now part of

The Old Power Station, Vastern Road, Reading

Proposed Drainage Strategy

On behalf of

Berkeley
Designed for life

Project Ref: 47500/2000 | Rev: A | Date: January 2020

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1 Introduction

1.1.1 Peter Brett Associates LLP (PBA) now Part of Stantec has been commissioned by Berkeley to prepare a Surface Water Drainage Strategy which supports a planning application at The Old Power Station, 53-55 Vastern Road, Reading, for the demolition of existing structures and erection of a series of buildings ranging in height up to 11 storeys, comprising 209 residential units, a café and associated parking together with a new north-south pedestrian link, connecting Christchurch Bridge to Vastern Road.

1.1.2 This strategy has been prepared in accordance with relevant national, regional and local planning policy guidance as follows:

- National policy regarding flood risk as contained within National Planning Policy Framework (NPPF), dated March 2012, and the accompanying National Planning Practice Guidance (NPPG), dated March 2015.
- The Ministerial Statement HCW161, dated 18th December 2014.
- Non-statutory Technical Standards for Sustainable Drainage Systems, March 2015, Defra.
- Reading Borough Local Plan, Adopted November 2019, Reading Borough Council.
- Flood Risk Assessments: Climate Change Allowances, 19th February 2016, Environment Agency.
- Reading Borough Council (RBC) Strategic Flood Risk Assessment (SFRA), June 2017.
- RBC Revised Sustainable Design and Construction Supplementary Planning Document, 11th July 2011.

1.2 Flood Risk Assessment

1.2.1 Section 10 of the National Planning Policy Framework, clause 103, footnote 20 states:

A site specific flood risk assessment is required for *proposals of 1 hectare or greater in Flood Zone 1:* ***all proposals for new development (including minor development and change of use) in Flood Zone 2 and 3****, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.*

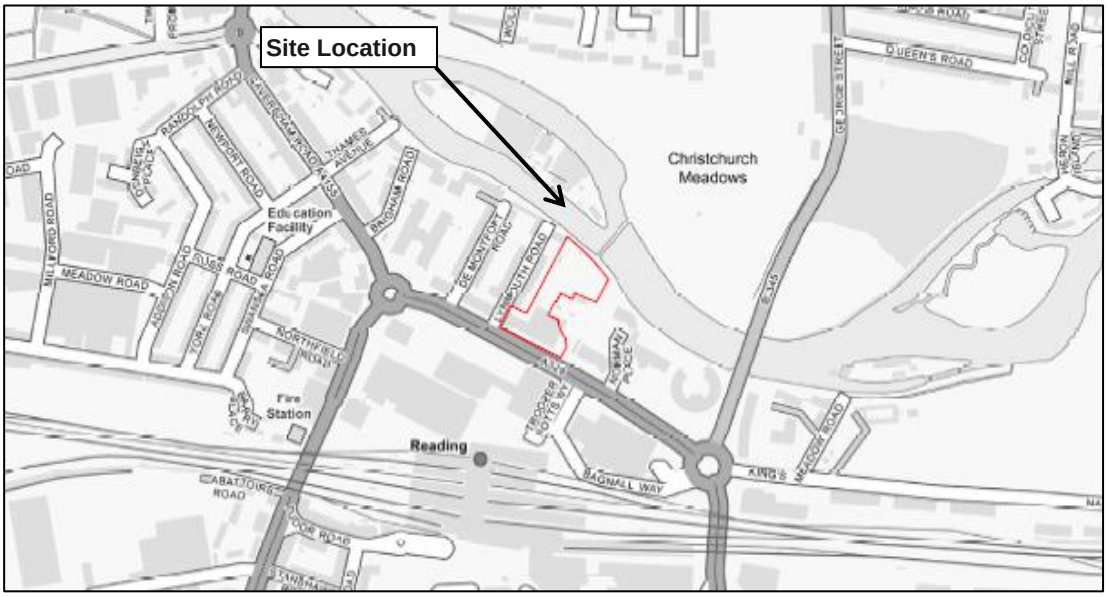
1.2.2 As parts of the site are within Flood Zone 2 a site specific flood risk assessment has been completed for the development. This is contained within a separate document submitted as part of the planning application.

