CLFA DESIGN

Report Title

Drainage Technical Note

Project

CLFA137-Blind Lane, Southwick

Report Reference

CLFA137-CLFA-00-XX-DR-0661

Client

Wainhomes Severn Valley

Date

September 2026

REPORT CONTROL SHEET

Client:	Wainhomes Severn Valley
Project:	Blind Lane, Southwick
Job Number:	CLFA137
Report Title:	Drainage Technical Note
Report Reference:	CLFA137-CLFA-00-XX-DR-0661
Prepared By:	C LEDOUX
Reviewed and Authorised By:	F ALGUACIL MEng (Hons)

Revision	Date	Description	Prepared By	Authorised By
P01	01/12/25	FIRST ISSUE	C LEDOUX	F ALGUACIL
P02	14/01/26	SECOND ISSUE	C LEDOUX	F ALGUACIL
P03	17/02/26	IMP. AREAS	C LEDOUX	F ALGUACIL
P04	08/09/26	DRAINAGE UPD.	C LEDOUX	F ALGUACIL

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1. INTRODUCTION

Wainhomes Severn Valley have commissioned CLFA Design to produce a Drainage Technical Note to support the submission of a Full Planning Application for their proposed residential development at Blind Lane, Southwick.

This report provides a summary of the drainage strategy that will be followed and considers the Sustainable Urban Drainage Systems (SuDS) that have been used.

2. PROPOSED DRAINAGE STRATEGY

1.1. EXISTING DRAINAGE

According to the Wessex Water (WW) Asset Map (Appendix A), there is an existing 150mm diameter foul water sewer to the north-east of the site and a 600mm diameter surface water sewer across the site.

Both sewers have been traced using GPR equipment and the survey results can be seen in Appendix B. The WW surface water sewer appears to be 450mm diameter.

1.2. SURFACE WATER PROPOSAL

When considering the surface water discharge, the standard hierarchical SUDS approach (shown below) should be followed:

1) Infiltration into the ground – Soakaway techniques not feasible. Refer to GI Extract in Appendix C.
2) **Discharge to a surface water body – Available**
3) Discharge to a surface water sewer or highways drain
4) Discharge to a combined sewer

Greenfield run off calculations have been undertaken in accordance with the IH124 method, and the results can be seen in Appendix D. Greenfield rates for the northern catchment are 2.1l/s for the 1 in 1 yr event and at 6.6l/s for the 1 in 100 yr event. Greenfield rates for the southern catchment are 4.5l/s for the 1 in 1 yr event and at 14.1l/s for the 1 in 100 yr event.

Greenfield volume calculations have also been undertaken for a 1 in 100 year, 6 hour storm and the results can be seen in Appendix E. The greenfield volume for the northern catchment is 36.781m³ and the greenfield volume for the southern catchment is 81.367m³.

Wiltshire's Council requirements regarding discharge rates and volumes are as follows:

1) Post development discharges from greenfield sites to provide 30% betterment over pre-development discharges for all storm events between the 1 in 1year and 1 in 100year return period.
2) The runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event.
3) Attenuation features to either have 50% capacity available 24 hours after a 1 in 30-year + climate change storm event (i.e., half drain time < 1440mins) or have the capacity to store a subsequent 1 in 10-year storm event after a 1 in 30-year+ climate change storm event.

Compliance with Wiltshire Council Guidance has been checked in Table 1-Table *3* below:

Table 1. Condition 1 – 30% betterment over greenfield rates

Catchment	Greenfield rate 1 in 1 year event	Greenfield rate 1 in 100 year event	Discharge rate 1 in 1 year event	Discharge rate 1 in 100 year event	Betterment provided 1 in 1 year event	Betterment provided 1 in 100 year event
Northern Catchment	2.1 l/s	6.6 l/s	1.2 l/s	1.2 l/s	42%	82%
Southern Catchment	4.5 l/s	14.1 l/s	2.5 l/s	2.5 l/s	44%	82%
Total	6.6 l/s	20.7 l/s	3.7 l/s	3.7 l/s	43%	82%

Table 2. Condition 2 – Greenfield Volume

Catchment	Greenfield Volume (m^3)	Discharged volume 1 in 100 year, 6 hour rainfall event (m^3)	Condition met?
Northern Catchment	37.893	36.781	✓
Southern Catchment	81.367	79.792	✓
Total	119.260	116.573	✓

A copy of the 1 in 100 year, 6 hour rainfall event calculations are shown in Appendix F.

Table 3. Condition 3 – Half Drain Times

Storage feature	Half Drain Time < 1440mins for a 1 in 30cc event (cc-Climate change 45%)
Northern Catchment	✓
Southern Catchment	✓

A copy of the 1 in 30cc year calculations can be found in Appendix G. The full 1 in 1, 1 in 100 and 1 in 100cc year calculations can be found in Appendix H.

Attenuation will be provided in the form of attenuation ponds. A copy of the drainage strategy can be seen in Appendix I.

According to the CIRIA SuDS Manual (C753 Report, 2015) and to deliver adequate treatment, the selected SuDS component should have a total pollution index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type). The Table below shows that the proposed SuDS features will provide the required treatment for the new development.

Land use	Pollution hazard level	Total suspended solids	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Residential car parking and access roads	Low	0.5	0.4	0.4
Total pollution level		**0.7**	**0.6**	**0.45**
SuDS mitigation – rain garden/filter drain		0.4	0.4	0.4
SuDS mitigation - pond		0.7	0.7	0.5
Total mitigation (> Total pollution level)		**1.1**	**1.1**	**0.9**

It is also recommended that the drainage system is maintained following the recommendations in the table below:

Maintenance Schedule	Required Action	Typical Frequency	Maintenance Responsibilities
Attenuation Ponds	Remove litter and debris	Monthly	By Management Company (TBC)
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required	
	Cut grass- meadow grass in and around basin	Half yearly (spring – before nesting season and autumn)	
	Manage other vegetation and remove nuisance plants	Monthly (at the start, then as required)	
	Inspect inlets, outlets and overflows for blockages and clear if required	Monthly	
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly	
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then annually or as required	
	Check any mechanical devices	Annually	
	Tidy all dead growth before start of growing season	Annually	
	Remove sediments from inlets and outlet	Annually (or as required)	
	Reseed areas of poor vegetation growth	As required	
	Prune and trim any trees and remove cuttings	Every 2 years, or as required	
	Remove sediments from inlets, outlets and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream sources control is provided)	
	Repair erosion or other damage by reseeding re-turfing	As required	
	Repair/rehabilitation of inlets, outlets and overflows	As required	
	Relevel uneven surfaces and reinstate design levels	As required	

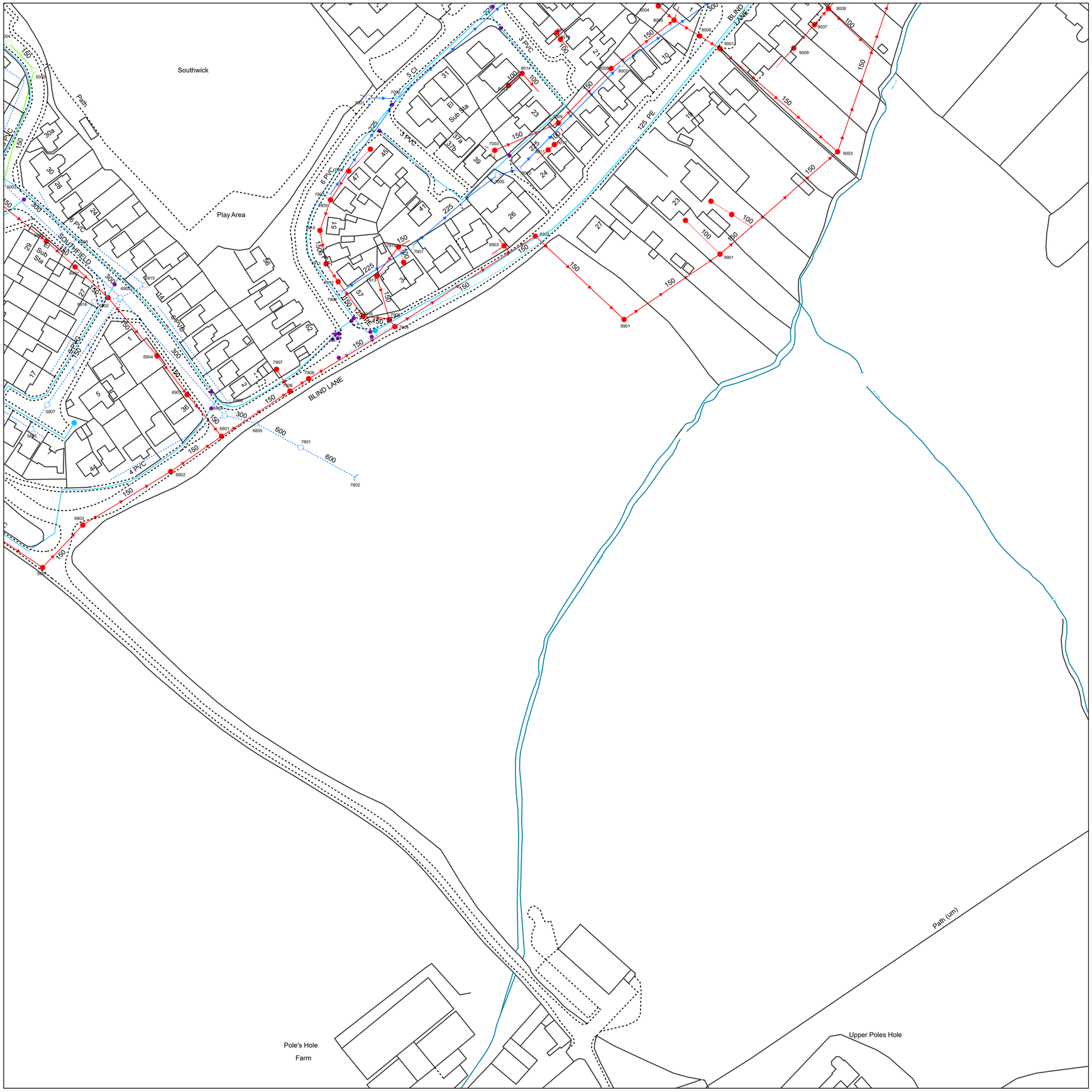
Maintenance Schedule	Required Action	Typical Frequency	Maintenance Responsibilities
Swales and rain gardens	Remove litter and debris	Monthly, or as required	Management Company (TBC)
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required	
	Manage other vegetation and remove nuisance plants	Monthly (at the start, then as required)	
	Inspect inlets, outlets and overflows for blockages and clear if required	Monthly	
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or as required	
	Inspect vegetation coverage	Monthly for six months, quarterly for 2 years, then half yearly	
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Half yearly	
	Reseed areas of poor vegetation growth	As required or if bare soil is exposed over 10% or more of the swale treatment area	
	Repair erosion or other damage by reseeding re-turfing	As required	
	Relevel uneven surfaces and reinstate design levels	As required	
	Scarify and spike topsoil to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required	
	Remove and dispose of oils or petrol residues using safe standard practices	As required	
Drainage runs, chambers and flow control structures	Remove weeds and clear obstructions	Once a year or as required	Water Authority or Management Company (TBC)
	Monitor inspection chambers. Inspect silt accumulation rates and determine cleaning frequencies	Once a year or as required	

1.1. FOUL WATER PROPOSAL

Foul water will discharge to an existing Wessex Water manhole (ID 8901) to the north-east of the site. A pump station will be required to achieve the required outfall levels.

APPENDIX A – EXISTING WESSEX WATER ASSET MAP

ST85SW/ 94



WATER MAINS

- Distribution
- Washout
- Raw Water
- Abandoned
- Private

FITTINGS

- Hydrant
- Other

SEWERS

	STRATEGIC	PUBLIC	PRIVATE	SECTION 104
Foul				
Surface				
Combined				
Abandoned				

Colours generally indicate the use of the sewer/drain (i.e Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow). Some styles of line and symbol are shown on the key in sample/typical colours.

OTHER WESSEX PIPES

- Rising Mains
- Standby Rising Mains
- Effluent Disposal
- Overflow
- Syphon

NON-WESSEX / UNKNOWN

- Private Rising Mains
- Culverted Watercourse
- Highway Drain
- Use Unknown
- Status Unknown

STRUCTURES

- Manhole - Foul
- Manhole - Surface
- Manhole - Combined
- Inlet
- Outfall
- Lamphole
- Bifurcation - Foul
- Bifurcation - Surface
- Bifurcation - Combined
- Combined Sewage Overflow
- Pumping Station - Surface
- Pumping Stn - Foul/Combined
- Gully
- Vent Column
- Rodding Eye
- Catchpit
- Flushing Chamber
- Soakaway
- Non Return Valve
- Air Valve
- Hatch Box
- Washout

OTHER STRUCTURES

- Attenuation Tank
- Storage Tank
- Chamber
- Tunnel
- Interceptor

Information in this map is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and lateral drains adopted by Wessex Water under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011 are to be plotted over time and may not yet be shown. In carrying out any works, you accept liability for the cost of any repairs to Wessex Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. If you are proposing to build over or near Wessex Water's apparatus you should contact the Developer Services Team, tel: 01225 526333 or e-mail: developer.enquiries@wessexwater.co.uk to discuss your proposals. Details of assets within Wessex Water's land ownership are unavailable through this service.

Wessex Water
YTL GROUP

Date: 20/06/2025
Centre: 383822E, 154837N
Scale: 1:884
(when printed at A1 size)

N W E S

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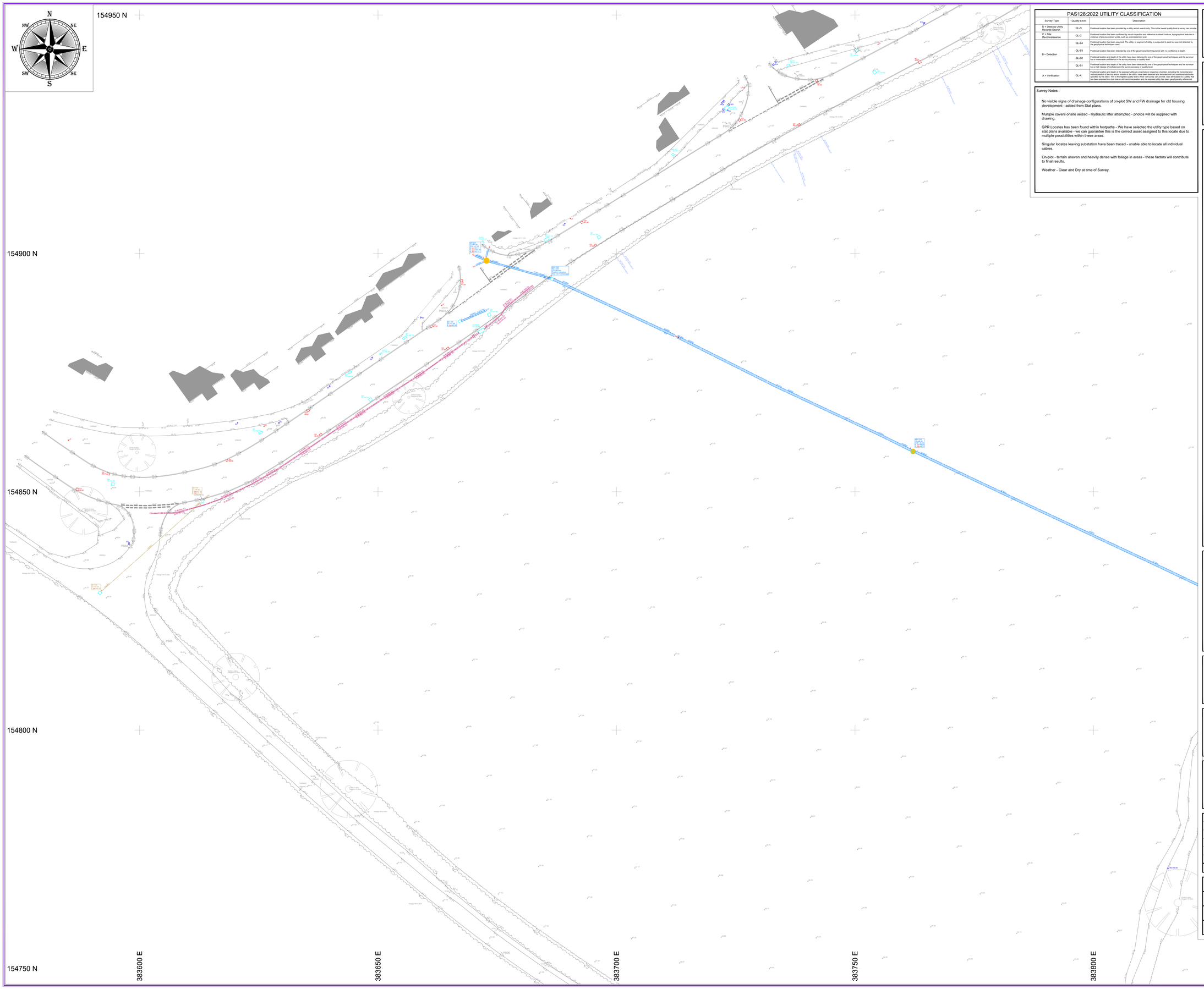
APPENDIX B – UTILITIES SURVEY



PAS128:2022 UTILITY CLASSIFICATION

Survey Type	Quality Level	Description
D = Desktop Utility Records Search	QL-D	Positional location has been provided by a utility record search only. This is the lowest quality level a survey can provide
C = Site Reconnaissance	QL-C	Positional location has been confirmed by visual inspection and reference to street furniture, topographical features or evidence of previous street works, such as a reinstatement scar
B = Detection	QL-B4	Positional location has been assumed. The utility, or segment of utility, is suspected to exist but was not detected by the geophysical techniques used
	QL-B3	Positional location has been detected by one of the geophysical techniques but with no confidence in depth.
	QL-B2	Positional location and depth of the utility have been detected by one of the geophysical techniques and the surveyor has a reasonable confidence in the survey accuracy or quality level
	QL-B1	Positional location and depth of the utility have been detected by one of the geophysical techniques and the surveyor has a high degree of confidence in the survey accuracy or quality level.
A = Verification	QL-A	Positional location and depth of the exposed utility at a manhole or inspection chamber, including the horizontal and vertical coordinates of the exposed utility, relative to the ground level, at a specified point, with a specified accuracy, as specified by the client. This is the highest quality level of PAS 128 survey can provide. Also attributable to a utility that has been exposed in a trial hole or slit trench/excavation and the exposed utility has been geophysically referenced.

Survey Notes :

No visible signs of drainage configurations of on-plot SW and FW drainage for old housing development - added from Stat plans.

Multiple covers onsite seized - Hydraulic lifter attempted - photos will be supplied with drawing.

GPR Locates has been found within footpaths - We have selected the utility type based on stat plans available - we can guarantee this is the correct asset assigned to this locate due to multiple possibilities within these areas.

Singular locates leaving substation have been traced - unable able to locate all individual cables.

On-plot - terrain uneven and heavily dense with foliage in areas - these factors will contribute to final results.

Weather - Clear and Dry at time of Survey.

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MEASURE | MAP | MASTER

TOPOGRAPHICAL SURVEYS, PAS128 UTILITY SURVEYS, CCTV DRAINAGE SURVEYS, AS-BUILT SURVEYS, 3D LASER SCANNING, SETTING OUT.

3 Holly Close
Speedwell
Bristol
BS5 7XP

0117 4627477
07535 349090
louis.firth@pointsurveys.co.uk

Utility Notes :

1. Grid and elevation measurements are based on the OSGB36 National Datum, sourced from the National GPS network.
2. We work to a standard specification as recommended by the Royal Institute of Chartered Surveyors (RICS) for measured surveys of Land, Buildings and Utilities.
3. Drainage details have been ascertained without direct access to chambers. While diligent efforts have been made for accuracy, it's advisable to independently verify critical information for future planning.
4. Unless verified by tracing techniques, all sewer segments are assumed to be linear between chambers.

UTILITY KEY

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- SERVICE DUCT B1 (PAS128)
- TRAFFIC B1 (PAS128)
- UNKNOWN B1 (PAS128)
- WATER B1 (PAS128)
- FOUL SEWER
- STORM SEWER
- 2025-04 Depth from GPR
- CAD 3D Depth from CATT Trace

100% Surveyed Underground Assets

UTILITY DISCLAIMER

Electromagnetic techniques, along with ground-penetrating radar, have been utilized to detect underground services. It's important to acknowledge that while these methods provide valuable insights, they are not infallible, and excavation is advised to confirm the identification, location, and depths of services. Complete assurance regarding underground services cannot be guaranteed.

Point Surveys Ltd does not verify whether a service is active or inactive, deferring this responsibility to the relevant service provider. As a result, all services are treated as active in our documentation. It's vital to understand that this drawing might not encompass all public services across the site, underscoring the need for a thorough desktop study to acquire all relevant service drawings, which should be used alongside our utility survey.

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Various factors such as ground conditions, proximity to other utilities, materials, and construction methods can affect the accuracy and quality of on-site data collection. Accessibility during the survey is also crucial, as inaccessible areas might contain access/manhole covers that impact the surveyed area.

Adhering to TSA Standards, it's important to recognize that even a meticulously conducted survey may not achieve a 100% detection rate due to inherent limitations and complexities.

CCTV & DRAINAGE

1. Survey to be read in conjunction with the CCTV Report.
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ABBREVIATIONS

AC Acoustic Connection	IL Invert Level	SOF Soffit Level
AR Assumed Route	IC Inspection Cover	SOFd Soffit Depth
BD Backdrop	KO Kerb Outlet	SP Soil Pipe
Bd Base Depth	LP Lamp Post	SS Soil Stack
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EP Electric Pole	RS Rod Stop	UTL Unable to Locate
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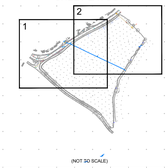
FH Fire Hydrant	SA Survey Abandoned	UTS Unable to Survey
GV Gas Valve	Sd Silt Depth	UTT Unable to Trace
GY Gully	SL Silt Level	Wd Water Depth
Id Invert Depth	SP Soil Pipe	WL Water Level

SHEET LAYOUT



Project:

BLIND LANE

Client:

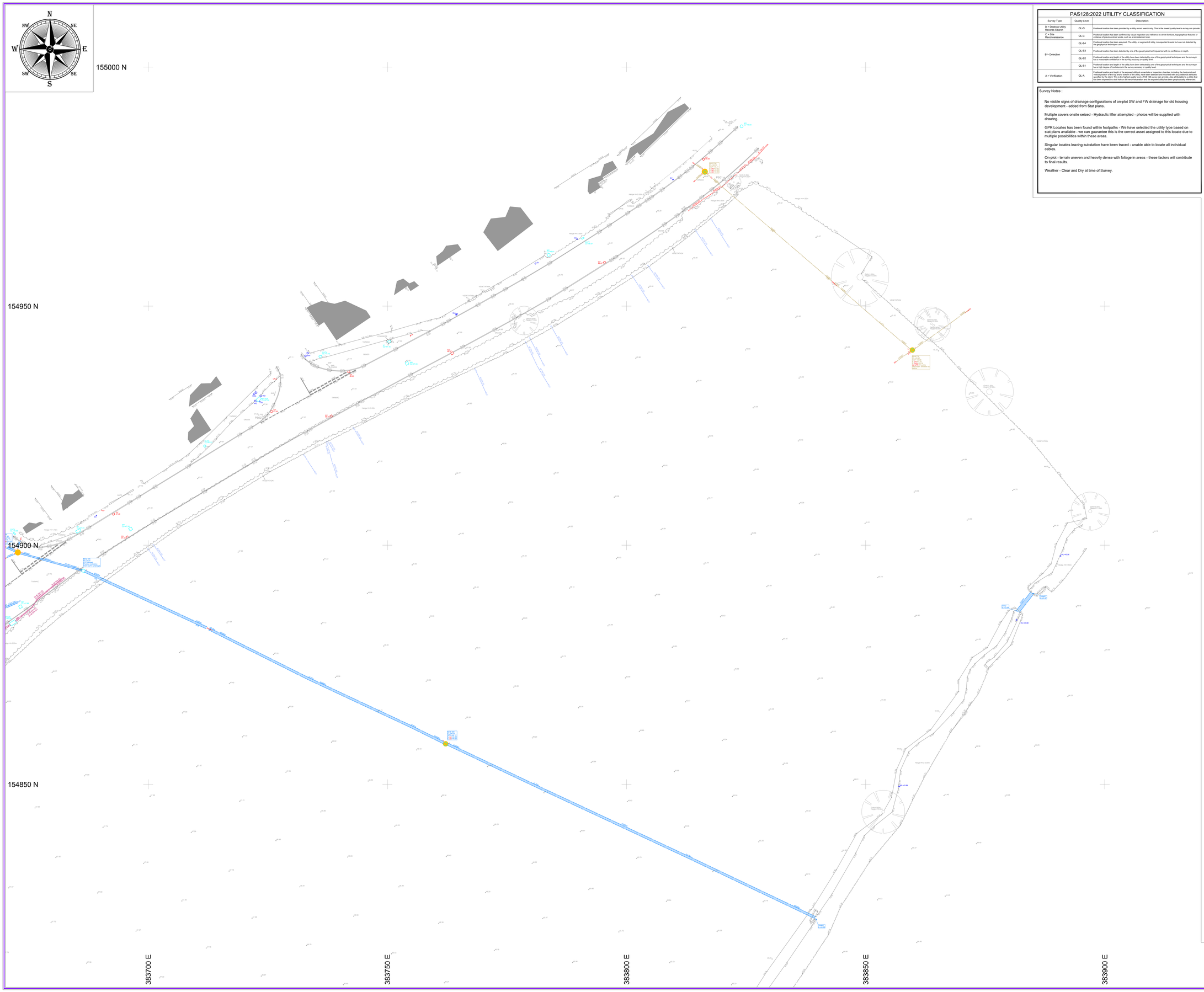
Wain HOMES

Title:

PAS128 Utility Survey & CCTV Drainage Survey

No.	Date	Drawing Revisions
R5		
R4		
R3		
R2		
R1	08/09/25	CCTV Drainage Survey added
R0	31/08/25	Utility & CCTV Drainage Survey

Job No.:	2265	Sheet No.:	1
Scale:	1:250	Date:	08/09/25
Surveyor:	LF	Revision:	R1
Status:	Complete	Approved:	LF



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- FOUL SEWER
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- Depth from GPR
- Depth from CAT Trace

Water B1 and Communications

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1500/BSI 1500/BSI

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GV Gas Valve	Sd Silt Depth	UTT Unable to Trace
GY Gully	SL Silt Level	Wd Water Depth
Id Invert Depth	SP Soil Pipe	WL Water Level

SHEET LAYOUT

1
2

(NOT 3D SCALE)

Project:

BLIND LANE

Client:

Wain HOMES

Title:

PAS128 Utility Survey & CCTV Drainage Survey

No.	Date	Drawing Revisions
R5		
R4		
R3		
R2		
R1	08/09/25	CCTV Drainage Survey added
R0	31/08/25	Utility & CCTV Drainage Survey

Job No.:	2265	Sheet No.:	2
Scale:	1:250	Date:	08/09/25
Surveyor:	LF	Revision:	R1
Status:	Complete	Approved:	LF

APPENDIX C – EXTRACT GROUND INVESTIGATION

P25-291
Blind Lane, Southwick

Desk Study and
Ground Investigation
Report

P25-291

Blind Lane, Southwick

Desk Study and Ground Investigation Report

For

Wain Homes

DATE: 9 September 2025

REV: P02

Document Reference & Control

Project Name:	**Blind Lane, Southwick**
Project Reference:	**P25-291**
Report Title:	**Combined Desk Study and Ground Investigation Report**
Client:	**Wain Homes**
Document Reference:	**Project Ref-RL-22-XX-RP-O-0005**
Report Status:	**P2**

Approval Status	Name & Position
Prepared by:	Ruth Hardy BSc Graduate Geo-Enviromental Project Engineer
Reviewed by:	Andy Jackson PGDip IEng MICE PMQ Principal Geo-Environmental Consultant
Approved by:	Chris Wilson BSc MCIWEM Principal Geo-Environmental Consultant

Revision Status	Date	Summary of Revision
P01	08/09/25	First Issue
P02	09/08/25	Topsoil reuse updated

Executive Summary

This presents the salient points of the report and should not be referred to in isolation.

Instruction	In June 2025 Wain Homes commissioned Rodgers Leask Ltd (RLL) to compile a Phase 1 Geo-environmental Desk Study (DS) and an intrusive ground investigation for a Site at Blind Lane, Southwick near Trowbridge in Wiltshire.
Proposed Development	The site is proposed to be developed for residential housing with associated private gardens public open space, highways and an attenuation pond.
Site Location and Description	The Site is located southeast of the A361, adjacent to Blind Lane in Southwick, and is approximately centred on National Grid Reference 383762E, 154835N. The Site postcode is BA14 9PA. It has an irregular shape and occupies an area of approximately 4.25 hectares. The land is currently in agricultural and use comprises a single field. Vehicular and pedestrian access to Site can be gained via a gate from Wesley Lane, located on the western site boundary.
History	Historical maps indicates that the Site has remained a greenfield for agricultural purposes from 1884 to present day, with the Lambrook Stream forming the eastern boundary. A footbridge was present from the late 19th century but was removed by 1992. However, no significant changes or developments have occurred on the Site. The surrounding area was primarily agricultural in the late 1800s, with Southwick Village, a school, and a brickworks located to the north and north-east. Over time, the brickworks became disused, and residential development gradually expanded around the Site, particularly to the north and north-east from the 1970s onward. Key developments included a Church of England primary school and supporting road infrastructure with no major developments occurring in the area since 2010.
Geology, Hydrogeology & Hydrology	Made Ground is not anticipated to be encountered on Site. According to published geological records, the southern portion of the Site is underlain by the Cornbrash Formation, which comprises limestone. The remainder of the Site is underlain by the Kellaway Formation, consisting of mudstone and sandstone. The Cornbrash formation, present in the southern portion of the Site, is classed as a Secondary A Aquifer. The Kellaways Formation is classified as an Unproductive Strata. A watercourse named the Lambrook Stream flows along the eastern boundary of the Site. The Lambrook forms as part of a wider drainage network, which extends to the northeast to the south of the Site.
Scope of Works	▪ A Phase 1 desk study to include a site walkover, a review of existing geo-environmental data such as historical maps, geological data, regulatory data and existing ground investigation data; ▪ Utilities mapping; ▪ Unexploded Ordnance (UXO) assessment;

	▪ An intrusive ground investigation in accordance with the scope of works set out in the above referenced fee proposal; ▪ Chemical and geotechnical testing; ▪ A generic quantitative risk assessment of the chemical status of the soils and groundwater in relation to the Conceptual Model; ▪ Assessment of the geotechnical ground conditions and recommendations for foundations, floor slabs, buried concrete, earthworks and abnormal ground related construction issues;
Ground Conditions Encountered	The following ground conditions were encountered during the works: ▪ TOPSOIL comprising light brown CLAY: encountered in all locations to a maximum depth of 0.30m bgl; ▪ KELLAWAYS FORMATION typically comprising firm to stiff grey orangish brown mottled CLAY: encountered in all locations to a maximum depth of 3.3m bgl; ▪ CORNBASH FORMATION comprising stiff dark bluish black CLAY: encountered in the majority of locations but base is not proven.
Contamination Issues	No visual or olfactory indications of contamination while carrying out the investigation.
Geotechnical Considerations	**Foundations:** The Site is suitable for traditional strip foundations. Deepening due to influence of existing or proposed trees will be required. **Floor Slabs:** It is understood that floor slabs are to be fully suspended. **Stability:** No instability was encountered during the investigation. **Soakaways:** Site should be positively drained. **Earthworks:** If cut and fill is proposed an earthworks specification will be required. **Pavement Design**: Preliminary CBR of 2-5%. **Waste Material:** No Made Ground was encountered. If Site-won material is required to be disposed to landfill it is likely to be classified as Non-Hazardous.
Mining	There are no records of mining on Site or within 500m. However, five records of historical surface ground workings were present on the Site, all relating to ponds shown on the historical maps between 1886 to 1956. No ponds are currently present on the Site.
Buried Concrete Classification	A Design Sulphate (DS) class of DS-1 and Aggressive Chemical Environment for Concrete (ACEC) class of AC-1 should be adopted for the site.
Recommendations for Further Works	▪ Discussion with the local water authority with regard to the requirement for protected water supply pipework; ▪ Update this report when a proposed development plan is available. There may be a requirement for additional ground investigation including deeper boreholes to confirm the design of traditional strip foundations; ▪ If any cut and fill is proposed, an Earthworks Specification will be required; ▪ A CL:AIRE approved Materials Management Plan (MMP) will be required for the re-use of soils on Site;

	▪ In-situ CBR testing will be required to inform road and hardstanding design. ▪ Undertake a tree survey; and ▪ Should there be a requirement to dispose of Made Ground from the site to landfill then WAC testing should be undertaken.

do occur, consideration will have to be given to the impact on foundation solution adopted.

