0.0429	
15 minute winter	S89	S89-S91	S91	3.0	1.186	0.274	0.0371	
240 minute winter	S87	S87-S88	S88	-12.1	-0.266	-0.074	1.6817	
15 minute winter	S23	S23-S40	S40	24.2	1.012	0.265	0.0922	
15 minute winter	S86	S86-S88	S88	1.8	0.923	0.056	0.0238	
15 minute winter	S85	S85-S86	S86	1.8	0.948	0.054	0.0319	
15 minute winter	S80	S80-S81	S81	1.8	0.861	0.063	0.0362	
15 minute winter	S82	S82-S83	S83	1.6	0.680	0.040	0.0375	
15 minute winter	S62	S62-S63	S63	1.6	0.933	0.056	0.0255	
15 minute winter	S63	S63-S64	S64	1.5	1.085	0.039	0.0096	

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Results for 1 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S64	232	22.183	0.205	20.6	0.0000	0.0000	OK
15 minute winter	S59	10	22.874	0.025	1.6	0.0066	0.0000	OK
15 minute winter	S60	10	22.495	0.021	1.6	0.0016	0.0000	OK
360 minute winter	S61	280	22.182	0.194	15.0	0.0369	0.0000	OK
15 minute winter	S50	10	23.025	0.031	1.6	0.0096	0.0000	OK
15 minute winter	S51	11	22.811	0.017	1.6	0.0014	0.0000	OK
15 minute winter	S52	11	22.201	0.129	33.0	0.0000	0.0000	OK
15 minute winter	S47	10	23.151	0.028	1.6	0.0088	0.0000	OK
15 minute winter	S48	10	22.820	0.017	1.6	0.0014	0.0000	OK
15 minute winter	S49	11	22.209	0.128	31.6	0.0000	0.0000	OK
15 minute winter	S44	10	23.125	0.031	1.6	0.0096	0.0000	OK
15 minute winter	S45	11	22.911	0.017	1.6	0.0014	0.0000	OK
15 minute winter	S46	11	22.286	0.120	30.2	0.0220	0.0000	OK
15 minute winter	S41	10	23.341	0.027	1.7	0.0098	0.0000	OK
15 minute winter	S43	11	22.294	0.118	26.6	0.0000	0.0000	OK
15 minute winter	S20	10	23.433	0.033	1.7	0.0136	0.0000	OK
15 minute winter	S22	11	22.365	0.105	23.0	0.0000	0.0000	OK
15 minute winter	S21	10	23.210	0.017	1.7	0.0013	0.0000	OK
15 minute winter	S42	10	22.917	0.018	1.7	0.0014	0.0000	OK
15 minute winter	S17	10	23.382	0.032	1.7	0.0126	0.0000	OK
15 minute winter	S18	10	23.186	0.017	1.7	0.0013	0.0000	OK
15 minute winter	S19	11	22.374	0.103	21.4	0.0000	0.0000	OK
15 minute winter	S13	10	23.472	0.022	1.3	0.0076	0.0000	OK
15 minute winter	S15	10	23.107	0.019	1.8	0.0015	0.0000	OK
15 minute winter	S16	11	22.461	0.095	19.8	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)
240 minute winter	S64	S64-S66	S66	11.1	0.841	0.123	0.3358	
15 minute winter	S59	S59-S60	S60	1.6	0.933	0.056	0.0255	
15 minute winter	S60	S60-S61	S61	1.5	1.085	0.039	0.0096	
360 minute winter	S61	S61-S64	S64	11.2	0.778	0.125	0.0749	
15 minute winter	S50	S50-S51	S51	1.6	0.850	0.079	0.0302	
15 minute winter	S51	S51-S52	S52	1.5	1.382	0.027	0.0064	
15 minute winter	S52	S52-S55	S55	32.9	1.123	0.362	0.0834	
15 minute winter	S47	S47-S48	S48	1.6	0.954	0.062	0.0268	
15 minute winter	S48	S48-S49	S49	1.5	1.381	0.027	0.0064	
15 minute winter	S49	S49-S52	S52	31.4	1.099	0.350	0.0395	
15 minute winter	S44	S44-S45	S45	1.6	0.850	0.079	0.0302	
15 minute winter	S45	S45-S46	S46	1.5	1.382	0.027	0.0064	
15 minute winter	S46	S46-S49	S49	30.0	1.100	0.332	0.3493	
15 minute winter	S41	S41-S42	S42	1.7	1.026	0.059	0.0274	
15 minute winter	S43	S43-S46	S46	26.6	1.038	0.296	0.0396	
15 minute winter	S20	S20-S21	S21	1.7	0.889	0.084	0.0321	
15 minute winter	S22	S22-S23	S23	23.0	1.022	0.254	0.1454	
15 minute winter	S21	S21-S22	S22	1.6	1.574	0.025	0.0060	
15 minute winter	S42	S42-S43	S43	1.7	1.408	0.029	0.0067	
15 minute winter	S17	S17-S18	S18	1.7	0.886	0.084	0.0280	
15 minute winter	S18	S18-S19	S19	1.6	1.545	0.026	0.0061	
15 minute winter	S19	S19-S22	S22	21.4	0.996	0.234	0.0351	
15 minute winter	S13	S13-S15	S15	1.3	0.799	0.045	0.0228	
15 minute winter	S15	S15-S16	S16	1.8	1.443	0.032	0.0071	
15 minute winter	S16	S16-S19	S19	19.7	0.981	0.218	0.2880	

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Results for 1 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	S38	136	23.373	0.580	2.7	1.9423	0.0000	SURCHARGED
15 minute winter	S14	10	23.371	0.015	0.6	0.0021	0.0000	OK
15 minute winter	S11	10	23.054	0.022	2.0	0.0035	0.0000	OK
15 minute winter	S10	10	23.501	0.021	1.4	0.0086	0.0000	OK
15 minute winter	S6	11	22.736	0.116	2.0	0.0445	0.0000	OK
15 minute summer	S4	1	23.487	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S8	11	22.736	0.136	11.2	0.0000	0.0000	OK
15 minute summer	S5	1	23.229	0.000	0.0	0.0000	0.0000	OK
180 minute winter	S33	136	23.373	0.530	1.6	0.0424	0.0000	SURCHARGED
15 minute summer	S54	1	22.590	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S57	10	22.598	0.018	1.7	0.0014	0.0000	OK
15 minute winter	S83	11	22.205	0.038	3.3	0.0030	0.0000	OK
15 minute winter	S81	11	22.256	0.027	1.8	0.0022	0.0000	OK
15 minute winter	S72	11	22.355	0.046	3.4	0.0077	0.0000	OK
15 minute winter	S71	10	22.471	0.026	1.0	0.0085	0.0000	OK
15 minute winter	S77	11	22.472	0.048	4.0	0.0160	0.0000	OK
15 minute winter	S78	11	22.355	0.049	4.0	0.0039	0.0000	OK
180 minute winter	S28	136	23.373	0.359	1.3	0.0287	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)
180 minute winter	S38	S38-S39	S39	1.2	0.413	0.058	0.1848	
15 minute winter	S14	S14-S15	S15	0.6	0.532	0.020	0.0115	
15 minute winter	S11	S11-S12	S12	1.9	1.271	0.042	0.0115	
15 minute winter	S10	S10-S11	S11	1.4	0.897	0.042	0.0207	
15 minute winter	S6	S6-S8	S8	2.0	0.193	0.140	0.0477	
15 minute summer	S4	S4-S6	S6	0.0	0.000	0.000	0.1186	
15 minute winter	S8	S8-S9	S9	11.2	0.668	0.782	0.0368	
15 minute summer	S5	S5-S6	S6	0.0	0.000	0.000	0.0499	
180 minute winter	S33	S33-S38	S38	1.5	0.364	0.077	0.0702	
15 minute summer	S54	S54-S55	S55	0.0	0.000	0.000	0.0000	
15 minute winter	S57	S57-S58	S58	1.7	1.405	0.029	0.0046	
15 minute winter	S83	S83-S84	S84	3.3	1.029	0.117	0.0173	
15 minute winter	S81	S81-S83	S83	1.8	0.629	0.062	0.0069	
15 minute winter	S72	S72-S79	S79	3.5	0.814	0.175	0.0261	
15 minute winter	S71	S71-S72	S72	1.0	0.598	0.142	0.0110	
15 minute winter	S77	S77-S78	S78	4.0	0.825	0.203	0.0462	
15 minute winter	S78	S78-S79	S79	4.1	0.848	0.204	0.0279	
180 minute winter	S28	S28-S33	S33	1.0	0.407	0.042	0.1818	