2 Site Information

2.1 Site Location and Plan

2.1.1 The site is located on the north side of Vastern Road in Reading, Berkshire (postcode RG1 8BU, site centre OS grid reference 471,530m E, 174,100m N – see **Figure 2 1**).

Figure 2 1: Site Location Plan (not to scale)



2.1.2 The site is currently occupied by SSE, and consists of an electricity sub-station, car parking and offices along the southern boundary. The site is bordered by the River Thames and the Thames footpath to the north (where a boundary wall runs along the back of the footpath), by office buildings on Norman Place to the east, by Vastern Road and a retail estate to the south, and by residential terraced housing on Lynmouth Road to the west.

2.1.3 The River Thames is a main river located adjacent to the northern boundary of the site. The Vastern Ditch is a culverted watercourse located below the northern footway of Vastern Road within the site boundary.

2.1.4 The site is approximately 0.766ha in area.

2.1.5 There is a high point in the centre of the site with gentle falls from the centre towards the northern and southern boundaries. Ground levels ranging between 38.7m AOD and 38.0m AOD.

2.1.6 A copy of the topographical survey of the existing site by Maltby Surveys LTD is given in **Appendix A**.

2.2 Proposals

2.2.1 The proposed redevelopment of the SSE site at 53-55 Vastern Road, Reading, includes the demolition of existing structures and erection of a series of buildings ranging in height up to 11 storeys, comprising 209 residential units, a café and associated parking together with a new north-south pedestrian link, connecting Christchurch Bridge to Vastern Road.

2.2.2 Details of the proposals by Berkeley Homes are included in **Appendix B**.

3 Existing Surface Water Drainage Regime

3.1.1 The existing surface water drainage regime was identified during a CCTV survey carried out by Subscan UDS LTD in September 2017 the results from this survey are shown in drawing 4657 (A1-L1) and 4657 (A1-L2) in **Appendix C**.

3.1.2 Surface Water from the northern region of the site discharges into a 150mmØ drain that flows north-west within the site, close to the northern boundary wall. The CCTV survey recorded this pipe turning towards the River Thames before the survey had to be abandoned as the pipe was flooded. Although the survey did not identify the outfall it is likely that this drain discharges into the adjacent River Thames.

3.1.3 The CCTV survey shows the surface water from the western region of the site is conveyed west to the boundary of the site with Lynmouth Road. The sewerage discharges from the site towards Lynmouth Road via a 225mmØ drain and a 150mmØ drain. It is assumed that both of these drains outfall to a foul sewer as Thames Water asset records show only a foul sewer in Lynmouth Road. It is possible that the 150mmØ sewer leads to the culverted Vastern Ditch watercourse below the northern footway of Vastern Road, but this can't be confirmed at this stage.

3.1.4 The surface water from the southern part of the existing building and northern footway of Vastern Road discharge to the culverted Vastern Ditch below the northern footway of Vastern Road. These areas drain directly into the culverted ditch via a number of small connections.

3.1.5 The existing site is almost entirely impermeable and there is no existing surface water attenuation on the site.

3.1.6 As described in **Section 2.1** there are two catchments on the existing site with the northern catchment falling northwards and the southern catchment falling southwards. The equivalent greenfield and existing brownfield discharge rates have been calculated for the northern and southern catchments separately.

3.1.7 The existing brownfield discharge rate has been calculated using the HR Wallingford Modified Rational Method. An assessment of the equivalent greenfield discharge rate from the site has been undertaken based on the method described in the Rainfall Runoff Management for Developments Report – SC030219.

3.1.8 A copy of the greenfield and existing discharge rate calculations are contained in **Appendix D**. **Table 3.1**, provides a summary of the discharge rates for the northern and southern catchments.

Return Period	Equivalent Greenfield Discharge Rate (l/s)		Equivalent Brownfield Discharge Rate (l/s)	
	Northern Catchment	Southern Catchment	Northern Catchment	Southern Catchment
1 in 1 year	0.6	0.6	53.7	56.9
1 in 30 year	1.5	1.6	129.5	137.1
1 in 100 year	2.0	2.2	160.4	169.8

Table 3.1: Equivalent greenfield and existing brownfield discharge rates

4 Existing Foul Water Drainage Regime

4.1.1 The existing foul water network was identified during a CCTV survey carried out by Subscan UDS LTD in September 2017 the results from this survey are shown in drawing 4657 (A1-L1) and 4657 (A1-L2) in **Appendix C**.