9.4.4. Soakaways

Soakaway testing undertaken as part of the 2025 RLL ground investigation. As the test did not reach an effective depth of 25%, an infiltration rate could not be calculated. As such, soakaway drainage solutions are not considered appropriate for the Site at this stage.

9.5. Earthworks

Details of earthworks and finished floor levels were not available at the time of the investigation.

For any proposed earthworks, it is recommended that they are undertaken in a controlled manner using appropriate methods in accordance with an Engineer's Earthworks Specification in order to minimise the settlement of hardstanding areas and services where any additional fill is placed.

Materials should be placed in layers and proof-rolled in accordance with an Engineer's Specification. Formation levels should be thoroughly proof rolled prior to construction.

9.6. Preliminary Foundation Appraisal

It is understood that the Site is to be primarily developed for residential dwellings. At the time of reporting, no indicative foundation loading information has been provided.

No Made Ground or soft/unsuitable deposits were identified during the investigation. Therefore, it is not currently anticipated that alternative foundation solutions such as piled foundations, raft foundations, or vibro ground improvement will be required, unless there is a significant increase in proposed Site levels.

Foundations should be deepened to bear in the stiff, high strength clay of either the Kellaways Formation or the Cornbash Formation. It should be noted that the Cornbash Formation was not encountered in all exploratory hole locations and may be present at depths exceeding 3.0m bgl. However, it may not be required to reach the Cornbash Formation where the overlying Kellaways Formation demonstrates stiff, high strength clays. An indicative Undrained Shear Strength of 100 kN/m^2 should be achievable within either material. RLL recommend an allowance is made for light reinforcement if foundations span the Cornbrash and the Kellaway clays to minimise any potential differential settlement.

Appendix F:

Soakaway Test Results

	Permeability Test Location Information			
	Date: 31/07/2025	**By:**	RH	**Project Ref:**
	Project: Blind Lane, Southwick	**Approved:**	AJ	P25-291

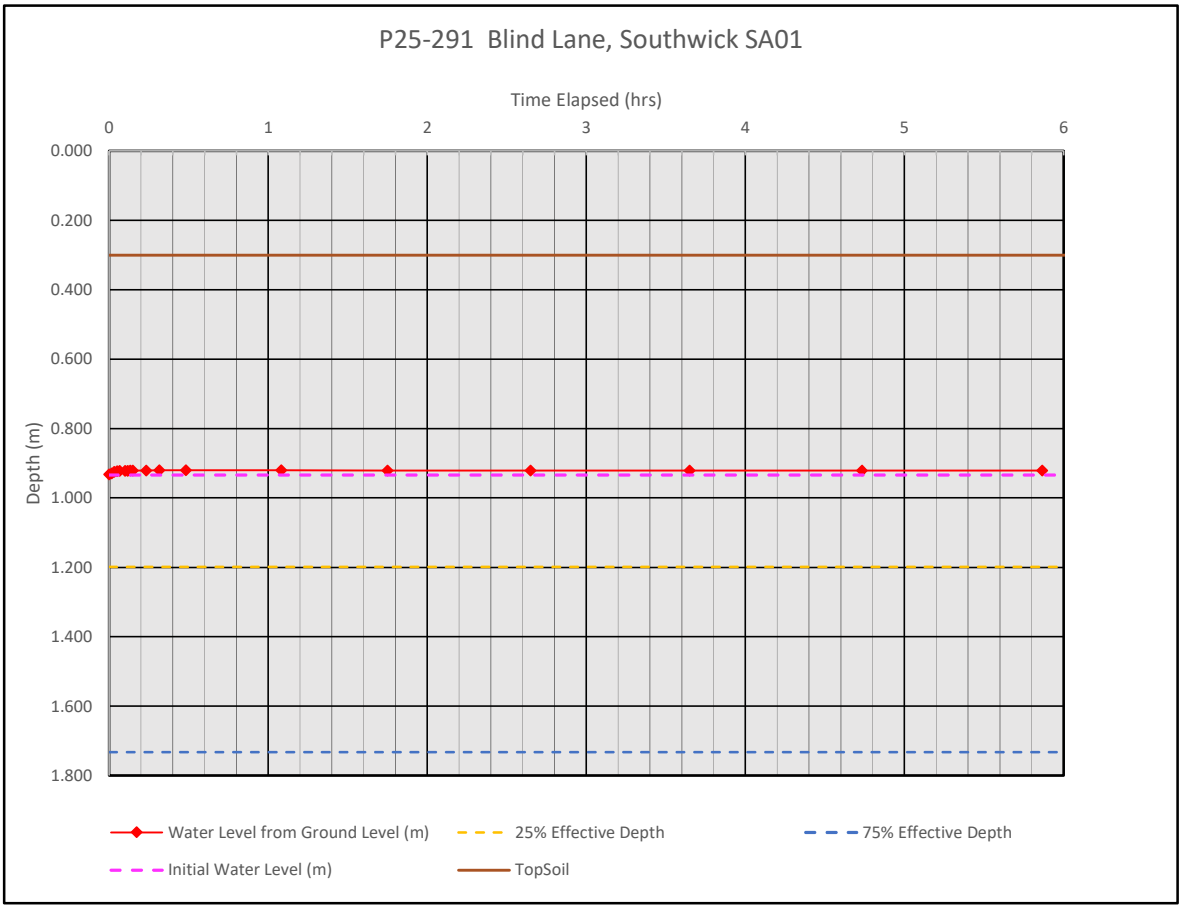
Location ID:	**SA01**
Effective Depth:	1.07
25% Effective Depth:	1.20
75% Effective Depth:	1.73

Start Fill:	08:52:00	**Water Used (m3):**	1.92
End Fill:	14:45:00	**Water Volume at End of Fill (m3):**	1.92
Rate of Fill (m/s):	3.20E-02	**Rate of Infiltration During Fill (m/s):**	-6.00E-05
Elapsed Time to 25% Effective Depth (mins):	***NOT ACHIEVED***	**Depth of Topsoil (m):**	**N/A**
Elapsed Time to 75% Effective Depth (mins):	***NOT ACHIEVED***	**Depth of Subsoil (m):**	1

Date	Time	Water Level from Ground Level (m)	Elapsed Time (hrs)	Rate of Change of Water	Water Level (mOAD)
22/07/2025	08:52:00	0.934			
22/07/2025	08:53:00	0.932	0.0		
22/07/2025	08:54:00	0.930	0.0	0.00	-0.93
22/07/2025	08:55:00	0.925	0.0	0.00	-0.93
22/07/2025	08:56:00	0.923	0.0	0.00	-0.92
22/07/2025	08:57:00	0.922	0.1	0.00	-0.92
22/07/2025	08:59:00	0.922	0.1	0.00	-0.92
22/07/2025	09:00:00	0.922	0.1	0.00	-0.92
22/07/2025	09:01:00	0.921	0.1	0.00	-0.92
22/07/2025	09:02:00	0.921	0.1	0.00	-0.92
22/07/2025	09:07:00	0.921	0.2	0.00	-0.92
22/07/2025	09:12:00	0.920	0.3	0.00	-0.92
22/07/2025	09:22:00	0.920	0.5	0.00	-0.92
22/07/2025	09:58:00	0.920	1.1	0.00	-0.92
22/07/2025	10:38:00	0.921	1.8	0.00	-0.92
22/07/2025	11:32:00	0.921	2.7	0.00	-0.92
22/07/2025	12:32:00	0.921	3.7	0.00	-0.92
22/07/2025	13:37:00	0.921	4.7	0.00	-0.92
22/07/2025	14:45:00	0.921	5.9	0.00	-0.92

Permeability Test Location Information

Date:	31/07/2025	**By:**	RH	**Project Ref:**
Project:	Blind Lane, Southwick	**Approved:**	AJ	P25-291



Time for outflow between 75% and 25 % effective depth (secs):	#VALUE!

vol between 75% and 25% (m3):	0.9612

as50 m2	5.6448

f (m/s)	#VALUE!

	Permeability Test Location Information			
	Date: 31/07/2025	**By:**	RH	**Project Ref:**
	Project: Blind Lane, Southwick	**Approved:**	AJ	P25-291

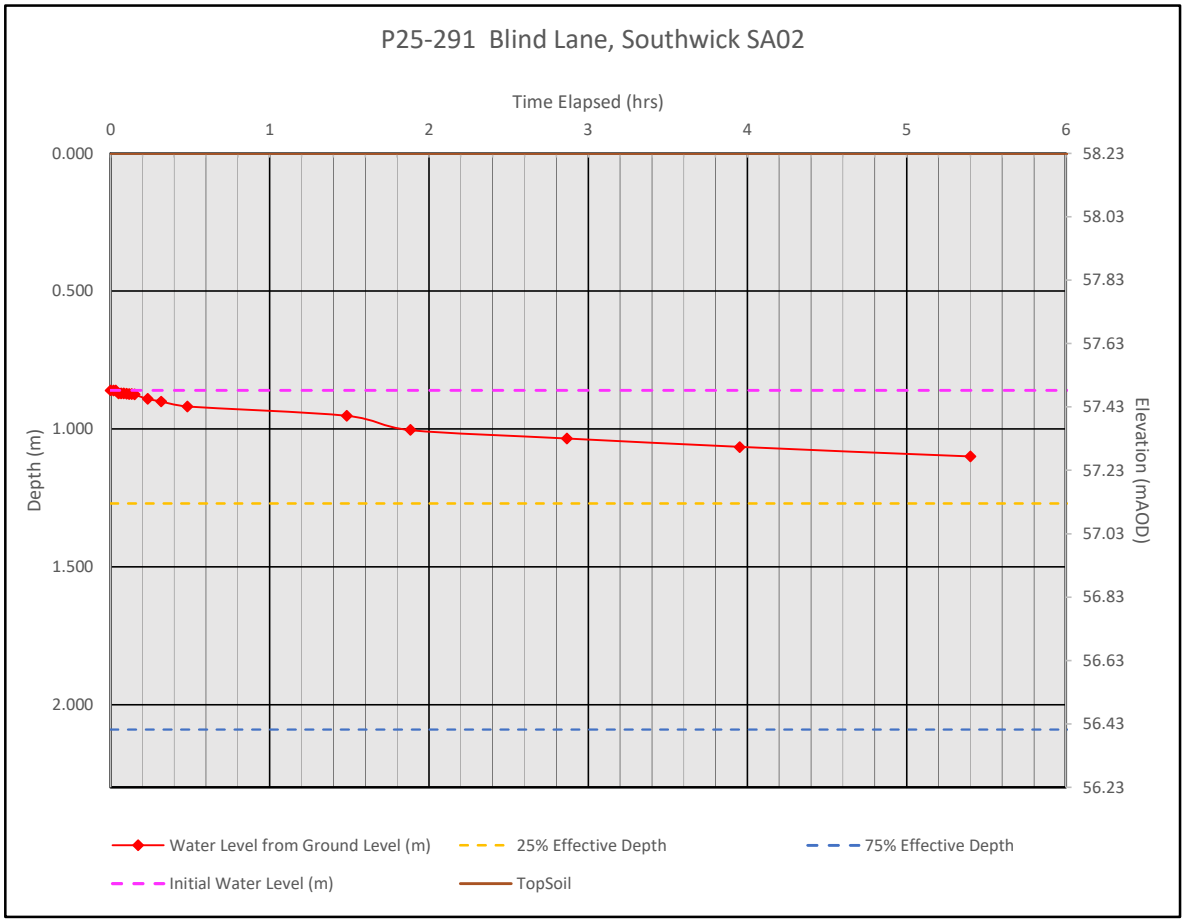
Location ID:	**SA02**
Effective Depth:	1.64
25% Effective Depth:	1.27
75% Effective Depth:	2.09

Start Fill:	09:36:00	**Water Used (m3):**	3.44
End Fill:	15:01:00	**Water Volume at End of Fill (m3):**	2.95
Rate of Fill (m/s):	1.76E-04	**Rate of Infiltration During Fill (m/s):**	2.50E-05
Elapsed Time to 25% Effective Depth (mins):	***NOT ACHIEVED***	**Depth of Topsoil (m):**	**N/A**
Elapsed Time to 75% Effective Depth (mins):	***NOT ACHIEVED***	**Depth of Subsoil (m):**	1

Date	Time	Water Level from Ground Level (m)	Elapsed Time (hrs)	Rate of Change of Water	Water Level (mOAD)
22/07/2025	09:36:00	0.860			
22/07/2025	09:37:00	0.860	0.0		
22/07/2025	09:38:00	0.861	0.0	0.00	-0.86
22/07/2025	09:39:00	0.861	0.0	0.00	-0.86
22/07/2025	09:40:00	0.871	0.1	0.01	-0.87
22/07/2025	09:41:00	0.871	0.1	0.00	-0.87
22/07/2025	09:42:00	0.871	0.1	0.00	-0.87
22/07/2025	09:43:00	0.872	0.1	0.00	-0.87
22/07/2025	09:44:00	0.873	0.1	0.00	-0.87
22/07/2025	09:45:00	0.873	0.1	0.00	-0.87
22/07/2025	09:46:00	0.875	0.2	0.00	-0.88
22/07/2025	09:51:00	0.891	0.2	0.00	-0.89
22/07/2025	09:56:00	0.900	0.3	0.00	-0.90
22/07/2025	10:06:00	0.918	0.5	0.00	-0.92
22/07/2025	11:06:00	0.952	1.5	0.00	-0.95
22/07/2025	11:30:00	1.004	1.9	0.00	-1.00
22/07/2025	12:29:00	1.034	2.9	0.00	-1.03
22/07/2025	13:34:00	1.065	4.0	0.00	-1.07
22/07/2025	15:01:00	1.100	5.4	0.00	-1.10

Permeability Test Location Information

Date:	31/07/2025	**By:**	RH	**Project Ref:**
Project:	Blind Lane, Southwick	**Approved:**	AJ	P25-291



Time for outflow between 75% and 25 % effective depth (secs):	#VALUE!
as50 m2	7.704

vol between 75% and 25% (m3):	1.476
f (m/s)	#VALUE!

APPENDIX D.1 – GREENFIELD RATES NORTHERN CATCHMENT

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

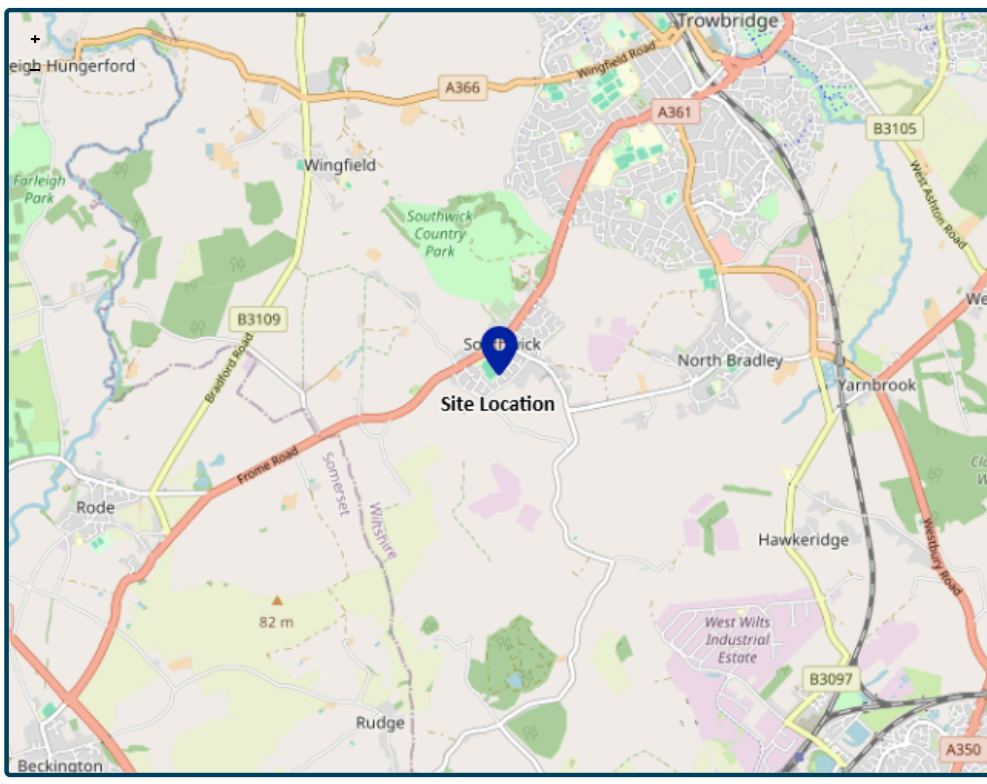
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	19/08/2026
Calculated by	Francisco Alguacil
Reference	CLFA137
Model version	2.2.3

Location

Site name	Blind Lane
Site location	Southwick



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Site easting (British National Grid)	383725
Site northing (British National Grid)	154850

Site details

Total site area (ha)	0.5156 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value	Map value
SAAR (mm)	750 mm	750
How should SPR be derived?	WRAP soil type	
WRAP soil type	4	4
SPR	0.47	
QBar (IH124) (l/s)	2.7 l/s	

Growth curve factors

	My value	Map value
Hydrological region	8	8
1 year growth factor	0.78	
2 year growth factor	0.93	
10 year growth factor	1.49	
30 year growth factor	1.95	
100 year growth factor	2.43	
200 year growth factor	2.78	

Results

Method	IH124	
Flow rate 1 year (l/s)	2.1	l/s
Flow rate 2 year (l/s)	2.5	l/s
Flow rate 10 years (l/s)	4.0	l/s
Flow rate 30 years (l/s)	5.3	l/s
Flow rate 100 years (l/s)	6.6	l/s
Flow rate 200 years (l/s)	7.5	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

APPENDIX D.2 – GREENFIELD RATES SOUTHERN CATCHMENT

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

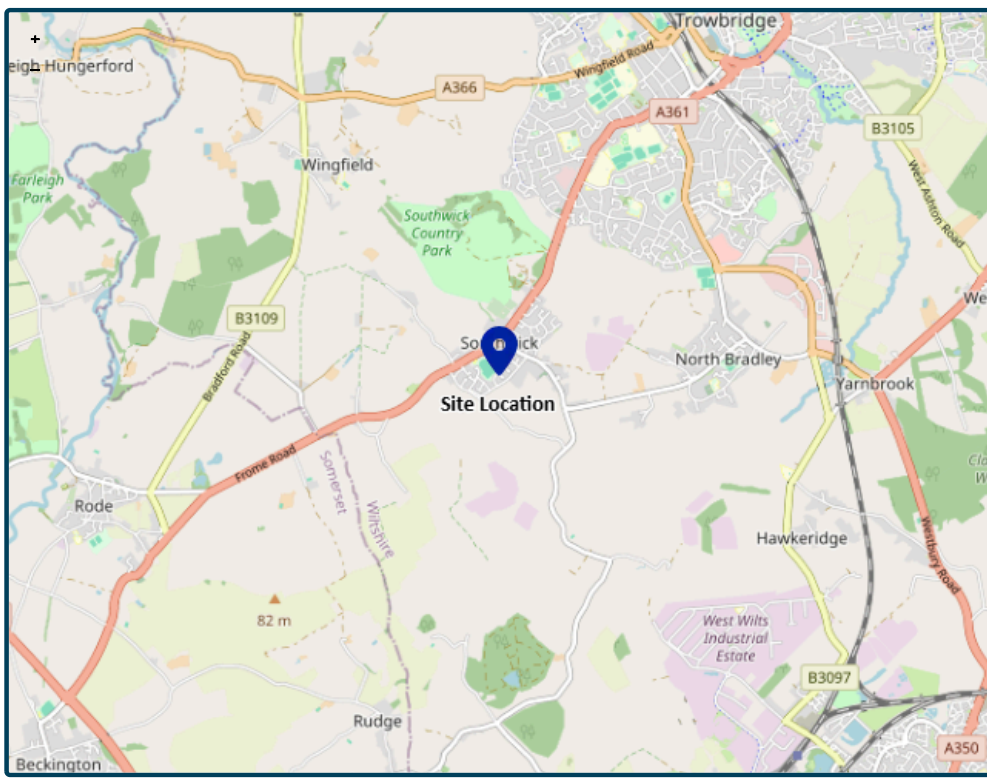
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	11/08/2026
Calculated by	Francisco Alguacil
Reference	CLFA137
Model version	2.2.3

Location

Site name	Blind Lane
Site location	Southwick



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Site easting (British National Grid)	383745
Site northing (British National Grid)	154844

Site details

Total site area (ha)	1.108 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value	Map value
SAAR (mm)	750 mm	750
How should SPR be derived?	WRAP soil type	
WRAP soil type	4	4
SPR	0.47	
QBar (IH124) (l/s)	5.8 l/s	

Growth curve factors

	My value	Map value
Hydrological region	8	8
1 year growth factor	0.78	
2 year growth factor	0.93	
10 year growth factor	1.49	
30 year growth factor	1.95	
100 year growth factor	2.43	
200 year growth factor	2.78	

Results

Method	IH124	
Flow rate 1 year (l/s)	4.5	l/s
Flow rate 2 year (l/s)	5.4	l/s
Flow rate 10 years (l/s)	8.6	l/s
Flow rate 30 years (l/s)	11.3	l/s
Flow rate 100 years (l/s)	14.1	l/s
Flow rate 200 years (l/s)	16.1	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

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APPENDIX E.1 – GREENFIELD VOLUME NORTHERN CATCHMENT

Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	20.900
Ratio R	0.350
Areal Reduction Factor	1.00
Area (ha)	0.516
SAAR (mm)	733
CWI	109.258
Urban	0.000
SPR	10.000

Results

Percentage Runoff (%)	10.74
Greenfield Runoff Volume (m^3)	37.893

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APPENDIX E.2 – GREENFIELD VOLUME SOUTHERN CATCHMENT

Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	20.900
Ratio R	0.350
Areal Reduction Factor	1.00
Area (ha)	1.108
SAAR (mm)	733
CWI	109.258
Urban	0.000
SPR	10.000

Results

Percentage Runoff (%)	10.74
Greenfield Runoff Volume (m^3)	81.367

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APPENDIX F.1 – MICRODRAINAGE CALCULATIONS 1 IN 100 YEAR 6 HOUR STORM. NORTHERN CATCHMENT

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 3

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.275	4-8	0.238

Total Area Contributing (ha) = 0.513

Total Pipe Volume (m³) = 20.053

Network Design Table for Surface Network 3

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	22.902	0.450	50.9	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	44.827	1.300	34.5	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	19.614	0.300	65.4	0.032	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	27.687	0.185	149.7	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	19.399	0.415	46.7	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.27	47.000	0.021	0.0	0.0	0.0	1.41	25.0	2.8
1.001	50.00	5.70	46.550	0.042	0.0	0.0	0.0	1.72	30.4	5.7
1.002	50.00	5.91	45.175	0.074	0.0	0.0	0.0	1.62	64.4	10.0
1.003	50.00	6.27	44.800	0.136	0.0	0.0	0.0	1.28	90.7	18.4
1.004	50.00	6.41	44.615	0.155	0.0	0.0	0.0	2.31	163.0	21.0

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Network Design Table for Surface Network 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	5.493	0.069	80.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	18.142	1.200	15.1	0.024	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	20.128	0.241	83.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	10.692	0.071	150.6	0.035	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	23.338	0.895	26.1	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	30.929	0.573	54.0	0.024	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	15.454	0.178	87.0	0.032	0.00	0.0	0.600	o	400	Pipe/Conduit	
4.000	22.935	0.153	149.9	0.103	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	22.909	0.153	150.0	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	
5.000	33.148	0.221	150.0	0.064	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.001	49.558	1.029	48.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	23.446	0.325	72.1	0.046	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.008	34.251	0.180	190.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	50.00	6.46	44.150	0.155	0.0	0.0	0.0	1.76	124.4	21.0
2.000	50.00	5.15	46.300	0.024	0.0	0.0	0.0	2.00	15.7	3.2
2.001	50.00	5.46	45.050	0.024	0.0	0.0	0.0	1.10	19.5	3.2
3.000	50.00	5.22	45.700	0.035	0.0	0.0	0.0	0.82	14.4	4.7
3.001	50.00	5.37	45.629	0.065	0.0	0.0	0.0	2.57	102.3	8.8
2.002	50.00	5.70	44.659	0.113	0.0	0.0	0.0	2.14	151.6	15.3
1.006	50.00	6.59	43.981	0.300	0.0	0.0	0.0	2.02	254.4	40.6
4.000	50.00	5.36	44.131	0.103	0.0	0.0	0.0	1.07	42.4	13.9
1.007	50.00	6.83	43.803	0.403	0.0	0.0	0.0	1.54	193.4	54.6
5.000	50.00	5.52	45.225	0.064	0.0	0.0	0.0	1.07	42.4	8.7
5.001	50.00	5.96	45.004	0.064	0.0	0.0	0.0	1.89	75.1	8.7
5.002	50.00	6.21	43.975	0.110	0.0	0.0	0.0	1.54	61.3	14.9
1.008	50.00	7.62	43.650	0.513	0.0	0.0	0.0	0.73	12.8«	69.5

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Free Flowing Outfall Details for Surface Network 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.008	Northern Outfall	44.270	43.470	0.000	0	0

Simulation Criteria for Surface Network 3

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.360		

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Online Controls for Surface Network 3

Hydro-Brake® Optimum Manhole: Northern Pond, DS/PN: 1.008, Volume (m³): 6.0

Unit Reference	MD-SHE-0050-1200-1100-1200
Design Head (m)	1.100
Design Flow (l/s)	1.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	50
Invert Level (m)	43.650
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	1.2
Flush-Flo™	0.222	1.0
Kick-Flo®	0.449	0.8
Mean Flow over Head Range	-	0.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.2	3.000	1.9	7.000	2.8
0.200	1.0	1.400	1.3	3.500	2.0	7.500	2.9
0.300	1.0	1.600	1.4	4.000	2.2	8.000	3.0
0.400	0.9	1.800	1.5	4.500	2.3	8.500	3.1
0.500	0.8	2.000	1.6	5.000	2.4	9.000	3.1
0.600	0.9	2.200	1.6	5.500	2.5	9.500	3.2
0.800	1.0	2.400	1.7	6.000	2.6		
1.000	1.1	2.600	1.8	6.500	2.7		

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Storage Structures for Surface Network 3

Tank or Pond Manhole: Northern Pond, DS/PN: 1.008

Invert Level (m) 43.650

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	333.5	1.700	786.7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 360
Return Period(s) (years) 100
Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	PS32	360 Summer	100	+0%				
1.001	PS33	360 Summer	100	+0%				
1.002	PS34	360 Summer	100	+0%				
1.003	PS45	360 Summer	100	+0%				
1.004	PS46	360 Summer	100	+0%				
1.005	PS47	360 Winter	100	+0%				
2.000	PS41	360 Summer	100	+0%				
2.001	PS42	360 Summer	100	+0%				
3.000	PS43	360 Summer	100	+0%				
3.001	PS44	360 Summer	100	+0%				
2.002	SN13	360 Summer	100	+0%				
1.006	SN14	360 Winter	100	+0%				
4.000	PS48	360 Winter	100	+0%				
1.007	SN15	360 Winter	100	+0%	100/360 Summer			
5.000	PS49	360 Summer	100	+0%				
5.001	PS50	360 Summer	100	+0%				
5.002	PS51	360 Winter	100	+0%	100/360 Summer			
1.008	Northern Pond	360 Winter	100	+0%	100/360 Summer			

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	PS32	47.028	-0.122	0.000	0.08			1.9	OK
1.001	PS33	46.585	-0.115	0.000	0.13			3.7	OK
1.002	PS34	45.225	-0.175	0.000	0.11			6.6	OK
1.003	PS45	44.877	-0.223	0.000	0.15			12.1	OK
1.004	PS46	44.678	-0.237	0.000	0.10			13.8	OK
1.005	PS47	44.305	-0.145	0.000	0.16			10.3	OK
2.000	PS41	46.325	-0.075	0.000	0.14			2.1	OK
2.001	PS42	45.084	-0.116	0.000	0.12			2.1	OK
3.000	PS43	45.750	-0.100	0.000	0.24			3.1	OK
3.001	PS44	45.665	-0.189	0.000	0.06			5.8	OK
2.002	SN13	44.712	-0.247	0.000	0.07			10.1	OK
1.006	SN14	44.304	-0.077	0.000	0.11			19.9	OK
4.000	PS48	44.305	-0.051	0.000	0.18			6.8	OK
1.007	SN15	44.304	0.101	0.000	0.16			26.1	SURCHARGED
5.000	PS49	45.281	-0.169	0.000	0.14			5.7	OK
5.001	PS50	45.046	-0.183	0.000	0.08			5.7	OK
5.002	PS51	44.304	0.104	0.000	0.13			7.3	SURCHARGED
1.008	Northern Pond	44.303	0.503	0.000	0.08			1.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	PS32	
1.001	PS33	
1.002	PS34	
1.003	PS45	
1.004	PS46	
1.005	PS47	
2.000	PS41	
2.001	PS42	
3.000	PS43	
3.001	PS44	
2.002	SN13	
1.006	SN14	
4.000	PS48	
1.007	SN15	
5.000	PS49	
5.001	PS50	
5.002	PS51	
1.008	Northern Pond	

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APPENDIX F.2 – MICRODRAINAGE CALCULATIONS 1 IN 100 YEAR 6 HOUR STORM. SOUTHERN CATCHMENT

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.522	4-8	0.580	8-12	0.006

Total Area Contributing (ha) = 1.108

Total Pipe Volume (m³) = 61.440

Network Design Table for Surface Network 2

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	26.103	0.174	150.0	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	15.284	0.102	149.8	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	23.880	0.874	27.3	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	18.730	0.650	28.8	0.011	5.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.53	47.900	0.027	0.0	0.0	0.0	0.82	14.5	3.7
1.001	50.00	5.84	47.726	0.040	0.0	0.0	0.0	0.82	14.5	5.4
1.002	50.00	6.00	47.549	0.059	0.0	0.0	0.0	2.51	99.9	8.0
2.000	50.00	5.22	47.450	0.011	0.0	0.0	0.0	1.44	11.3	1.5