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Results for 30 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	S88	570	22.640	0.871	18.7	1.6959	0.0000	SURCHARGED
600 minute winter	S12	570	22.640	0.261	5.9	0.2954	0.0000	OK
15 minute winter	S7	13	22.943	0.296	25.7	4.3816	0.0000	FLOOD RISK
600 minute winter	S92	570	22.640	0.912	5.3	1.3044	0.0000	SURCHARGED
15 minute summer	S93	1	21.606	0.000	4.4	0.0000	0.0000	OK
600 minute winter	S79	570	22.640	0.557	4.0	1.0712	0.0000	SURCHARGED
600 minute winter	S84	570	22.640	0.757	17.2	0.9981	0.0000	SURCHARGED
240 minute winter	S32	212	23.682	0.739	1.2	0.0591	0.0000	FLOOD RISK
240 minute winter	S30	212	23.682	0.528	0.6	0.0422	0.0000	FLOOD RISK
240 minute winter	S29	216	23.682	0.382	0.7	0.1317	0.0000	FLOOD RISK
240 minute winter	S31	212	23.682	0.543	0.8	0.1623	0.0000	FLOOD RISK
240 minute winter	S37	212	23.682	0.820	1.6	0.0656	0.0000	FLOOD RISK
240 minute winter	S36	212	23.682	0.205	1.0	0.1198	0.0000	FLOOD RISK
240 minute winter	S35	212	23.682	0.606	0.9	0.0485	0.0000	FLOOD RISK
240 minute winter	S34	212	23.682	0.459	1.0	0.1707	0.0000	FLOOD RISK
240 minute winter	S27	216	23.682	0.570	0.4	0.0456	0.0000	SURCHARGED
240 minute winter	S26	216	23.682	0.377	0.1	0.0068	0.0000	SURCHARGED
240 minute winter	S25	212	23.682	0.343	2.5	0.3596	0.0000	SURCHARGED
240 minute winter	S24	220	23.682	0.162	0.2	0.0029	0.0000	SURCHARGED
15 minute winter	S1	10	23.162	0.029	1.7	0.0042	0.0000	OK
15 minute winter	S2	10	23.038	0.064	7.5	0.0378	0.0000	OK
15 minute winter	S3	12	22.896	0.200	7.4	0.0160	0.0000	SURCHARGED
15 minute winter	S9	12	22.883	0.298	26.4	0.1118	0.0000	SURCHARGED
240 minute winter	S39	212	23.681	1.019	1.2	0.1692	0.0000	FLOOD RISK
600 minute winter	S40	570	22.640	0.449	22.0	0.0000	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)
600 minute winter	S88	S88-S92	S92	5.1	0.255	0.031	0.6728	
600 minute winter	S12	S12-S16	S16	5.9	0.669	0.065	0.1300	
15 minute winter	S7	S7-S8	S8	16.4	0.930	1.129	0.1233	
600 minute winter	S92	StormBrake™	S93	4.9				220.0
600 minute winter	S79	S79-S84	S84	3.5	0.229	0.039	2.1084	
600 minute winter	S84	S84-S88	S88	16.9	0.434	0.104	1.8910	
240 minute winter	S32	S32-S33	S33	1.1	0.244	0.057	0.1408	
240 minute winter	S30	S30-S32	S32	0.5	0.311	0.077	0.1007	
240 minute winter	S29	S29-S30	S30	0.6	0.434	0.090	0.0917	
240 minute winter	S31	S31-S32	S32	0.7	0.368	0.105	0.0917	
240 minute winter	S37	S37-S38	S38	1.5	0.278	0.075	0.0971	
240 minute winter	S36	S36-S37	S37	0.9	0.622	0.066	0.0884	
240 minute winter	S35	S35-S37	S37	0.8	0.383	0.116	0.1031	
240 minute winter	S34	S34-S35	S35	0.9	0.423	0.132	0.0916	
240 minute winter	S27	S27-S28	S28	-0.4	-0.022	-0.017	0.1026	
240 minute winter	S26	S26-S27	S27	-0.1	-0.023	-0.021	0.0815	
240 minute winter	S25	S25-S28	S28	2.3	0.507	0.102	0.3428	
240 minute winter	S24	S24-S25	S25	-0.2	-0.018	-0.008	0.1912	
15 minute winter	S1	S1-S2	S2	1.7	0.358	0.084	0.0609	
15 minute winter	S2	S2-S3	S3	7.4	0.834	0.370	0.2743	
15 minute winter	S3	S3-S9	S9	6.7	0.382	0.337	0.1558	
15 minute winter	S9	S9-S12	S12	26.3	1.497	1.827	0.1361	
240 minute winter	S39	Orifice	S40	1.2				
600 minute winter	S40	S40-S43	S43	24.0	0.769	0.261	0.1641	

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Results for 30 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S53	1	23.310	0.000	0.0	0.0000	0.0000	OK
600 minute winter	S55	570	22.640	0.587	36.2	0.0000	0.0000	SURCHARGED
15 minute winter	S56	10	23.099	0.039	4.1	0.0179	0.0000	OK
600 minute winter	S58	570	22.640	0.597	11.6	0.0000	0.0000	SURCHARGED
15 minute winter	S65	10	23.032	0.032	4.1	0.0135	0.0000	OK
600 minute winter	S66	570	22.640	0.703	13.2	0.0000	0.0000	SURCHARGED
600 minute winter	S70	570	22.640	0.262	0.8	0.0209	0.0000	SURCHARGED
600 minute winter	S69	570	22.640	0.082	0.4	0.0263	0.0000	OK
600 minute winter	S68	570	22.640	0.090	0.4	0.0353	0.0000	OK
15 minute summer	S67	1	22.723	0.000	0.0	0.0000	0.0000	OK
600 minute winter	S74	570	22.640	0.135	0.4	0.0108	0.0000	OK
15 minute winter	S73	10	22.768	0.049	3.1	0.0211	0.0000	OK
600 minute winter	S76	570	22.640	0.137	0.4	0.0109	0.0000	OK
15 minute winter	S75	10	22.766	0.049	3.1	0.0210	0.0000	OK
15 minute summer	S90	1	22.680	0.000	0.0	0.0000	0.0000	OK
600 minute winter	S91	570	22.640	0.461	0.9	0.0368	0.0000	SURCHARGED
15 minute winter	S89	10	22.773	0.063	7.6	0.0520	0.0000	OK
600 minute winter	S87	570	22.640	0.761	16.6	174.1371	0.0000	SURCHARGED
600 minute winter	S23	570	22.640	0.423	7.9	0.0504	0.0000	SURCHARGED
600 minute winter	S86	570	22.640	0.447	0.7	0.0357	0.0000	SURCHARGED
15 minute winter	S85	10	22.798	0.038	4.5	0.0210	0.0000	OK
15 minute winter	S80	10	22.707	0.040	4.5	0.0187	0.0000	OK
15 minute winter	S82	10	22.989	0.031	3.8	0.0112	0.0000	OK
15 minute winter	S62	10	22.878	0.039	3.8	0.0120	0.0000	OK
600 minute winter	S63	570	22.640	0.176	0.5	0.0141	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S53	S53-S54	S54	0.0	0.000	0.000	0.0000	
600 minute winter	S55	S55-S58	S58	-13.1	0.811	-0.146	0.1070	
15 minute winter	S56	S56-S57	S57	4.1	1.425	0.125	0.0414	
600 minute winter	S58	S58-S61	S61	12.7	0.726	0.140	0.5805	
15 minute winter	S65	S65-S66	S66	4.1	1.204	0.102	0.1859	
600 minute winter	S66	S66-S84	S84	12.7	0.642	0.140	0.5669	
600 minute winter	S70	S70-S72	S72	0.9	0.475	0.043	0.0968	
600 minute winter	S69	S69-S70	S70	0.4	0.469	0.059	0.0760	
600 minute winter	S68	S68-S70	S70	0.4	0.445	0.020	0.1891	
15 minute summer	S67	S67-S68	S68	0.0	0.000	0.000	0.0000	
600 minute winter	S74	S74-S77	S77	0.4	0.290	0.020	0.1117	
15 minute winter	S73	S73-S74	S74	3.0	0.820	0.448	0.0485	
600 minute winter	S76	S76-S77	S77	0.4	0.290	0.020	0.1095	
15 minute winter	S75	S75-S76	S76	3.0	0.820	0.448	0.0485	
15 minute summer	S90	S90-S91	S91	0.0	0.000	0.000	0.0000	
600 minute winter	S91	S91-S92	S92	0.9	0.647	0.027	0.1059	
15 minute winter	S89	S89-S91	S91	7.5	1.474	0.674	0.0732	
600 minute winter	S87	S87-S88	S88	-15.0	-0.136	-0.092	1.8154	
600 minute winter	S23	S23-S40	S40	20.8	0.715	0.228	0.2699	
600 minute winter	S86	S86-S88	S88	0.6	0.567	0.019	0.1053	
15 minute winter	S85	S85-S86	S86	4.5	1.259	0.137	0.0601	
15 minute winter	S80	S80-S81	S81	4.5	1.065	0.158	0.0732	
15 minute winter	S82	S82-S83	S83	3.8	0.903	0.094	0.1171	
15 minute winter	S62	S62-S63	S63	3.8	1.202	0.134	0.0471	
600 minute winter	S63	S63-S64	S64	0.5	0.718	0.013	0.1184	