4.1.2 Foul water from the western part of the existing building is conveyed west towards Lynmouth Road. The foul water is combined with the surface water from the western part of the site. The sewerage outfalls from the site into Lynmouth Road via a 225mmØ drain and a 150mmØ drain. It is assumed that both of these drains outfall to a foul sewer as Thames Water asset records show only a foul sewer in Lynmouth Road. It is possible that the 150mmØ sewer leads to the culverted Vastern Ditch watercourse below the northern footway of Vastern Road, but this can't be confirmed at this stage.

4.1.3 A foul water drain serving the southern part of the existing building is shown crossing the Vastern Road footway, conveying foul water south. It is assumed that this foul drain discharges into the 300mmØ Thames Water sewer in Vastern Road.

5 Proposed Surface Water Drainage Strategy

5.1 Proposed Surface Water Drainage Layout

5.1.1 Surface water runoff from the proposed buildings and external paved areas will enter either the northern or southern surface water drainage network. Separate foul and surface water drainage networks will be provided.

5.1.2 The northern drainage network conveys water to the northern boundary of the site. Surface water passes through a bypass separator before leaving the site and discharging into the River Thames via a new 300mmØ outfall pipe.

5.1.3 The southern drainage network conveys water to the southern boundary of the site. Surface water passes through a bypass separator before leaving the site and discharging into the culverted Vastern Ditch watercourse in the northern footway of Vastern Road via a new 300mmØ outfall.

5.1.4 The surface water discharge from both the northern and southern networks will be controlled by flow control devices, with water attenuated in underground cellular storage tanks that are located beneath the northern undercroft car park and the southern external car park. PBA drawing 47500/2001/001 shows the proposed drainage layout and is contained in **Appendix E**.

5.2 Discharge Destination

5.2.1 In accordance with the discharge destination hierarchies of the Building Regulations H3 and the National Planning Practice Guidance an assessment of the suitability of the site to utilise infiltration drainage techniques has been undertaken.

See the Planning Practice Guidance

This states:

"Generally the aim should be discharge surface runoff as high up the following hierarchy of drainage options as reasonably practicable:

1. *Into the ground (infiltration)*
2. *To a surface water body;*
3. *To a surface water sewer, highway drain or another drainage system;*
4. *To a combined sewer."*

5.2.2 A Phase I-II Geo-Environmental Site Assessment carried out by OMNIA Environmental Consulting has identified that the site is underlain by made ground up to 3.5m thick overlying cohesive strata of Alluvium, overlying granular strata of Kempton Park Gravel formation which immediately overlies Chalk. Although infiltration tests have not been carried out on the site based on the depth of made ground and former usages of the site, we have assumed that infiltration is not a suitable method of discharge for the development.

5.2.3 Following the discharge hierarchy, outfall to a surface water body is the next option considered. The River Thames is located adjacent to the site to the north and the culverted Vastern Ditch crosses the south of the site. The proposed surface water drainage strategy is to discharge surface water to these watercourses.

5.3 Peak Flow Control – Defra Technical Standard S3

> **S3.** For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

5.3.1 As previously discussed, (in **Section 3**), the application site is currently developed and the existing peak discharge rates from the site are contained in **Table 3.1**.

5.3.2 The EA's Flood Risk Assessments: Climate Change Allowances guidance which supports the NPPF provides contingency allowances for potential increases in sea level rise, peak river flow and rainfall intensity (allowances are set out in **Table 4.1**).

5.3.3 In accordance with this guidance, the potential for increased flood probability as the result of possible climate change has been taken into account in the consideration of mitigation measures over the lifetime of the development through a +40% allowance for increases in peak rainfall intensity (i.e. surface water drainage).

Table 4.1: Flood Risk Assessments: Climate Change Allowance Table 1 - Peak river flow allowances by river basin district (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for 2010 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
Upper End	10%	20%	40%
Central	5%	10%	20%

5.3.4 The Reading Borough Local Plan (November 2019) Policy EN18 states that Runoff rates should aim to reflect greenfield conditions and, in any case, must be no greater than the existing conditions of the site.