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.003	10.160	0.192	52.9	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	30.478	0.742	41.1	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	29.775	0.381	78.1	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	31.317	0.350	89.5	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	11.018	0.100	110.2	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	13.952	0.900	15.5	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	13.640	0.123	110.9	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	17.186	0.128	134.3	0.038	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.006	12.311	0.204	60.3	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	
5.000	36.767	0.900	40.9	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	12.055	0.305	39.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	27.045	0.450	60.1	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	9.519	0.155	61.4	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	41.607	0.375	111.0	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.003	50.00	6.10	46.675	0.081	0.0	0.0	0.0	1.80	71.7	11.0
3.000	50.00	5.32	47.300	0.033	0.0	0.0	0.0	1.57	27.8	4.5
1.004	50.00	6.37	46.408	0.125	0.0	0.0	0.0	1.78	125.8	16.9
4.000	50.00	5.49	47.650	0.029	0.0	0.0	0.0	1.06	18.8	3.9
4.001	50.00	5.64	47.225	0.063	0.0	0.0	0.0	1.24	49.5	8.5
4.002	50.00	5.71	47.125	0.092	0.0	0.0	0.0	3.34	132.8	12.5
4.003	50.00	5.89	46.225	0.119	0.0	0.0	0.0	1.24	49.3	16.1
1.005	50.00	6.55	45.927	0.282	0.0	0.0	0.0	1.63	204.5	38.2
1.006	50.00	6.63	45.799	0.282	0.0	0.0	0.0	2.43	305.8	38.2
5.000	50.00	5.39	47.050	0.020	0.0	0.0	0.0	1.58	27.9	2.7
5.001	50.00	5.51	46.150	0.020	0.0	0.0	0.0	1.61	28.4	2.7
6.000	50.00	5.27	46.375	0.045	0.0	0.0	0.0	1.69	67.2	6.1
6.001	50.00	5.36	45.925	0.074	0.0	0.0	0.0	1.67	66.5	10.0
1.007	50.00	7.02	45.595	0.376	0.0	0.0	0.0	1.79	225.1	50.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
7.000	27.389	0.780	35.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.008	11.933	0.181	65.9	0.008	0.00	0.0	0.600	o	400	Pipe/Conduit	
8.000	27.345	0.461	59.3	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	15.810	0.139	113.7	0.016	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.010	10.499	0.150	70.0	0.023	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	24.152	0.350	69.0	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	3.309	0.022	150.4	0.036	0.00	0.0	0.600	o	150	Pipe/Conduit	
9.002	5.710	0.038	150.3	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.003	3.438	0.023	149.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.004	7.310	0.217	33.7	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.005	15.565	0.104	150.0	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.006	15.655	0.783	20.0	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.011	73.616	0.650	113.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	15.199	0.350	43.4	0.011	5.00	0.0	0.600	o	150	Pipe/Conduit	
10.001	17.652	0.150	117.7	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
7.000	50.00	5.35	46.300	0.008	0.0	0.0	0.0	1.31	10.3	1.1
1.008	50.00	7.11	45.220	0.392	0.0	0.0	0.0	2.33	292.5	53.1
8.000	50.00	5.35	45.750	0.026	0.0	0.0	0.0	1.31	23.1	3.5
1.009	50.00	7.26	45.039	0.434	0.0	0.0	0.0	1.77	222.3	58.8
1.010	50.00	7.33	44.850	0.457	0.0	0.0	0.0	2.43	386.9	61.9
9.000	50.00	5.33	46.550	0.013	0.0	0.0	0.0	1.21	21.4	1.8
9.001	50.00	5.40	46.200	0.049	0.0	0.0	0.0	0.82	14.4	6.6
9.002	50.00	5.49	46.103	0.055	0.0	0.0	0.0	1.06	42.3	7.4
9.003	50.00	5.54	46.065	0.055	0.0	0.0	0.0	1.07	42.4	7.4
9.004	50.00	5.60	46.042	0.072	0.0	0.0	0.0	2.26	89.9	9.7
9.005	50.00	5.84	45.825	0.080	0.0	0.0	0.0	1.07	42.4	10.8
9.006	50.00	5.93	45.721	0.118	0.0	0.0	0.0	2.94	116.9	16.0
1.011	50.00	7.97	44.700	0.575	0.0	0.0	0.0	1.91	303.7	77.9
10.000	50.00	5.17	46.850	0.011	0.0	0.0	0.0	1.53	27.1	1.5
10.001	50.00	5.48	46.500	0.030	0.0	0.0	0.0	0.93	16.4	4.1

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
10.002	10.001	0.100	100.0	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.000	15.126	0.300	50.4	0.013	5.00	0.0	0.600	o	100	Pipe/Conduit	
10.003	25.716	0.782	32.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
12.000	28.465	1.423	20.0	0.065	5.00	0.0	0.600	o	225	Pipe/Conduit	
12.001	22.754	0.446	51.0	0.054	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.002	10.502	0.082	128.1	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.004	24.908	0.249	100.0	0.029	0.00	0.0	0.600	o	400	Pipe/Conduit	
10.005	29.515	0.518	57.0	0.032	0.00	0.0	0.600	o	400	Pipe/Conduit	
13.000	13.136	0.215	61.1	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
13.001	26.330	0.350	75.2	0.025	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.002	10.557	0.200	52.8	0.039	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.003	7.821	0.100	78.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.004	33.322	0.950	35.1	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.005	6.349	0.352	18.0	0.073	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.006	32.945	0.398	82.8	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
10.002	50.00	5.61	46.275	0.058	0.0	0.0	0.0	1.31	52.0	7.9
11.000	50.00	5.23	46.600	0.013	0.0	0.0	0.0	1.09	8.5	1.8
10.003	50.00	5.80	46.175	0.071	0.0	0.0	0.0	2.29	91.0	9.6
12.000	50.00	5.16	47.368	0.065	0.0	0.0	0.0	2.94	116.9	8.8
12.001	50.00	5.33	45.850	0.119	0.0	0.0	0.0	2.21	156.0	16.1
12.002	50.00	5.46	45.400	0.156	0.0	0.0	0.0	1.39	98.1	21.1
10.004	50.00	6.02	45.218	0.256	0.0	0.0	0.0	1.89	237.2	34.7
10.005	50.00	6.21	44.968	0.288	0.0	0.0	0.0	2.50	314.7	39.0
13.000	50.00	5.17	46.915	0.018	0.0	0.0	0.0	1.29	22.8	2.4
13.001	50.00	5.46	46.625	0.043	0.0	0.0	0.0	1.51	60.0	5.8
13.002	50.00	5.56	46.275	0.082	0.0	0.0	0.0	1.80	71.7	11.1
13.003	50.00	5.65	46.075	0.082	0.0	0.0	0.0	1.48	58.8	11.1
13.004	50.00	5.90	45.975	0.133	0.0	0.0	0.0	2.22	88.1	18.0
13.005	50.00	5.93	44.975	0.206	0.0	0.0	0.0	3.10	123.1	27.9
10.006	50.00	6.48	44.448	0.494	0.0	0.0	0.0	2.08	260.9	66.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.012	23.181	0.025	927.2	0.039	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.013	11.289	0.125	90.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.012	50.00	8.60	44.050	1.108	0.0	0.0	0.0	0.61	76.9«	150.0
1.013	50.00	8.78	44.025	1.108	0.0	0.0	0.0	1.06	18.7«	150.0

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.013	Southern Outfall	44.589	43.900	0.000	0	0

Simulation Criteria for Surface Network 2

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.360		

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: SS12-FC, DS/PN: 1.013, Volume (m³): 8.4

Unit Reference	MD-SHE-0069-2500-1475-2500
Design Head (m)	1.475
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	69
Invert Level (m)	44.025
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.475	2.5
Flush-Flo™	0.303	2.1
Kick-Flo®	0.614	1.7
Mean Flow over Head Range	-	2.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	1.200	2.3	3.000	3.5	7.000	5.2
0.200	2.0	1.400	2.4	3.500	3.7	7.500	5.3
0.300	2.1	1.600	2.6	4.000	4.0	8.000	5.5
0.400	2.0	1.800	2.7	4.500	4.2	8.500	5.7
0.500	2.0	2.000	2.9	5.000	4.4	9.000	5.8
0.600	1.7	2.200	3.0	5.500	4.6	9.500	6.0
0.800	1.9	2.400	3.1	6.000	4.8		
1.000	2.1	2.600	3.2	6.500	5.0		

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Storage Structures for Surface Network 2

Tank or Pond Manhole: Southern Pond, DS/PN: 1.012

Invert Level (m) 44.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	484.6	2.200	1303.7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 360
Return Period(s) (years) 100
Climate Change (%) 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS1	360 Summer	100	+0%					47.943
1.001	PS2	360 Summer	100	+0%					47.779
1.002	PS3	360 Summer	100	+0%					47.584
2.000	PS4	360 Summer	100	+0%					47.470
1.003	PS5	360 Summer	100	+0%					46.728
3.000	PS6	360 Summer	100	+0%					47.334
1.004	SS1	360 Summer	100	+0%					46.471
4.000	PS7	360 Summer	100	+0%					47.688
4.001	PS8	360 Summer	100	+0%					47.281
4.002	PS9	360 Summer	100	+0%					47.165
4.003	PS10	360 Summer	100	+0%					46.302
1.005	SS2	360 Summer	100	+0%					46.035
1.006	SS3	360 Summer	100	+0%					45.894
5.000	PS11	360 Summer	100	+0%					47.076
5.001	PS12	360 Summer	100	+0%					46.176
6.000	PS13	360 Summer	100	+0%					46.413
6.001	PS14	360 Summer	100	+0%					45.977
1.007	SS4	360 Summer	100	+0%					45.705
7.000	PS15	360 Summer	100	+0%					46.318

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	PS1	-0.107	0.000	0.18			2.5	OK	
1.001	PS2	-0.097	0.000	0.28			3.7	OK	
1.002	PS3	-0.190	0.000	0.06			5.4	OK	
2.000	PS4	-0.080	0.000	0.09			1.0	OK	
1.003	PS5	-0.172	0.000	0.13			7.5	OK	
3.000	PS6	-0.116	0.000	0.11			3.0	OK	
1.004	SS1	-0.237	0.000	0.10			11.5	OK	
4.000	PS7	-0.112	0.000	0.15			2.7	OK	
4.001	PS8	-0.169	0.000	0.14			5.8	OK	
4.002	PS9	-0.185	0.000	0.07			8.5	OK	
4.003	PS10	-0.148	0.000	0.26			11.0	OK	
1.005	SS2	-0.292	0.000	0.16			26.0	OK	
1.006	SS3	-0.305	0.000	0.13			26.0	OK	
5.000	PS11	-0.124	0.000	0.07			1.8	OK	
5.001	PS12	-0.124	0.000	0.07			1.8	OK	
6.000	PS13	-0.187	0.000	0.07			4.2	OK	
6.001	PS14	-0.173	0.000	0.12			6.8	OK	
1.007	SS4	-0.290	0.000	0.17			34.7	OK	
7.000	PS15	-0.082	0.000	0.07			0.7	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.008	SS5	360 Summer	100	+0%			
8.000	PS16	360 Summer	100	+0%			
1.009	SS6	360 Summer	100	+0%			
1.010	SS7	360 Summer	100	+0%			
9.000	PS17	360 Summer	100	+0%			
9.001	PS18	360 Summer	100	+0%			
9.002	PS19	360 Summer	100	+0%			
9.003	PS20	360 Summer	100	+0%			
9.004	PS21	360 Summer	100	+0%			
9.005	PS22	360 Summer	100	+0%			
9.006	PS23	360 Summer	100	+0%			
1.011	SS8	360 Winter	100	+0%			
10.000	PS24	360 Summer	100	+0%			
10.001	PS25	360 Summer	100	+0%			
10.002	PS26	360 Summer	100	+0%			
11.000	PS27	360 Summer	100	+0%			
10.003	PS28	360 Summer	100	+0%			
12.000	PS29	360 Summer	100	+0%			
12.001	PS30	360 Summer	100	+0%			
12.002	PS31	360 Summer	100	+0%			
10.004	SS9	360 Summer	100	+0%			
10.005	SS10	360 Summer	100	+0%			
13.000	PS35	360 Summer	100	+0%			
13.001	PS36	360 Summer	100	+0%			
13.002	PS37	360 Summer	100	+0%			
13.003	PS38	360 Summer	100	+0%			
13.004	PS39	360 Summer	100	+0%			
13.005	PS40	360 Summer	100	+0%			
10.006	SS11	360 Winter	100	+0%	100/360 Summer		
1.012	Southern Pond	360 Winter	100	+0%	100/360 Summer		
1.013	SS12-FC	360 Winter	100	+0%	100/360 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.008	SS5		45.338	-0.282	0.000	0.19			36.2
8.000	PS16		45.783	-0.117	0.000	0.11			2.4
1.009	SS6		45.172	-0.267	0.000	0.24			40.0
1.010	SS7		44.983	-0.317	0.000	0.19			42.1
9.000	PS17		46.573	-0.127	0.000	0.06			1.2
9.001	PS18		46.268	-0.082	0.000	0.42			4.5
9.002	PS19		46.165	-0.163	0.000	0.17			5.1
9.003	PS20		46.129	-0.161	0.000	0.18			5.1
9.004	PS21		46.090	-0.177	0.000	0.10			6.7
9.005	PS22		45.893	-0.157	0.000	0.20			7.4
9.006	PS23		45.770	-0.176	0.000	0.11			10.9

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.011	SS8		44.963	-0.187	0.000	0.14			38.4
10.000	PS24		46.869	-0.131	0.000	0.04			1.0
10.001	PS25		46.543	-0.107	0.000	0.18			2.8
10.002	PS26		46.327	-0.173	0.000	0.12			5.4
11.000	PS27		46.625	-0.075	0.000	0.15			1.2
10.003	PS28		46.217	-0.183	0.000	0.08			6.6
12.000	PS29		47.402	-0.191	0.000	0.06			6.0
12.001	PS30		45.906	-0.244	0.000	0.08			11.0
12.002	PS31		45.491	-0.209	0.000	0.20			14.4
10.004	SS9		45.308	-0.310	0.000	0.12			23.7
10.005	SS10		45.051	-0.317	0.000	0.10			26.6
13.000	PS35		46.943	-0.122	0.000	0.08			1.7
13.001	PS36		46.664	-0.186	0.000	0.07			4.0
13.002	PS37		46.328	-0.172	0.000	0.13			7.6
13.003	PS38		46.137	-0.163	0.000	0.17			7.6
13.004	PS39		46.032	-0.168	0.000	0.15			12.3
13.005	PS40		45.047	-0.153	0.000	0.23			19.0
10.006	SS11		44.963	0.115	0.000	0.14			32.8
1.012	Southern Pond		44.963	0.513	0.000	0.13			6.0
1.013	SS12-FC		45.302	1.127	0.000	0.12			2.1

PN	US/MH Name	Status	Level Exceeded
1.008	SS5	OK	
8.000	PS16	OK	
1.009	SS6	OK	
1.010	SS7	OK	
9.000	PS17	OK	
9.001	PS18	OK	
9.002	PS19	OK	
9.003	PS20	OK	
9.004	PS21	OK	
9.005	PS22	OK	
9.006	PS23	OK	
1.011	SS8	OK	
10.000	PS24	OK	
10.001	PS25	OK	
10.002	PS26	OK	
11.000	PS27	OK	
10.003	PS28	OK	
12.000	PS29	OK	
12.001	PS30	OK	
12.002	PS31	OK	
10.004	SS9	OK	
10.005	SS10	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
13.000	PS35	OK	
13.001	PS36	OK	
13.002	PS37	OK	
13.003	PS38	OK	
13.004	PS39	OK	
13.005	PS40	OK	
10.006	SS11	SURCHARGED	
1.012	Southern Pond	SURCHARGED	
1.013	SS12-FC	SURCHARGED	

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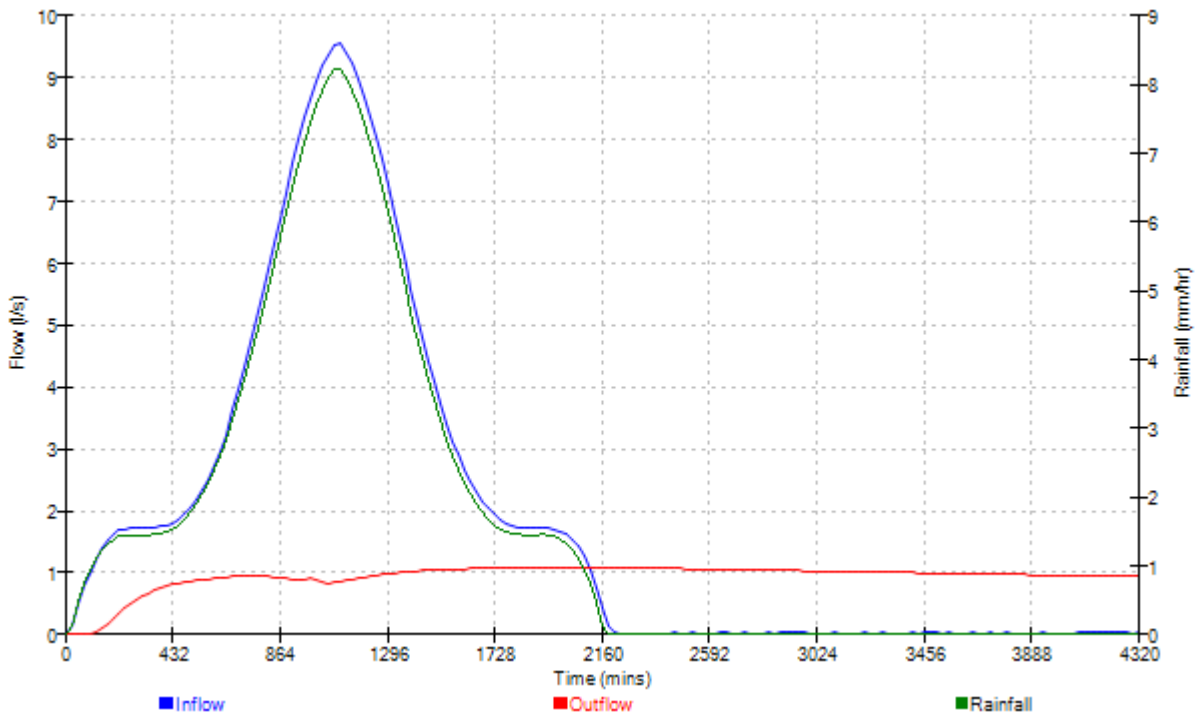
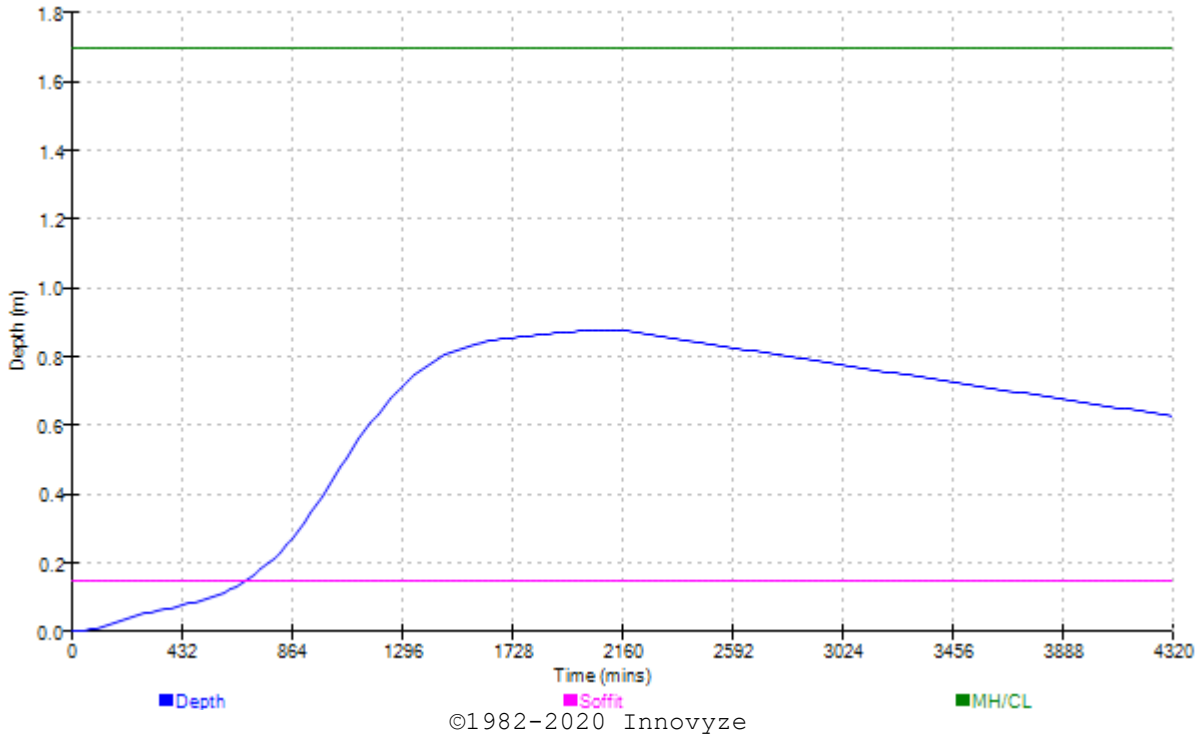
APPENDIX G.1 – MICRODRAINAGE CALCULATIONS 1 IN 30CC EVENT. NORTHERN CATCHMENT

Graphs for Pipe 1.008 US/MH Northern Pond (Surface Network 3)
2160 minute 30 year Winter I+45%
Status: SURCHARGED





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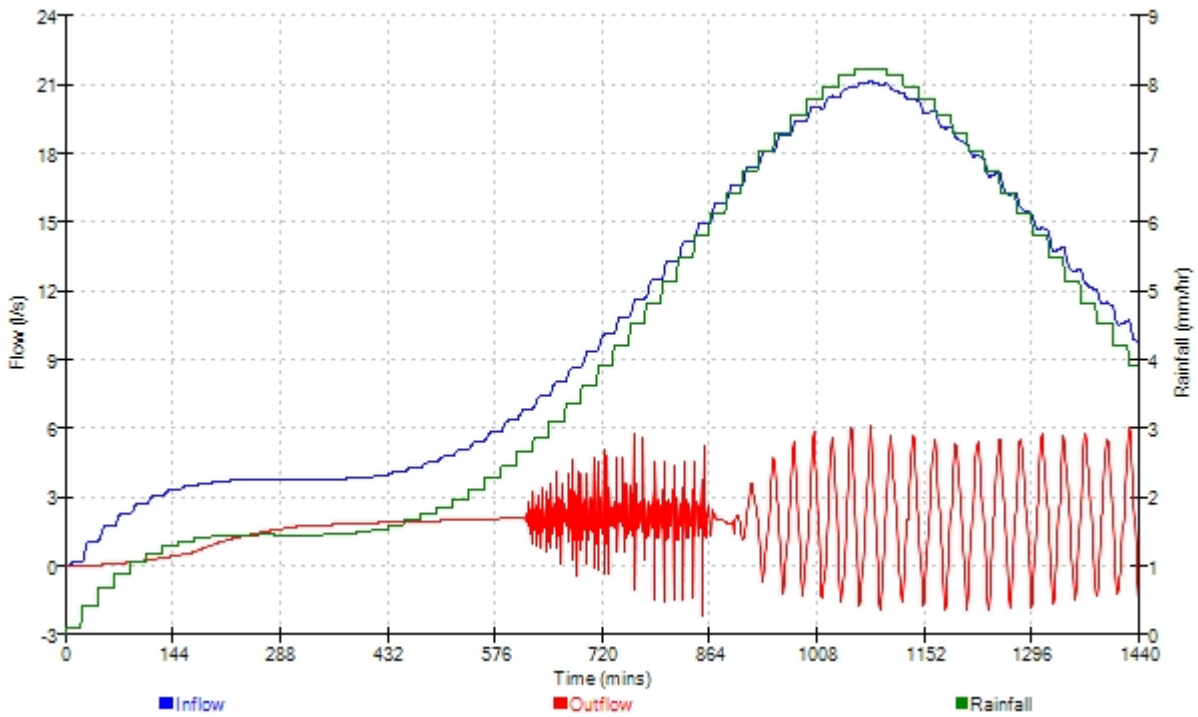
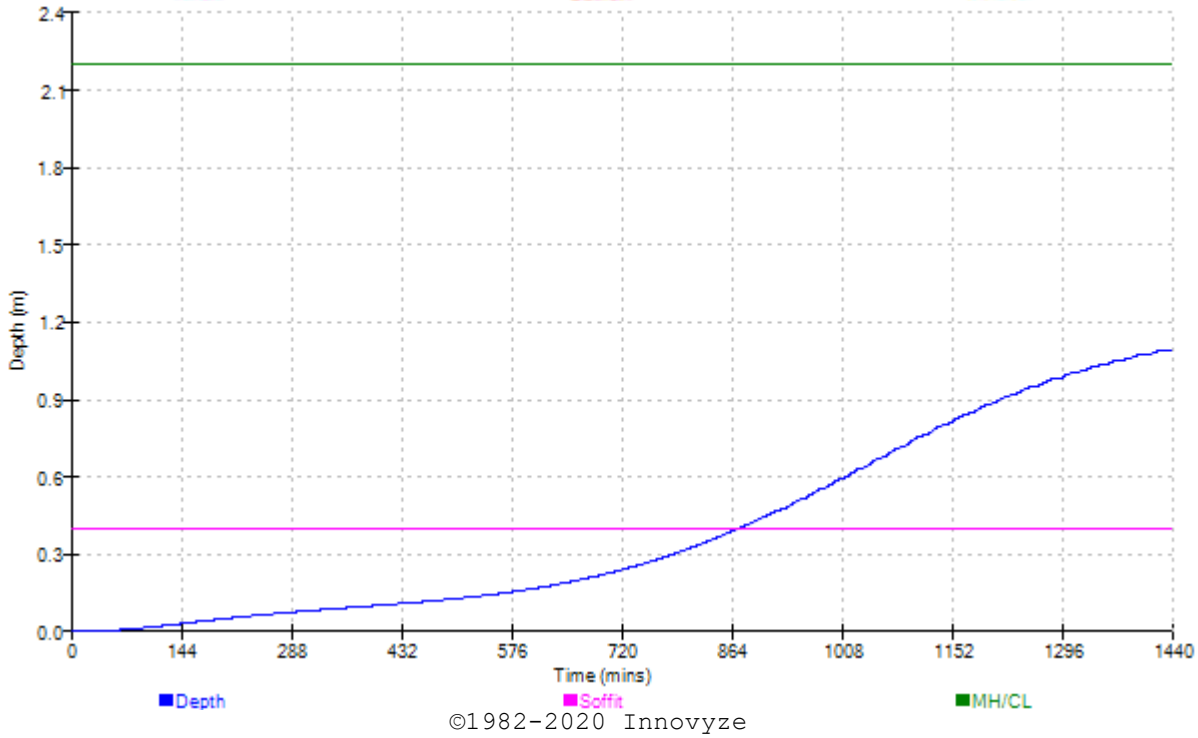
APPENDIX G.2 – MICRODRAINAGE CALCULATIONS 1 IN 30CC EVENT. SOUTHERN CATCHMENT

Graphs for Pipe 1.012 US/MH Southern Pond (Surface Network 2)
2160 minute 30 year Winter I+45%
Status: SURCHARGED (1 of 3)





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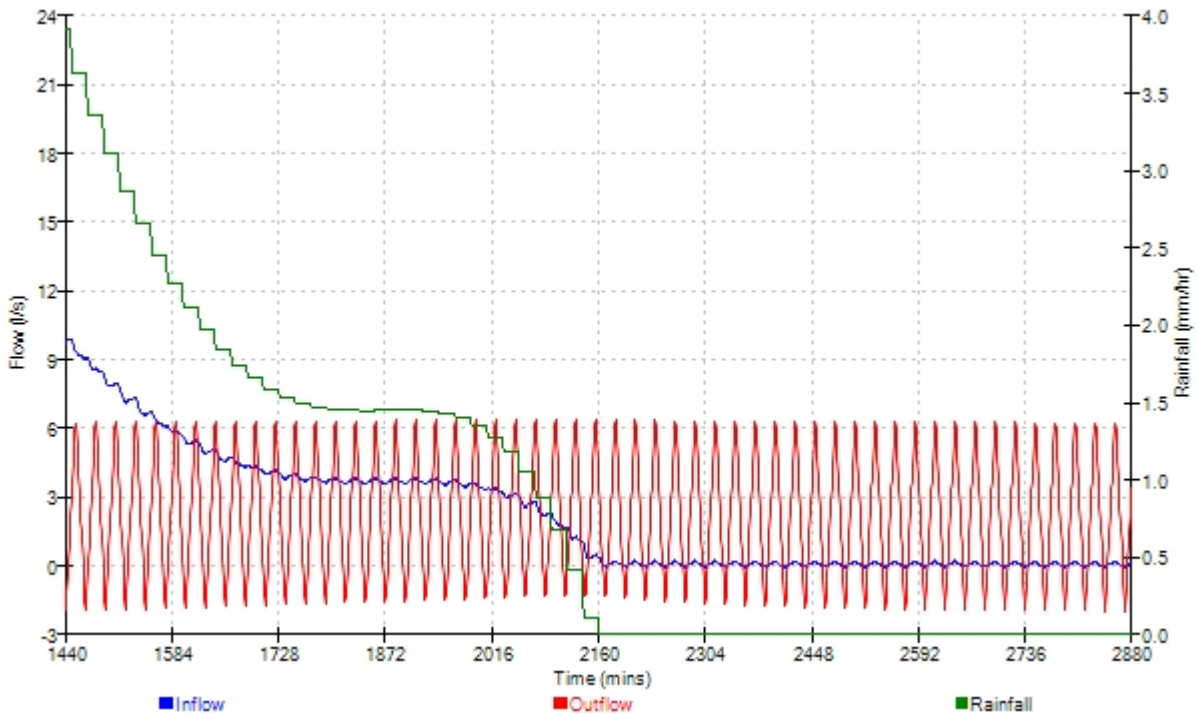
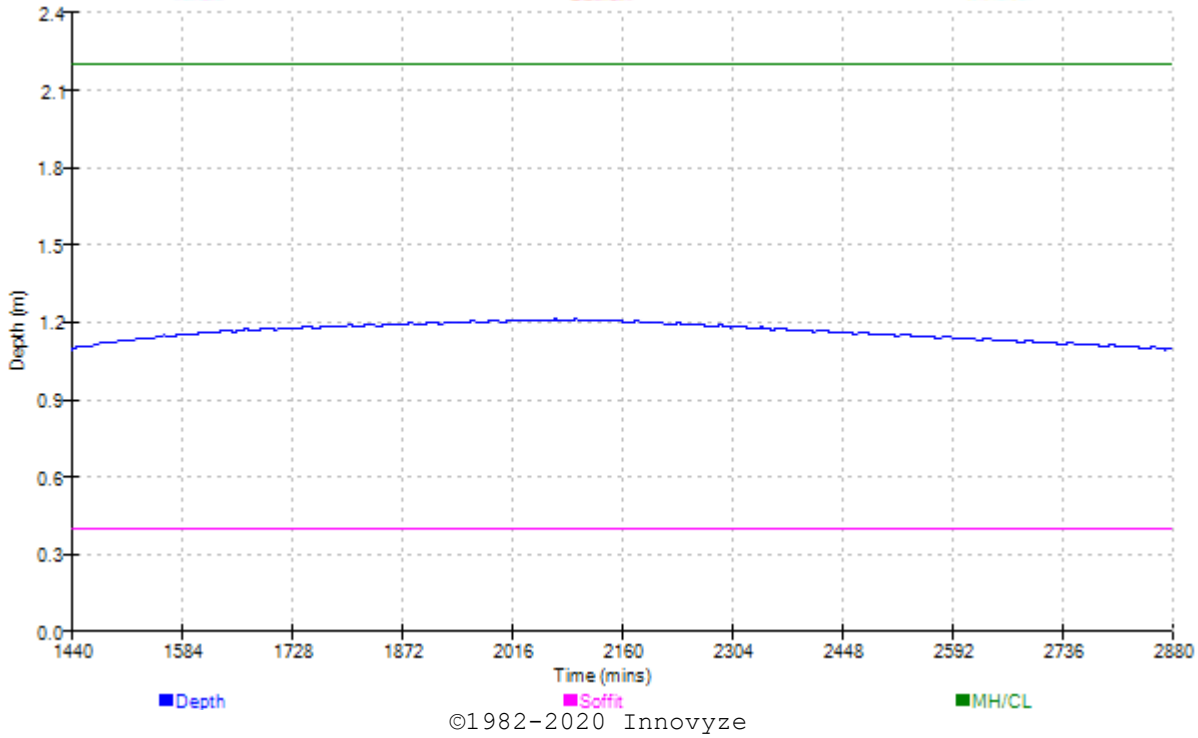
Graphs for Pipe 1.012 US/MH Southern Pond (Surface Network 2)
2160 minute 30 year Winter I+45%
Status: SURCHARGED (2 of 3)