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Results for 30 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	S64	570	22.640	0.662	29.6	0.0000	0.0000	SURCHARGED
15 minute winter	S59	10	22.888	0.039	3.8	0.0103	0.0000	OK
600 minute winter	S60	570	22.640	0.166	0.5	0.0133	0.0000	SURCHARGED
600 minute winter	S61	570	22.640	0.652	13.6	0.1239	0.0000	SURCHARGED
15 minute winter	S50	10	23.043	0.049	3.8	0.0151	0.0000	OK
15 minute winter	S51	10	22.820	0.026	3.8	0.0021	0.0000	OK
600 minute winter	S52	570	22.640	0.568	13.2	0.0000	0.0000	SURCHARGED
15 minute winter	S47	10	23.166	0.043	3.8	0.0137	0.0000	OK
15 minute winter	S48	10	22.829	0.026	3.8	0.0021	0.0000	OK
600 minute winter	S49	570	22.640	0.559	14.9	0.0000	0.0000	SURCHARGED
15 minute winter	S44	10	23.143	0.049	3.8	0.0150	0.0000	OK
15 minute winter	S45	10	22.921	0.027	3.8	0.0021	0.0000	OK
600 minute winter	S46	570	22.640	0.474	19.0	0.0872	0.0000	SURCHARGED
15 minute winter	S41	10	23.356	0.042	4.1	0.0154	0.0000	OK
600 minute winter	S43	570	22.640	0.464	39.1	0.0000	0.0000	SURCHARGED
15 minute winter	S20	10	23.451	0.051	4.1	0.0214	0.0000	OK
600 minute winter	S22	570	22.640	0.380	14.0	0.0000	0.0000	SURCHARGED
15 minute winter	S21	10	23.219	0.026	4.1	0.0021	0.0000	OK
15 minute winter	S42	10	22.927	0.028	4.1	0.0022	0.0000	OK
15 minute winter	S17	10	23.401	0.051	4.1	0.0197	0.0000	OK
15 minute winter	S18	10	23.195	0.026	4.1	0.0021	0.0000	OK
600 minute winter	S19	570	22.640	0.369	16.4	0.0000	0.0000	SURCHARGED
15 minute winter	S13	10	23.484	0.034	3.1	0.0118	0.0000	OK
15 minute winter	S15	10	23.117	0.029	4.4	0.0023	0.0000	OK
600 minute winter	S16	570	22.640	0.274	6.5	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)
600 minute winter	S64	S64-S66	S66	12.7	0.752	0.141	0.4258	
15 minute winter	S59	S59-S60	S60	3.8	1.202	0.134	0.0471	
600 minute winter	S60	S60-S61	S61	0.5	0.718	0.013	0.1184	
600 minute winter	S61	S61-S64	S64	29.2	0.736	0.325	0.1074	
15 minute winter	S50	S50-S51	S51	3.8	1.094	0.189	0.0561	
15 minute winter	S51	S51-S52	S52	3.7	1.642	0.066	0.0553	
600 minute winter	S52	S52-S55	S55	24.3	0.820	0.267	0.1998	
15 minute winter	S47	S47-S48	S48	3.8	1.230	0.149	0.0496	
15 minute winter	S48	S48-S49	S49	3.7	1.719	0.066	0.0544	
600 minute winter	S49	S49-S52	S52	12.7	0.794	0.141	0.0968	
15 minute winter	S44	S44-S45	S45	3.8	1.085	0.189	0.0565	
15 minute winter	S45	S45-S46	S46	3.7	1.786	0.066	0.0251	
600 minute winter	S46	S46-S49	S49	10.3	0.785	0.113	0.8978	
15 minute winter	S41	S41-S42	S42	4.1	1.316	0.144	0.0518	
600 minute winter	S43	S43-S46	S46	18.0	0.779	0.200	0.1074	
15 minute winter	S20	S20-S21	S21	4.1	1.140	0.204	0.0606	
600 minute winter	S22	S22-S23	S23	7.5	0.742	0.082	0.4533	
15 minute winter	S21	S21-S22	S22	4.0	2.045	0.061	0.0113	
15 minute winter	S42	S42-S43	S43	4.0	1.827	0.071	0.0234	
15 minute winter	S17	S17-S18	S18	4.1	1.136	0.204	0.0529	
15 minute winter	S18	S18-S19	S19	4.0	2.007	0.062	0.0115	
600 minute winter	S19	S19-S22	S22	11.5	0.727	0.125	0.1145	
15 minute winter	S13	S13-S15	S15	3.0	1.030	0.108	0.0427	
15 minute winter	S15	S15-S16	S16	4.4	1.872	0.077	0.0134	
600 minute winter	S16	S16-S19	S19	6.5	0.716	0.072	0.9827	