5.3.5 Due to the constrained space for attenuation on the development it is not possible for the drainage strategy to match the equivalent greenfield runoff rates. The drainage strategy has been designed to attenuate surface water from the development to provide a more than 50% betterment compared to the existing condition for the 1 in 1 year, 1 in 30 year and 1 in 100 year with an allowance for climate change events.

5.3.6 **Table 4.2** confirms the proposed peak rates.

Table 4.2: Proposed and Existing Discharge Rate Comparison

Return Period	Existing Brownfield Discharge Rate (l/s)		Proposed Peak Discharge (l/s)	
	Northern Catchment	Southern Catchment	Northern Catchment	Southern Catchment
1 in 1 Year	53.7	56.9	15.8	20.4
1 in 30 year	129.5	137.1	45.3	50.2

1 in 100 year	160.4	169.8	55.4	65.8
1 in 100 year + 40% allowance for climate change	-	-	76.0	84.8

5.3.7 In order to demonstrate that the proposed peak discharge rates are deliverable within the proposed development layout, an outline proposed surface water drainage network has been modelled. A copy of the MicroDrainage calculations for the proposed development are contained within **Appendix F**.

5.4 Volume Control - Defra Technical Standard S6

> **S5.** Where reasonably practicable, for developments which have been previously developed, 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 must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

5.4.1 The impermeable area on the site will be reduced by 19% (from 0.766ha to 0.619ha) as a result of the development. Therefore, the volume of run-off in the 100 year 6 hour storm event will be similarly reduced, which is a reduction on the existing volume discharge.

5.5 Flood Risk within the Development – Defra Technical Standards S7 to S9

> **S7.** The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.
>
> **S8.** The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement) or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

5.5.1 The proposed surface water drainage network has been designed not to flood in a 1 in 100 annual probability event or a 1 in 100 annual probability event with a +40% climate change.

5.5.2 A copy of the Proposed Surface Water Drainage Strategy drawing 47500/2001/001 and accompanying MicroDrainage calculations are contained within **Appendices E and F** respectively.

> **S9**. The design of the site must ensure that so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed in exceedance routes that minimise the risks to people and property.

5.5.3 The drainage network has been tested with surcharged outfalls and the results are contained in **Appendix G**. The northern network was tested with a water level of 37.09m AOD, which is the 1 in 20 year flood water level in the River Thames. The southern network was tested with 1m deep water in the culverted Vastern Ditch. The MicroDrainage results indicate there is no flooding for the any event up to the 1 in 100 +40% climate change.

5.5.4 Exceedance flood modelling has been carried out on the drainage network for a 100 year storm event with an 80% allowance for climate change and surcharged outfalls. During this flood event 6m³ flooding occurs at surface water manhole 10 and this flooding will be contained in the undercroft car park. Elsewhere in the network there is minor flooding at surface water manholes 36 and 32 and this flooding will be contained within the nearby road and car park and very minor flooding from manhole 1 which will flow north to the River Thames. PBA drawing 47500/2001/002 shows exceedance flooding and is contained in **Appendix H** along with the MicroDrainage calculations.

5.6 SuDS Selection

5.6.1 The Ministerial Statement HCWS161, dated 18th December 2014 states that:

> *'…..the Government's expectation is that sustainable drainage systems will be provided in new developments* ***wherever this is appropriate****.'*

5.6.2 The NPPG paragraph 051 describes SuDS as follows:

> *'Sustainable drainage systems are designed to control surface water run off close to where it falls and mimic natural drainage as closely as possible.* ***They provide opportunities to:***
>
> - *reduce the causes and impacts of flooding;*
> - *remove pollutants from urban run-off at source;*
> - *combine water management with green space with benefits for amenity, recreation and wildlife.'*

5.6.3 The current planning policy and guidance advises that SuDS in the form of open or near surface systems employing natural processes should be used where possible, not that they must be used. They can also provide opportunities to combine water management with amenity and wildlife, but only where appropriate.

5.6.4 The Geo-Environmental Site Assessment has identified that ground conditions are not suitable for infiltration, (see **Section 5.2**). Therefore, a system which utilises cellular attenuation is proposed. This will still follow the principles of the NPPG SuDS requirements by reducing flood risk and removal of pollutants / contaminants through the use of trapped gullies and catchpits.