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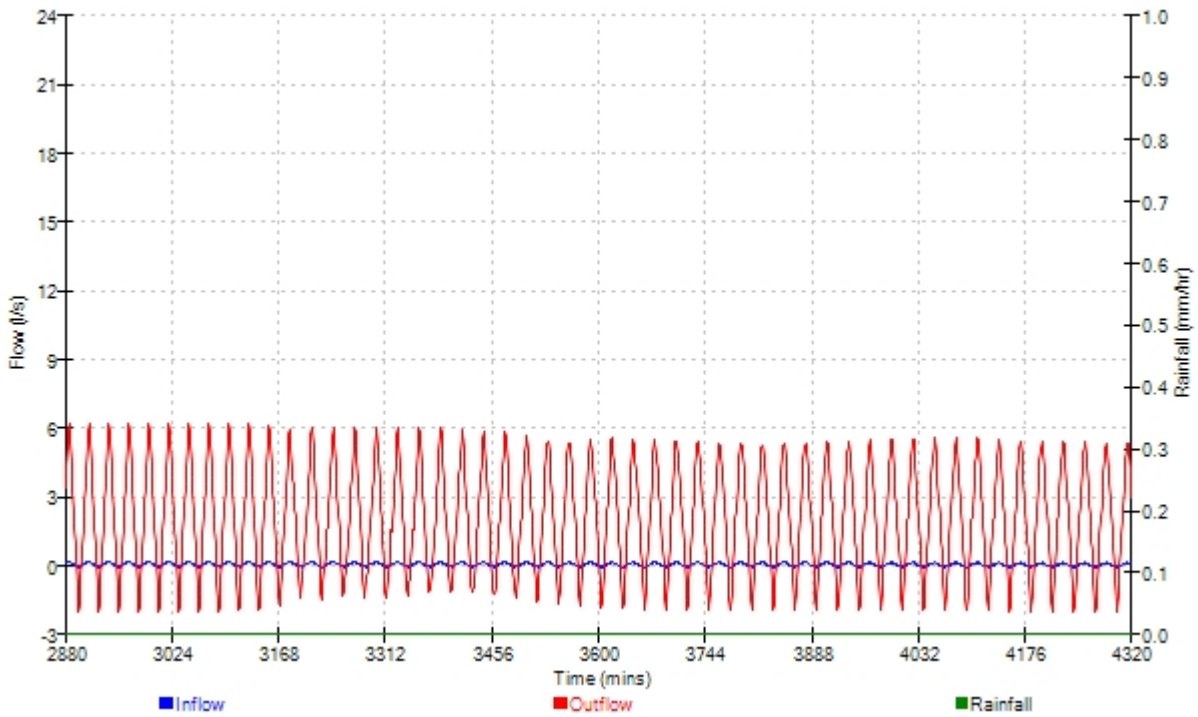
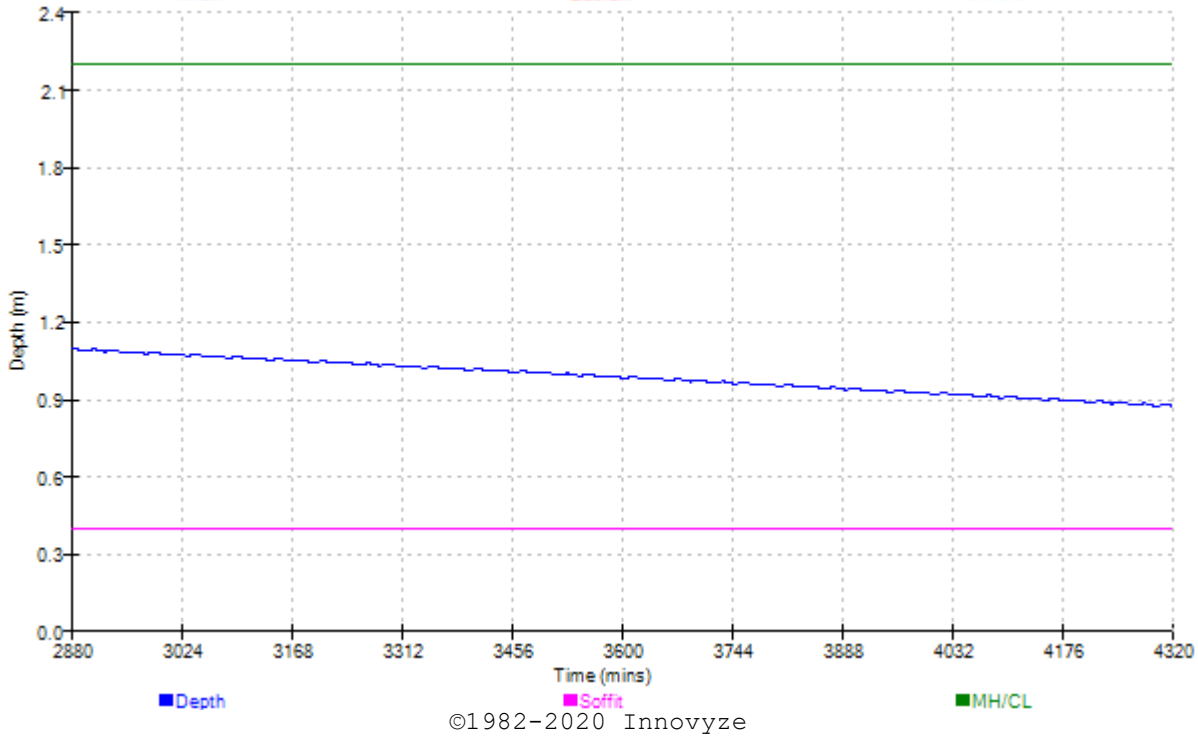
Graphs for Pipe 1.012 US/MH Southern Pond (Surface Network 2)
2160 minute 30 year Winter I+45%
Status: SURCHARGED (3 of 3)





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APPENDIX H.1 – MICRODRAINAGE CALCULATIONS 1 IN 1, 1 IN 100 AND 1 IN 100CC YEAR EVENTS. NORTHERN CATCHMENT

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 3

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.275	4-8	0.238

Total Area Contributing (ha) = 0.513

Total Pipe Volume (m³) = 20.053

Network Design Table for Surface Network 3

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	22.902	0.450	50.9	0.021	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	44.827	1.300	34.5	0.021	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	19.614	0.300	65.4	0.032	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	27.687	0.185	149.7	0.062	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	19.399	0.415	46.7	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.27	47.000	0.021	0.0	0.0	0.0	1.41	25.0	2.8
1.001	50.00	5.70	46.550	0.042	0.0	0.0	0.0	1.72	30.4	5.7
1.002	50.00	5.91	45.175	0.074	0.0	0.0	0.0	1.62	64.4	10.0
1.003	50.00	6.27	44.800	0.136	0.0	0.0	0.0	1.28	90.7	18.4
1.004	50.00	6.41	44.615	0.155	0.0	0.0	0.0	2.31	163.0	21.0

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Network Design Table for Surface Network 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	5.493	0.069	80.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	18.142	1.200	15.1	0.024	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	20.128	0.241	83.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	10.692	0.071	150.6	0.035	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.001	23.338	0.895	26.1	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	30.929	0.573	54.0	0.024	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	15.454	0.178	87.0	0.032	0.00	0.0	0.600	o	400	Pipe/Conduit	
4.000	22.935	0.153	149.9	0.103	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	22.909	0.153	150.0	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	
5.000	33.148	0.221	150.0	0.064	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.001	49.558	1.029	48.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	23.446	0.325	72.1	0.046	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.008	34.251	0.180	190.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	50.00	6.46	44.150	0.155	0.0	0.0	0.0	1.76	124.4	21.0
2.000	50.00	5.15	46.300	0.024	0.0	0.0	0.0	2.00	15.7	3.2
2.001	50.00	5.46	45.050	0.024	0.0	0.0	0.0	1.10	19.5	3.2
3.000	50.00	5.22	45.700	0.035	0.0	0.0	0.0	0.82	14.4	4.7
3.001	50.00	5.37	45.629	0.065	0.0	0.0	0.0	2.57	102.3	8.8
2.002	50.00	5.70	44.659	0.113	0.0	0.0	0.0	2.14	151.6	15.3
1.006	50.00	6.59	43.981	0.300	0.0	0.0	0.0	2.02	254.4	40.6
4.000	50.00	5.36	44.131	0.103	0.0	0.0	0.0	1.07	42.4	13.9
1.007	50.00	6.83	43.803	0.403	0.0	0.0	0.0	1.54	193.4	54.6
5.000	50.00	5.52	45.225	0.064	0.0	0.0	0.0	1.07	42.4	8.7
5.001	50.00	5.96	45.004	0.064	0.0	0.0	0.0	1.89	75.1	8.7
5.002	50.00	6.21	43.975	0.110	0.0	0.0	0.0	1.54	61.3	14.9
1.008	50.00	7.62	43.650	0.513	0.0	0.0	0.0	0.73	12.8«	69.5

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Free Flowing Outfall Details for Surface Network 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.008	Northern Outfall	44.270	43.470	0.000	0	0

Simulation Criteria for Surface Network 3

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.360		

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Online Controls for Surface Network 3

Hydro-Brake® Optimum Manhole: Northern Pond, DS/PN: 1.008, Volume (m³): 6.0

Unit Reference	MD-SHE-0050-1200-1100-1200
Design Head (m)	1.100
Design Flow (l/s)	1.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	50
Invert Level (m)	43.650
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	1.2
Flush-Flo™	0.222	1.0
Kick-Flo®	0.449	0.8
Mean Flow over Head Range	-	0.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.9	1.200	1.2	3.000	1.9	7.000	2.8
0.200	1.0	1.400	1.3	3.500	2.0	7.500	2.9
0.300	1.0	1.600	1.4	4.000	2.2	8.000	3.0
0.400	0.9	1.800	1.5	4.500	2.3	8.500	3.1
0.500	0.8	2.000	1.6	5.000	2.4	9.000	3.1
0.600	0.9	2.200	1.6	5.500	2.5	9.500	3.2
0.800	1.0	2.400	1.7	6.000	2.6		
1.000	1.1	2.600	1.8	6.500	2.7		

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Storage Structures for Surface Network 3

Tank or Pond Manhole: Northern Pond, DS/PN: 1.008

Invert Level (m) 43.650

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	333.5	1.700	786.7

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.000	PS32	15 Winter	1	+0%			
1.001	PS33	15 Winter	1	+0%			
1.002	PS34	15 Winter	1	+0%			
1.003	PS45	15 Winter	1	+0%			
1.004	PS46	15 Winter	1	+0%			
1.005	PS47	15 Winter	1	+0%	100/15 Summer		
2.000	PS41	15 Winter	1	+0%			
2.001	PS42	15 Winter	1	+0%			
3.000	PS43	15 Winter	1	+0%	100/15 Summer		
3.001	PS44	15 Winter	1	+0%			
2.002	SN13	15 Winter	1	+0%			
1.006	SN14	15 Winter	1	+0%	100/960 Winter		
4.000	PS48	15 Winter	1	+0%	100/15 Summer		
1.007	SN15	15 Winter	1	+0%	30/600 Winter		
5.000	PS49	15 Winter	1	+0%			
5.001	PS50	15 Winter	1	+0%			
5.002	PS51	15 Winter	1	+0%	30/600 Winter		
1.008	Northern Pond	1440 Winter	1	+0%	1/60 Winter		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	PS32		47.035	-0.115	0.000	0.12			3.0
1.001	PS33		46.594	-0.106	0.000	0.18			5.5
1.002	PS34		45.235	-0.165	0.000	0.16			9.3
1.003	PS45		44.892	-0.208	0.000	0.20			16.7
1.004	PS46		44.688	-0.227	0.000	0.13			18.9
1.005	PS47		44.259	-0.191	0.000	0.29			18.9
2.000	PS41		46.332	-0.068	0.000	0.23			3.4
2.001	PS42		45.094	-0.106	0.000	0.18			3.3
3.000	PS43		45.765	-0.085	0.000	0.38			5.0
3.001	PS44		45.675	-0.179	0.000	0.09			8.5
2.002	SN13		44.725	-0.234	0.000	0.11			14.8
1.006	SN14		44.102	-0.279	0.000	0.20			37.5
4.000	PS48		44.227	-0.129	0.000	0.37			14.4
1.007	SN15		43.956	-0.247	0.000	0.32			51.6
5.000	PS49		45.298	-0.152	0.000	0.22			8.9
5.001	PS50		45.057	-0.172	0.000	0.12			8.9
5.002	PS51		44.052	-0.148	0.000	0.25			14.3
1.008	Northern Pond		43.928	0.128	0.000	0.08			1.0

PN	US/MH Name	Status	Level Exceeded
1.000	PS32	OK	
1.001	PS33	OK	
1.002	PS34	OK	
1.003	PS45	OK	
1.004	PS46	OK	
1.005	PS47	OK	
2.000	PS41	OK	
2.001	PS42	OK	
3.000	PS43	OK	
3.001	PS44	OK	
2.002	SN13	OK	
1.006	SN14	OK	
4.000	PS48	OK	
1.007	SN15	OK	
5.000	PS49	OK	
5.001	PS50	OK	
5.002	PS51	OK	
1.008	Northern Pond	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.000	PS32	15 Winter	30	+0%			
1.001	PS33	15 Winter	30	+0%			
1.002	PS34	15 Winter	30	+0%			
1.003	PS45	15 Winter	30	+0%			
1.004	PS46	15 Winter	30	+0%			
1.005	PS47	15 Winter	30	+0%	100/15 Summer		
2.000	PS41	15 Winter	30	+0%			
2.001	PS42	15 Winter	30	+0%			
3.000	PS43	15 Winter	30	+0%	100/15 Summer		
3.001	PS44	15 Winter	30	+0%			
2.002	SN13	15 Winter	30	+0%			
1.006	SN14	1440 Winter	30	+0%	100/960 Winter		
4.000	PS48	15 Winter	30	+0%	100/15 Summer		
1.007	SN15	1440 Winter	30	+0%	30/600 Winter		
5.000	PS49	15 Winter	30	+0%			
5.001	PS50	15 Winter	30	+0%			
5.002	PS51	1440 Winter	30	+0%	30/600 Winter		
1.008	Northern Pond	1440 Winter	30	+0%	1/60 Winter		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	PS32		47.057	-0.093	0.000	0.31			7.3
1.001	PS33		46.626	-0.074	0.000	0.50			14.7
1.002	PS34		45.282	-0.118	0.000	0.46			26.5
1.003	PS45		44.969	-0.131	0.000	0.60			48.9
1.004	PS46		44.747	-0.168	0.000	0.39			55.4
1.005	PS47		44.365	-0.085	0.000	0.84			55.4
2.000	PS41		46.354	-0.046	0.000	0.56			8.4
2.001	PS42		45.121	-0.079	0.000	0.45			8.2
3.000	PS43		45.816	-0.034	0.000	0.94			12.2
3.001	PS44		45.705	-0.149	0.000	0.25			23.2
2.002	SN13		44.770	-0.189	0.000	0.29			39.9
1.006	SN14		44.256	-0.125	0.000	0.03			5.4
4.000	PS48		44.302	-0.054	0.000	0.91			35.3
1.007	SN15		44.256	0.053	0.000	0.04			7.1
5.000	PS49		45.346	-0.104	0.000	0.55			21.7
5.001	PS50		45.089	-0.140	0.000	0.30			21.8
5.002	PS51		44.256	0.056	0.000	0.04			2.0
1.008	Northern Pond		44.256	0.456	0.000	0.08			1.0

PN	US/MH Name	Status	Level Exceeded
1.000	PS32	OK	
1.001	PS33	OK	
1.002	PS34	OK	
1.003	PS45	OK	
1.004	PS46	OK	
1.005	PS47	OK	
2.000	PS41	OK	
2.001	PS42	OK	
3.000	PS43	OK	
3.001	PS44	OK	
2.002	SN13	OK	
1.006	SN14	OK	
4.000	PS48	OK	
1.007	SN15	SURCHARGED	
5.000	PS49	OK	
5.001	PS50	OK	
5.002	PS51	SURCHARGED	
1.008	Northern Pond	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.000	PS32	15 Winter	100	+0%			
1.001	PS33	15 Winter	100	+0%			
1.002	PS34	15 Winter	100	+0%			
1.003	PS45	15 Winter	100	+0%			
1.004	PS46	15 Winter	100	+0%			
1.005	PS47	15 Winter	100	+0%	100/15 Summer		
2.000	PS41	15 Winter	100	+0%			
2.001	PS42	15 Winter	100	+0%			
3.000	PS43	15 Winter	100	+0%	100/15 Summer		
3.001	PS44	15 Winter	100	+0%			
2.002	SN13	15 Winter	100	+0%			
1.006	SN14	2160 Winter	100	+0%	100/960 Winter		
4.000	PS48	15 Winter	100	+0%	100/15 Summer		
1.007	SN15	2160 Winter	100	+0%	30/600 Winter		
5.000	PS49	15 Winter	100	+0%			
5.001	PS50	15 Winter	100	+0%			
5.002	PS51	2160 Winter	100	+0%	30/600 Winter		
1.008	Northern Pond	2160 Winter	100	+0%	1/60 Winter		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	PS32		47.066	-0.084	0.000	0.40			9.4
1.001	PS33		46.640	-0.060	0.000	0.65			19.1
1.002	PS34		45.301	-0.099	0.000	0.59			34.4
1.003	PS45		45.002	-0.098	0.000	0.78			63.5
1.004	PS46		44.769	-0.146	0.000	0.51			71.9
1.005	PS47		44.452	0.002	0.000	1.09			71.5
2.000	PS41		46.364	-0.036	0.000	0.72			10.9
2.001	PS42		45.134	-0.066	0.000	0.58			10.7
3.000	PS43		45.880	0.030	0.000	1.22			15.8
3.001	PS44		45.717	-0.137	0.000	0.32			30.1
2.002	SN13		44.788	-0.171	0.000	0.38			51.8
1.006	SN14		44.408	0.027	0.000	0.03			4.9
4.000	PS48		44.423	0.067	0.000	1.18			45.8
1.007	SN15		44.408	0.205	0.000	0.04			6.5
5.000	PS49		45.369	-0.081	0.000	0.71			28.2
5.001	PS50		45.103	-0.126	0.000	0.39			28.3
5.002	PS51		44.408	0.208	0.000	0.03			1.8
1.008	Northern Pond		44.408	0.608	0.000	0.08			1.0

PN	US/MH Name	Status	Level Exceeded
1.000	PS32	OK	
1.001	PS33	OK	
1.002	PS34	OK	
1.003	PS45	OK	
1.004	PS46	OK	
1.005	PS47	SURCHARGED	
2.000	PS41	OK	
2.001	PS42	OK	
3.000	PS43	SURCHARGED	
3.001	PS44	OK	
2.002	SN13	OK	
1.006	SN14	SURCHARGED	
4.000	PS48	SURCHARGED	
1.007	SN15	SURCHARGED	
5.000	PS49	OK	
5.001	PS50	OK	
5.002	PS51	SURCHARGED	
1.008	Northern Pond	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	PS32	15 Winter	100	+45%				
1.001	PS33	15 Winter	100	+45%				
1.002	PS34	15 Winter	100	+45%				
1.003	PS45	15 Winter	100	+45%	100/15 Summer			
1.004	PS46	15 Winter	100	+45%				
1.005	PS47	2160 Winter	100	+45%	100/15 Summer			
2.000	PS41	15 Winter	100	+45%	100/15 Summer			
2.001	PS42	15 Winter	100	+45%				
3.000	PS43	15 Winter	100	+45%	100/15 Summer			
3.001	PS44	15 Winter	100	+45%				
2.002	SN13	15 Winter	100	+45%				
1.006	SN14	2160 Winter	100	+45%	100/15 Summer			
4.000	PS48	15 Winter	100	+45%	100/15 Summer			
1.007	SN15	2160 Winter	100	+45%	100/15 Summer			
5.000	PS49	15 Winter	100	+45%	100/15 Winter			
5.001	PS50	15 Winter	100	+45%				
5.002	PS51	2160 Winter	100	+45%	100/15 Summer			
1.008	Northern Pond	2160 Winter	100	+45%	100/15 Summer			

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	PS32	47.083	-0.067	0.000	0.58			13.7	OK
1.001	PS33	46.667	-0.033	0.000	0.94			27.7	OK
1.002	PS34	45.370	-0.030	0.000	0.85			49.7	OK
1.003	PS45	45.142	0.042	0.000	1.11			90.7	SURCHARGED
1.004	PS46	44.912	-0.003	0.000	0.68			96.3	OK
1.005	PS47	44.726	0.276	0.000	0.06			3.7	SURCHARGED
2.000	PS41	46.508	0.108	0.000	1.03			15.5	SURCHARGED
2.001	PS42	45.157	-0.043	0.000	0.85			15.6	OK
3.000	PS43	45.999	0.149	0.000	1.76			22.8	SURCHARGED
3.001	PS44	45.738	-0.116	0.000	0.47			43.6	OK
2.002	SN13	44.819	-0.140	0.000	0.54			74.9	OK
1.006	SN14	44.726	0.345	0.000	0.04			7.0	SURCHARGED
4.000	PS48	44.854	0.498	0.000	1.69			65.7	SURCHARGED
1.007	SN15	44.725	0.523	0.000	0.06			9.3	SURCHARGED
5.000	PS49	45.468	0.018	0.000	1.03			40.9	SURCHARGED
5.001	PS50	45.127	-0.102	0.000	0.57			40.9	OK
5.002	PS51	44.726	0.526	0.000	0.05			2.6	SURCHARGED
1.008	Northern Pond	44.725	0.925	0.000	0.10			1.2	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	PS32	
1.001	PS33	
1.002	PS34	
1.003	PS45	
1.004	PS46	
1.005	PS47	
2.000	PS41	
2.001	PS42	
3.000	PS43	
3.001	PS44	
2.002	SN13	
1.006	SN14	
4.000	PS48	
1.007	SN15	
5.000	PS49	
5.001	PS50	
5.002	PS51	
1.008	Northern Pond	

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APPENDIX H.2 – MICRODRAINAGE CALCULATIONS 1 IN 1, 1 IN 100 AND 1 IN 100CC YEAR EVENTS. SOUTHERN CATCHMENT

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.522	4-8	0.580	8-12	0.006

Total Area Contributing (ha) = 1.108

Total Pipe Volume (m³) = 61.440

Network Design Table for Surface Network 2

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	26.103	0.174	150.0	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	15.284	0.102	149.8	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	23.880	0.874	27.3	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	18.730	0.650	28.8	0.011	5.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.53	47.900	0.027	0.0	0.0	0.0	0.82	14.5	3.7
1.001	50.00	5.84	47.726	0.040	0.0	0.0	0.0	0.82	14.5	5.4
1.002	50.00	6.00	47.549	0.059	0.0	0.0	0.0	2.51	99.9	8.0
2.000	50.00	5.22	47.450	0.011	0.0	0.0	0.0	1.44	11.3	1.5

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.003	10.160	0.192	52.9	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	30.478	0.742	41.1	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	29.775	0.381	78.1	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	31.317	0.350	89.5	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	11.018	0.100	110.2	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	13.952	0.900	15.5	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	13.640	0.123	110.9	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	17.186	0.128	134.3	0.038	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.006	12.311	0.204	60.3	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	
5.000	36.767	0.900	40.9	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	12.055	0.305	39.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	27.045	0.450	60.1	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	9.519	0.155	61.4	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	41.607	0.375	111.0	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.003	50.00	6.10	46.675	0.081	0.0	0.0	0.0	1.80	71.7	11.0
3.000	50.00	5.32	47.300	0.033	0.0	0.0	0.0	1.57	27.8	4.5
1.004	50.00	6.37	46.408	0.125	0.0	0.0	0.0	1.78	125.8	16.9
4.000	50.00	5.49	47.650	0.029	0.0	0.0	0.0	1.06	18.8	3.9
4.001	50.00	5.64	47.225	0.063	0.0	0.0	0.0	1.24	49.5	8.5
4.002	50.00	5.71	47.125	0.092	0.0	0.0	0.0	3.34	132.8	12.5
4.003	50.00	5.89	46.225	0.119	0.0	0.0	0.0	1.24	49.3	16.1
1.005	50.00	6.55	45.927	0.282	0.0	0.0	0.0	1.63	204.5	38.2
1.006	50.00	6.63	45.799	0.282	0.0	0.0	0.0	2.43	305.8	38.2
5.000	50.00	5.39	47.050	0.020	0.0	0.0	0.0	1.58	27.9	2.7
5.001	50.00	5.51	46.150	0.020	0.0	0.0	0.0	1.61	28.4	2.7
6.000	50.00	5.27	46.375	0.045	0.0	0.0	0.0	1.69	67.2	6.1
6.001	50.00	5.36	45.925	0.074	0.0	0.0	0.0	1.67	66.5	10.0
1.007	50.00	7.02	45.595	0.376	0.0	0.0	0.0	1.79	225.1	50.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
7.000	27.389	0.780	35.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.008	11.933	0.181	65.9	0.008	0.00	0.0	0.600	o	400	Pipe/Conduit	
8.000	27.345	0.461	59.3	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	15.810	0.139	113.7	0.016	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.010	10.499	0.150	70.0	0.023	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	24.152	0.350	69.0	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	3.309	0.022	150.4	0.036	0.00	0.0	0.600	o	150	Pipe/Conduit	
9.002	5.710	0.038	150.3	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.003	3.438	0.023	149.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.004	7.310	0.217	33.7	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.005	15.565	0.104	150.0	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.006	15.655	0.783	20.0	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.011	73.616	0.650	113.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	15.199	0.350	43.4	0.011	5.00	0.0	0.600	o	150	Pipe/Conduit	
10.001	17.652	0.150	117.7	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
7.000	50.00	5.35	46.300	0.008	0.0	0.0	0.0	1.31	10.3	1.1
1.008	50.00	7.11	45.220	0.392	0.0	0.0	0.0	2.33	292.5	53.1
8.000	50.00	5.35	45.750	0.026	0.0	0.0	0.0	1.31	23.1	3.5
1.009	50.00	7.26	45.039	0.434	0.0	0.0	0.0	1.77	222.3	58.8
1.010	50.00	7.33	44.850	0.457	0.0	0.0	0.0	2.43	386.9	61.9
9.000	50.00	5.33	46.550	0.013	0.0	0.0	0.0	1.21	21.4	1.8
9.001	50.00	5.40	46.200	0.049	0.0	0.0	0.0	0.82	14.4	6.6
9.002	50.00	5.49	46.103	0.055	0.0	0.0	0.0	1.06	42.3	7.4
9.003	50.00	5.54	46.065	0.055	0.0	0.0	0.0	1.07	42.4	7.4
9.004	50.00	5.60	46.042	0.072	0.0	0.0	0.0	2.26	89.9	9.7
9.005	50.00	5.84	45.825	0.080	0.0	0.0	0.0	1.07	42.4	10.8
9.006	50.00	5.93	45.721	0.118	0.0	0.0	0.0	2.94	116.9	16.0
1.011	50.00	7.97	44.700	0.575	0.0	0.0	0.0	1.91	303.7	77.9
10.000	50.00	5.17	46.850	0.011	0.0	0.0	0.0	1.53	27.1	1.5
10.001	50.00	5.48	46.500	0.030	0.0	0.0	0.0	0.93	16.4	4.1

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
10.002	10.001	0.100	100.0	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.000	15.126	0.300	50.4	0.013	5.00	0.0	0.600	o	100	Pipe/Conduit	
10.003	25.716	0.782	32.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
12.000	28.465	1.423	20.0	0.065	5.00	0.0	0.600	o	225	Pipe/Conduit	
12.001	22.754	0.446	51.0	0.054	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.002	10.502	0.082	128.1	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.004	24.908	0.249	100.0	0.029	0.00	0.0	0.600	o	400	Pipe/Conduit	
10.005	29.515	0.518	57.0	0.032	0.00	0.0	0.600	o	400	Pipe/Conduit	
13.000	13.136	0.215	61.1	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
13.001	26.330	0.350	75.2	0.025	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.002	10.557	0.200	52.8	0.039	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.003	7.821	0.100	78.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.004	33.322	0.950	35.1	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.005	6.349	0.352	18.0	0.073	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.006	32.945	0.398	82.8	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
10.002	50.00	5.61	46.275	0.058	0.0	0.0	0.0	1.31	52.0	7.9
11.000	50.00	5.23	46.600	0.013	0.0	0.0	0.0	1.09	8.5	1.8
10.003	50.00	5.80	46.175	0.071	0.0	0.0	0.0	2.29	91.0	9.6
12.000	50.00	5.16	47.368	0.065	0.0	0.0	0.0	2.94	116.9	8.8
12.001	50.00	5.33	45.850	0.119	0.0	0.0	0.0	2.21	156.0	16.1
12.002	50.00	5.46	45.400	0.156	0.0	0.0	0.0	1.39	98.1	21.1
10.004	50.00	6.02	45.218	0.256	0.0	0.0	0.0	1.89	237.2	34.7
10.005	50.00	6.21	44.968	0.288	0.0	0.0	0.0	2.50	314.7	39.0
13.000	50.00	5.17	46.915	0.018	0.0	0.0	0.0	1.29	22.8	2.4
13.001	50.00	5.46	46.625	0.043	0.0	0.0	0.0	1.51	60.0	5.8
13.002	50.00	5.56	46.275	0.082	0.0	0.0	0.0	1.80	71.7	11.1
13.003	50.00	5.65	46.075	0.082	0.0	0.0	0.0	1.48	58.8	11.1
13.004	50.00	5.90	45.975	0.133	0.0	0.0	0.0	2.22	88.1	18.0
13.005	50.00	5.93	44.975	0.206	0.0	0.0	0.0	3.10	123.1	27.9
10.006	50.00	6.48	44.448	0.494	0.0	0.0	0.0	2.08	260.9	66.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.012	23.181	0.025	927.2	0.039	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.013	11.289	0.125	90.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.012	50.00	8.60	44.050	1.108	0.0	0.0	0.0	0.61	76.9«	150.0
1.013	50.00	8.78	44.025	1.108	0.0	0.0	0.0	1.06	18.7«	150.0

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.013	Southern Outfall	44.589	43.900	0.000	0	0

Simulation Criteria for Surface Network 2

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.360		

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: SS12-FC, DS/PN: 1.013, Volume (m³): 8.4

Unit Reference	MD-SHE-0069-2500-1475-2500
Design Head (m)	1.475
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	69
Invert Level (m)	44.025
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.475	2.5
Flush-Flo™	0.303	2.1
Kick-Flo®	0.614	1.7
Mean Flow over Head Range	-	2.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	1.200	2.3	3.000	3.5	7.000	5.2
0.200	2.0	1.400	2.4	3.500	3.7	7.500	5.3
0.300	2.1	1.600	2.6	4.000	4.0	8.000	5.5
0.400	2.0	1.800	2.7	4.500	4.2	8.500	5.7
0.500	2.0	2.000	2.9	5.000	4.4	9.000	5.8
0.600	1.7	2.200	3.0	5.500	4.6	9.500	6.0
0.800	1.9	2.400	3.1	6.000	4.8		
1.000	2.1	2.600	3.2	6.500	5.0		

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Storage Structures for Surface Network 2

Tank or Pond Manhole: Southern Pond, DS/PN: 1.012

Invert Level (m) 44.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	484.6	2.200	1303.7

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS1	15 Winter	1	+0%	100/15 Summer				47.954
1.001	PS2	15 Winter	1	+0%	100/15 Summer				47.792
1.002	PS3	15 Winter	1	+0%					47.592
2.000	PS4	15 Winter	1	+0%					47.475
1.003	PS5	15 Winter	1	+0%					46.738
3.000	PS6	15 Winter	1	+0%					47.342
1.004	SS1	15 Winter	1	+0%					46.483
4.000	PS7	15 Winter	1	+0%					47.699
4.001	PS8	15 Winter	1	+0%					47.293
4.002	PS9	15 Winter	1	+0%					47.173
4.003	PS10	15 Winter	1	+0%	100/15 Summer				46.317
1.005	SS2	15 Winter	1	+0%					46.055
1.006	SS3	15 Winter	1	+0%					45.912
5.000	PS11	15 Winter	1	+0%					47.082
5.001	PS12	15 Winter	1	+0%					46.183
6.000	PS13	15 Winter	1	+0%					46.423
6.001	PS14	15 Winter	1	+0%					45.989