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Results for 30 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S38	212	23.682	0.889	5.3	14.7056	0.0000	FLOOD RISK
15 minute winter	S14	10	23.379	0.023	1.4	0.0032	0.0000	OK
15 minute winter	S11	10	23.066	0.034	4.8	0.0055	0.0000	OK
15 minute winter	S10	10	23.513	0.033	3.4	0.0133	0.0000	OK
15 minute winter	S6	12	22.903	0.283	4.8	0.1080	0.0000	SURCHARGED
15 minute summer	S4	1	23.487	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S8	12	22.901	0.301	18.2	0.0000	0.0000	SURCHARGED
15 minute summer	S5	1	23.229	0.000	0.0	0.0000	0.0000	OK
240 minute winter	S33	216	23.682	0.839	3.1	0.0671	0.0000	FLOOD RISK
600 minute winter	S54	570	22.640	0.050	0.2	0.0040	0.0000	OK
600 minute winter	S57	570	22.640	0.060	0.5	0.0048	0.0000	OK
600 minute winter	S83	570	22.640	0.473	1.4	0.0378	0.0000	SURCHARGED
600 minute winter	S81	570	22.640	0.411	0.6	0.0329	0.0000	SURCHARGED
600 minute winter	S72	570	22.640	0.331	1.2	0.0549	0.0000	SURCHARGED
600 minute winter	S71	570	22.640	0.195	0.3	0.0625	0.0000	SURCHARGED
600 minute winter	S77	570	22.640	0.216	1.3	0.0725	0.0000	SURCHARGED
600 minute winter	S78	570	22.640	0.334	1.3	0.0267	0.0000	SURCHARGED
240 minute winter	S28	216	23.682	0.668	2.3	0.0534	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)
240 minute winter	S38	S38-S39	S39	1.2	0.371	0.062	0.1848	
15 minute winter	S14	S14-S15	S15	1.4	0.685	0.049	0.0217	
15 minute winter	S11	S11-S12	S12	4.7	1.636	0.102	0.0218	
15 minute winter	S10	S10-S11	S11	3.4	1.150	0.103	0.0394	
15 minute winter	S6	S6-S8	S8	3.8	0.318	0.266	0.0534	
15 minute summer	S4	S4-S6	S6	0.0	0.000	0.000	0.1526	
15 minute winter	S8	S8-S9	S9	18.5	1.052	1.298	0.0379	
15 minute summer	S5	S5-S6	S6	0.0	0.000	0.000	0.0643	
240 minute winter	S33	S33-S38	S38	3.0	0.424	0.148	0.0702	
600 minute winter	S54	S54-S55	S55	-0.2	-0.013	-0.003	0.0441	
600 minute winter	S57	S57-S58	S58	0.5	0.916	0.009	0.0468	
600 minute winter	S83	S83-S84	S84	1.3	0.633	0.045	0.0945	
600 minute winter	S81	S81-S83	S83	0.9	0.468	0.032	0.0434	
600 minute winter	S72	S72-S79	S79	1.6	0.590	0.080	0.1076	
600 minute winter	S71	S71-S72	S72	0.3	0.430	0.044	0.0533	
600 minute winter	S77	S77-S78	S78	1.3	0.628	0.065	0.1656	
600 minute winter	S78	S78-S79	S79	1.3	0.605	0.065	0.1025	
240 minute winter	S28	S28-S33	S33	2.0	0.453	0.087	0.1818	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	S88	570	22.835	1.066	23.0	2.0759	0.0000	FLOOD RISK
600 minute winter	S12	570	22.835	0.456	7.5	0.5160	0.0000	SURCHARGED
15 minute winter	S7	14	23.008	0.361	33.1	7.2009	0.0000	FLOOD RISK
600 minute winter	S92	570	22.835	1.107	5.4	1.5835	0.0000	FLOOD RISK
15 minute summer	S93	1	21.606	0.000	4.4	0.0000	0.0000	OK
600 minute winter	S79	570	22.835	0.752	4.7	1.4465	0.0000	FLOOD RISK
600 minute winter	S84	570	22.835	0.952	21.2	1.2554	0.0000	SURCHARGED
240 minute winter	S32	232	23.828	0.885	1.6	0.0708	0.0000	FLOOD RISK
240 minute winter	S30	232	23.828	0.674	0.8	0.0539	0.0000	FLOOD RISK
240 minute winter	S29	232	23.828	0.528	0.9	0.1821	0.0000	FLOOD RISK
240 minute winter	S31	232	23.828	0.689	1.0	0.2060	0.0000	FLOOD RISK
240 minute winter	S37	232	23.828	0.966	2.1	0.0773	0.0000	FLOOD RISK
240 minute winter	S36	232	23.828	0.351	1.2	0.2053	0.0000	FLOOD RISK
240 minute winter	S35	232	23.828	0.752	1.1	0.0602	0.0000	FLOOD RISK
240 minute winter	S34	232	23.828	0.605	1.2	0.2251	0.0000	FLOOD RISK
240 minute winter	S27	232	23.828	0.716	0.3	0.0573	0.0000	FLOOD RISK
240 minute winter	S26	232	23.828	0.523	0.2	0.0094	0.0000	FLOOD RISK
240 minute winter	S25	232	23.828	0.489	3.3	0.5129	0.0000	FLOOD RISK
240 minute winter	S24	232	23.828	0.308	0.2	0.0055	0.0000	FLOOD RISK
15 minute winter	S1	10	23.166	0.033	2.2	0.0048	0.0000	OK
15 minute winter	S2	10	23.048	0.074	9.7	0.0437	0.0000	OK
15 minute winter	S3	12	22.967	0.271	9.5	0.0217	0.0000	SURCHARGED
15 minute winter	S9	12	22.945	0.360	30.0	0.1348	0.0000	SURCHARGED
240 minute winter	S39	232	23.827	1.165	1.3	0.1934	0.0000	FLOOD RISK
600 minute winter	S40	570	22.835	0.644	10.0	0.0000	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)
600 minute winter	S88	S88-S92	S92	5.3	0.298	0.032	0.6728	
600 minute winter	S12	S12-S16	S16	7.9	0.711	0.087	0.1381	
15 minute winter	S7	S7-S8	S8	19.1	1.087	1.319	0.1233	
600 minute winter	S92	StormBrake™	S93	5.4				236.0
600 minute winter	S79	S79-S84	S84	4.2	0.230	0.046	2.1084	
600 minute winter	S84	S84-S88	S88	20.8	0.514	0.128	1.8910	
240 minute winter	S32	S32-S33	S33	1.5	0.269	0.073	0.1408	
240 minute winter	S30	S30-S32	S32	0.7	0.383	0.100	0.1007	
240 minute winter	S29	S29-S30	S30	0.8	0.434	0.117	0.0917	
240 minute winter	S31	S31-S32	S32	0.9	0.382	0.132	0.0917	
240 minute winter	S37	S37-S38	S38	2.0	0.260	0.098	0.0971	
240 minute winter	S36	S36-S37	S37	1.1	0.622	0.080	0.0884	
240 minute winter	S35	S35-S37	S37	1.0	0.383	0.144	0.1031	
240 minute winter	S34	S34-S35	S35	1.1	0.420	0.161	0.0916	
240 minute winter	S27	S27-S28	S28	-0.3	-0.021	-0.013	0.1026	
240 minute winter	S26	S26-S27	S27	-0.2	-0.038	-0.026	0.0815	
240 minute winter	S25	S25-S28	S28	3.0	0.537	0.129	0.3428	
240 minute winter	S24	S24-S25	S25	-0.2	-0.020	-0.010	0.1912	
15 minute winter	S1	S1-S2	S2	2.2	0.384	0.109	0.0736	
15 minute winter	S2	S2-S3	S3	9.5	0.877	0.480	0.2909	
15 minute winter	S3	S3-S9	S9	8.8	0.498	0.440	0.1558	
15 minute winter	S9	S9-S12	S12	29.9	1.701	2.077	0.1366	
240 minute winter	S39	Orifice	S40	1.2				
600 minute winter	S40	S40-S43	S43	27.8	0.777	0.302	0.1641	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S53	1	23.310	0.000	0.0	0.0000	0.0000	OK
600 minute winter	S55	570	22.835	0.782	13.6	0.0000	0.0000	SURCHARGED
15 minute winter	S56	10	23.104	0.044	5.3	0.0204	0.0000	OK
600 minute winter	S58	570	22.835	0.792	16.6	0.0000	0.0000	SURCHARGED
15 minute winter	S65	10	23.037	0.037	5.3	0.0154	0.0000	OK
600 minute winter	S66	570	22.835	0.898	18.6	0.0000	0.0000	SURCHARGED
600 minute winter	S70	570	22.835	0.457	1.0	0.0365	0.0000	SURCHARGED
600 minute winter	S69	570	22.835	0.277	0.5	0.0892	0.0000	SURCHARGED
600 minute winter	S68	570	22.835	0.285	0.5	0.1120	0.0000	FLOOD RISK
600 minute winter	S67	570	22.835	0.112	0.0	0.0020	0.0000	SURCHARGED
600 minute winter	S74	570	22.835	0.330	0.5	0.0264	0.0000	SURCHARGED
600 minute winter	S73	570	22.835	0.116	0.5	0.0504	0.0000	SURCHARGED
600 minute winter	S76	570	22.835	0.332	0.5	0.0266	0.0000	SURCHARGED
600 minute winter	S75	570	22.835	0.118	0.5	0.0511	0.0000	SURCHARGED
600 minute winter	S90	570	22.835	0.155	0.1	0.0028	0.0000	SURCHARGED
600 minute winter	S91	570	22.835	0.656	1.2	0.0524	0.0000	SURCHARGED
600 minute winter	S89	570	22.835	0.125	1.2	0.1024	0.0000	SURCHARGED
600 minute winter	S87	570	22.835	0.956	21.7	238.1540	0.0000	FLOOD RISK
600 minute winter	S23	570	22.835	0.618	13.2	0.0736	0.0000	SURCHARGED
600 minute winter	S86	570	22.835	0.642	0.7	0.0513	0.0000	FLOOD RISK
600 minute winter	S85	570	22.835	0.075	0.7	0.0409	0.0000	OK
600 minute winter	S80	570	22.835	0.168	0.7	0.0779	0.0000	SURCHARGED
15 minute winter	S82	10	22.993	0.035	4.9	0.0127	0.0000	OK
15 minute winter	S62	10	22.884	0.045	4.9	0.0138	0.0000	OK
600 minute winter	S63	570	22.835	0.371	0.6	0.0297	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S53	S53-S54	S54	0.0	0.000	0.000	0.0000	
600 minute winter	S55	S55-S58	S58	16.1	0.795	0.179	0.1070	
15 minute winter	S56	S56-S57	S57	5.3	1.530	0.161	0.0498	
600 minute winter	S58	S58-S61	S61	14.0	0.739	0.155	0.5805	
15 minute winter	S65	S65-S66	S66	5.3	1.291	0.132	0.1912	
600 minute winter	S66	S66-S84	S84	15.4	0.586	0.170	0.5669	
600 minute winter	S70	S70-S72	S72	1.0	0.475	0.050	0.0968	
600 minute winter	S69	S69-S70	S70	0.5	0.500	0.074	0.0810	
600 minute winter	S68	S68-S70	S70	0.5	0.475	0.025	0.2328	
600 minute winter	S67	S67-S68	S68	0.0	-0.008	-0.007	0.0810	
600 minute winter	S74	S74-S77	S77	0.5	0.301	0.025	0.1147	
600 minute winter	S73	S73-S74	S74	0.5	0.501	0.074	0.1029	
600 minute winter	S76	S76-S77	S77	0.5	0.301	0.025	0.1119	
600 minute winter	S75	S75-S76	S76	0.5	0.501	0.074	0.1029	
600 minute winter	S90	S90-S91	S91	-0.1	-0.009	-0.004	0.0705	
600 minute winter	S91	S91-S92	S92	1.1	0.596	0.032	0.1059	
600 minute winter	S89	S89-S91	S91	1.2	0.843	0.108	0.1129	
600 minute winter	S87	S87-S88	S88	-19.6	-0.178	-0.120	1.8154	
600 minute winter	S23	S23-S40	S40	8.9	0.725	0.097	0.2699	
600 minute winter	S86	S86-S88	S88	0.6	0.567	0.020	0.1053	
600 minute winter	S85	S85-S86	S86	0.7	0.639	0.021	0.2240	
600 minute winter	S80	S80-S81	S81	0.7	0.609	0.025	0.3081	
15 minute winter	S82	S82-S83	S83	4.9	0.960	0.122	0.1634	
15 minute winter	S62	S62-S63	S63	4.9	1.289	0.172	0.0566	
600 minute winter	S63	S63-S64	S64	0.6	0.660	0.015	0.1184	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	S64	570	22.835	0.857	23.0	0.0000	0.0000	SURCHARGED
15 minute winter	S59	10	22.894	0.045	4.9	0.0117	0.0000	OK
600 minute winter	S60	570	22.835	0.361	0.6	0.0289	0.0000	SURCHARGED
600 minute winter	S61	570	22.835	0.847	36.2	0.1609	0.0000	SURCHARGED
15 minute winter	S50	10	23.050	0.056	4.9	0.0172	0.0000	OK
600 minute winter	S51	570	22.835	0.041	0.6	0.0033	0.0000	OK
600 minute winter	S52	570	22.835	0.763	16.5	0.0000	0.0000	SURCHARGED
15 minute winter	S47	10	23.172	0.049	4.9	0.0157	0.0000	OK
600 minute winter	S48	570	22.835	0.032	0.6	0.0026	0.0000	OK
600 minute winter	S49	570	22.835	0.754	12.5	0.0000	0.0000	SURCHARGED
15 minute winter	S44	10	23.150	0.056	4.9	0.0172	0.0000	OK
15 minute winter	S45	10	22.924	0.030	4.8	0.0024	0.0000	OK
600 minute winter	S46	570	22.835	0.669	26.7	0.1231	0.0000	SURCHARGED
15 minute winter	S41	10	23.362	0.048	5.3	0.0176	0.0000	OK
600 minute winter	S43	570	22.835	0.659	30.1	0.0000	0.0000	SURCHARGED
15 minute winter	S20	10	23.459	0.059	5.3	0.0245	0.0000	OK
600 minute winter	S22	570	22.835	0.575	22.0	0.0000	0.0000	SURCHARGED
15 minute winter	S21	10	23.222	0.029	5.2	0.0023	0.0000	OK
15 minute winter	S42	10	22.930	0.031	5.2	0.0025	0.0000	OK
15 minute winter	S17	10	23.409	0.059	5.3	0.0226	0.0000	OK
15 minute winter	S18	10	23.199	0.030	5.2	0.0024	0.0000	OK
600 minute winter	S19	570	22.835	0.564	8.5	0.0000	0.0000	SURCHARGED
15 minute winter	S13	10	23.489	0.039	4.0	0.0134	0.0000	OK
15 minute winter	S15	10	23.121	0.033	5.7	0.0026	0.0000	OK
600 minute winter	S16	570	22.835	0.469	8.6	0.0000	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)
600 minute winter	S64	S64-S66	S66	18.1	0.746	0.201	0.4258	
15 minute winter	S59	S59-S60	S60	4.9	1.289	0.172	0.0566	
600 minute winter	S60	S60-S61	S61	0.6	0.717	0.015	0.1184	
600 minute winter	S61	S61-S64	S64	22.6	0.753	0.252	0.1074	
15 minute winter	S50	S50-S51	S51	4.8	1.174	0.243	0.0673	
600 minute winter	S51	S51-S52	S52	0.6	0.979	0.011	0.0616	
600 minute winter	S52	S52-S55	S55	13.6	0.805	0.149	0.1998	
15 minute winter	S47	S47-S48	S48	4.8	1.319	0.192	0.0596	
600 minute winter	S48	S48-S49	S49	0.6	0.979	0.011	0.0583	
600 minute winter	S49	S49-S52	S52	16.0	0.786	0.178	0.0968	
15 minute winter	S44	S44-S45	S45	4.8	1.174	0.243	0.0673	
15 minute winter	S45	S45-S46	S46	4.8	1.795	0.085	0.0573	
600 minute winter	S46	S46-S49	S49	11.9	0.780	0.132	0.8978	
15 minute winter	S41	S41-S42	S42	5.2	1.426	0.186	0.0618	
600 minute winter	S43	S43-S46	S46	25.3	0.788	0.282	0.1074	
15 minute winter	S20	S20-S21	S21	5.2	1.223	0.264	0.0729	
600 minute winter	S22	S22-S23	S23	10.0	0.751	0.110	0.4533	
15 minute winter	S21	S21-S22	S22	5.2	2.201	0.078	0.0563	
15 minute winter	S42	S42-S43	S43	5.2	1.860	0.092	0.0577	
15 minute winter	S17	S17-S18	S18	5.2	1.217	0.263	0.0636	
15 minute winter	S18	S18-S19	S19	5.2	2.161	0.081	0.0561	
600 minute winter	S19	S19-S22	S22	21.4	0.748	0.234	0.1145	
15 minute winter	S13	S13-S15	S15	3.9	1.106	0.139	0.0513	
15 minute winter	S15	S15-S16	S16	5.7	2.013	0.100	0.0346	
600 minute winter	S16	S16-S19	S19	7.9	0.740	0.087	1.0034	