5.7 Structural Integrity – Defra Technical Standards S10 & S11

> **S10.** Components must be designed to ensure structural integrity of the drainage system and any adjacent structures or infrastructure under anticipated loading conditions over the design life of the development taking into account the requirement for reasonable levels of maintenance.
>
> **S11.** The materials, including products, components, fittings or naturally occurring materials, which are specified by the designer must be of a suitable nature and quality for their intended use.

5.7.1 The components that make up any drainage network have different life expectances which can be greatly affected by the effectiveness of their maintenance regime and upstream sediment capture/management.

5.7.2 This drainage network comprises a piped network, inspection chambers / catchpits, cellular crate storage, oil separator and a hydraulic flow control. As with any drainage system, this network requires regular inspection and maintenance to ensure that the individual components continue to operate as designed, both in terms of hydraulic capacity and potential pollutant removal.

5.7.3 All the drainage channel sumps, catchpits, cellular crate storage points and oil separator will therefore be inspected and cleaned regularly by a private maintenance company.

5.7.4 The detail design of each of the individual components will be undertaken at the detailed design stage.

5.7.5 Further details regarding the maintenance of the proposed system are contained in **Section 6**.

6 Proposed Foul Water Drainage Strategy

6.1.1 The proposed foul water drainage strategy is to discharge to the existing Thames Water foul sewer in Lynmouth Road to the south west of the site, as shown in PBA drawing 47500/2001/SK001 included in **Appendix E**.

6.1.2 The proposal is to install a new 150mmØ foul drainage lateral connection in the south-western corner of the site to the existing 225mm Ø Thames Water sewer in Lynmouth Road.

6.1.3 We received a pre-planning enquiry response from Thames Water that confirms that there is sufficient capacity in the adjacent foul water network to serve the development. The Thames Water response is contained in **Appendix I**.

7 Maintenance Strategy

7.1.1 This section sets out the inspection and maintenance requirements for long term management of the development's surface water drainage system. This work is to be undertaken by a private maintenance company.

7.2 Health, Safety and Welfare

7.2.1 All those responsible for maintenance should take appropriate health, safety and welfare precautions for all activities including lone working, if relevant, and risk assessments should always be undertaken. The site's infrastructure Health and Safety File should be consulted before carrying out any works either inside or outside of the development's boundary and information regarding the location of existing utilities passed on to operatives.

7.2.2 The requirements of the Health and Safety at Work Act 1974 and The Construction (Design and Management) Regulations 2015 should be adhered to and any residual risks identified in the Health and Safety File should be managed and information passed on to maintenance operatives through task specific risk assessments.

7.3 Operation and Maintenance

7.3.1 There are three types of maintenance activities associated with surface water drainage systems. The SuDS Manual, CIRIA C753, defines these as:

- Regular Maintenance – '*basic tasks undertaken on a frequent and predictable schedule' including vegetation management, litter and debris removal, and inspections*.'
- Occasional Maintenance – *'tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example.'*
- Remedial Maintenance – *'intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.*'

7.3.2 Specific maintenance needs should be monitored and maintenance schedules adjusted to suit the location and condition of the drainage feature in question.

Operation and Maintenance Activity	SuDS Component	
	Piped Network / Inspection Chambers	Cellular / Modular Storage
Regular Maintenance		
Inspection	■	■
Litter and debris removal	■	□
Occasional Maintenance		
Sediment management[1]	■	■
Remedial Maintenance		
Structure rehabilitation / repair	□	□

Operation and Maintenance Activity	SuDS Component	
	Piped Network / Inspection Chambers	Cellular / Modular Storage
■ Will be required □ May be required [1] Sediment should be collected and managed in pre-treatment systems, upstream of the main device.		

Table 5.1: Extract from The SuDS Manual Table 32.1: Typical key SuDS components operation and maintenance activities.