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	PS1	-0.096	0.000	0.27			3.7	OK	
1.001	PS2	-0.084	0.000	0.40			5.3	OK	
1.002	PS3	-0.182	0.000	0.08			7.6	OK	
2.000	PS4	-0.075	0.000	0.14			1.6	OK	
1.003	PS5	-0.162	0.000	0.17			10.4	OK	
3.000	PS6	-0.108	0.000	0.17			4.6	OK	
1.004	SS1	-0.225	0.000	0.14			16.3	OK	
4.000	PS7	-0.101	0.000	0.22			4.0	OK	
4.001	PS8	-0.157	0.000	0.19			8.1	OK	
4.002	PS9	-0.177	0.000	0.10			11.6	OK	
4.003	PS10	-0.133	0.000	0.35			14.8	OK	
1.005	SS2	-0.272	0.000	0.22			35.7	OK	
1.006	SS3	-0.287	0.000	0.18			35.6	OK	
5.000	PS11	-0.118	0.000	0.10			2.8	OK	
5.001	PS12	-0.117	0.000	0.11			2.8	OK	
6.000	PS13	-0.177	0.000	0.10			6.3	OK	
6.001	PS14	-0.161	0.000	0.18			9.7	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.007	SS4	15 Winter	1	+0%			
7.000	PS15	15 Winter	1	+0%			
1.008	SS5	15 Winter	1	+0%			
8.000	PS16	15 Winter	1	+0%			
1.009	SS6	15 Winter	1	+0%	100/15 Summer		
1.010	SS7	15 Winter	1	+0%			
9.000	PS17	15 Winter	1	+0%			
9.001	PS18	15 Winter	1	+0%	30/15 Summer		
9.002	PS19	15 Winter	1	+0%			
9.003	PS20	15 Winter	1	+0%			
9.004	PS21	15 Winter	1	+0%			
9.005	PS22	15 Winter	1	+0%			
9.006	PS23	15 Winter	1	+0%			
1.011	SS8	15 Winter	1	+0%			
10.000	PS24	15 Winter	1	+0%			
10.001	PS25	15 Winter	1	+0%			
10.002	PS26	15 Winter	1	+0%			
11.000	PS27	15 Winter	1	+0%			
10.003	PS28	15 Winter	1	+0%			
12.000	PS29	15 Winter	1	+0%			
12.001	PS30	15 Winter	1	+0%			
12.002	PS31	15 Winter	1	+0%			
10.004	SS9	15 Winter	1	+0%			
10.005	SS10	15 Winter	1	+0%			
13.000	PS35	15 Winter	1	+0%			
13.001	PS36	15 Winter	1	+0%			
13.002	PS37	15 Winter	1	+0%			
13.003	PS38	15 Winter	1	+0%			
13.004	PS39	15 Winter	1	+0%			
13.005	PS40	15 Winter	1	+0%	100/15 Summer		
10.006	SS11	15 Winter	1	+0%	30/720 Winter		
1.012	Southern Pond	960 Winter	1	+0%	30/30 Winter		
1.013	SS12-FC	1440 Winter	1	+0%	1/15 Winter		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.007	SS4		45.726	-0.269	0.000	0.23			47.3
7.000	PS15		46.322	-0.078	0.000	0.11			1.1
1.008	SS5		45.359	-0.261	0.000	0.26			49.6
8.000	PS16		45.791	-0.109	0.000	0.16			3.6
1.009	SS6		45.197	-0.242	0.000	0.33			54.8
1.010	SS7		45.006	-0.294	0.000	0.26			57.3
9.000	PS17		46.580	-0.120	0.000	0.09			1.8
9.001	PS18		46.282	-0.068	0.000	0.57			6.1
9.002	PS19		46.176	-0.152	0.000	0.23			6.8

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
9.003	PS20		46.141	-0.149	0.000	0.25			6.9
9.004	PS21		46.097	-0.170	0.000	0.14			8.9
9.005	PS22		45.903	-0.147	0.000	0.26			9.9
9.006	PS23		45.777	-0.169	0.000	0.14			14.3
1.011	SS8		44.852	-0.298	0.000	0.24			69.5
10.000	PS24		46.874	-0.126	0.000	0.06			1.6
10.001	PS25		46.551	-0.099	0.000	0.25			3.8
10.002	PS26		46.337	-0.163	0.000	0.16			7.1
11.000	PS27		46.632	-0.068	0.000	0.23			1.8
10.003	PS28		46.224	-0.176	0.000	0.11			9.0
12.000	PS29		47.412	-0.181	0.000	0.08			9.2
12.001	PS30		45.917	-0.233	0.000	0.11			15.6
12.002	PS31		45.509	-0.191	0.000	0.28			19.9
10.004	SS9		45.326	-0.292	0.000	0.16			32.6
10.005	SS10		45.065	-0.303	0.000	0.13			36.5
13.000	PS35		46.950	-0.115	0.000	0.12			2.6
13.001	PS36		46.673	-0.177	0.000	0.10			5.5
13.002	PS37		46.337	-0.163	0.000	0.17			10.1
13.003	PS38		46.148	-0.152	0.000	0.23			10.2
13.004	PS39		46.043	-0.157	0.000	0.20			16.3
13.005	PS40		45.060	-0.140	0.000	0.30			24.9
10.006	SS11		44.588	-0.260	0.000	0.27			61.4
1.012	Southern Pond		44.442	-0.008	0.000	0.14			6.2
1.013	SS12-FC		44.452	0.277	0.000	0.12			2.1

PN	US/MH Name	Status	Level Exceeded
1.007	SS4	OK	
7.000	PS15	OK	
1.008	SS5	OK	
8.000	PS16	OK	
1.009	SS6	OK	
1.010	SS7	OK	
9.000	PS17	OK	
9.001	PS18	OK	
9.002	PS19	OK	
9.003	PS20	OK	
9.004	PS21	OK	
9.005	PS22	OK	
9.006	PS23	OK	
1.011	SS8	OK	
10.000	PS24	OK	
10.001	PS25	OK	
10.002	PS26	OK	
11.000	PS27	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
10.003	PS28	OK	
12.000	PS29	OK	
12.001	PS30	OK	
12.002	PS31	OK	
10.004	SS9	OK	
10.005	SS10	OK	
13.000	PS35	OK	
13.001	PS36	OK	
13.002	PS37	OK	
13.003	PS38	OK	
13.004	PS39	OK	
13.005	PS40	OK	
10.006	SS11	OK	
1.012	Southern Pond	OK	
1.013	SS12-FC	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS1	15 Winter	30	+0%	100/15 Summer				47.992
1.001	PS2	15 Winter	30	+0%	100/15 Summer				47.858
1.002	PS3	15 Summer	30	+0%					47.621
2.000	PS4	15 Winter	30	+0%					47.491
1.003	PS5	15 Winter	30	+0%					46.784
3.000	PS6	15 Winter	30	+0%					47.369
1.004	SS1	15 Winter	30	+0%					46.537
4.000	PS7	15 Winter	30	+0%					47.731
4.001	PS8	15 Winter	30	+0%					47.343
4.002	PS9	15 Winter	30	+0%					47.207
4.003	PS10	15 Winter	30	+0%	100/15 Summer				46.423
1.005	SS2	15 Winter	30	+0%					46.158
1.006	SS3	15 Winter	30	+0%					45.998
5.000	PS11	15 Winter	30	+0%					47.102
5.001	PS12	15 Winter	30	+0%					46.203
6.000	PS13	15 Winter	30	+0%					46.452
6.001	PS14	15 Winter	30	+0%					46.035

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	PS1	-0.058	0.000	0.66			9.2	OK	
1.001	PS2	-0.018	0.000	1.00			13.4	OK	
1.002	PS3	-0.153	0.000	0.22			19.9	OK	
2.000	PS4	-0.059	0.000	0.35			3.8	OK	
1.003	PS5	-0.116	0.000	0.47			27.9	OK	
3.000	PS6	-0.081	0.000	0.43			11.4	OK	
1.004	SS1	-0.171	0.000	0.37			42.6	OK	
4.000	PS7	-0.069	0.000	0.54			9.8	OK	
4.001	PS8	-0.107	0.000	0.53			22.3	OK	
4.002	PS9	-0.143	0.000	0.28			33.0	OK	
4.003	PS10	-0.027	0.000	1.00			42.7	OK	
1.005	SS2	-0.169	0.000	0.62			98.1	OK	
1.006	SS3	-0.201	0.000	0.49			99.1	OK	
5.000	PS11	-0.098	0.000	0.25			6.8	OK	
5.001	PS12	-0.097	0.000	0.27			6.8	OK	
6.000	PS13	-0.148	0.000	0.25			15.5	OK	
6.001	PS14	-0.115	0.000	0.48			26.1	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.007	SS4	15 Winter	30	+0%			
7.000	PS15	15 Winter	30	+0%			
1.008	SS5	15 Winter	30	+0%			
8.000	PS16	15 Winter	30	+0%			
1.009	SS6	15 Winter	30	+0%	100/15 Summer		
1.010	SS7	15 Winter	30	+0%			
9.000	PS17	15 Winter	30	+0%			
9.001	PS18	15 Winter	30	+0%	30/15 Summer		
9.002	PS19	15 Winter	30	+0%			
9.003	PS20	15 Winter	30	+0%			
9.004	PS21	15 Winter	30	+0%			
9.005	PS22	15 Winter	30	+0%			
9.006	PS23	15 Winter	30	+0%			
1.011	SS8	15 Winter	30	+0%			
10.000	PS24	15 Winter	30	+0%			
10.001	PS25	15 Winter	30	+0%			
10.002	PS26	15 Winter	30	+0%			
11.000	PS27	15 Winter	30	+0%			
10.003	PS28	15 Winter	30	+0%			
12.000	PS29	15 Winter	30	+0%			
12.001	PS30	15 Winter	30	+0%			
12.002	PS31	15 Winter	30	+0%			
10.004	SS9	15 Winter	30	+0%			
10.005	SS10	15 Winter	30	+0%			
13.000	PS35	15 Winter	30	+0%			
13.001	PS36	15 Winter	30	+0%			
13.002	PS37	15 Winter	30	+0%			
13.003	PS38	15 Winter	30	+0%			
13.004	PS39	15 Winter	30	+0%			
13.005	PS40	15 Winter	30	+0%	100/15 Summer		
10.006	SS11	1440 Winter	30	+0%	30/720 Winter		
1.012	Southern Pond	1440 Winter	30	+0%	30/30 Winter		
1.013	SS12-FC	1440 Winter	30	+0%	1/15 Winter		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.007	SS4		45.830	-0.165	0.000	0.64			130.8
7.000	PS15		46.336	-0.064	0.000	0.28			2.7
1.008	SS5		45.472	-0.148	0.000	0.71			134.4
8.000	PS16		45.817	-0.083	0.000	0.40			8.9
1.009	SS6		45.337	-0.102	0.000	0.89			147.5
1.010	SS7		45.134	-0.166	0.000	0.71			154.8
9.000	PS17		46.598	-0.102	0.000	0.22			4.5
9.001	PS18		46.403	0.053	0.000	1.65			17.8
9.002	PS19		46.239	-0.089	0.000	0.67			19.9

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
9.003	PS20		46.206	-0.084	0.000	0.71			19.8
9.004	PS21		46.141	-0.126	0.000	0.39			25.9
9.005	PS22		45.976	-0.074	0.000	0.76			28.5
9.006	PS23		45.823	-0.123	0.000	0.41			42.2
1.011	SS8		44.974	-0.176	0.000	0.67			189.4
10.000	PS24		46.889	-0.111	0.000	0.15			3.8
10.001	PS25		46.594	-0.056	0.000	0.71			10.8
10.002	PS26		46.387	-0.113	0.000	0.49			21.1
11.000	PS27		46.654	-0.046	0.000	0.56			4.5
10.003	PS28		46.260	-0.140	0.000	0.30			25.6
12.000	PS29		47.438	-0.155	0.000	0.21			22.6
12.001	PS30		45.964	-0.186	0.000	0.31			42.5
12.002	PS31		45.602	-0.098	0.000	0.78			56.0
10.004	SS9		45.408	-0.210	0.000	0.45			91.9
10.005	SS10		45.139	-0.229	0.000	0.37			103.0
13.000	PS35		46.971	-0.094	0.000	0.30			6.3
13.001	PS36		46.706	-0.144	0.000	0.28			15.4
13.002	PS37		46.388	-0.112	0.000	0.50			29.9
13.003	PS38		46.211	-0.089	0.000	0.67			29.7
13.004	PS39		46.100	-0.100	0.000	0.59			48.5
13.005	PS40		45.143	-0.057	0.000	0.90			75.4
10.006	SS11		44.895	0.047	0.000	0.04			8.9
1.012	Southern Pond		44.895	0.445	0.000	0.15			6.7
1.013	SS12-FC		45.232	1.057	0.000	0.12			2.1

PN	US/MH Name	Status	Level Exceeded
1.007	SS4	OK	
7.000	PS15	OK	
1.008	SS5	OK	
8.000	PS16	OK	
1.009	SS6	OK	
1.010	SS7	OK	
9.000	PS17	OK	
9.001	PS18	SURCHARGED	
9.002	PS19	OK	
9.003	PS20	OK	
9.004	PS21	OK	
9.005	PS22	OK	
9.006	PS23	OK	
1.011	SS8	OK	
10.000	PS24	OK	
10.001	PS25	OK	
10.002	PS26	OK	
11.000	PS27	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
10.003	PS28	OK	
12.000	PS29	OK	
12.001	PS30	OK	
12.002	PS31	OK	
10.004	SS9	OK	
10.005	SS10	OK	
13.000	PS35	OK	
13.001	PS36	OK	
13.002	PS37	OK	
13.003	PS38	OK	
13.004	PS39	OK	
13.005	PS40	OK	
10.006	SS11	SURCHARGED	
1.012	Southern Pond	SURCHARGED	
1.013	SS12-FC	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS1	15 Winter	100	+0%	100/15 Summer				48.079
1.001	PS2	15 Winter	100	+0%	100/15 Summer				47.943
1.002	PS3	15 Winter	100	+0%					47.631
2.000	PS4	15 Winter	100	+0%					47.498
1.003	PS5	15 Winter	100	+0%					46.802
3.000	PS6	15 Winter	100	+0%					47.381
1.004	SS1	15 Winter	100	+0%					46.557
4.000	PS7	15 Winter	100	+0%					47.746
4.001	PS8	15 Winter	100	+0%					47.365
4.002	PS9	15 Winter	100	+0%					47.220
4.003	PS10	15 Winter	100	+0%	100/15 Summer				46.529
1.005	SS2	15 Winter	100	+0%					46.202
1.006	SS3	15 Winter	100	+0%					46.031
5.000	PS11	15 Winter	100	+0%					47.110
5.001	PS12	15 Winter	100	+0%					46.211
6.000	PS13	15 Winter	100	+0%					46.464
6.001	PS14	15 Winter	100	+0%					46.055

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	PS1	0.029	0.000	0.86			11.9	SURCHARGED	
1.001	PS2	0.067	0.000	1.30			17.4	SURCHARGED	
1.002	PS3	-0.143	0.000	0.28			25.4	OK	
2.000	PS4	-0.052	0.000	0.46			5.0	OK	
1.003	PS5	-0.098	0.000	0.58			35.0	OK	
3.000	PS6	-0.069	0.000	0.55			14.8	OK	
1.004	SS1	-0.151	0.000	0.48			54.7	OK	
4.000	PS7	-0.054	0.000	0.71			12.8	OK	
4.001	PS8	-0.085	0.000	0.69			29.0	OK	
4.002	PS9	-0.130	0.000	0.37			42.8	OK	
4.003	PS10	0.079	0.000	1.30			55.6	SURCHARGED	
1.005	SS2	-0.125	0.000	0.79			126.1	OK	
1.006	SS3	-0.168	0.000	0.63			127.6	OK	
5.000	PS11	-0.090	0.000	0.33			8.9	OK	
5.001	PS12	-0.089	0.000	0.34			8.9	OK	
6.000	PS13	-0.136	0.000	0.32			20.2	OK	
6.001	PS14	-0.095	0.000	0.62			33.9	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.007	SS4	15 Winter	100	+0%			
7.000	PS15	15 Winter	100	+0%			
1.008	SS5	15 Winter	100	+0%			
8.000	PS16	15 Winter	100	+0%			
1.009	SS6	15 Winter	100	+0%	100/15 Summer		
1.010	SS7	15 Winter	100	+0%			
9.000	PS17	15 Winter	100	+0%			
9.001	PS18	15 Winter	100	+0%	30/15 Summer		
9.002	PS19	15 Winter	100	+0%			
9.003	PS20	15 Winter	100	+0%			
9.004	PS21	15 Winter	100	+0%			
9.005	PS22	15 Winter	100	+0%			
9.006	PS23	15 Summer	100	+0%			
1.011	SS8	2160 Winter	100	+0%			
10.000	PS24	15 Winter	100	+0%			
10.001	PS25	15 Winter	100	+0%			
10.002	PS26	15 Winter	100	+0%			
11.000	PS27	15 Winter	100	+0%			
10.003	PS28	15 Winter	100	+0%			
12.000	PS29	15 Winter	100	+0%			
12.001	PS30	15 Winter	100	+0%			
12.002	PS31	15 Winter	100	+0%			
10.004	SS9	15 Winter	100	+0%			
10.005	SS10	15 Winter	100	+0%			
13.000	PS35	15 Winter	100	+0%			
13.001	PS36	15 Winter	100	+0%			
13.002	PS37	15 Winter	100	+0%			
13.003	PS38	15 Winter	100	+0%			
13.004	PS39	15 Winter	100	+0%			
13.005	PS40	15 Winter	100	+0%	100/15 Summer		
10.006	SS11	2160 Winter	100	+0%	30/720 Winter		
1.012	Southern Pond	2160 Winter	100	+0%	30/30 Winter		
1.013	SS12-FC	2160 Winter	100	+0%	1/15 Winter		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.007	SS4		45.875	-0.120	0.000	0.83			168.3
7.000	PS15		46.342	-0.058	0.000	0.36			3.6
1.008	SS5		45.597	-0.023	0.000	0.90			169.6
8.000	PS16		45.828	-0.072	0.000	0.52			11.6
1.009	SS6		45.452	0.013	0.000	1.11			184.2
1.010	SS7		45.177	-0.123	0.000	0.87			189.9
9.000	PS17		46.605	-0.095	0.000	0.29			5.8
9.001	PS18		46.459	0.109	0.000	2.14			23.0
9.002	PS19		46.266	-0.062	0.000	0.86			25.8

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
9.003	PS20		46.235	-0.055	0.000	0.91			25.6
9.004	PS21		46.157	-0.110	0.000	0.51			33.4
9.005	PS22		46.022	-0.028	0.000	0.99			36.9
9.006	PS23		45.839	-0.107	0.000	0.52			54.0
1.011	SS8		45.101	-0.049	0.000	0.03			9.5
10.000	PS24		46.895	-0.105	0.000	0.20			5.0
10.001	PS25		46.614	-0.036	0.000	0.92			14.0
10.002	PS26		46.406	-0.094	0.000	0.63			27.4
11.000	PS27		46.664	-0.036	0.000	0.72			5.9
10.003	PS28		46.274	-0.126	0.000	0.39			33.2
12.000	PS29		47.448	-0.145	0.000	0.27			29.4
12.001	PS30		45.982	-0.168	0.000	0.40			55.2
12.002	PS31		45.673	-0.027	0.000	1.00			71.6
10.004	SS9		45.439	-0.179	0.000	0.58			118.3
10.005	SS10		45.165	-0.203	0.000	0.48			132.5
13.000	PS35		46.980	-0.085	0.000	0.39			8.1
13.001	PS36		46.719	-0.131	0.000	0.36			20.1
13.002	PS37		46.407	-0.093	0.000	0.64			38.8
13.003	PS38		46.238	-0.062	0.000	0.87			38.6
13.004	PS39		46.123	-0.077	0.000	0.76			63.0
13.005	PS40		45.328	0.128	0.000	1.16			96.9
10.006	SS11		45.100	0.252	0.000	0.03			8.1
1.012	Southern Pond		45.101	0.651	0.000	0.16			7.3
1.013	SS12-FC		45.440	1.265	0.000	0.13			2.2

PN	US/MH Name	Status	Level Exceeded
1.007	SS4	OK	
7.000	PS15	OK	
1.008	SS5	OK	
8.000	PS16	OK	
1.009	SS6	SURCHARGED	
1.010	SS7	OK	
9.000	PS17	OK	
9.001	PS18	SURCHARGED	
9.002	PS19	OK	
9.003	PS20	OK	
9.004	PS21	OK	
9.005	PS22	OK	
9.006	PS23	OK	
1.011	SS8	OK	
10.000	PS24	OK	
10.001	PS25	OK	
10.002	PS26	OK	
11.000	PS27	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
10.003	PS28	OK	
12.000	PS29	OK	
12.001	PS30	OK	
12.002	PS31	OK	
10.004	SS9	OK	
10.005	SS10	OK	
13.000	PS35	OK	
13.001	PS36	OK	
13.002	PS37	OK	
13.003	PS38	OK	
13.004	PS39	OK	
13.005	PS40	SURCHARGED	
10.006	SS11	SURCHARGED	
1.012	Southern Pond	SURCHARGED	
1.013	SS12-FC	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS1	15 Winter	100	+45%	100/15 Summer				48.451
1.001	PS2	15 Winter	100	+45%	100/15 Summer				48.163
1.002	PS3	15 Winter	100	+45%					47.652
2.000	PS4	15 Winter	100	+45%					47.510
1.003	PS5	15 Winter	100	+45%					46.842
3.000	PS6	15 Winter	100	+45%					47.404
1.004	SS1	15 Winter	100	+45%					46.644
4.000	PS7	15 Winter	100	+45%	100/15 Summer				47.838
4.001	PS8	15 Winter	100	+45%					47.426
4.002	PS9	15 Winter	100	+45%					47.242
4.003	PS10	15 Winter	100	+45%	100/15 Summer				46.824
1.005	SS2	15 Winter	100	+45%	100/15 Summer				46.488
1.006	SS3	15 Winter	100	+45%	100/15 Summer				46.366
5.000	PS11	15 Winter	100	+45%					47.124
5.001	PS12	15 Winter	100	+45%	100/15 Winter				46.307
6.000	PS13	15 Winter	100	+45%					46.484
6.001	PS14	15 Winter	100	+45%	100/15 Summer				46.323

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	PS1	0.401	0.000	1.25			17.3	FLOOD RISK	
1.001	PS2	0.287	0.000	1.91			25.5	SURCHARGED	
1.002	PS3	-0.122	0.000	0.41			37.5	OK	
2.000	PS4	-0.040	0.000	0.66			7.2	OK	
1.003	PS5	-0.058	0.000	0.86			51.6	OK	
3.000	PS6	-0.046	0.000	0.80			21.4	OK	
1.004	SS1	-0.064	0.000	0.69			78.7	OK	
4.000	PS7	0.038	0.000	1.03			18.6	SURCHARGED	
4.001	PS8	-0.024	0.000	1.00			41.6	OK	
4.002	PS9	-0.108	0.000	0.53			61.8	OK	
4.003	PS10	0.374	0.000	1.86			79.8	SURCHARGED	
1.005	SS2	0.161	0.000	1.08			171.4	SURCHARGED	
1.006	SS3	0.167	0.000	0.81			162.9	SURCHARGED	
5.000	PS11	-0.076	0.000	0.48			12.9	OK	
5.001	PS12	0.007	0.000	0.49			12.7	SURCHARGED	
6.000	PS13	-0.116	0.000	0.47			29.3	OK	
6.001	PS14	0.173	0.000	0.84			45.9	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.007	SS4	15 Winter	100	+45%	100/15 Summer		
7.000	PS15	15 Winter	100	+45%			
1.008	SS5	15 Winter	100	+45%	100/15 Summer		
8.000	PS16	15 Winter	100	+45%			
1.009	SS6	15 Winter	100	+45%	100/15 Summer		
1.010	SS7	2880 Winter	100	+45%	100/15 Summer		
9.000	PS17	15 Winter	100	+45%	100/15 Summer		
9.001	PS18	15 Winter	100	+45%	100/15 Summer		
9.002	PS19	15 Winter	100	+45%	100/15 Summer		
9.003	PS20	15 Winter	100	+45%	100/15 Summer		
9.004	PS21	15 Winter	100	+45%	100/15 Summer		
9.005	PS22	15 Winter	100	+45%	100/15 Summer		
9.006	PS23	15 Winter	100	+45%			
1.011	SS8	2880 Winter	100	+45%	100/15 Summer		
10.000	PS24	15 Winter	100	+45%			
10.001	PS25	15 Winter	100	+45%	100/15 Summer		
10.002	PS26	15 Winter	100	+45%			
11.000	PS27	15 Winter	100	+45%	100/15 Winter		
10.003	PS28	15 Winter	100	+45%			
12.000	PS29	15 Winter	100	+45%			
12.001	PS30	15 Winter	100	+45%			
12.002	PS31	15 Winter	100	+45%	100/15 Summer		
10.004	SS9	2880 Winter	100	+45%			
10.005	SS10	2880 Winter	100	+45%	100/600 Winter		
13.000	PS35	15 Winter	100	+45%	100/15 Summer		
13.001	PS36	15 Winter	100	+45%	100/15 Summer		
13.002	PS37	15 Winter	100	+45%	100/15 Summer		
13.003	PS38	15 Winter	100	+45%	100/15 Summer		
13.004	PS39	15 Winter	100	+45%	100/15 Summer		
13.005	PS40	15 Winter	100	+45%	100/15 Summer		
10.006	SS11	2880 Winter	100	+45%	100/15 Summer		
1.012	Southern Pond	2880 Winter	100	+45%	100/15 Summer		
1.013	SS12-FC	2880 Winter	100	+45%	100/15 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.007	SS4		46.254	0.259	0.000	1.02			208.3
7.000	PS15		46.352	-0.048	0.000	0.52			5.2
1.008	SS5		45.892	0.272	0.000	1.12			211.8
8.000	PS16		45.853	-0.047	0.000	0.76			16.8
1.009	SS6		45.667	0.228	0.000	1.39			231.0
1.010	SS7		45.518	0.218	0.000	0.04			8.7
9.000	PS17		46.763	0.063	0.000	0.42			8.5
9.001	PS18		46.702	0.352	0.000	3.05			32.9
9.002	PS19		46.417	0.089	0.000	1.23			36.7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
9.003	PS20		46.346	0.056	0.000	1.30			36.5
9.004	PS21		46.276	0.009	0.000	0.72			47.5
9.005	PS22		46.155	0.105	0.000	1.42			53.0
9.006	PS23		45.871	-0.075	0.000	0.75			76.9
1.011	SS8		45.518	0.368	0.000	0.04			10.8
10.000	PS24		46.905	-0.095	0.000	0.29			7.2
10.001	PS25		46.763	0.113	0.000	1.31			20.0
10.002	PS26		46.445	-0.055	0.000	0.91			39.3
11.000	PS27		46.732	0.032	0.000	1.04			8.4
10.003	PS28		46.298	-0.102	0.000	0.56			47.4
12.000	PS29		47.466	-0.127	0.000	0.39			42.6
12.001	PS30		46.015	-0.135	0.000	0.58			80.0
12.002	PS31		45.785	0.085	0.000	1.47			105.2
10.004	SS9		45.518	-0.100	0.000	0.02			4.9
10.005	SS10		45.518	0.150	0.000	0.02			5.5
13.000	PS35		47.194	0.129	0.000	0.54			11.3
13.001	PS36		47.131	0.281	0.000	0.49			27.2
13.002	PS37		47.048	0.548	0.000	0.83			50.2
13.003	PS38		46.895	0.595	0.000	1.18			52.6
13.004	PS39		46.812	0.612	0.000	0.96			79.8
13.005	PS40		45.892	0.692	0.000	1.48			124.0
10.006	SS11		45.518	0.670	0.000	0.04			9.3
1.012	Southern Pond		45.518	1.068	0.000	0.20			9.2
1.013	SS12-FC		45.868	1.693	0.000	0.15			2.5

PN	US/MH Name	Status	Level Exceeded
1.007	SS4	SURCHARGED	
7.000	PS15	OK	
1.008	SS5	SURCHARGED	
8.000	PS16	OK	
1.009	SS6	SURCHARGED	
1.010	SS7	SURCHARGED	
9.000	PS17	SURCHARGED	
9.001	PS18	FLOOD RISK	
9.002	PS19	SURCHARGED	
9.003	PS20	SURCHARGED	
9.004	PS21	SURCHARGED	
9.005	PS22	SURCHARGED	
9.006	PS23	OK	
1.011	SS8	SURCHARGED	
10.000	PS24	OK	
10.001	PS25	SURCHARGED	
10.002	PS26	OK	
11.000	PS27	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
10.003	PS28	OK	
12.000	PS29	OK	
12.001	PS30	OK	
12.002	PS31	SURCHARGED	
10.004	SS9	OK	
10.005	SS10	SURCHARGED	
13.000	PS35	SURCHARGED	
13.001	PS36	SURCHARGED	
13.002	PS37	FLOOD RISK	
13.003	PS38	FLOOD RISK	
13.004	PS39	FLOOD RISK	
13.005	PS40	SURCHARGED	
10.006	SS11	SURCHARGED	
1.012	Southern Pond	SURCHARGED	
1.013	SS12-FC	SURCHARGED	

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APPENDIX H.3 – MICRODRAINAGE CALCULATIONS 1 IN 100CC YEAR EVENT (SUBMERGED OUTFALL). NORTHERN CATCHMENT

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	PS32	15 Winter	100	+45%				
1.001	PS33	15 Winter	100	+45%				
1.002	PS34	15 Winter	100	+45%				
1.003	PS45	15 Winter	100	+45%	100/15 Summer			
1.004	PS46	15 Winter	100	+45%				
1.005	PS47	7200 Winter	100	+45%	100/15 Summer			
2.000	PS41	15 Winter	100	+45%	100/15 Summer			
2.001	PS42	15 Winter	100	+45%				
3.000	PS43	15 Winter	100	+45%	100/15 Summer			
3.001	PS44	15 Winter	100	+45%				
2.002	SN13	7200 Winter	100	+45%				
1.006	SN14	7200 Winter	100	+45%	100/15 Summer			
4.000	PS48	7200 Winter	100	+45%	100/15 Summer			
1.007	SN15	7200 Winter	100	+45%	100/15 Summer			
5.000	PS49	15 Winter	100	+45%	100/15 Winter			
5.001	PS50	15 Winter	100	+45%				
5.002	PS51	7200 Winter	100	+45%	100/15 Summer			
1.008	Northern Pond	7200 Winter	100	+45%	100/15 Summer			

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 3

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	PS32	47.083	-0.067	0.000	0.58			13.7	OK
1.001	PS33	46.667	-0.033	0.000	0.94			27.7	OK
1.002	PS34	45.370	-0.030	0.000	0.85			49.7	OK
1.003	PS45	45.142	0.042	0.000	1.11			90.7	SURCHARGED
1.004	PS46	44.912	-0.003	0.000	0.68			96.3	OK
1.005	PS47	44.866	0.416	0.000	0.02			1.4	SURCHARGED
2.000	PS41	46.508	0.108	0.000	1.03			15.5	SURCHARGED
2.001	PS42	45.157	-0.043	0.000	0.85			15.6	OK
3.000	PS43	45.999	0.149	0.000	1.76			22.8	SURCHARGED
3.001	PS44	45.738	-0.116	0.000	0.47			43.6	OK
2.002	SN13	44.866	-0.093	0.000	0.01			1.0	OK
1.006	SN14	44.866	0.485	0.000	0.01			2.7	SURCHARGED
4.000	PS48	44.866	0.510	0.000	0.02			0.9	SURCHARGED
1.007	SN15	44.866	0.663	0.000	0.02			3.6	SURCHARGED
5.000	PS49	45.468	0.018	0.000	1.03			40.9	SURCHARGED
5.001	PS50	45.127	-0.102	0.000	0.57			40.9	OK
5.002	PS51	44.866	0.666	0.000	0.02			1.0	FLOOD RISK
1.008	Northern Pond	44.866	1.066	0.000	0.08			1.0	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	PS32	
1.001	PS33	
1.002	PS34	
1.003	PS45	
1.004	PS46	
1.005	PS47	
2.000	PS41	
2.001	PS42	
3.000	PS43	
3.001	PS44	
2.002	SN13	
1.006	SN14	
4.000	PS48	
1.007	SN15	
5.000	PS49	
5.001	PS50	
5.002	PS51	
1.008	Northern Pond	