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Results for 100 year +30% CC Critical Storm Duration. Lowest mass balance: 94.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S38	232	23.828	1.035	7.0	23.5844	0.0000	FLOOD RISK
15 minute winter	S14	10	23.382	0.026	1.8	0.0036	0.0000	OK
15 minute winter	S11	10	23.071	0.039	6.2	0.0063	0.0000	OK
15 minute winter	S10	10	23.518	0.038	4.4	0.0152	0.0000	OK
15 minute winter	S6	12	22.966	0.346	6.2	0.1322	0.0000	SURCHARGED
15 minute summer	S4	1	23.487	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S8	12	22.963	0.363	20.6	0.0000	0.0000	SURCHARGED
15 minute summer	S5	1	23.229	0.000	0.0	0.0000	0.0000	OK
240 minute winter	S33	232	23.828	0.985	4.1	0.0788	0.0000	FLOOD RISK
600 minute winter	S54	570	22.835	0.245	0.1	0.0196	0.0000	SURCHARGED
600 minute winter	S57	570	22.835	0.255	0.6	0.0204	0.0000	SURCHARGED
600 minute winter	S83	570	22.835	0.668	2.0	0.0534	0.0000	SURCHARGED
600 minute winter	S81	570	22.835	0.606	1.2	0.0485	0.0000	SURCHARGED
600 minute winter	S72	570	22.835	0.526	1.4	0.0873	0.0000	FLOOD RISK
600 minute winter	S71	570	22.835	0.390	0.4	0.1251	0.0000	FLOOD RISK
600 minute winter	S77	570	22.835	0.411	1.6	0.1381	0.0000	SURCHARGED
600 minute winter	S78	570	22.835	0.529	1.6	0.0423	0.0000	FLOOD RISK
240 minute winter	S28	232	23.828	0.814	3.0	0.0651	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	S38	S38-S39	S39	1.3	0.368	0.066	0.1848	
15 minute winter	S14	S14-S15	S15	1.8	0.736	0.063	0.0260	
15 minute winter	S11	S11-S12	S12	6.1	1.755	0.133	0.0425	
15 minute winter	S10	S10-S11	S11	4.4	1.231	0.134	0.0478	
15 minute winter	S6	S6-S8	S8	5.0	0.299	0.349	0.0534	
15 minute summer	S4	S4-S6	S6	0.0	0.000	0.000	0.1526	
15 minute winter	S8	S8-S9	S9	21.0	1.194	1.473	0.0379	
15 minute summer	S5	S5-S6	S6	0.0	0.000	0.000	0.0643	
240 minute winter	S33	S33-S38	S38	3.9	0.391	0.198	0.0702	
600 minute winter	S54	S54-S55	S55	-0.1	-0.009	-0.002	0.0682	
600 minute winter	S57	S57-S58	S58	0.6	0.916	0.011	0.0682	
600 minute winter	S83	S83-S84	S84	1.2	0.633	0.044	0.0945	
600 minute winter	S81	S81-S83	S83	1.4	0.469	0.048	0.0434	
600 minute winter	S72	S72-S79	S79	1.1	0.590	0.057	0.1076	
600 minute winter	S71	S71-S72	S72	0.4	0.466	0.059	0.0533	
600 minute winter	S77	S77-S78	S78	1.6	0.628	0.080	0.1656	
600 minute winter	S78	S78-S79	S79	1.8	0.618	0.093	0.1025	
240 minute winter	S28	S28-S33	S33	2.6	0.423	0.114	0.1818	

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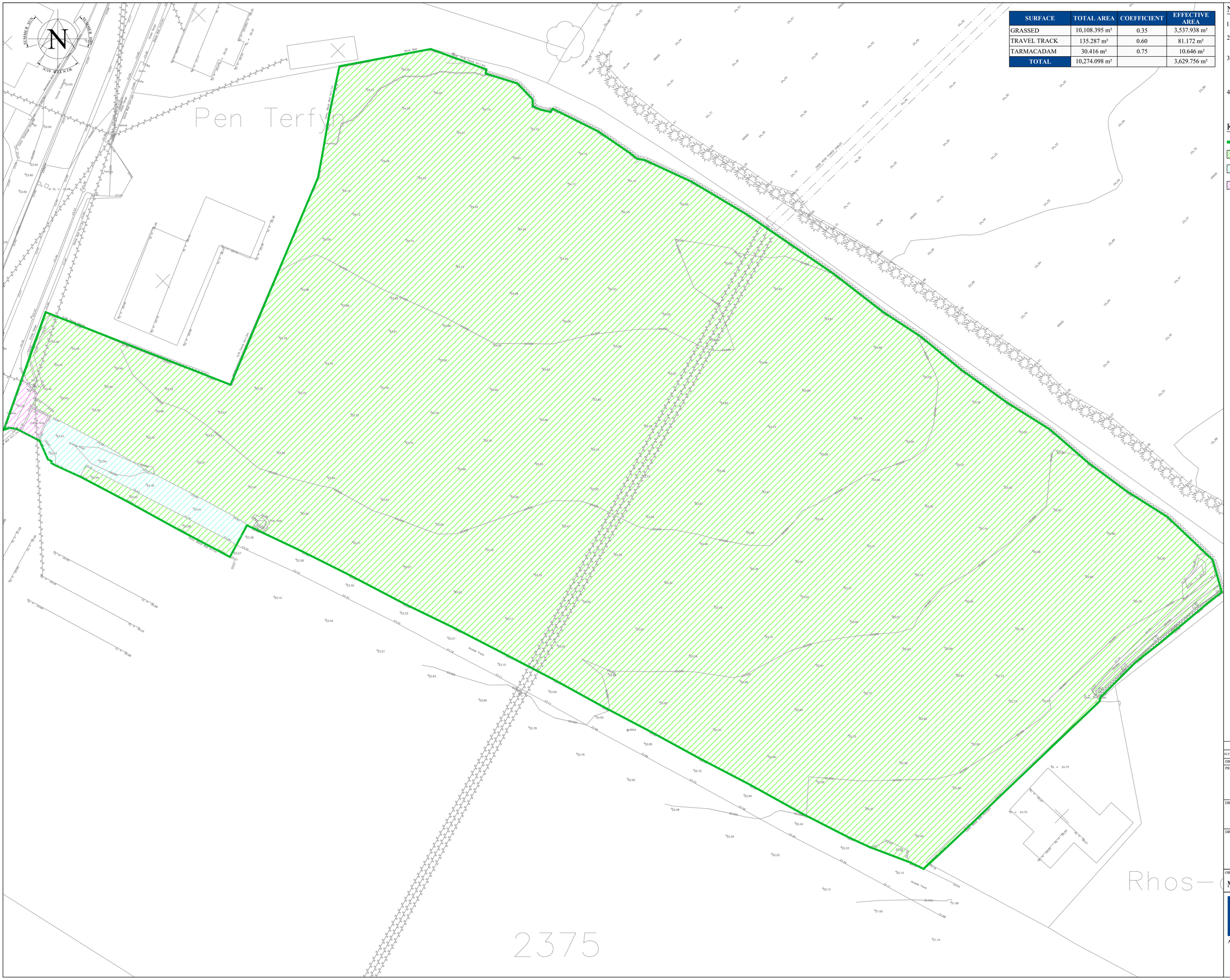
APPENDIX G