7.4 Piped Network / Inspection Chambers

7.4.1 Piped network components requires regular inspection and maintenance to ensure that the individual components continue to operate as designed, both in terms of hydraulic capacity and potential pollutant removal. All the gullies, inspection chambers and catchpits will therefore be inspected and cleaned regularly.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any features that are not operating correctly. If required take remedial action	Monthly for three months, then six monthly
	Debris removal from catchment surface / gratings (where may cause risks to performance)	Monthly (and after large storms)
	Remove sediment from trapped sumps, manholes and catchpits.	Annually or as required
Remedial Maintenance	Repair / rehabilitation of gratings, inlets and outlets	As required
Monitoring	Inspect / check all gratings, trapped sumps, manholes and catchpits to ensure that they are in good condition and operating as designed	Annually and after large storm events
Structure Rehabilitation / Repair	Regular Maintenance and Monitoring to identify if repair and / or replacement of features or pipework is required.	As required

Table 5.2: Piped Network / Inspection Chambers operation and maintenance

7.5 Cellular / Modular Storage

7.5.1 Cellular storage systems are plastic high void ratio modular systems which can be used to control and manage runoff.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required take remedial action	Monthly for three months, then annually
	Remove debris from catchment surface (where may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary	Annually
	Remove sediment from pre-treatment structures and / or internal forebays	Annually, or as required
Remedial Maintenance	Repair / rehabilitate inlets, outlets, overflows and vents	As required
Monitoring	Inspect / check all inlets, outlets, vents and overflows to	Annually, and after large

	ensure that they are in good condition and operating as designed	rainfall events
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
Structure Rehabilitation / Repair	Regular Maintenance and Monitoring to identify if repair and / or replacement of storage units is required.	As required

Table 5.4: The SuDS Manual Table 21.3: Operation and maintenance requirements for attenuation storage tanks

8 Summary

8.1.1 This Drainage Strategy has been developed in accordance with relevant national, regional and local planning policy guidance.

8.1.2 The Geo-Environmental Site Assessment has identified that the ground conditions are not suitable for infiltration for the site. The proposed drainage strategy is to discharge surface water to the River Thames and the culverted Vastern Ditch watercourses.

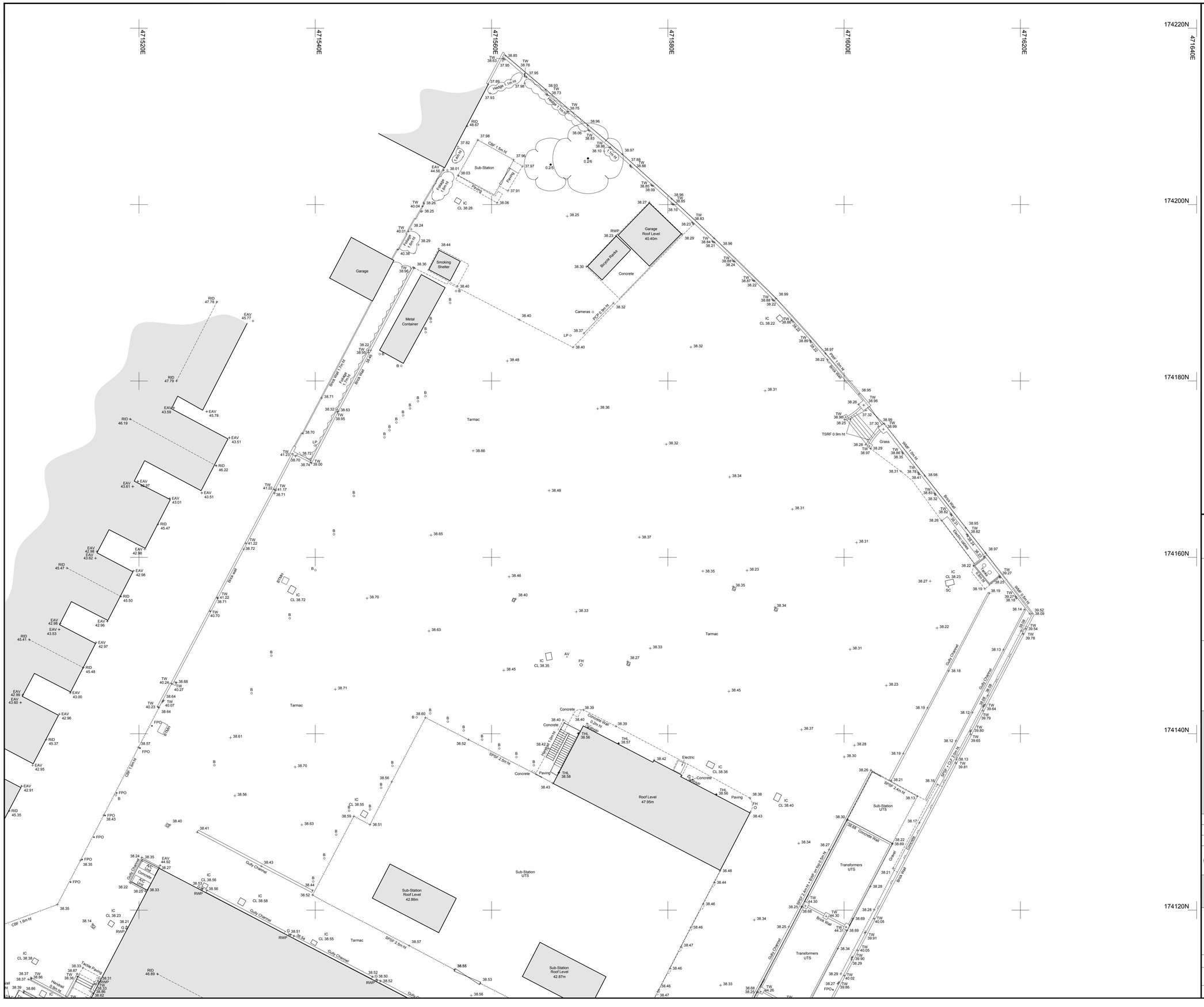
8.1.3 The drainage strategy has been designed to attenuate surface water from the development to provide more than 50% betterment compared to the existing condition for the 1 in 1 year, 1 in 30 year and 1 in 100 year with an allowance for climate change events.