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APPENDIX H.4 – MICRODRAINAGE CALCULATIONS 1 IN 100CC YEAR EVENT (SUBMERGED OUTFALL). SOUTHERN CATCHMENT

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.522	4-8	0.580	8-12	0.006

Total Area Contributing (ha) = 1.108

Total Pipe Volume (m³) = 61.440

Network Design Table for Surface Network 2

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	26.103	0.174	150.0	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	15.284	0.102	149.8	0.013	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	23.880	0.874	27.3	0.019	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	18.730	0.650	28.8	0.011	5.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.53	47.900	0.027	0.0	0.0	0.0	0.82	14.5	3.7
1.001	50.00	5.84	47.726	0.040	0.0	0.0	0.0	0.82	14.5	5.4
1.002	50.00	6.00	47.549	0.059	0.0	0.0	0.0	2.51	99.9	8.0
2.000	50.00	5.22	47.450	0.011	0.0	0.0	0.0	1.44	11.3	1.5

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.003	10.160	0.192	52.9	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	30.478	0.742	41.1	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	29.775	0.381	78.1	0.011	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	31.317	0.350	89.5	0.029	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	11.018	0.100	110.2	0.034	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.002	13.952	0.900	15.5	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.003	13.640	0.123	110.9	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	17.186	0.128	134.3	0.038	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.006	12.311	0.204	60.3	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	
5.000	36.767	0.900	40.9	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	12.055	0.305	39.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	27.045	0.450	60.1	0.045	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.001	9.519	0.155	61.4	0.029	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	41.607	0.375	111.0	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.003	50.00	6.10	46.675	0.081	0.0	0.0	0.0	1.80	71.7	11.0
3.000	50.00	5.32	47.300	0.033	0.0	0.0	0.0	1.57	27.8	4.5
1.004	50.00	6.37	46.408	0.125	0.0	0.0	0.0	1.78	125.8	16.9
4.000	50.00	5.49	47.650	0.029	0.0	0.0	0.0	1.06	18.8	3.9
4.001	50.00	5.64	47.225	0.063	0.0	0.0	0.0	1.24	49.5	8.5
4.002	50.00	5.71	47.125	0.092	0.0	0.0	0.0	3.34	132.8	12.5
4.003	50.00	5.89	46.225	0.119	0.0	0.0	0.0	1.24	49.3	16.1
1.005	50.00	6.55	45.927	0.282	0.0	0.0	0.0	1.63	204.5	38.2
1.006	50.00	6.63	45.799	0.282	0.0	0.0	0.0	2.43	305.8	38.2
5.000	50.00	5.39	47.050	0.020	0.0	0.0	0.0	1.58	27.9	2.7
5.001	50.00	5.51	46.150	0.020	0.0	0.0	0.0	1.61	28.4	2.7
6.000	50.00	5.27	46.375	0.045	0.0	0.0	0.0	1.69	67.2	6.1
6.001	50.00	5.36	45.925	0.074	0.0	0.0	0.0	1.67	66.5	10.0
1.007	50.00	7.02	45.595	0.376	0.0	0.0	0.0	1.79	225.1	50.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
7.000	27.389	0.780	35.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.008	11.933	0.181	65.9	0.008	0.00	0.0	0.600	o	400	Pipe/Conduit	
8.000	27.345	0.461	59.3	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	15.810	0.139	113.7	0.016	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.010	10.499	0.150	70.0	0.023	0.00	0.0	0.600	o	450	Pipe/Conduit	
9.000	24.152	0.350	69.0	0.013	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	3.309	0.022	150.4	0.036	0.00	0.0	0.600	o	150	Pipe/Conduit	
9.002	5.710	0.038	150.3	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.003	3.438	0.023	149.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.004	7.310	0.217	33.7	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.005	15.565	0.104	150.0	0.008	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.006	15.655	0.783	20.0	0.038	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.011	73.616	0.650	113.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
10.000	15.199	0.350	43.4	0.011	5.00	0.0	0.600	o	150	Pipe/Conduit	
10.001	17.652	0.150	117.7	0.019	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
7.000	50.00	5.35	46.300	0.008	0.0	0.0	0.0	1.31	10.3	1.1
1.008	50.00	7.11	45.220	0.392	0.0	0.0	0.0	2.33	292.5	53.1
8.000	50.00	5.35	45.750	0.026	0.0	0.0	0.0	1.31	23.1	3.5
1.009	50.00	7.26	45.039	0.434	0.0	0.0	0.0	1.77	222.3	58.8
1.010	50.00	7.33	44.850	0.457	0.0	0.0	0.0	2.43	386.9	61.9
9.000	50.00	5.33	46.550	0.013	0.0	0.0	0.0	1.21	21.4	1.8
9.001	50.00	5.40	46.200	0.049	0.0	0.0	0.0	0.82	14.4	6.6
9.002	50.00	5.49	46.103	0.055	0.0	0.0	0.0	1.06	42.3	7.4
9.003	50.00	5.54	46.065	0.055	0.0	0.0	0.0	1.07	42.4	7.4
9.004	50.00	5.60	46.042	0.072	0.0	0.0	0.0	2.26	89.9	9.7
9.005	50.00	5.84	45.825	0.080	0.0	0.0	0.0	1.07	42.4	10.8
9.006	50.00	5.93	45.721	0.118	0.0	0.0	0.0	2.94	116.9	16.0
1.011	50.00	7.97	44.700	0.575	0.0	0.0	0.0	1.91	303.7	77.9
10.000	50.00	5.17	46.850	0.011	0.0	0.0	0.0	1.53	27.1	1.5
10.001	50.00	5.48	46.500	0.030	0.0	0.0	0.0	0.93	16.4	4.1

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
10.002	10.001	0.100	100.0	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
11.000	15.126	0.300	50.4	0.013	5.00	0.0	0.600	o	100	Pipe/Conduit	
10.003	25.716	0.782	32.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
12.000	28.465	1.423	20.0	0.065	5.00	0.0	0.600	o	225	Pipe/Conduit	
12.001	22.754	0.446	51.0	0.054	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.002	10.502	0.082	128.1	0.037	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.004	24.908	0.249	100.0	0.029	0.00	0.0	0.600	o	400	Pipe/Conduit	
10.005	29.515	0.518	57.0	0.032	0.00	0.0	0.600	o	400	Pipe/Conduit	
13.000	13.136	0.215	61.1	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
13.001	26.330	0.350	75.2	0.025	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.002	10.557	0.200	52.8	0.039	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.003	7.821	0.100	78.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.004	33.322	0.950	35.1	0.051	0.00	0.0	0.600	o	225	Pipe/Conduit	
13.005	6.349	0.352	18.0	0.073	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.006	32.945	0.398	82.8	0.000	0.00	0.0	0.600	o	400	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
10.002	50.00	5.61	46.275	0.058	0.0	0.0	0.0	1.31	52.0	7.9
11.000	50.00	5.23	46.600	0.013	0.0	0.0	0.0	1.09	8.5	1.8
10.003	50.00	5.80	46.175	0.071	0.0	0.0	0.0	2.29	91.0	9.6
12.000	50.00	5.16	47.368	0.065	0.0	0.0	0.0	2.94	116.9	8.8
12.001	50.00	5.33	45.850	0.119	0.0	0.0	0.0	2.21	156.0	16.1
12.002	50.00	5.46	45.400	0.156	0.0	0.0	0.0	1.39	98.1	21.1
10.004	50.00	6.02	45.218	0.256	0.0	0.0	0.0	1.89	237.2	34.7
10.005	50.00	6.21	44.968	0.288	0.0	0.0	0.0	2.50	314.7	39.0
13.000	50.00	5.17	46.915	0.018	0.0	0.0	0.0	1.29	22.8	2.4
13.001	50.00	5.46	46.625	0.043	0.0	0.0	0.0	1.51	60.0	5.8
13.002	50.00	5.56	46.275	0.082	0.0	0.0	0.0	1.80	71.7	11.1
13.003	50.00	5.65	46.075	0.082	0.0	0.0	0.0	1.48	58.8	11.1
13.004	50.00	5.90	45.975	0.133	0.0	0.0	0.0	2.22	88.1	18.0
13.005	50.00	5.93	44.975	0.206	0.0	0.0	0.0	3.10	123.1	27.9
10.006	50.00	6.48	44.448	0.494	0.0	0.0	0.0	2.08	260.9	66.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.012	23.181	0.025	927.2	0.039	0.00	0.0	0.600	o	400	Pipe/Conduit	
1.013	11.289	0.125	90.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.012	50.00	8.60	44.050	1.108	0.0	0.0	0.0	0.61	76.9«	150.0
1.013	50.00	8.78	44.025	1.108	0.0	0.0	0.0	1.06	18.7«	150.0

Surcharged Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.013	Southern Outfall	44.589	43.900	0.000	0	0

Datum (m) 43.900 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
5	1.050	125	1.050	245	1.050	365	1.050	485	1.050	605	1.050
10	1.050	130	1.050	250	1.050	370	1.050	490	1.050	610	1.050
15	1.050	135	1.050	255	1.050	375	1.050	495	1.050	615	1.050
20	1.050	140	1.050	260	1.050	380	1.050	500	1.050	620	1.050
25	1.050	145	1.050	265	1.050	385	1.050	505	1.050	625	1.050
30	1.050	150	1.050	270	1.050	390	1.050	510	1.050	630	1.050
35	1.050	155	1.050	275	1.050	395	1.050	515	1.050	635	1.050
40	1.050	160	1.050	280	1.050	400	1.050	520	1.050	640	1.050
45	1.050	165	1.050	285	1.050	405	1.050	525	1.050	645	1.050
50	1.050	170	1.050	290	1.050	410	1.050	530	1.050	650	1.050
55	1.050	175	1.050	295	1.050	415	1.050	535	1.050	655	1.050
60	1.050	180	1.050	300	1.050	420	1.050	540	1.050	660	1.050
65	1.050	185	1.050	305	1.050	425	1.050	545	1.050	665	1.050
70	1.050	190	1.050	310	1.050	430	1.050	550	1.050	670	1.050
75	1.050	195	1.050	315	1.050	435	1.050	555	1.050	675	1.050
80	1.050	200	1.050	320	1.050	440	1.050	560	1.050	680	1.050
85	1.050	205	1.050	325	1.050	445	1.050	565	1.050	685	1.050
90	1.050	210	1.050	330	1.050	450	1.050	570	1.050	690	1.050
95	1.050	215	1.050	335	1.050	455	1.050	575	1.050	695	1.050
100	1.050	220	1.050	340	1.050	460	1.050	580	1.050	700	1.050
105	1.050	225	1.050	345	1.050	465	1.050	585	1.050	705	1.050
110	1.050	230	1.050	350	1.050	470	1.050	590	1.050	710	1.050
115	1.050	235	1.050	355	1.050	475	1.050	595	1.050	715	1.050
120	1.050	240	1.050	360	1.050	480	1.050	600	1.050	720	1.050

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Surcharged Outfall Details for Surface Network 2