Existing Greenfield Impermeable Area Plan



SURFACE	TOTAL AREA	COEFFICIENT	EFFECTIVE AREA
GRASSED	10,108.395 m²	0.35	3,537.938 m²
TRAVEL TRACK	135.287 m²	0.60	81.172 m²
TARMACADAM	30.416 m²	0.75	10.646 m²
TOTAL	10,274.098 m²		3,629.756 m²

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS IN METRES UNLESS NOTED OTHERWISE ON DRAWING.
3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

KEY

- DENOTES SITE BOUNDARY
- DENOTES EXTENT OF EXISTING AREAS.
- DENOTES EXISTING AREA OF GRAVEL TRACK.
- DENOTES EXISTING AREA OF TARMACADAM.

SUITABILITY	REV	DATE	DESCRIPTION	Org.	Ckd'd	Appr'd	Auth.
S1	P01	14.10.21	FIRST ISSUE				

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

EXISTING AREAS

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
015721	CCE	V1	XX	40:40:01	C
50:30 CLASSIFICATION		0001 No.	S1 SUITABILITY	P01 REVISION	

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	14.10.2021	1:250	A1

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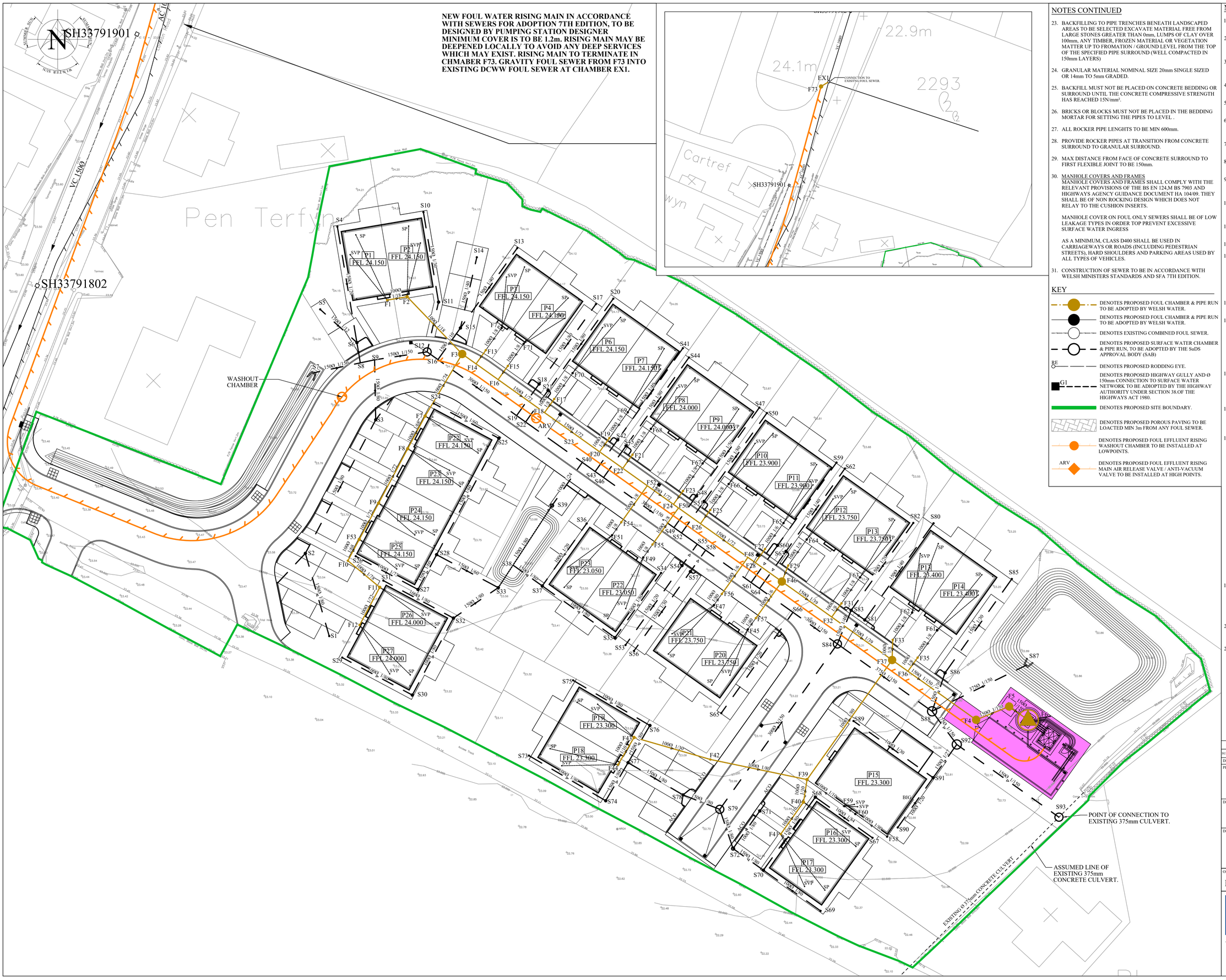
APPENDIX H

Proposed Drainage Layout

NEW FOUL WATER RISING MAIN IN ACCORDANCE WITH SEWERS FOR ADOPTION 7TH EDITION, TO BE DESIGNED BY PUMPING STATION DESIGNER MINIMUM COVER IS TO BE 1.2m. RISING MAIN MAY BE DEEPENED LOCALLY TO AVOID ANY DEEP SERVICES WHICH MAY EXIST. RISING MAIN TO TERMINATE IN CHMABER F73. GRAVITY FOUL SEWER FROM F73 INTO EXISTING DCWW FOUL SEWER AT CHAMBER EX1.



NOTES CONTINUED

23. BACKFILLING TO PIPE TRENCHES BENEATH LANDSCAPED AREAS TO BE SELECTED EXCAVATE MATERIAL FREE FROM LARGE STONES GREATER THAN 0mm, LUMPS OF CLAY OVER 100mm, ANY TIMBER, FROZEN MATERIAL OR VEGETATION MATTER UP TO FROMATION / GROUND LEVEL FROM THE TOP OF THE SPECIFIED PIPE SURROUND (WELL COMPACTED IN 150mm LAYERS)

24. GRANULAR MATERIAL NOMINAL SIZE 20mm SINGLE SIZED OR 14mm TO 5mm GRADED.

25. BACKFILL MUST NOT BE PLACED ON CONCRETE BEDDING OR SURROUND UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED 15N/mm².

26. BRICKS OR BLOCKS MUST NOT BE PLACED IN THE BEDDING MORTAR FOR SETTING THE PIPES TO LEVEL .

27. ALL ROCKER PIPE LENGHTS TO BE MIN 600mm.

28. PROVIDE ROCKER PIPES AT TRANSITION FROM CONCRETE SURROUND TO GRANULAR SURROUND.

29. MAX DISTANCE FROM FACE OF CONCRETE SURROUND TO FIRST FLEXIBLE JOINT TO BE 150mm.

30. MANHOLE COVERS AND FRAMES
MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF THE BS EN 124.M BS 7903 AND HIGHWAYS AGENCY GUIDANCE DOCUMENT HA 104/09. THEY SHALL BE OF NON ROCKING DESIGN WHICH DOES NOT RELAY TO THE CUSHION INSERTS.

MANHOLE COVER ON FOUL ONLY SEWERS SHALL BE OF LOW LEAKAGE TYPES IN ORDER TOP PREVENT EXCESSIVE SURFACE WATER INGRESS

AS A MINIMUM, CLASS D400 SHALL BE USED IN CARRIAGEWAYS OR ROADS (INCLUDING PEDESTRIAN STREETS), HARD SHOULDERS AND PARKING AREAS USED BY ALL TYPES OF VEHICLES.