8.1.4 A system which utilises underground cellular attenuation is proposed. This will follow the principles of the NPPG SuDS requirements by reducing flood risk and removal of pollutants / contaminants through the use of trapped gullies, oil interceptors and catchpits / silt traps.

8.1.5 A private maintenance contractor will be responsible for the long-term maintenance of the proposed system and will undertake inspection and maintenance in accordance with this Strategy.

8.1.6 As a result, the principles advocated by relevant national, regional and local planning policy guidance have been satisfactorily addressed.

Appendix A Site Topographical Survey, 16/295/100-A and 16/295/100-A



Sheet Layout

16295-100-A

16295-100-B

Grid

N W E S

LEGEND

BANKING — Top / Bottom

BUSHES & HEDGES

TREES — MT / 3T / 0.2 / 6 (Multiple Trees No of Trees Dia of Bole Height of Tree)

NOTE:- SPREADS AND HEIGHTS ARE INDICATIVE ONLY

GATES — Single / Double

WALL — Width drawn to scale 0.23w

BUILDING

OPEN SIDED BUILDING

GLASS ROOFED

CONTOURS — 25.50

ABBREVIATIONS (WHERE APPLICABLE)

ARCH HEAD HEIGHT	AHH	MARKER	MKR
ARCH HEAD LEVEL	AHL	NOTICE BOARD	NB
ARCH SPRINGER HEIGHT	ASH	NAME PLATE	NP
ARCH SPRINGER LEVEL	ASL	OVERHEAD WIRES	OHW
AIR VALVE	AV	PARKING METER	PM
BED LEVEL	BL	RIDGE LEVEL	RID
BELISHA BEACON	BB	ROOF LEVEL	RL
BOLLARD	B	ROAD SIGN	RS
BRITISH TELECOM BOX	BTB	RODDING EYE	RE
BRITISH TELECOM MANHOLE	BTMH	RETAINING WALL	RTW
BRICKWORK	BKWK	RAIN WATER PIPE	RWP
BUS STOP	BS	SLUICE VALVE	SV
CABLE TV	CATV	STOP COCK	SC
COVER LEVEL	CL	SOFFIT LEVEL	SOF
CABLE MARKER	CM	STRUCTURAL SLAB LEVEL	SSL
COLUMN	Col	TREE STUMP	ST
CONCRETE POST	CP	SOIL AND VENT PIPE	SVP
EAVES LEVEL	EAV	THRESHOLD LEVEL	THL
ELECTRICAL COVER	ELEC	TELEGRAPH POLE	TP
ELECTRICITY CONTROL BOX	ECB	TELEPHONE CALL BOX	TCB
ELECTRICITY POLE	EP	TOP OF KERB	TK
EARTH ROD	ER	TURNSTILE	TS
FLOWER BED	FB	TRAFFIC LIGHT	TL
FINISHED FLOOR LEVEL	FFL	TOP OF WALL	TW
FIRE HYDRANT	FH	UNABLE TO LIFT	UTL
FLOOR LEVEL	FL	UNABLE TO SURVEY	UTS
FLAG STAFF	FS	VENT PIPE	VP
GAS PIPE	GP	WATER METER	WM
GAS VALVE	GV	WATER LEVEL	WL
GULLY	G	WASH OUT	WO
GATE STOP	GS	WASTE PIPE	WP
INSPECTION COVER	IC	WATER TANK	WT
LETTER BOX	LB	WATER VALVE	WV
LAMP POST	LP		