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
725	1.050	975	1.050	1225	1.050	1475	1.050	1725	1.050	1975	1.050
730	1.050	980	1.050	1230	1.050	1480	1.050	1730	1.050	1980	1.050
735	1.050	985	1.050	1235	1.050	1485	1.050	1735	1.050	1985	1.050
740	1.050	990	1.050	1240	1.050	1490	1.050	1740	1.050	1990	1.050
745	1.050	995	1.050	1245	1.050	1495	1.050	1745	1.050	1995	1.050
750	1.050	1000	1.050	1250	1.050	1500	1.050	1750	1.050	2000	1.050
755	1.050	1005	1.050	1255	1.050	1505	1.050	1755	1.050	2005	1.050
760	1.050	1010	1.050	1260	1.050	1510	1.050	1760	1.050	2010	1.050
765	1.050	1015	1.050	1265	1.050	1515	1.050	1765	1.050	2015	1.050
770	1.050	1020	1.050	1270	1.050	1520	1.050	1770	1.050	2020	1.050
775	1.050	1025	1.050	1275	1.050	1525	1.050	1775	1.050	2025	1.050
780	1.050	1030	1.050	1280	1.050	1530	1.050	1780	1.050	2030	1.050
785	1.050	1035	1.050	1285	1.050	1535	1.050	1785	1.050	2035	1.050
790	1.050	1040	1.050	1290	1.050	1540	1.050	1790	1.050	2040	1.050
795	1.050	1045	1.050	1295	1.050	1545	1.050	1795	1.050	2045	1.050
800	1.050	1050	1.050	1300	1.050	1550	1.050	1800	1.050	2050	1.050
805	1.050	1055	1.050	1305	1.050	1555	1.050	1805	1.050	2055	1.050
810	1.050	1060	1.050	1310	1.050	1560	1.050	1810	1.050	2060	1.050
815	1.050	1065	1.050	1315	1.050	1565	1.050	1815	1.050	2065	1.050
820	1.050	1070	1.050	1320	1.050	1570	1.050	1820	1.050	2070	1.050
825	1.050	1075	1.050	1325	1.050	1575	1.050	1825	1.050	2075	1.050
830	1.050	1080	1.050	1330	1.050	1580	1.050	1830	1.050	2080	1.050
835	1.050	1085	1.050	1335	1.050	1585	1.050	1835	1.050	2085	1.050
840	1.050	1090	1.050	1340	1.050	1590	1.050	1840	1.050	2090	1.050
845	1.050	1095	1.050	1345	1.050	1595	1.050	1845	1.050	2095	1.050
850	1.050	1100	1.050	1350	1.050	1600	1.050	1850	1.050	2100	1.050
855	1.050	1105	1.050	1355	1.050	1605	1.050	1855	1.050	2105	1.050
860	1.050	1110	1.050	1360	1.050	1610	1.050	1860	1.050	2110	1.050
865	1.050	1115	1.050	1365	1.050	1615	1.050	1865	1.050	2115	1.050
870	1.050	1120	1.050	1370	1.050	1620	1.050	1870	1.050	2120	1.050
875	1.050	1125	1.050	1375	1.050	1625	1.050	1875	1.050	2125	1.050
880	1.050	1130	1.050	1380	1.050	1630	1.050	1880	1.050	2130	1.050
885	1.050	1135	1.050	1385	1.050	1635	1.050	1885	1.050	2135	1.050
890	1.050	1140	1.050	1390	1.050	1640	1.050	1890	1.050	2140	1.050
895	1.050	1145	1.050	1395	1.050	1645	1.050	1895	1.050	2145	1.050
900	1.050	1150	1.050	1400	1.050	1650	1.050	1900	1.050	2150	1.050
905	1.050	1155	1.050	1405	1.050	1655	1.050	1905	1.050	2155	1.050
910	1.050	1160	1.050	1410	1.050	1660	1.050	1910	1.050	2160	1.050
915	1.050	1165	1.050	1415	1.050	1665	1.050	1915	1.050	2165	1.050
920	1.050	1170	1.050	1420	1.050	1670	1.050	1920	1.050	2170	1.050
925	1.050	1175	1.050	1425	1.050	1675	1.050	1925	1.050	2175	1.050
930	1.050	1180	1.050	1430	1.050	1680	1.050	1930	1.050	2180	1.050
935	1.050	1185	1.050	1435	1.050	1685	1.050	1935	1.050	2185	1.050
940	1.050	1190	1.050	1440	1.050	1690	1.050	1940	1.050	2190	1.050
945	1.050	1195	1.050	1445	1.050	1695	1.050	1945	1.050	2195	1.050
950	1.050	1200	1.050	1450	1.050	1700	1.050	1950	1.050	2200	1.050
955	1.050	1205	1.050	1455	1.050	1705	1.050	1955	1.050	2205	1.050
960	1.050	1210	1.050	1460	1.050	1710	1.050	1960	1.050	2210	1.050
965	1.050	1215	1.050	1465	1.050	1715	1.050	1965	1.050	2215	1.050
970	1.050	1220	1.050	1470	1.050	1720	1.050	1970	1.050	2220	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
2225	1.050	2475	1.050	2725	1.050	2975	1.050	3225	1.050	3475	1.050
2230	1.050	2480	1.050	2730	1.050	2980	1.050	3230	1.050	3480	1.050
2235	1.050	2485	1.050	2735	1.050	2985	1.050	3235	1.050	3485	1.050
2240	1.050	2490	1.050	2740	1.050	2990	1.050	3240	1.050	3490	1.050
2245	1.050	2495	1.050	2745	1.050	2995	1.050	3245	1.050	3495	1.050
2250	1.050	2500	1.050	2750	1.050	3000	1.050	3250	1.050	3500	1.050
2255	1.050	2505	1.050	2755	1.050	3005	1.050	3255	1.050	3505	1.050
2260	1.050	2510	1.050	2760	1.050	3010	1.050	3260	1.050	3510	1.050
2265	1.050	2515	1.050	2765	1.050	3015	1.050	3265	1.050	3515	1.050
2270	1.050	2520	1.050	2770	1.050	3020	1.050	3270	1.050	3520	1.050
2275	1.050	2525	1.050	2775	1.050	3025	1.050	3275	1.050	3525	1.050
2280	1.050	2530	1.050	2780	1.050	3030	1.050	3280	1.050	3530	1.050
2285	1.050	2535	1.050	2785	1.050	3035	1.050	3285	1.050	3535	1.050
2290	1.050	2540	1.050	2790	1.050	3040	1.050	3290	1.050	3540	1.050
2295	1.050	2545	1.050	2795	1.050	3045	1.050	3295	1.050	3545	1.050
2300	1.050	2550	1.050	2800	1.050	3050	1.050	3300	1.050	3550	1.050
2305	1.050	2555	1.050	2805	1.050	3055	1.050	3305	1.050	3555	1.050
2310	1.050	2560	1.050	2810	1.050	3060	1.050	3310	1.050	3560	1.050
2315	1.050	2565	1.050	2815	1.050	3065	1.050	3315	1.050	3565	1.050
2320	1.050	2570	1.050	2820	1.050	3070	1.050	3320	1.050	3570	1.050
2325	1.050	2575	1.050	2825	1.050	3075	1.050	3325	1.050	3575	1.050
2330	1.050	2580	1.050	2830	1.050	3080	1.050	3330	1.050	3580	1.050
2335	1.050	2585	1.050	2835	1.050	3085	1.050	3335	1.050	3585	1.050
2340	1.050	2590	1.050	2840	1.050	3090	1.050	3340	1.050	3590	1.050
2345	1.050	2595	1.050	2845	1.050	3095	1.050	3345	1.050	3595	1.050
2350	1.050	2600	1.050	2850	1.050	3100	1.050	3350	1.050	3600	1.050
2355	1.050	2605	1.050	2855	1.050	3105	1.050	3355	1.050	3605	1.050
2360	1.050	2610	1.050	2860	1.050	3110	1.050	3360	1.050	3610	1.050
2365	1.050	2615	1.050	2865	1.050	3115	1.050	3365	1.050	3615	1.050
2370	1.050	2620	1.050	2870	1.050	3120	1.050	3370	1.050	3620	1.050
2375	1.050	2625	1.050	2875	1.050	3125	1.050	3375	1.050	3625	1.050
2380	1.050	2630	1.050	2880	1.050	3130	1.050	3380	1.050	3630	1.050
2385	1.050	2635	1.050	2885	1.050	3135	1.050	3385	1.050	3635	1.050
2390	1.050	2640	1.050	2890	1.050	3140	1.050	3390	1.050	3640	1.050
2395	1.050	2645	1.050	2895	1.050	3145	1.050	3395	1.050	3645	1.050
2400	1.050	2650	1.050	2900	1.050	3150	1.050	3400	1.050	3650	1.050
2405	1.050	2655	1.050	2905	1.050	3155	1.050	3405	1.050	3655	1.050
2410	1.050	2660	1.050	2910	1.050	3160	1.050	3410	1.050	3660	1.050
2415	1.050	2665	1.050	2915	1.050	3165	1.050	3415	1.050	3665	1.050
2420	1.050	2670	1.050	2920	1.050	3170	1.050	3420	1.050	3670	1.050
2425	1.050	2675	1.050	2925	1.050	3175	1.050	3425	1.050	3675	1.050
2430	1.050	2680	1.050	2930	1.050	3180	1.050	3430	1.050	3680	1.050
2435	1.050	2685	1.050	2935	1.050	3185	1.050	3435	1.050	3685	1.050
2440	1.050	2690	1.050	2940	1.050	3190	1.050	3440	1.050	3690	1.050
2445	1.050	2695	1.050	2945	1.050	3195	1.050	3445	1.050	3695	1.050
2450	1.050	2700	1.050	2950	1.050	3200	1.050	3450	1.050	3700	1.050
2455	1.050	2705	1.050	2955	1.050	3205	1.050	3455	1.050	3705	1.050
2460	1.050	2710	1.050	2960	1.050	3210	1.050	3460	1.050	3710	1.050
2465	1.050	2715	1.050	2965	1.050	3215	1.050	3465	1.050	3715	1.050
2470	1.050	2720	1.050	2970	1.050	3220	1.050	3470	1.050	3720	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
3725	1.050	3975	1.050	4225	1.050	4475	1.050	4725	1.050	4975	1.050
3730	1.050	3980	1.050	4230	1.050	4480	1.050	4730	1.050	4980	1.050
3735	1.050	3985	1.050	4235	1.050	4485	1.050	4735	1.050	4985	1.050
3740	1.050	3990	1.050	4240	1.050	4490	1.050	4740	1.050	4990	1.050
3745	1.050	3995	1.050	4245	1.050	4495	1.050	4745	1.050	4995	1.050
3750	1.050	4000	1.050	4250	1.050	4500	1.050	4750	1.050	5000	1.050
3755	1.050	4005	1.050	4255	1.050	4505	1.050	4755	1.050	5005	1.050
3760	1.050	4010	1.050	4260	1.050	4510	1.050	4760	1.050	5010	1.050
3765	1.050	4015	1.050	4265	1.050	4515	1.050	4765	1.050	5015	1.050
3770	1.050	4020	1.050	4270	1.050	4520	1.050	4770	1.050	5020	1.050
3775	1.050	4025	1.050	4275	1.050	4525	1.050	4775	1.050	5025	1.050
3780	1.050	4030	1.050	4280	1.050	4530	1.050	4780	1.050	5030	1.050
3785	1.050	4035	1.050	4285	1.050	4535	1.050	4785	1.050	5035	1.050
3790	1.050	4040	1.050	4290	1.050	4540	1.050	4790	1.050	5040	1.050
3795	1.050	4045	1.050	4295	1.050	4545	1.050	4795	1.050	5045	1.050
3800	1.050	4050	1.050	4300	1.050	4550	1.050	4800	1.050	5050	1.050
3805	1.050	4055	1.050	4305	1.050	4555	1.050	4805	1.050	5055	1.050
3810	1.050	4060	1.050	4310	1.050	4560	1.050	4810	1.050	5060	1.050
3815	1.050	4065	1.050	4315	1.050	4565	1.050	4815	1.050	5065	1.050
3820	1.050	4070	1.050	4320	1.050	4570	1.050	4820	1.050	5070	1.050
3825	1.050	4075	1.050	4325	1.050	4575	1.050	4825	1.050	5075	1.050
3830	1.050	4080	1.050	4330	1.050	4580	1.050	4830	1.050	5080	1.050
3835	1.050	4085	1.050	4335	1.050	4585	1.050	4835	1.050	5085	1.050
3840	1.050	4090	1.050	4340	1.050	4590	1.050	4840	1.050	5090	1.050
3845	1.050	4095	1.050	4345	1.050	4595	1.050	4845	1.050	5095	1.050
3850	1.050	4100	1.050	4350	1.050	4600	1.050	4850	1.050	5100	1.050
3855	1.050	4105	1.050	4355	1.050	4605	1.050	4855	1.050	5105	1.050
3860	1.050	4110	1.050	4360	1.050	4610	1.050	4860	1.050	5110	1.050
3865	1.050	4115	1.050	4365	1.050	4615	1.050	4865	1.050	5115	1.050
3870	1.050	4120	1.050	4370	1.050	4620	1.050	4870	1.050	5120	1.050
3875	1.050	4125	1.050	4375	1.050	4625	1.050	4875	1.050	5125	1.050
3880	1.050	4130	1.050	4380	1.050	4630	1.050	4880	1.050	5130	1.050
3885	1.050	4135	1.050	4385	1.050	4635	1.050	4885	1.050	5135	1.050
3890	1.050	4140	1.050	4390	1.050	4640	1.050	4890	1.050	5140	1.050
3895	1.050	4145	1.050	4395	1.050	4645	1.050	4895	1.050	5145	1.050
3900	1.050	4150	1.050	4400	1.050	4650	1.050	4900	1.050	5150	1.050
3905	1.050	4155	1.050	4405	1.050	4655	1.050	4905	1.050	5155	1.050
3910	1.050	4160	1.050	4410	1.050	4660	1.050	4910	1.050	5160	1.050
3915	1.050	4165	1.050	4415	1.050	4665	1.050	4915	1.050	5165	1.050
3920	1.050	4170	1.050	4420	1.050	4670	1.050	4920	1.050	5170	1.050
3925	1.050	4175	1.050	4425	1.050	4675	1.050	4925	1.050	5175	1.050
3930	1.050	4180	1.050	4430	1.050	4680	1.050	4930	1.050	5180	1.050
3935	1.050	4185	1.050	4435	1.050	4685	1.050	4935	1.050	5185	1.050
3940	1.050	4190	1.050	4440	1.050	4690	1.050	4940	1.050	5190	1.050
3945	1.050	4195	1.050	4445	1.050	4695	1.050	4945	1.050	5195	1.050
3950	1.050	4200	1.050	4450	1.050	4700	1.050	4950	1.050	5200	1.050
3955	1.050	4205	1.050	4455	1.050	4705	1.050	4955	1.050	5205	1.050
3960	1.050	4210	1.050	4460	1.050	4710	1.050	4960	1.050	5210	1.050
3965	1.050	4215	1.050	4465	1.050	4715	1.050	4965	1.050	5215	1.050
3970	1.050	4220	1.050	4470	1.050	4720	1.050	4970	1.050	5220	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
5225	1.050	5475	1.050	5725	1.050	5975	1.050	6225	1.050	6475	1.050
5230	1.050	5480	1.050	5730	1.050	5980	1.050	6230	1.050	6480	1.050
5235	1.050	5485	1.050	5735	1.050	5985	1.050	6235	1.050	6485	1.050
5240	1.050	5490	1.050	5740	1.050	5990	1.050	6240	1.050	6490	1.050
5245	1.050	5495	1.050	5745	1.050	5995	1.050	6245	1.050	6495	1.050
5250	1.050	5500	1.050	5750	1.050	6000	1.050	6250	1.050	6500	1.050
5255	1.050	5505	1.050	5755	1.050	6005	1.050	6255	1.050	6505	1.050
5260	1.050	5510	1.050	5760	1.050	6010	1.050	6260	1.050	6510	1.050
5265	1.050	5515	1.050	5765	1.050	6015	1.050	6265	1.050	6515	1.050
5270	1.050	5520	1.050	5770	1.050	6020	1.050	6270	1.050	6520	1.050
5275	1.050	5525	1.050	5775	1.050	6025	1.050	6275	1.050	6525	1.050
5280	1.050	5530	1.050	5780	1.050	6030	1.050	6280	1.050	6530	1.050
5285	1.050	5535	1.050	5785	1.050	6035	1.050	6285	1.050	6535	1.050
5290	1.050	5540	1.050	5790	1.050	6040	1.050	6290	1.050	6540	1.050
5295	1.050	5545	1.050	5795	1.050	6045	1.050	6295	1.050	6545	1.050
5300	1.050	5550	1.050	5800	1.050	6050	1.050	6300	1.050	6550	1.050
5305	1.050	5555	1.050	5805	1.050	6055	1.050	6305	1.050	6555	1.050
5310	1.050	5560	1.050	5810	1.050	6060	1.050	6310	1.050	6560	1.050
5315	1.050	5565	1.050	5815	1.050	6065	1.050	6315	1.050	6565	1.050
5320	1.050	5570	1.050	5820	1.050	6070	1.050	6320	1.050	6570	1.050
5325	1.050	5575	1.050	5825	1.050	6075	1.050	6325	1.050	6575	1.050
5330	1.050	5580	1.050	5830	1.050	6080	1.050	6330	1.050	6580	1.050
5335	1.050	5585	1.050	5835	1.050	6085	1.050	6335	1.050	6585	1.050
5340	1.050	5590	1.050	5840	1.050	6090	1.050	6340	1.050	6590	1.050
5345	1.050	5595	1.050	5845	1.050	6095	1.050	6345	1.050	6595	1.050
5350	1.050	5600	1.050	5850	1.050	6100	1.050	6350	1.050	6600	1.050
5355	1.050	5605	1.050	5855	1.050	6105	1.050	6355	1.050	6605	1.050
5360	1.050	5610	1.050	5860	1.050	6110	1.050	6360	1.050	6610	1.050
5365	1.050	5615	1.050	5865	1.050	6115	1.050	6365	1.050	6615	1.050
5370	1.050	5620	1.050	5870	1.050	6120	1.050	6370	1.050	6620	1.050
5375	1.050	5625	1.050	5875	1.050	6125	1.050	6375	1.050	6625	1.050
5380	1.050	5630	1.050	5880	1.050	6130	1.050	6380	1.050	6630	1.050
5385	1.050	5635	1.050	5885	1.050	6135	1.050	6385	1.050	6635	1.050
5390	1.050	5640	1.050	5890	1.050	6140	1.050	6390	1.050	6640	1.050
5395	1.050	5645	1.050	5895	1.050	6145	1.050	6395	1.050	6645	1.050
5400	1.050	5650	1.050	5900	1.050	6150	1.050	6400	1.050	6650	1.050
5405	1.050	5655	1.050	5905	1.050	6155	1.050	6405	1.050	6655	1.050
5410	1.050	5660	1.050	5910	1.050	6160	1.050	6410	1.050	6660	1.050
5415	1.050	5665	1.050	5915	1.050	6165	1.050	6415	1.050	6665	1.050
5420	1.050	5670	1.050	5920	1.050	6170	1.050	6420	1.050	6670	1.050
5425	1.050	5675	1.050	5925	1.050	6175	1.050	6425	1.050	6675	1.050
5430	1.050	5680	1.050	5930	1.050	6180	1.050	6430	1.050	6680	1.050
5435	1.050	5685	1.050	5935	1.050	6185	1.050	6435	1.050	6685	1.050
5440	1.050	5690	1.050	5940	1.050	6190	1.050	6440	1.050	6690	1.050
5445	1.050	5695	1.050	5945	1.050	6195	1.050	6445	1.050	6695	1.050
5450	1.050	5700	1.050	5950	1.050	6200	1.050	6450	1.050	6700	1.050
5455	1.050	5705	1.050	5955	1.050	6205	1.050	6455	1.050	6705	1.050
5460	1.050	5710	1.050	5960	1.050	6210	1.050	6460	1.050	6710	1.050
5465	1.050	5715	1.050	5965	1.050	6215	1.050	6465	1.050	6715	1.050
5470	1.050	5720	1.050	5970	1.050	6220	1.050	6470	1.050	6720	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
6725	1.050	6975	1.050	7225	1.050	7475	1.050	7725	1.050	7975	1.050
6730	1.050	6980	1.050	7230	1.050	7480	1.050	7730	1.050	7980	1.050
6735	1.050	6985	1.050	7235	1.050	7485	1.050	7735	1.050	7985	1.050
6740	1.050	6990	1.050	7240	1.050	7490	1.050	7740	1.050	7990	1.050
6745	1.050	6995	1.050	7245	1.050	7495	1.050	7745	1.050	7995	1.050
6750	1.050	7000	1.050	7250	1.050	7500	1.050	7750	1.050	8000	1.050
6755	1.050	7005	1.050	7255	1.050	7505	1.050	7755	1.050	8005	1.050
6760	1.050	7010	1.050	7260	1.050	7510	1.050	7760	1.050	8010	1.050
6765	1.050	7015	1.050	7265	1.050	7515	1.050	7765	1.050	8015	1.050
6770	1.050	7020	1.050	7270	1.050	7520	1.050	7770	1.050	8020	1.050
6775	1.050	7025	1.050	7275	1.050	7525	1.050	7775	1.050	8025	1.050
6780	1.050	7030	1.050	7280	1.050	7530	1.050	7780	1.050	8030	1.050
6785	1.050	7035	1.050	7285	1.050	7535	1.050	7785	1.050	8035	1.050
6790	1.050	7040	1.050	7290	1.050	7540	1.050	7790	1.050	8040	1.050
6795	1.050	7045	1.050	7295	1.050	7545	1.050	7795	1.050	8045	1.050
6800	1.050	7050	1.050	7300	1.050	7550	1.050	7800	1.050	8050	1.050
6805	1.050	7055	1.050	7305	1.050	7555	1.050	7805	1.050	8055	1.050
6810	1.050	7060	1.050	7310	1.050	7560	1.050	7810	1.050	8060	1.050
6815	1.050	7065	1.050	7315	1.050	7565	1.050	7815	1.050	8065	1.050
6820	1.050	7070	1.050	7320	1.050	7570	1.050	7820	1.050	8070	1.050
6825	1.050	7075	1.050	7325	1.050	7575	1.050	7825	1.050	8075	1.050
6830	1.050	7080	1.050	7330	1.050	7580	1.050	7830	1.050	8080	1.050
6835	1.050	7085	1.050	7335	1.050	7585	1.050	7835	1.050	8085	1.050
6840	1.050	7090	1.050	7340	1.050	7590	1.050	7840	1.050	8090	1.050
6845	1.050	7095	1.050	7345	1.050	7595	1.050	7845	1.050	8095	1.050
6850	1.050	7100	1.050	7350	1.050	7600	1.050	7850	1.050	8100	1.050
6855	1.050	7105	1.050	7355	1.050	7605	1.050	7855	1.050	8105	1.050
6860	1.050	7110	1.050	7360	1.050	7610	1.050	7860	1.050	8110	1.050
6865	1.050	7115	1.050	7365	1.050	7615	1.050	7865	1.050	8115	1.050
6870	1.050	7120	1.050	7370	1.050	7620	1.050	7870	1.050	8120	1.050
6875	1.050	7125	1.050	7375	1.050	7625	1.050	7875	1.050	8125	1.050
6880	1.050	7130	1.050	7380	1.050	7630	1.050	7880	1.050	8130	1.050
6885	1.050	7135	1.050	7385	1.050	7635	1.050	7885	1.050	8135	1.050
6890	1.050	7140	1.050	7390	1.050	7640	1.050	7890	1.050	8140	1.050
6895	1.050	7145	1.050	7395	1.050	7645	1.050	7895	1.050	8145	1.050
6900	1.050	7150	1.050	7400	1.050	7650	1.050	7900	1.050	8150	1.050
6905	1.050	7155	1.050	7405	1.050	7655	1.050	7905	1.050	8155	1.050
6910	1.050	7160	1.050	7410	1.050	7660	1.050	7910	1.050	8160	1.050
6915	1.050	7165	1.050	7415	1.050	7665	1.050	7915	1.050	8165	1.050
6920	1.050	7170	1.050	7420	1.050	7670	1.050	7920	1.050	8170	1.050
6925	1.050	7175	1.050	7425	1.050	7675	1.050	7925	1.050	8175	1.050
6930	1.050	7180	1.050	7430	1.050	7680	1.050	7930	1.050	8180	1.050
6935	1.050	7185	1.050	7435	1.050	7685	1.050	7935	1.050	8185	1.050
6940	1.050	7190	1.050	7440	1.050	7690	1.050	7940	1.050	8190	1.050
6945	1.050	7195	1.050	7445	1.050	7695	1.050	7945	1.050	8195	1.050
6950	1.050	7200	1.050	7450	1.050	7700	1.050	7950	1.050	8200	1.050
6955	1.050	7205	1.050	7455	1.050	7705	1.050	7955	1.050	8205	1.050
6960	1.050	7210	1.050	7460	1.050	7710	1.050	7960	1.050	8210	1.050
6965	1.050	7215	1.050	7465	1.050	7715	1.050	7965	1.050	8215	1.050
6970	1.050	7220	1.050	7470	1.050	7720	1.050	7970	1.050	8220	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
8225	1.050	8475	1.050	8725	1.050	8975	1.050	9225	1.050	9475	1.050
8230	1.050	8480	1.050	8730	1.050	8980	1.050	9230	1.050	9480	1.050
8235	1.050	8485	1.050	8735	1.050	8985	1.050	9235	1.050	9485	1.050
8240	1.050	8490	1.050	8740	1.050	8990	1.050	9240	1.050	9490	1.050
8245	1.050	8495	1.050	8745	1.050	8995	1.050	9245	1.050	9495	1.050
8250	1.050	8500	1.050	8750	1.050	9000	1.050	9250	1.050	9500	1.050
8255	1.050	8505	1.050	8755	1.050	9005	1.050	9255	1.050	9505	1.050
8260	1.050	8510	1.050	8760	1.050	9010	1.050	9260	1.050	9510	1.050
8265	1.050	8515	1.050	8765	1.050	9015	1.050	9265	1.050	9515	1.050
8270	1.050	8520	1.050	8770	1.050	9020	1.050	9270	1.050	9520	1.050
8275	1.050	8525	1.050	8775	1.050	9025	1.050	9275	1.050	9525	1.050
8280	1.050	8530	1.050	8780	1.050	9030	1.050	9280	1.050	9530	1.050
8285	1.050	8535	1.050	8785	1.050	9035	1.050	9285	1.050	9535	1.050
8290	1.050	8540	1.050	8790	1.050	9040	1.050	9290	1.050	9540	1.050
8295	1.050	8545	1.050	8795	1.050	9045	1.050	9295	1.050	9545	1.050
8300	1.050	8550	1.050	8800	1.050	9050	1.050	9300	1.050	9550	1.050
8305	1.050	8555	1.050	8805	1.050	9055	1.050	9305	1.050	9555	1.050
8310	1.050	8560	1.050	8810	1.050	9060	1.050	9310	1.050	9560	1.050
8315	1.050	8565	1.050	8815	1.050	9065	1.050	9315	1.050	9565	1.050
8320	1.050	8570	1.050	8820	1.050	9070	1.050	9320	1.050	9570	1.050
8325	1.050	8575	1.050	8825	1.050	9075	1.050	9325	1.050	9575	1.050
8330	1.050	8580	1.050	8830	1.050	9080	1.050	9330	1.050	9580	1.050
8335	1.050	8585	1.050	8835	1.050	9085	1.050	9335	1.050	9585	1.050
8340	1.050	8590	1.050	8840	1.050	9090	1.050	9340	1.050	9590	1.050
8345	1.050	8595	1.050	8845	1.050	9095	1.050	9345	1.050	9595	1.050
8350	1.050	8600	1.050	8850	1.050	9100	1.050	9350	1.050	9600	1.050
8355	1.050	8605	1.050	8855	1.050	9105	1.050	9355	1.050	9605	1.050
8360	1.050	8610	1.050	8860	1.050	9110	1.050	9360	1.050	9610	1.050
8365	1.050	8615	1.050	8865	1.050	9115	1.050	9365	1.050	9615	1.050
8370	1.050	8620	1.050	8870	1.050	9120	1.050	9370	1.050	9620	1.050
8375	1.050	8625	1.050	8875	1.050	9125	1.050	9375	1.050	9625	1.050
8380	1.050	8630	1.050	8880	1.050	9130	1.050	9380	1.050	9630	1.050
8385	1.050	8635	1.050	8885	1.050	9135	1.050	9385	1.050	9635	1.050
8390	1.050	8640	1.050	8890	1.050	9140	1.050	9390	1.050	9640	1.050
8395	1.050	8645	1.050	8895	1.050	9145	1.050	9395	1.050	9645	1.050
8400	1.050	8650	1.050	8900	1.050	9150	1.050	9400	1.050	9650	1.050
8405	1.050	8655	1.050	8905	1.050	9155	1.050	9405	1.050	9655	1.050
8410	1.050	8660	1.050	8910	1.050	9160	1.050	9410	1.050	9660	1.050
8415	1.050	8665	1.050	8915	1.050	9165	1.050	9415	1.050	9665	1.050
8420	1.050	8670	1.050	8920	1.050	9170	1.050	9420	1.050	9670	1.050
8425	1.050	8675	1.050	8925	1.050	9175	1.050	9425	1.050	9675	1.050
8430	1.050	8680	1.050	8930	1.050	9180	1.050	9430	1.050	9680	1.050
8435	1.050	8685	1.050	8935	1.050	9185	1.050	9435	1.050	9685	1.050
8440	1.050	8690	1.050	8940	1.050	9190	1.050	9440	1.050	9690	1.050
8445	1.050	8695	1.050	8945	1.050	9195	1.050	9445	1.050	9695	1.050
8450	1.050	8700	1.050	8950	1.050	9200	1.050	9450	1.050	9700	1.050
8455	1.050	8705	1.050	8955	1.050	9205	1.050	9455	1.050	9705	1.050
8460	1.050	8710	1.050	8960	1.050	9210	1.050	9460	1.050	9710	1.050
8465	1.050	8715	1.050	8965	1.050	9215	1.050	9465	1.050	9715	1.050
8470	1.050	8720	1.050	8970	1.050	9220	1.050	9470	1.050	9720	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
9725	1.050	9975	1.050	10225	1.050	10475	1.050	10725	1.050	10975	1.050
9730	1.050	9980	1.050	10230	1.050	10480	1.050	10730	1.050	10980	1.050
9735	1.050	9985	1.050	10235	1.050	10485	1.050	10735	1.050	10985	1.050
9740	1.050	9990	1.050	10240	1.050	10490	1.050	10740	1.050	10990	1.050
9745	1.050	9995	1.050	10245	1.050	10495	1.050	10745	1.050	10995	1.050
9750	1.050	10000	1.050	10250	1.050	10500	1.050	10750	1.050	11000	1.050
9755	1.050	10005	1.050	10255	1.050	10505	1.050	10755	1.050	11005	1.050
9760	1.050	10010	1.050	10260	1.050	10510	1.050	10760	1.050	11010	1.050
9765	1.050	10015	1.050	10265	1.050	10515	1.050	10765	1.050	11015	1.050
9770	1.050	10020	1.050	10270	1.050	10520	1.050	10770	1.050	11020	1.050
9775	1.050	10025	1.050	10275	1.050	10525	1.050	10775	1.050	11025	1.050
9780	1.050	10030	1.050	10280	1.050	10530	1.050	10780	1.050	11030	1.050
9785	1.050	10035	1.050	10285	1.050	10535	1.050	10785	1.050	11035	1.050
9790	1.050	10040	1.050	10290	1.050	10540	1.050	10790	1.050	11040	1.050
9795	1.050	10045	1.050	10295	1.050	10545	1.050	10795	1.050	11045	1.050
9800	1.050	10050	1.050	10300	1.050	10550	1.050	10800	1.050	11050	1.050
9805	1.050	10055	1.050	10305	1.050	10555	1.050	10805	1.050	11055	1.050
9810	1.050	10060	1.050	10310	1.050	10560	1.050	10810	1.050	11060	1.050
9815	1.050	10065	1.050	10315	1.050	10565	1.050	10815	1.050	11065	1.050
9820	1.050	10070	1.050	10320	1.050	10570	1.050	10820	1.050	11070	1.050
9825	1.050	10075	1.050	10325	1.050	10575	1.050	10825	1.050	11075	1.050
9830	1.050	10080	1.050	10330	1.050	10580	1.050	10830	1.050	11080	1.050
9835	1.050	10085	1.050	10335	1.050	10585	1.050	10835	1.050	11085	1.050
9840	1.050	10090	1.050	10340	1.050	10590	1.050	10840	1.050	11090	1.050
9845	1.050	10095	1.050	10345	1.050	10595	1.050	10845	1.050	11095	1.050
9850	1.050	10100	1.050	10350	1.050	10600	1.050	10850	1.050	11100	1.050
9855	1.050	10105	1.050	10355	1.050	10605	1.050	10855	1.050	11105	1.050
9860	1.050	10110	1.050	10360	1.050	10610	1.050	10860	1.050	11110	1.050
9865	1.050	10115	1.050	10365	1.050	10615	1.050	10865	1.050	11115	1.050
9870	1.050	10120	1.050	10370	1.050	10620	1.050	10870	1.050	11120	1.050
9875	1.050	10125	1.050	10375	1.050	10625	1.050	10875	1.050	11125	1.050
9880	1.050	10130	1.050	10380	1.050	10630	1.050	10880	1.050	11130	1.050
9885	1.050	10135	1.050	10385	1.050	10635	1.050	10885	1.050	11135	1.050
9890	1.050	10140	1.050	10390	1.050	10640	1.050	10890	1.050	11140	1.050
9895	1.050	10145	1.050	10395	1.050	10645	1.050	10895	1.050	11145	1.050
9900	1.050	10150	1.050	10400	1.050	10650	1.050	10900	1.050	11150	1.050
9905	1.050	10155	1.050	10405	1.050	10655	1.050	10905	1.050	11155	1.050
9910	1.050	10160	1.050	10410	1.050	10660	1.050	10910	1.050	11160	1.050
9915	1.050	10165	1.050	10415	1.050	10665	1.050	10915	1.050	11165	1.050
9920	1.050	10170	1.050	10420	1.050	10670	1.050	10920	1.050	11170	1.050
9925	1.050	10175	1.050	10425	1.050	10675	1.050	10925	1.050	11175	1.050
9930	1.050	10180	1.050	10430	1.050	10680	1.050	10930	1.050	11180	1.050
9935	1.050	10185	1.050	10435	1.050	10685	1.050	10935	1.050	11185	1.050
9940	1.050	10190	1.050	10440	1.050	10690	1.050	10940	1.050	11190	1.050
9945	1.050	10195	1.050	10445	1.050	10695	1.050	10945	1.050	11195	1.050
9950	1.050	10200	1.050	10450	1.050	10700	1.050	10950	1.050	11200	1.050
9955	1.050	10205	1.050	10455	1.050	10705	1.050	10955	1.050	11205	1.050
9960	1.050	10210	1.050	10460	1.050	10710	1.050	10960	1.050	11210	1.050
9965	1.050	10215	1.050	10465	1.050	10715	1.050	10965	1.050	11215	1.050
9970	1.050	10220	1.050	10470	1.050	10720	1.050	10970	1.050	11220	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
11225	1.050	11475	1.050	11725	1.050	11975	1.050	12225	1.050	12475	1.050
11230	1.050	11480	1.050	11730	1.050	11980	1.050	12230	1.050	12480	1.050
11235	1.050	11485	1.050	11735	1.050	11985	1.050	12235	1.050	12485	1.050
11240	1.050	11490	1.050	11740	1.050	11990	1.050	12240	1.050	12490	1.050
11245	1.050	11495	1.050	11745	1.050	11995	1.050	12245	1.050	12495	1.050
11250	1.050	11500	1.050	11750	1.050	12000	1.050	12250	1.050	12500	1.050
11255	1.050	11505	1.050	11755	1.050	12005	1.050	12255	1.050	12505	1.050
11260	1.050	11510	1.050	11760	1.050	12010	1.050	12260	1.050	12510	1.050
11265	1.050	11515	1.050	11765	1.050	12015	1.050	12265	1.050	12515	1.050
11270	1.050	11520	1.050	11770	1.050	12020	1.050	12270	1.050	12520	1.050
11275	1.050	11525	1.050	11775	1.050	12025	1.050	12275	1.050	12525	1.050
11280	1.050	11530	1.050	11780	1.050	12030	1.050	12280	1.050	12530	1.050
11285	1.050	11535	1.050	11785	1.050	12035	1.050	12285	1.050	12535	1.050
11290	1.050	11540	1.050	11790	1.050	12040	1.050	12290	1.050	12540	1.050
11295	1.050	11545	1.050	11795	1.050	12045	1.050	12295	1.050	12545	1.050
11300	1.050	11550	1.050	11800	1.050	12050	1.050	12300	1.050	12550	1.050
11305	1.050	11555	1.050	11805	1.050	12055	1.050	12305	1.050	12555	1.050
11310	1.050	11560	1.050	11810	1.050	12060	1.050	12310	1.050	12560	1.050
11315	1.050	11565	1.050	11815	1.050	12065	1.050	12315	1.050	12565	1.050
11320	1.050	11570	1.050	11820	1.050	12070	1.050	12320	1.050	12570	1.050
11325	1.050	11575	1.050	11825	1.050	12075	1.050	12325	1.050	12575	1.050
11330	1.050	11580	1.050	11830	1.050	12080	1.050	12330	1.050	12580	1.050
11335	1.050	11585	1.050	11835	1.050	12085	1.050	12335	1.050	12585	1.050
11340	1.050	11590	1.050	11840	1.050	12090	1.050	12340	1.050	12590	1.050
11345	1.050	11595	1.050	11845	1.050	12095	1.050	12345	1.050	12595	1.050
11350	1.050	11600	1.050	11850	1.050	12100	1.050	12350	1.050	12600	1.050
11355	1.050	11605	1.050	11855	1.050	12105	1.050	12355	1.050	12605	1.050
11360	1.050	11610	1.050	11860	1.050	12110	1.050	12360	1.050	12610	1.050
11365	1.050	11615	1.050	11865	1.050	12115	1.050	12365	1.050	12615	1.050
11370	1.050	11620	1.050	11870	1.050	12120	1.050	12370	1.050	12620	1.050
11375	1.050	11625	1.050	11875	1.050	12125	1.050	12375	1.050	12625	1.050
11380	1.050	11630	1.050	11880	1.050	12130	1.050	12380	1.050	12630	1.050
11385	1.050	11635	1.050	11885	1.050	12135	1.050	12385	1.050	12635	1.050
11390	1.050	11640	1.050	11890	1.050	12140	1.050	12390	1.050	12640	1.050
11395	1.050	11645	1.050	11895	1.050	12145	1.050	12395	1.050	12645	1.050
11400	1.050	11650	1.050	11900	1.050	12150	1.050	12400	1.050	12650	1.050
11405	1.050	11655	1.050	11905	1.050	12155	1.050	12405	1.050	12655	1.050
11410	1.050	11660	1.050	11910	1.050	12160	1.050	12410	1.050	12660	1.050
11415	1.050	11665	1.050	11915	1.050	12165	1.050	12415	1.050	12665	1.050
11420	1.050	11670	1.050	11920	1.050	12170	1.050	12420	1.050	12670	1.050
11425	1.050	11675	1.050	11925	1.050	12175	1.050	12425	1.050	12675	1.050
11430	1.050	11680	1.050	11930	1.050	12180	1.050	12430	1.050	12680	1.050
11435	1.050	11685	1.050	11935	1.050	12185	1.050	12435	1.050	12685	1.050
11440	1.050	11690	1.050	11940	1.050	12190	1.050	12440	1.050	12690	1.050
11445	1.050	11695	1.050	11945	1.050	12195	1.050	12445	1.050	12695	1.050
11450	1.050	11700	1.050	11950	1.050	12200	1.050	12450	1.050	12700	1.050
11455	1.050	11705	1.050	11955	1.050	12205	1.050	12455	1.050	12705	1.050
11460	1.050	11710	1.050	11960	1.050	12210	1.050	12460	1.050	12710	1.050
11465	1.050	11715	1.050	11965	1.050	12215	1.050	12465	1.050	12715	1.050
11470	1.050	11720	1.050	11970	1.050	12220	1.050	12470	1.050	12720	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
12725	1.050	12975	1.050	13225	1.050	13475	1.050	13725	1.050	13975	1.050
12730	1.050	12980	1.050	13230	1.050	13480	1.050	13730	1.050	13980	1.050
12735	1.050	12985	1.050	13235	1.050	13485	1.050	13735	1.050	13985	1.050
12740	1.050	12990	1.050	13240	1.050	13490	1.050	13740	1.050	13990	1.050
12745	1.050	12995	1.050	13245	1.050	13495	1.050	13745	1.050	13995	1.050
12750	1.050	13000	1.050	13250	1.050	13500	1.050	13750	1.050	14000	1.050
12755	1.050	13005	1.050	13255	1.050	13505	1.050	13755	1.050	14005	1.050
12760	1.050	13010	1.050	13260	1.050	13510	1.050	13760	1.050	14010	1.050
12765	1.050	13015	1.050	13265	1.050	13515	1.050	13765	1.050	14015	1.050
12770	1.050	13020	1.050	13270	1.050	13520	1.050	13770	1.050	14020	1.050
12775	1.050	13025	1.050	13275	1.050	13525	1.050	13775	1.050	14025	1.050
12780	1.050	13030	1.050	13280	1.050	13530	1.050	13780	1.050	14030	1.050
12785	1.050	13035	1.050	13285	1.050	13535	1.050	13785	1.050	14035	1.050
12790	1.050	13040	1.050	13290	1.050	13540	1.050	13790	1.050	14040	1.050
12795	1.050	13045	1.050	13295	1.050	13545	1.050	13795	1.050	14045	1.050
12800	1.050	13050	1.050	13300	1.050	13550	1.050	13800	1.050	14050	1.050
12805	1.050	13055	1.050	13305	1.050	13555	1.050	13805	1.050	14055	1.050
12810	1.050	13060	1.050	13310	1.050	13560	1.050	13810	1.050	14060	1.050
12815	1.050	13065	1.050	13315	1.050	13565	1.050	13815	1.050	14065	1.050
12820	1.050	13070	1.050	13320	1.050	13570	1.050	13820	1.050	14070	1.050
12825	1.050	13075	1.050	13325	1.050	13575	1.050	13825	1.050	14075	1.050
12830	1.050	13080	1.050	13330	1.050	13580	1.050	13830	1.050	14080	1.050
12835	1.050	13085	1.050	13335	1.050	13585	1.050	13835	1.050	14085	1.050
12840	1.050	13090	1.050	13340	1.050	13590	1.050	13840	1.050	14090	1.050
12845	1.050	13095	1.050	13345	1.050	13595	1.050	13845	1.050	14095	1.050
12850	1.050	13100	1.050	13350	1.050	13600	1.050	13850	1.050	14100	1.050
12855	1.050	13105	1.050	13355	1.050	13605	1.050	13855	1.050	14105	1.050
12860	1.050	13110	1.050	13360	1.050	13610	1.050	13860	1.050	14110	1.050
12865	1.050	13115	1.050	13365	1.050	13615	1.050	13865	1.050	14115	1.050
12870	1.050	13120	1.050	13370	1.050	13620	1.050	13870	1.050	14120	1.050
12875	1.050	13125	1.050	13375	1.050	13625	1.050	13875	1.050	14125	1.050
12880	1.050	13130	1.050	13380	1.050	13630	1.050	13880	1.050	14130	1.050
12885	1.050	13135	1.050	13385	1.050	13635	1.050	13885	1.050	14135	1.050
12890	1.050	13140	1.050	13390	1.050	13640	1.050	13890	1.050	14140	1.050
12895	1.050	13145	1.050	13395	1.050	13645	1.050	13895	1.050	14145	1.050
12900	1.050	13150	1.050	13400	1.050	13650	1.050	13900	1.050	14150	1.050
12905	1.050	13155	1.050	13405	1.050	13655	1.050	13905	1.050	14155	1.050
12910	1.050	13160	1.050	13410	1.050	13660	1.050	13910	1.050	14160	1.050
12915	1.050	13165	1.050	13415	1.050	13665	1.050	13915	1.050	14165	1.050
12920	1.050	13170	1.050	13420	1.050	13670	1.050	13920	1.050	14170	1.050
12925	1.050	13175	1.050	13425	1.050	13675	1.050	13925	1.050	14175	1.050
12930	1.050	13180	1.050	13430	1.050	13680	1.050	13930	1.050	14180	1.050
12935	1.050	13185	1.050	13435	1.050	13685	1.050	13935	1.050	14185	1.050
12940	1.050	13190	1.050	13440	1.050	13690	1.050	13940	1.050	14190	1.050
12945	1.050	13195	1.050	13445	1.050	13695	1.050	13945	1.050	14195	1.050
12950	1.050	13200	1.050	13450	1.050	13700	1.050	13950	1.050	14200	1.050
12955	1.050	13205	1.050	13455	1.050	13705	1.050	13955	1.050	14205	1.050
12960	1.050	13210	1.050	13460	1.050	13710	1.050	13960	1.050	14210	1.050
12965	1.050	13215	1.050	13465	1.050	13715	1.050	13965	1.050	14215	1.050
12970	1.050	13220	1.050	13470	1.050	13720	1.050	13970	1.050	14220	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
14225	1.050	14475	1.050	14725	1.050	14975	1.050	15225	1.050	15475	1.050
14230	1.050	14480	1.050	14730	1.050	14980	1.050	15230	1.050	15480	1.050
14235	1.050	14485	1.050	14735	1.050	14985	1.050	15235	1.050	15485	1.050
14240	1.050	14490	1.050	14740	1.050	14990	1.050	15240	1.050	15490	1.050
14245	1.050	14495	1.050	14745	1.050	14995	1.050	15245	1.050	15495	1.050
14250	1.050	14500	1.050	14750	1.050	15000	1.050	15250	1.050	15500	1.050
14255	1.050	14505	1.050	14755	1.050	15005	1.050	15255	1.050	15505	1.050
14260	1.050	14510	1.050	14760	1.050	15010	1.050	15260	1.050	15510	1.050
14265	1.050	14515	1.050	14765	1.050	15015	1.050	15265	1.050	15515	1.050
14270	1.050	14520	1.050	14770	1.050	15020	1.050	15270	1.050	15520	1.050
14275	1.050	14525	1.050	14775	1.050	15025	1.050	15275	1.050	15525	1.050
14280	1.050	14530	1.050	14780	1.050	15030	1.050	15280	1.050	15530	1.050
14285	1.050	14535	1.050	14785	1.050	15035	1.050	15285	1.050	15535	1.050
14290	1.050	14540	1.050	14790	1.050	15040	1.050	15290	1.050	15540	1.050
14295	1.050	14545	1.050	14795	1.050	15045	1.050	15295	1.050	15545	1.050
14300	1.050	14550	1.050	14800	1.050	15050	1.050	15300	1.050	15550	1.050
14305	1.050	14555	1.050	14805	1.050	15055	1.050	15305	1.050	15555	1.050
14310	1.050	14560	1.050	14810	1.050	15060	1.050	15310	1.050	15560	1.050
14315	1.050	14565	1.050	14815	1.050	15065	1.050	15315	1.050	15565	1.050
14320	1.050	14570	1.050	14820	1.050	15070	1.050	15320	1.050	15570	1.050
14325	1.050	14575	1.050	14825	1.050	15075	1.050	15325	1.050	15575	1.050
14330	1.050	14580	1.050	14830	1.050	15080	1.050	15330	1.050	15580	1.050
14335	1.050	14585	1.050	14835	1.050	15085	1.050	15335	1.050	15585	1.050
14340	1.050	14590	1.050	14840	1.050	15090	1.050	15340	1.050	15590	1.050
14345	1.050	14595	1.050	14845	1.050	15095	1.050	15345	1.050	15595	1.050
14350	1.050	14600	1.050	14850	1.050	15100	1.050	15350	1.050	15600	1.050
14355	1.050	14605	1.050	14855	1.050	15105	1.050	15355	1.050	15605	1.050
14360	1.050	14610	1.050	14860	1.050	15110	1.050	15360	1.050	15610	1.050
14365	1.050	14615	1.050	14865	1.050	15115	1.050	15365	1.050	15615	1.050
14370	1.050	14620	1.050	14870	1.050	15120	1.050	15370	1.050	15620	1.050
14375	1.050	14625	1.050	14875	1.050	15125	1.050	15375	1.050	15625	1.050
14380	1.050	14630	1.050	14880	1.050	15130	1.050	15380	1.050	15630	1.050
14385	1.050	14635	1.050	14885	1.050	15135	1.050	15385	1.050	15635	1.050
14390	1.050	14640	1.050	14890	1.050	15140	1.050	15390	1.050	15640	1.050
14395	1.050	14645	1.050	14895	1.050	15145	1.050	15395	1.050	15645	1.050
14400	1.050	14650	1.050	14900	1.050	15150	1.050	15400	1.050	15650	1.050
14405	1.050	14655	1.050	14905	1.050	15155	1.050	15405	1.050	15655	1.050
14410	1.050	14660	1.050	14910	1.050	15160	1.050	15410	1.050	15660	1.050
14415	1.050	14665	1.050	14915	1.050	15165	1.050	15415	1.050	15665	1.050
14420	1.050	14670	1.050	14920	1.050	15170	1.050	15420	1.050	15670	1.050
14425	1.050	14675	1.050	14925	1.050	15175	1.050	15425	1.050	15675	1.050
14430	1.050	14680	1.050	14930	1.050	15180	1.050	15430	1.050	15680	1.050
14435	1.050	14685	1.050	14935	1.050	15185	1.050	15435	1.050	15685	1.050
14440	1.050	14690	1.050	14940	1.050	15190	1.050	15440	1.050	15690	1.050
14445	1.050	14695	1.050	14945	1.050	15195	1.050	15445	1.050	15695	1.050
14450	1.050	14700	1.050	14950	1.050	15200	1.050	15450	1.050	15700	1.050
14455	1.050	14705	1.050	14955	1.050	15205	1.050	15455	1.050	15705	1.050
14460	1.050	14710	1.050	14960	1.050	15210	1.050	15460	1.050	15710	1.050
14465	1.050	14715	1.050	14965	1.050	15215	1.050	15465	1.050	15715	1.050
14470	1.050	14720	1.050	14970	1.050	15220	1.050	15470	1.050	15720	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
15725	1.050	15975	1.050	16225	1.050	16475	1.050	16725	1.050	16975	1.050
15730	1.050	15980	1.050	16230	1.050	16480	1.050	16730	1.050	16980	1.050
15735	1.050	15985	1.050	16235	1.050	16485	1.050	16735	1.050	16985	1.050
15740	1.050	15990	1.050	16240	1.050	16490	1.050	16740	1.050	16990	1.050
15745	1.050	15995	1.050	16245	1.050	16495	1.050	16745	1.050	16995	1.050
15750	1.050	16000	1.050	16250	1.050	16500	1.050	16750	1.050	17000	1.050
15755	1.050	16005	1.050	16255	1.050	16505	1.050	16755	1.050	17005	1.050
15760	1.050	16010	1.050	16260	1.050	16510	1.050	16760	1.050	17010	1.050
15765	1.050	16015	1.050	16265	1.050	16515	1.050	16765	1.050	17015	1.050
15770	1.050	16020	1.050	16270	1.050	16520	1.050	16770	1.050	17020	1.050
15775	1.050	16025	1.050	16275	1.050	16525	1.050	16775	1.050	17025	1.050
15780	1.050	16030	1.050	16280	1.050	16530	1.050	16780	1.050	17030	1.050
15785	1.050	16035	1.050	16285	1.050	16535	1.050	16785	1.050	17035	1.050
15790	1.050	16040	1.050	16290	1.050	16540	1.050	16790	1.050	17040	1.050
15795	1.050	16045	1.050	16295	1.050	16545	1.050	16795	1.050	17045	1.050
15800	1.050	16050	1.050	16300	1.050	16550	1.050	16800	1.050	17050	1.050
15805	1.050	16055	1.050	16305	1.050	16555	1.050	16805	1.050	17055	1.050
15810	1.050	16060	1.050	16310	1.050	16560	1.050	16810	1.050	17060	1.050
15815	1.050	16065	1.050	16315	1.050	16565	1.050	16815	1.050	17065	1.050
15820	1.050	16070	1.050	16320	1.050	16570	1.050	16820	1.050	17070	1.050
15825	1.050	16075	1.050	16325	1.050	16575	1.050	16825	1.050	17075	1.050
15830	1.050	16080	1.050	16330	1.050	16580	1.050	16830	1.050	17080	1.050
15835	1.050	16085	1.050	16335	1.050	16585	1.050	16835	1.050	17085	1.050
15840	1.050	16090	1.050	16340	1.050	16590	1.050	16840	1.050	17090	1.050
15845	1.050	16095	1.050	16345	1.050	16595	1.050	16845	1.050	17095	1.050
15850	1.050	16100	1.050	16350	1.050	16600	1.050	16850	1.050	17100	1.050
15855	1.050	16105	1.050	16355	1.050	16605	1.050	16855	1.050	17105	1.050
15860	1.050	16110	1.050	16360	1.050	16610	1.050	16860	1.050	17110	1.050
15865	1.050	16115	1.050	16365	1.050	16615	1.050	16865	1.050	17115	1.050
15870	1.050	16120	1.050	16370	1.050	16620	1.050	16870	1.050	17120	1.050
15875	1.050	16125	1.050	16375	1.050	16625	1.050	16875	1.050	17125	1.050
15880	1.050	16130	1.050	16380	1.050	16630	1.050	16880	1.050	17130	1.050
15885	1.050	16135	1.050	16385	1.050	16635	1.050	16885	1.050	17135	1.050
15890	1.050	16140	1.050	16390	1.050	16640	1.050	16890	1.050	17140	1.050
15895	1.050	16145	1.050	16395	1.050	16645	1.050	16895	1.050	17145	1.050
15900	1.050	16150	1.050	16400	1.050	16650	1.050	16900	1.050	17150	1.050
15905	1.050	16155	1.050	16405	1.050	16655	1.050	16905	1.050	17155	1.050
15910	1.050	16160	1.050	16410	1.050	16660	1.050	16910	1.050	17160	1.050
15915	1.050	16165	1.050	16415	1.050	16665	1.050	16915	1.050	17165	1.050
15920	1.050	16170	1.050	16420	1.050	16670	1.050	16920	1.050	17170	1.050
15925	1.050	16175	1.050	16425	1.050	16675	1.050	16925	1.050	17175	1.050
15930	1.050	16180	1.050	16430	1.050	16680	1.050	16930	1.050	17180	1.050
15935	1.050	16185	1.050	16435	1.050	16685	1.050	16935	1.050	17185	1.050
15940	1.050	16190	1.050	16440	1.050	16690	1.050	16940	1.050	17190	1.050
15945	1.050	16195	1.050	16445	1.050	16695	1.050	16945	1.050	17195	1.050
15950	1.050	16200	1.050	16450	1.050	16700	1.050	16950	1.050	17200	1.050
15955	1.050	16205	1.050	16455	1.050	16705	1.050	16955	1.050	17205	1.050
15960	1.050	16210	1.050	16460	1.050	16710	1.050	16960	1.050	17210	1.050
15965	1.050	16215	1.050	16465	1.050	16715	1.050	16965	1.050	17215	1.050
15970	1.050	16220	1.050	16470	1.050	16720	1.050	16970	1.050	17220	1.050