31. CONSTRUCTION OF SEWER TO BE IN ACCORDANCE WITH WELSH MINISTERS STANDARDS AND SFA 7TH EDITION.

KEY

- DENOTES PROPOSED FOUL CHAMBER & PIPE RUN TO BE ADOPTED BY WELSH WATER.
- DENOTES PROPOSED FOUL CHAMBER & PIPE RUN TO BE ADOPTED BY WELSH WATER.
- DENOTES EXISTING COMBINED FOUL SEWER.
- DENOTES PROPOSED SURFACE WATER CHAMBER & PIPE RUN, TO BE ADOPTED BY THE SuDS APPROVAL BODY (SAB)
- RE — DENOTES PROPOSED RODDING EYE.
- G1 — DENOTES PROPOSED HIGHWAY GULLY AND Ø 150mm CONNECTION TO SURFACE WATER NETWORK TO BE ADIOPTED BY THE HIGHWAY AUTHORITY UNDER SECTION 38.OF THE HIGHWAYS ACT 1980.
- DENOTES PROPOSED SITE BOUNDARY.
- DENOTES PROPOSED POROUS PAVING TO BE LOACTED MIN 3m FROM ANY FOUL SEWER.
- DENOTES PROPOSED FOUL EFFLUENT RISING WASHOUT CHAMBER TO BE INSTALLED AT LOWPOINTS.
- ARV — DENOTES PROPOSED FOUL EFFLUENT RISING MAIN AIR RELEASE VALVE / ANTI-VACUUM VALVE TO BE INSTALLED AT HIGH POINTS.

NOTES

1. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.
2. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.
4. PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.
5. THE LOCAL AUTHORITY AND SERVICE COMPANIES ARE TO BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK ON SITE.
6. ALL DRAINAGE COMPONENTS ARE TO COMPLY WITH CURRENT BRITISH STANDARDS AND BUILDING REGULATIONS REQUIREMENTS.
7. ALL WORKS TO BE IN ACCORDANCE WITH THE LOCAL AUTHORITYS ROADS FOR ADOPTION SPECIFICATION.
8. ALL WORKS AND MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAY WORKS (SHW SERIES 500).
9. DRAIN PIPE THROUGH WALLS OR BENEATH FOUNDATIONS (SPREAD ONLY) TO HAVE R.C BRIDGE LINTELS OVER AND PIPE SURROUNDED IN FLEXIBLE MATERIAL (50mm).
10. FINAL LOCATIONS AND DETAILS OF SOIL VENT PIPES, STUB STACKS, RAINWATER DOWN PIPES, GULLIES ETC. TO BE CONFIRMED BY REFERENCE TO ARCHITECT' DRAWINGS.
11. ALL THRESHOLD DRAIN DETAILS TO BE TO ARCHITECT' DETAILS.
12. ALL PIPES INTO CHAMBERS TO SOFFIT TO SOFFIT U.N.O.
13. AT ALL OUTFALL POINTS TO AN EXISTING NETWORK, THE POSITION AND INVERT LEVEL OF EXISTING DRAINS MUST BE CONFIRMED WELL IN ADVANCE OF THE PROGRAMMED DATE FOR INSTALLING ANY OF THE UPSTREAM DRAINAGE, OR ORDERING OF ANY MATERIALS IN ORDER TO ALLOW TIME FOR ANY NECESSARY REVISIONS TO THE HYDRAULIC DESIGN.
14. ALL GRAVITY UPVC PIPEWORK TO BE TO BS 4660 OR BS 5481 WHERE RELEVANT UNLESS NOTED OTHERWISE.
15. ALL NON-ADOPTABLE DOMESTIC FOUL AND SURFACE WATER PIPE RUNS SHALL CONSIST OF 100mm DIA. PIPES LAID AT NO FLATTER THAN 1/80 FALLS U.N.O. A SEWER OR LATERAL DRAIN WITH A NOMINAL INTERNAL DIAMETER OF 100mm, OR A LATERAL DRAIN SERVING TEN OR LESS PROPERTIES IS LAID TO A GRADIENT NOT FLATTER THAN 1:80, WHERE THERE IS AT LEAST ONE WC CONNECTED AND 1:40 IF THERE IS NO WC CONNECTED.
16. ALL CONNECTIONS FROM HIGHWAY GULLIES TO BE 150mm DIA. LAID AT FALLS OF BETWEEN 1/20 AND 1/100 WITH TYPE S BED AND SURROUND TO ALL CONNECTIONS WITH MIN. 1.20m COVER, TYPE Z BED AND SURROUND TO ALL OTHER CONNECTIONS.
17. THERMOPLASTIC PIPES & FITTINGS:
THERMOPLASTIC PIPES, JOINTS & FITTINGS FOR GRAVITY SEWERS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1401-1, BS EN 1852 & BS EN 12666-1.
18. THERMOPLASTIC STRUCTURED WALL PIPE:
THERMOPLASTIC STRUCTURED WALL SEWER PIPE SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13476-1 & WIS 4-35-01 AND BS EN 13476-2 OR BS EN 13476-3. PIPES SHALL BE BSI KITEMARKED OR HAVE EQUIVALENT THIRD PART CERTIFICATION. PIPES LESS THAN OR EQUAL TO 500mm IN DIAMETER SHALL HAVE NOMINAL SHORT-TERM RING STIFFNESS NOT LESS THAN 8KN/m² (SN8) OR BE SUBJECT TO A QUALITY SYSTEM FOR STORAGE & EMBEDMENT.

Nom. SHORT TERM RING STIFFNESS OF 2KN/m² (SN2) IS ACCEPTABLE FOR PIPES GREATER THAN Ø500mm, SUBJECT TO SUPPORTING STRUCTURAL DESIGN LOAD CALCULATIONS BEING PROVIDED.

TRANSPORTATION, HANDLING, STORAGE AND LAYING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

WHERE A FITTING IS INSTALLED ON A SEWER LENGTH, IT SHALL HAVE THE SAME INTERNAL BORE AS THE SEWER. Max. LENGTH OF PIPE FOR LAYING IS 3.0m OR Ø x 10, WHICHEVER IS THE GREATER, UNLESS WELDED JOINTS ARE USED.

19. CONNECTION TO THE PUBLIC SEWER
A SECTION 106 APPLICATION TO CONNECT MUST BE MADE TO DCWW. THE DEVELOPER SHALL GIVE 21 DAYS NOTICE PRIOR TO CONNECTION, THE WORKS MAY ONLY BE UNDERTAKEN BY A DCWW HEALTH AND SAFETY APPROVED CONTRACTOR.
21. OPTIMUM TRENCH WIDTH
OPTIMUM TRENCH WIDTH = PIPE + 300mm. CONTRACTOR TO ENSURE TRENCH WALLS ARE SUITABLY PROPPED.
22. BACKFILLING TO PIPE TRENCHES BENEATH ROADS, CAR PARKING AND STRUCTURES TO BE M.O.T. TYPE 1 GRANULAR MATERIAL UP TO FORMATION LEVEL FROM THE TOP OF THE SPECIFIED PIPE SURROUND (WELL COMPACTED IN 150mm LAYERS).

SUITABILITY	REV	DATE	DESCRIPTION	Org.	Chk'd	App'd	Auth.
S1	P01	01.11.21	FIRST ISSUE				

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

SECTION 104 DRAINAGE LAYOUT

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
015721	CCE	V1	XX	40:40:01	C

CLASSIFICATION	No.	SUITABILITY	REVISION
50:30	0007	S1	P01

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	01.11.2021	1:250	A1

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NOTES

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3. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO UNDERTAKING ANY WORKS, ORDERING MATERIALS OR FABRICATING ANY COMPONENTS.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

KEY

- DENOTES PROPOSED SURFACE WATER CHAMBER AND PIPEWORK TO BE ADOPTED BY CONWY HIGHWAY AUTHORITY.
- DENOTES PROPOSED SURFACE WATER CHAMBER AND PIPEWORK TO BE ADOPTED BY CONWY SuDS APPROVAL BODY (SAB).
- DENOTES PROPOSED FOUL CHAMBER AND PIPEWORK TO BE ADOPTED BY DCWW UNDER SECTION 104 OF THE WATERS INDUSTRY ACT 1991.
- G1 — DENOTES PROPOSED HIGHWAY GULLY AND Ø 150mm CONNECTION TO SURFACE WATER NETWORK TO BE ADIOPTED BY THE HIGHWAY AUTHORITY UNDER SECTION 38 OF THE HIGHWAYS ACT 1980.
- DENOTES PROPOSED SITE BOUNDARY.
- DENOTES PROPOSED EXTENT OF HIGHWAY TO BE ADOPTED BY CONWY HIGHWAY AUTHORITY.
- DENOTES AREA OF PROPOSED SECTION 278, WORKS WITHIN AN EXISTING HIGHWAY.
- DENOTES PROPOSED RISING MAIN SEWER TO BE ADOPTED BY DCWW.

S1	P01	29.10.21	FIRST ISSUE				
SUITABILITY	REV	DATE	DESCRIPTION	Orig.	Chk'd	App'd	Auth.

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PANNAF

DRAWING TITLE:

PROPOSED SECTION 38 LAYOUT

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
15721	CCE	V1	XX	40:40:01	C

CLASSIFICATION	No.	SUITABILITY	REVISION
50:30	0021	S1	P01

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	29.10.2021	1:250	A1

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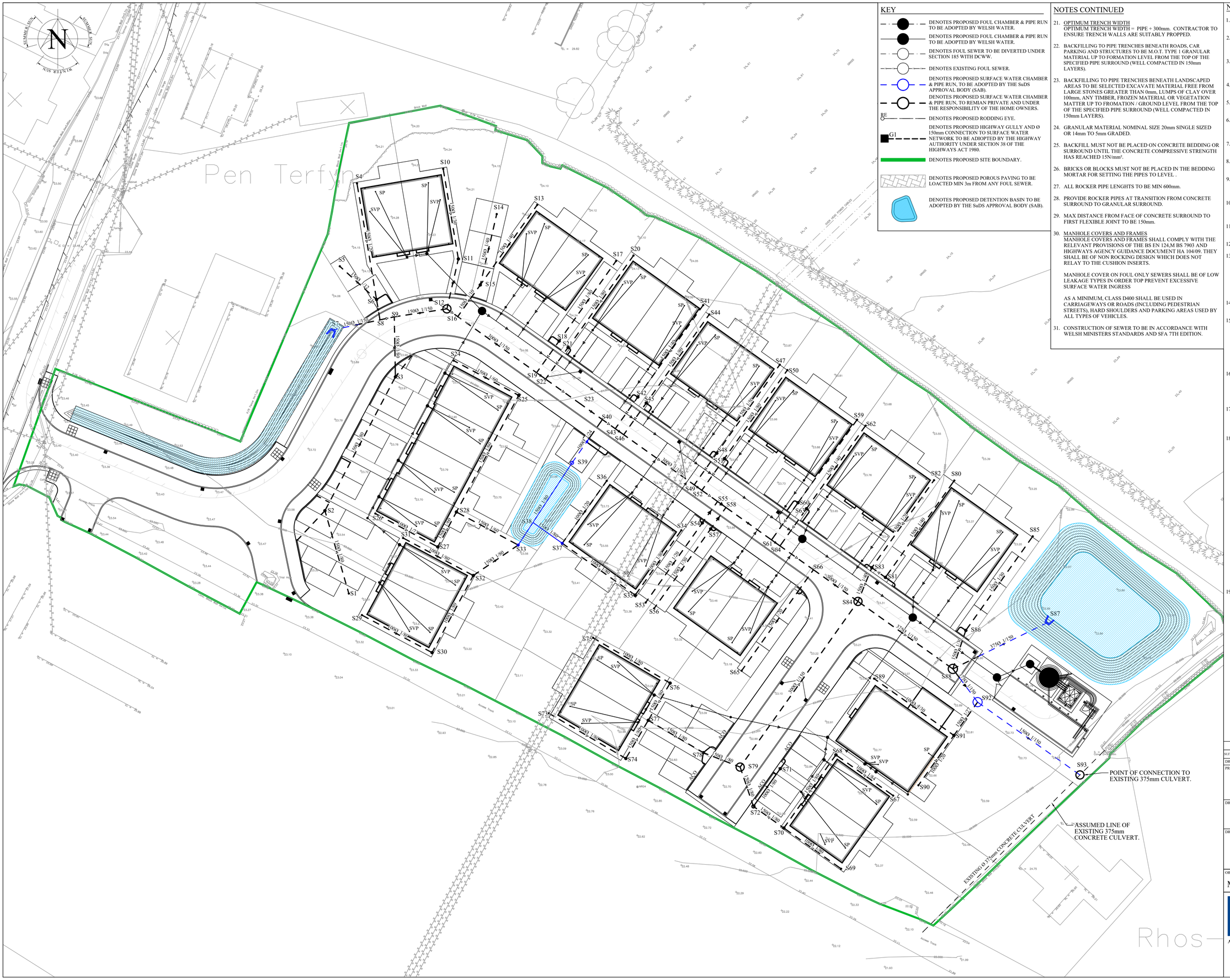

KEY

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- DENOTES PROPOSED FOUL CHAMBER & PIPE RUN TO BE ADOPTED BY WELSH WATER.
- DENOTES FOUL SEWER TO BE DIVERTED UNDER SECTION 185 WITH DCWW.
- DENOTES EXISTING FOUL SEWER.
- DENOTES PROPOSED SURFACE WATER CHAMBER & PIPE RUN, TO BE ADOPTED BY THE SuDS APPROVAL BODY (SAB).
- DENOTES PROPOSED SURFACE WATER CHAMBER & PIPE RUN, TO REMIAN PRIVATE AND UNDER THE RESPONSIBILITY OF THE HOME OWNERS.
- RE — DENOTES PROPOSED RODDING EYE.
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- DENOTES PROPOSED DETENTION BASIN TO BE ADOPTED BY THE SuDS APPROVAL BODY (SAB).

NOTES CONTINUED

21. OPTIMUM TRENCH WIDTH
OPTIMUM TRENCH WIDTH = PIPE + 300mm. CONTRACTOR TO ENSURE TRENCH WALLS ARE SUITABLY PROPPED.

22. BACKFILLING TO PIPE TRENCHES BENEATH ROADS, CAR PARKING AND STRUCTURES TO BE M.O.T. TYPE 1 GRANULAR MATERIAL UP TO FORMATION LEVEL FROM THE TOP OF THE SPECIFIED PIPE SURROUND (WELL COMPACTED IN 150mm LAYERS).

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14. ALL GRAVITY UPVC PIPEWORK TO BE TO BS 4660 OR BS 5481 WHERE RELEVANT UNLESS NOTED OTHERWISE.
15. ALL NON ADOPTABLE DOMESTIC FOUL AND SURFACE WATER PIPE RUNS SHALL CONSIST OF 100mm DIA. PIPES LAID AT NO FLATTER THAN 1/80 FALLS U.N.O. A SEWER OR LATERAL DRAIN WITH A NOMINAL INTERNAL DIAMETER OF 100mm, OR A LATERAL DRAIN SERVING TEN OR LESS PROPERTIES IS LAID TO A GRADIENT NOT FLATTER THAN 1:80, WHERE THERE IS AT LEAST ONE WC CONNECTED AND 1:40 IF THERE IS NO WC CONNECTED.
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18. THERMOPLASTIC STRUCTURED WALL PIPE:
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19. CONNECTION TO THE PUBLIC SEWER
A SECTION 106 APPLICATION TO CONNECT MUST BE MADE TO DCWW. THE DEVELOPER SHALL GIVE 21 DAYS NOTICE PRIOR TO CONNECTION, THE WORKS MAY ONLY BE UNDERTAKEN BY A DCWW HEALTH AND SAFETY APPROVED CONTRACTOR.

S1	P01	08/08/00	FIRST ISSUE					
SUITABILITY	REV.	DATE	DESCRIPTION	Org.	Chk'd	App'd	Auth.	

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

PROPOSED SuDS APPROVAL BODY (SAB) ADOPTION LAYOUT

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
015721	CCE	V1	XX	40:40:01	C
50:30 CLASSIFICATION		0022 No.	S1 SUITABILITY	P01 REVISION	

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	01.11.2021	1:250	A1

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APPENDIX I

Proposed Impermeable Area Plan

SURFACE	TOTAL AREA	COEFFICIENT	EFFECTIVE AREA
PARKING	870.325 m²	1.00	870.325 m²
ROAD	1,807.205 m²	1.00	1,807.205 m²
PATHS	1,030.926 m²	1.00	1,030.926 m²
ATTENUATION BASIN	587.222 m²	1.00	587.222 m²
PUMPING STATION	128.319 m²	1.00	128.319 m²
GRASS	4,043.101 m²	0.35	1,415.085 m²
ROOFS	1,806.955 m²	1.00	1,806.955 m²
TOTAL	10,256.766 m²		7,646.082 m²

NOTES

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4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.

KEY

- DENOTES AREA OF PROPOSED GRASS.
- DENOTES AREA OF PROPOSED HOUSES.
- DENOTES AREA OF PROPSOED PARKING.
- DENOTES AREA OF PROPOSED CONCRETE PATHS.
- DENOTES AREA OF PROPOSED ROAD.
- DENOTES AREA OF PROPOSED PUMPING STATION.
- DENOTES AREA OF PROPOSED ATTENUATION
- DENOTES SITE BOUNDARY

S1	P01	27.10.21	FIRST ISSUE				
SUITABILITY	REV	DATE	DESCRIPTION	Orig.	Chk'd	Appd	Auth.

DRAWING STATUS:

PROJECT TITLE:

TRE ANGHARAD PENNAF

DRAWING TITLE:

PROPOSED HARDSTANDING AREAS

DRAWING No:

PROJECT	ORIGINATOR	VOL.	LOC.	TYPE	ROLE
015721	CCE	V1	XX	40:40:01	C
50:30 (CLASSIFICATION)		0004 (No.)	S1 (SUITABILITY)	P01 (REVISION)	

ORIGINATOR:	DATE:	SCALE:	ORIGINAL SIZE:
M.JONES	27.10.2021	1:250	A1

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