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Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
17225	1.050	17475	1.050	17725	1.050	17975	1.050	18225	1.050	18475	1.050
17230	1.050	17480	1.050	17730	1.050	17980	1.050	18230	1.050	18480	1.050
17235	1.050	17485	1.050	17735	1.050	17985	1.050	18235	1.050	18485	1.050
17240	1.050	17490	1.050	17740	1.050	17990	1.050	18240	1.050	18490	1.050
17245	1.050	17495	1.050	17745	1.050	17995	1.050	18245	1.050	18495	1.050
17250	1.050	17500	1.050	17750	1.050	18000	1.050	18250	1.050	18500	1.050
17255	1.050	17505	1.050	17755	1.050	18005	1.050	18255	1.050	18505	1.050
17260	1.050	17510	1.050	17760	1.050	18010	1.050	18260	1.050	18510	1.050
17265	1.050	17515	1.050	17765	1.050	18015	1.050	18265	1.050	18515	1.050
17270	1.050	17520	1.050	17770	1.050	18020	1.050	18270	1.050	18520	1.050
17275	1.050	17525	1.050	17775	1.050	18025	1.050	18275	1.050	18525	1.050
17280	1.050	17530	1.050	17780	1.050	18030	1.050	18280	1.050	18530	1.050
17285	1.050	17535	1.050	17785	1.050	18035	1.050	18285	1.050	18535	1.050
17290	1.050	17540	1.050	17790	1.050	18040	1.050	18290	1.050	18540	1.050
17295	1.050	17545	1.050	17795	1.050	18045	1.050	18295	1.050	18545	1.050
17300	1.050	17550	1.050	17800	1.050	18050	1.050	18300	1.050	18550	1.050
17305	1.050	17555	1.050	17805	1.050	18055	1.050	18305	1.050	18555	1.050
17310	1.050	17560	1.050	17810	1.050	18060	1.050	18310	1.050	18560	1.050
17315	1.050	17565	1.050	17815	1.050	18065	1.050	18315	1.050	18565	1.050
17320	1.050	17570	1.050	17820	1.050	18070	1.050	18320	1.050	18570	1.050
17325	1.050	17575	1.050	17825	1.050	18075	1.050	18325	1.050	18575	1.050
17330	1.050	17580	1.050	17830	1.050	18080	1.050	18330	1.050	18580	1.050
17335	1.050	17585	1.050	17835	1.050	18085	1.050	18335	1.050	18585	1.050
17340	1.050	17590	1.050	17840	1.050	18090	1.050	18340	1.050	18590	1.050
17345	1.050	17595	1.050	17845	1.050	18095	1.050	18345	1.050	18595	1.050
17350	1.050	17600	1.050	17850	1.050	18100	1.050	18350	1.050	18600	1.050
17355	1.050	17605	1.050	17855	1.050	18105	1.050	18355	1.050	18605	1.050
17360	1.050	17610	1.050	17860	1.050	18110	1.050	18360	1.050	18610	1.050
17365	1.050	17615	1.050	17865	1.050	18115	1.050	18365	1.050	18615	1.050
17370	1.050	17620	1.050	17870	1.050	18120	1.050	18370	1.050	18620	1.050
17375	1.050	17625	1.050	17875	1.050	18125	1.050	18375	1.050	18625	1.050
17380	1.050	17630	1.050	17880	1.050	18130	1.050	18380	1.050	18630	1.050
17385	1.050	17635	1.050	17885	1.050	18135	1.050	18385	1.050	18635	1.050
17390	1.050	17640	1.050	17890	1.050	18140	1.050	18390	1.050	18640	1.050
17395	1.050	17645	1.050	17895	1.050	18145	1.050	18395	1.050	18645	1.050
17400	1.050	17650	1.050	17900	1.050	18150	1.050	18400	1.050	18650	1.050
17405	1.050	17655	1.050	17905	1.050	18155	1.050	18405	1.050	18655	1.050
17410	1.050	17660	1.050	17910	1.050	18160	1.050	18410	1.050	18660	1.050
17415	1.050	17665	1.050	17915	1.050	18165	1.050	18415	1.050	18665	1.050
17420	1.050	17670	1.050	17920	1.050	18170	1.050	18420	1.050	18670	1.050
17425	1.050	17675	1.050	17925	1.050	18175	1.050	18425	1.050	18675	1.050
17430	1.050	17680	1.050	17930	1.050	18180	1.050	18430	1.050	18680	1.050
17435	1.050	17685	1.050	17935	1.050	18185	1.050	18435	1.050	18685	1.050
17440	1.050	17690	1.050	17940	1.050	18190	1.050	18440	1.050	18690	1.050
17445	1.050	17695	1.050	17945	1.050	18195	1.050	18445	1.050	18695	1.050
17450	1.050	17700	1.050	17950	1.050	18200	1.050	18450	1.050	18700	1.050
17455	1.050	17705	1.050	17955	1.050	18205	1.050	18455	1.050	18705	1.050
17460	1.050	17710	1.050	17960	1.050	18210	1.050	18460	1.050	18710	1.050
17465	1.050	17715	1.050	17965	1.050	18215	1.050	18465	1.050	18715	1.050
17470	1.050	17720	1.050	17970	1.050	18220	1.050	18470	1.050	18720	1.050

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Surcharged Outfall Details for Surface Network 2

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
18725	1.050	18965	1.050	19205	1.050	19445	1.050	19685	1.050	19925	1.050
18730	1.050	18970	1.050	19210	1.050	19450	1.050	19690	1.050	19930	1.050
18735	1.050	18975	1.050	19215	1.050	19455	1.050	19695	1.050	19935	1.050
18740	1.050	18980	1.050	19220	1.050	19460	1.050	19700	1.050	19940	1.050
18745	1.050	18985	1.050	19225	1.050	19465	1.050	19705	1.050	19945	1.050
18750	1.050	18990	1.050	19230	1.050	19470	1.050	19710	1.050	19950	1.050
18755	1.050	18995	1.050	19235	1.050	19475	1.050	19715	1.050	19955	1.050
18760	1.050	19000	1.050	19240	1.050	19480	1.050	19720	1.050	19960	1.050
18765	1.050	19005	1.050	19245	1.050	19485	1.050	19725	1.050	19965	1.050
18770	1.050	19010	1.050	19250	1.050	19490	1.050	19730	1.050	19970	1.050
18775	1.050	19015	1.050	19255	1.050	19495	1.050	19735	1.050	19975	1.050
18780	1.050	19020	1.050	19260	1.050	19500	1.050	19740	1.050	19980	1.050
18785	1.050	19025	1.050	19265	1.050	19505	1.050	19745	1.050	19985	1.050
18790	1.050	19030	1.050	19270	1.050	19510	1.050	19750	1.050	19990	1.050
18795	1.050	19035	1.050	19275	1.050	19515	1.050	19755	1.050	19995	1.050
18800	1.050	19040	1.050	19280	1.050	19520	1.050	19760	1.050	20000	1.050
18805	1.050	19045	1.050	19285	1.050	19525	1.050	19765	1.050	20005	1.050
18810	1.050	19050	1.050	19290	1.050	19530	1.050	19770	1.050	20010	1.050
18815	1.050	19055	1.050	19295	1.050	19535	1.050	19775	1.050	20015	1.050
18820	1.050	19060	1.050	19300	1.050	19540	1.050	19780	1.050	20020	1.050
18825	1.050	19065	1.050	19305	1.050	19545	1.050	19785	1.050	20025	1.050
18830	1.050	19070	1.050	19310	1.050	19550	1.050	19790	1.050	20030	1.050
18835	1.050	19075	1.050	19315	1.050	19555	1.050	19795	1.050	20035	1.050
18840	1.050	19080	1.050	19320	1.050	19560	1.050	19800	1.050	20040	1.050
18845	1.050	19085	1.050	19325	1.050	19565	1.050	19805	1.050	20045	1.050
18850	1.050	19090	1.050	19330	1.050	19570	1.050	19810	1.050	20050	1.050
18855	1.050	19095	1.050	19335	1.050	19575	1.050	19815	1.050	20055	1.050
18860	1.050	19100	1.050	19340	1.050	19580	1.050	19820	1.050	20060	1.050
18865	1.050	19105	1.050	19345	1.050	19585	1.050	19825	1.050	20065	1.050
18870	1.050	19110	1.050	19350	1.050	19590	1.050	19830	1.050	20070	1.050
18875	1.050	19115	1.050	19355	1.050	19595	1.050	19835	1.050	20075	1.050
18880	1.050	19120	1.050	19360	1.050	19600	1.050	19840	1.050	20080	1.050
18885	1.050	19125	1.050	19365	1.050	19605	1.050	19845	1.050	20085	1.050
18890	1.050	19130	1.050	19370	1.050	19610	1.050	19850	1.050	20090	1.050
18895	1.050	19135	1.050	19375	1.050	19615	1.050	19855	1.050	20095	1.050
18900	1.050	19140	1.050	19380	1.050	19620	1.050	19860	1.050	20100	1.050
18905	1.050	19145	1.050	19385	1.050	19625	1.050	19865	1.050	20105	1.050
18910	1.050	19150	1.050	19390	1.050	19630	1.050	19870	1.050	20110	1.050
18915	1.050	19155	1.050	19395	1.050	19635	1.050	19875	1.050	20115	1.050
18920	1.050	19160	1.050	19400	1.050	19640	1.050	19880	1.050	20120	1.050
18925	1.050	19165	1.050	19405	1.050	19645	1.050	19885	1.050	20125	1.050
18930	1.050	19170	1.050	19410	1.050	19650	1.050	19890	1.050	20130	1.050
18935	1.050	19175	1.050	19415	1.050	19655	1.050	19895	1.050	20135	1.050
18940	1.050	19180	1.050	19420	1.050	19660	1.050	19900	1.050	20140	1.050
18945	1.050	19185	1.050	19425	1.050	19665	1.050	19905	1.050	20145	1.050
18950	1.050	19190	1.050	19430	1.050	19670	1.050	19910	1.050	20150	1.050
18955	1.050	19195	1.050	19435	1.050	19675	1.050	19915	1.050	20155	1.050
18960	1.050	19200	1.050	19440	1.050	19680	1.050	19920	1.050	20160	1.050

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Simulation Criteria for Surface Network 2

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.360		

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: SS12-FC, DS/PN: 1.013, Volume (m³): 8.4

Unit Reference	MD-SHE-0069-2500-1475-2500
Design Head (m)	1.475
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	69
Invert Level (m)	44.025
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.475	2.5
Flush-Flo™	0.303	2.1
Kick-Flo®	0.614	1.7
Mean Flow over Head Range	-	2.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.7	1.200	2.3	3.000	3.5	7.000	5.2
0.200	2.0	1.400	2.4	3.500	3.7	7.500	5.3
0.300	2.1	1.600	2.6	4.000	4.0	8.000	5.5
0.400	2.0	1.800	2.7	4.500	4.2	8.500	5.7
0.500	2.0	2.000	2.9	5.000	4.4	9.000	5.8
0.600	1.7	2.200	3.0	5.500	4.6	9.500	6.0
0.800	1.9	2.400	3.1	6.000	4.8		
1.000	2.1	2.600	3.2	6.500	5.0		

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Storage Structures for Surface Network 2

Tank or Pond Manhole: Southern Pond, DS/PN: 1.012

Invert Level (m) 44.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	484.6	2.200	1303.7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 0.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	PS1	15 Winter	100	+45%	100/15 Summer				48.451
1.001	PS2	15 Winter	100	+45%	100/15 Summer				48.163
1.002	PS3	15 Winter	100	+45%					47.652
2.000	PS4	15 Winter	100	+45%					47.510
1.003	PS5	15 Winter	100	+45%					46.842
3.000	PS6	15 Winter	100	+45%					47.404
1.004	SS1	15 Winter	100	+45%					46.644
4.000	PS7	15 Winter	100	+45%	100/15 Summer				47.838
4.001	PS8	15 Winter	100	+45%					47.426
4.002	PS9	15 Winter	100	+45%					47.242
4.003	PS10	15 Winter	100	+45%	100/15 Summer				46.824
1.005	SS2	15 Winter	100	+45%	100/15 Summer				46.488
1.006	SS3	15 Winter	100	+45%	100/15 Summer				46.366
5.000	PS11	15 Winter	100	+45%					47.124
5.001	PS12	15 Winter	100	+45%	100/15 Winter				46.307
6.000	PS13	15 Winter	100	+45%					46.484
6.001	PS14	15 Winter	100	+45%	100/15 Summer				46.323

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	PS1	0.401	0.000	1.25			17.3	FLOOD RISK	
1.001	PS2	0.287	0.000	1.91			25.5	SURCHARGED	
1.002	PS3	-0.122	0.000	0.41			37.5	OK	
2.000	PS4	-0.040	0.000	0.66			7.2	OK	
1.003	PS5	-0.058	0.000	0.86			51.6	OK	
3.000	PS6	-0.046	0.000	0.80			21.4	OK	
1.004	SS1	-0.064	0.000	0.69			78.7	OK	
4.000	PS7	0.038	0.000	1.03			18.6	SURCHARGED	
4.001	PS8	-0.024	0.000	1.00			41.6	OK	
4.002	PS9	-0.108	0.000	0.53			61.8	OK	
4.003	PS10	0.374	0.000	1.86			79.8	SURCHARGED	
1.005	SS2	0.161	0.000	1.08			171.4	SURCHARGED	
1.006	SS3	0.167	0.000	0.81			162.9	SURCHARGED	
5.000	PS11	-0.076	0.000	0.48			12.9	OK	
5.001	PS12	0.007	0.000	0.49			12.7	SURCHARGED	
6.000	PS13	-0.116	0.000	0.47			29.3	OK	
6.001	PS14	0.173	0.000	0.84			45.9	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
1.007	SS4	15 Winter	100	+45%	100/15 Summer		
7.000	PS15	15 Winter	100	+45%			
1.008	SS5	15 Winter	100	+45%	100/15 Summer		
8.000	PS16	15 Winter	100	+45%			
1.009	SS6	7200 Winter	100	+45%	100/15 Summer		
1.010	SS7	7200 Winter	100	+45%	100/15 Summer		
9.000	PS17	15 Winter	100	+45%	100/15 Summer		
9.001	PS18	15 Winter	100	+45%	100/15 Summer		
9.002	PS19	15 Winter	100	+45%	100/15 Summer		
9.003	PS20	15 Winter	100	+45%	100/15 Summer		
9.004	PS21	15 Winter	100	+45%	100/15 Summer		
9.005	PS22	15 Winter	100	+45%	100/15 Summer		
9.006	PS23	15 Winter	100	+45%			
1.011	SS8	7200 Winter	100	+45%	100/15 Summer		
10.000	PS24	15 Winter	100	+45%			
10.001	PS25	15 Winter	100	+45%	100/15 Summer		
10.002	PS26	15 Winter	100	+45%			
11.000	PS27	15 Winter	100	+45%	100/15 Winter		
10.003	PS28	15 Winter	100	+45%			
12.000	PS29	15 Winter	100	+45%			
12.001	PS30	15 Winter	100	+45%			
12.002	PS31	15 Winter	100	+45%	100/15 Summer		
10.004	SS9	7200 Winter	100	+45%	100/2160 Winter		
10.005	SS10	7200 Winter	100	+45%	100/480 Winter		
13.000	PS35	15 Winter	100	+45%	100/15 Summer		
13.001	PS36	15 Winter	100	+45%	100/15 Summer		
13.002	PS37	15 Winter	100	+45%	100/15 Summer		
13.003	PS38	15 Winter	100	+45%	100/15 Summer		
13.004	PS39	15 Winter	100	+45%	100/15 Summer		
13.005	PS40	15 Winter	100	+45%	100/15 Summer		
10.006	SS11	7200 Winter	100	+45%	100/15 Summer		
1.012	Southern Pond	7200 Winter	100	+45%	100/15 Summer		
1.013	SS12-FC	7200 Winter	100	+45%	100/15 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.007	SS4		46.254	0.259	0.000	1.02			208.3
7.000	PS15		46.352	-0.048	0.000	0.52			5.2
1.008	SS5		45.892	0.272	0.000	1.12			211.8
8.000	PS16		45.853	-0.047	0.000	0.76			16.8
1.009	SS6		45.708	0.269	0.000	0.02			4.0
1.010	SS7		45.708	0.408	0.000	0.02			4.2
9.000	PS17		46.763	0.063	0.000	0.42			8.5
9.001	PS18		46.702	0.352	0.000	3.05			32.9
9.002	PS19		46.417	0.089	0.000	1.23			36.7

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
9.003	PS20		46.346	0.056	0.000	1.30			36.5
9.004	PS21		46.276	0.009	0.000	0.72			47.5
9.005	PS22		46.155	0.105	0.000	1.42			53.0
9.006	PS23		45.871	-0.075	0.000	0.75			76.9
1.011	SS8		45.708	0.558	0.000	0.02			5.2
10.000	PS24		46.905	-0.095	0.000	0.29			7.2
10.001	PS25		46.763	0.113	0.000	1.31			20.0
10.002	PS26		46.445	-0.055	0.000	0.91			39.3
11.000	PS27		46.732	0.032	0.000	1.04			8.4
10.003	PS28		46.298	-0.102	0.000	0.56			47.4
12.000	PS29		47.466	-0.127	0.000	0.39			42.6
12.001	PS30		46.015	-0.135	0.000	0.58			80.0
12.002	PS31		45.785	0.085	0.000	1.47			105.2
10.004	SS9		45.708	0.090	0.000	0.01			2.3
10.005	SS10		45.708	0.340	0.000	0.01			2.6
13.000	PS35		47.194	0.129	0.000	0.54			11.3
13.001	PS36		47.131	0.281	0.000	0.49			27.2
13.002	PS37		47.048	0.548	0.000	0.83			50.2
13.003	PS38		46.895	0.595	0.000	1.18			52.6
13.004	PS39		46.812	0.612	0.000	0.96			79.8
13.005	PS40		45.892	0.692	0.000	1.48			124.0
10.006	SS11		45.708	0.860	0.000	0.02			4.5
1.012	Southern Pond		45.708	1.258	0.000	0.22			9.9
1.013	SS12-FC		46.060	1.885	0.000	0.12			2.0

PN	US/MH Name	Status	Level Exceeded
1.007	SS4	SURCHARGED	
7.000	PS15	OK	
1.008	SS5	SURCHARGED	
8.000	PS16	OK	
1.009	SS6	SURCHARGED	
1.010	SS7	SURCHARGED	
9.000	PS17	SURCHARGED	
9.001	PS18	FLOOD RISK	
9.002	PS19	SURCHARGED	
9.003	PS20	SURCHARGED	
9.004	PS21	SURCHARGED	
9.005	PS22	SURCHARGED	
9.006	PS23	OK	
1.011	SS8	SURCHARGED	
10.000	PS24	OK	
10.001	PS25	SURCHARGED	
10.002	PS26	OK	
11.000	PS27	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Status	Level Exceeded
10.003	PS28	OK	
12.000	PS29	OK	
12.001	PS30	OK	
12.002	PS31	SURCHARGED	
10.004	SS9	SURCHARGED	
10.005	SS10	SURCHARGED	
13.000	PS35	SURCHARGED	
13.001	PS36	SURCHARGED	
13.002	PS37	FLOOD RISK	
13.003	PS38	FLOOD RISK	
13.004	PS39	FLOOD RISK	
13.005	PS40	SURCHARGED	
10.006	SS11	SURCHARGED	
1.012	Southern Pond	SURCHARGED	
1.013	SS12-FC	FLOOD RISK	

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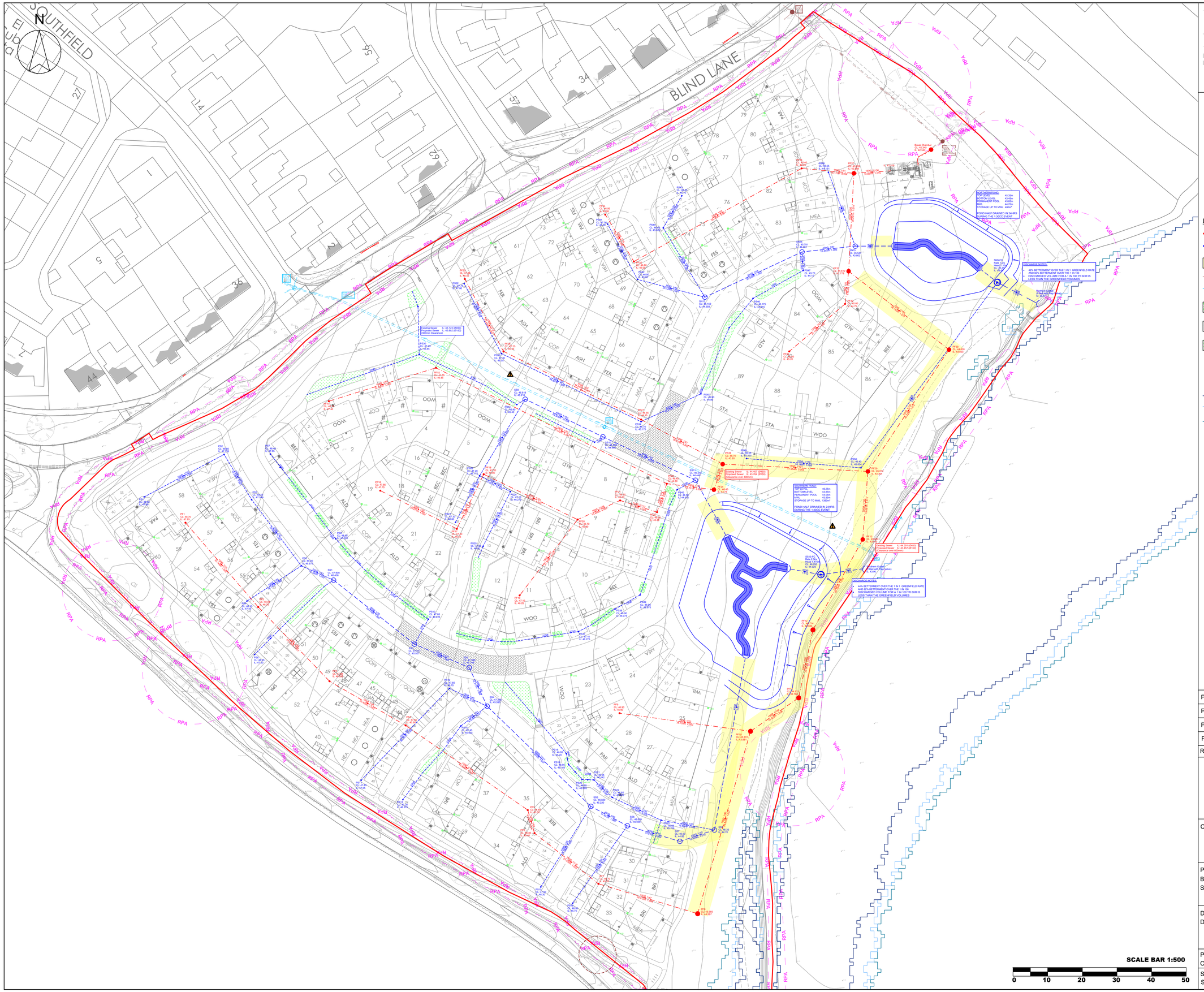
APPENDIX I – DRAINAGE STRATEGY



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CONTRACTORS MUST CHECK ALL DIMENSIONS ON SITE.

THE CONTRACTORS MUST REFER TO THE EXISTING SERVICES INFORMATION, DESIGNER'S RISK ASSESSMENT AND RESIDUAL RISKS IN THE CONTRACT DOCUMENTATION.

THIS SYMBOL IS USED TO HIGHLIGHT INSTANCES OF RISK WITHIN THE CONSTRUCTION PROCESS.

THE INFORMATION SHOWN ON THIS DRAWING HAS BEEN BASED UPON THE SITE LAYOUT:

RECEIVED ON:

GENERAL NOTES:
1. Do not scale this drawing.
2. All levels are shown in metres above Ordnance Datum (m AOD).
3. Contractor to verify dimmensions on site.
4. This drawing is to be read in conjunction with the relevant Architect's, Engineer's and specialist manufacture's drawings, reports and specifications.

DRAINAGE WORKS:
1. All drainage to be laid soffit to soffit unless otherwise shown.
2. All drainage for adoption is to comply with the Design and Construction Guidance (DCG). All private drainage is to comply with the current Building Regulations, BS EN-752 Drain and Sewer systems outside buildings and other relevant British Standards and Codes of Practice.

LEGEND:
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- ADOPTABLE SEWER EASEMENT (3m min unless otherwise shown)
- EXISTING FOUL SEWER
- EXISTING SURFACE SEWER
- RAIN GARDEN WITH CONNECTION FROM GULLY CHUTE (Refer to Details)
- RAIN GARDEN WITH KERB OPENING (Refer to Details)
- ROAD SWALE (Refer to Details)
- WB WATER BUTT
- EXISTING TREE ROUTE PROTECTION AREA
- 1 IN 30 YEAR FLOOD OUTLINE
- 1 IN 100 YEAR FLOOD OUTLINE
- 1 IN 100CC YEAR FLOOD OUTLINE (CC - CLIMATE CHANGE 26%)

REV	DESCRIPTION	BY	APP	DATE
P04	REVISED PLANNING ISSUE - SITE LAYOUT	CL	FA	08/09/26
P03	SITE LAYOUT UPDATES - ROADS	CL	FA	17/02/26
P02	LEVELS STRATEGY UPDATES	CL	FA	14/01/26
P01	FIRST ISSUE	CL	FA	01/12/25

CLFA DESIGN
71-75 Shelton Street, Covent Garden
London, WC2H 9JQ

CLIENT:
Wain HOMES

PROJECT:
BLIND LANE
SOUTHWICK

DRAWING:
DRAINAGE STRATEGY FOR PLANNING

PROJECT NUMBER:	DRAWING NUMBER:	
CLFA137	CLFA137-CLFA-00-XX-DR-C-0512	
STATUS: S2	SCALE @ A1 1:500	REV: P04

MANHOLE CATCHMENT		
MANHOLE ID	IMPERMEABLE AREA (m^2)	INCLUDING URBAN CREEP 10% (m^2)
SOUTHERN CATCHMENT		
PS1	259	269
PS2	126	132
PS3	186	192
PS4	97	106
PS5	97	106
PS6	324	333
SS1	108	108
PS7	286	294
PS8	334	341
PS9	273	285
PS10	260	267
SS2	347	381
SS3	0	0
PS11	183	201
PS12	0	0
PS13	432	447
PS14	283	289
SS4	0	0
PS15	69	76
SS5	73	80
PS16	261	261
SS6	145	160
SS7	209	230
PS17	125	125
PS18	351	359
PS19	60	60
PS20	0	0
PS21	163	174
PS22	69	76
PS23	375	381
SS8	0	0
PS24	111	111
PS25	191	191
PS26	271	284
PS27	129	129
PS28	0	0
PS29	636	650
PS30	537	545
PS31	372	372
SS9	273	288
SS10	310	317
PS35	181	181
PS36	243	249
PS37	378	386
PS38	0	0
PS39	501	509
PS40	718	734
SS11	0	0
S. Pond	376	392
TOTAL	**10721**	**11073**
NORTHERN CATCHMENT		
PS32	199	212
PS33	201	214
PS34	298	318
PS41	220	242
PS42	0	0
PS43	341	354
PS44	303	303
SN13	220	242
PS45	615	622
PS46	195	195
PS47	0	0
SN14	308	322
PS48	1004	1033
SN15	0	0
PS49	610	640
PS50	0	0
PS51	446	460
TOTAL	**4958**	**5156**

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THE INFORMATION SHOWN ON THIS DRAWING HAS BEEN BASED UPON THE SITE LAYOUT:

RECEIVED ON:

REV	DESCRIPTION	BY	APP	DATE
P04	REVISED PLANNING ISSUE - SITE LAYOUT	CL	FA	08/09/26
P03	SITE LAYOUT UPDATES - ROADS	CL	FA	17/02/26
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P01	FIRST ISSUE	CL	FA	01/12/25

CLFA DESIGN

71-75 Shelton Street, Covent Garden
London, WC2H 9JQ

CLIENT:

Wain HOMES

PROJECT:
BLIND LANE
SOUTHWICK

DRAWING:
IMPERMEABLE AREAS PLAN

PROJECT NUMBER:	DRAWING NUMBER:	
CLFA137	CLFA137-CLFA-00-XX-DR-C-0681	
STATUS: S2	SCALE @ A1 1:500	REV: P04

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DO NOT SCALE FROM THIS DRAWING. CONTRACTORS MUST CHECK ALL DIMENSIONS ON SITE.

THE CONTRACTORS MUST REFER TO THE EXISTING SERVICES INFORMATION, DESIGNER'S RISK ASSESSMENT AND RESIDUAL RISKS IN THE CONTRACT DOCUMENTATION.

THIS SYMBOL IS USED TO HIGHLIGHT INSTANCES OF RISK WITHIN THE CONSTRUCTION PROCESS.

THE INFORMATION SHOWN ON THIS DRAWING HAS BEEN BASED UPON THE SITE LAYOUT:

RECEIVED ON:

LEGEND:

MAIN EXCEEDANCE ROUTE

LOCAL EXCEEDANCE ROUTE

REV	DESCRIPTION	BY	APP	DATE
P03	REVISED PLANNING ISSUE - SITE LAYOUT	CL	FA	08/09/26
P02	SITE LAYOUT UPDATES - ROADS	CL	FA	17/02/26
P01	FIRST ISSUE	CL	FA	14/01/25

CLFA DESIGN

71-75 Shelton Street, Covent Garden
London, WC2H 9JQ

CLIENT:

Wain HOMES

PROJECT:
BLIND LANE
SOUTHWICK

DRAWING:
DRAINAGE EXCEEDANCE PLAN

PROJECT NUMBER:	DRAWING NUMBER:	
CLFA137	CLFA137XXX-CLFA-00-XX-DR-C-0695	
STATUS: S2	SCALE @ A1 1:500	REV: P03