FENCES

BARBED WIRE FENCE	BWF	LARCH LAP FENCE	LLF
CORRUGATED IRON FENCE	CIF	METAL RAILING FENCE	MRF
CLOSE BOARD FENCE	CBF	POST AND CHAIN FENCE	PCF
CHAIN LINK FENCE	CLF	PICKET FENCE	PIF
CHESTNUT PALING FENCE	CPF	POST AND RAIL FENCE	PRF
FENCE POST	FPO	POST AND WIRE FENCE	PWF
INTERWOVEN FENCE	IWF	STEEL PALISADE SECURITY FENCE	SPSF
IRON RAILING FENCE	IRF	TUBULAR STEEL RAIL FENCE	TSRF

REV.	NOTES	DWN	DATE
A	---	---	--/----/----

ISO 9001 REGISTERED FIRM — Certificate Number: GB 6562

A MEMBER OF THE THE SURVEY ASSOCIATION

ISO 14001 REGISTERED FIRM — Certificate Number: GB 11414

Notes:

Grid and levels relate to OS GPS Active Network.

Maltby Surveys Ltd

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SURVEYED	NBJ	CLIENT
DRAWN	NBJ	Cushman & Wakefield LLP
CHECKED	RB	SCALE
		1/200 (A1 Sheet)

RICS

55 Vastern Road, Reading, RG1 8BU

TOPOGRAPHICAL SURVEY

Job No	Rev	Drawing Number
16/295		16/295/100-A

Date : October 2016

Sheet Layout

16295-100-A

16295-100-B

Grid

N W E S

LEGEND

BANKING — Top / Bottom

BUSHES & HEDGES

TREES — MT / 3T / 0.2 / 6 (Multiple Trunks No of Trunks; Dia of Bole; Height of Tree)

NOTE:- SPREADS AND HEIGHTS ARE INDICATIVE ONLY

GATES — Single / Double

WALL — Width drawn to scale 0.23w

BUILDING

OPEN SIDED BUILDING

GLASS ROOFED

CONTOURS — 25.50

ABBREVIATIONS (WHERE APPLICABLE)

ARCH HEAD HEIGHT	AHH	MARKER	MKR
ARCH HEAD LEVEL	AHL	NOTICE BOARD	NB
ARCH SPRINGER HEIGHT	ASH	NAME PLATE	NP
ARCH SPRINGER LEVEL	ASL	OVERHEAD WIRES	OHW
AIR VALVE	AV	PARKING METER	PM
BED LEVEL	BL	RIDGE LEVEL	RID
BELISHA BEACON	BB	ROOF LEVEL	RL
BOLLARD	B	ROAD SIGN	RS
BRITISH TELECOM BOX	BTB	RODDING EYE	RE
BRITISH TELECOM MANHOLE	BTMH	RETAINING WALL	RTW
BRICKWORK	BKWK	RAIN WATER PIPE	RWP
BUS STOP	BS	SLUICE VALVE	SV
CABLE TV	CATV	STOP COCK	SC
COVER LEVEL	CL	SOFFIT LEVEL	SOF
CABLE MARKER	CM	STRUCTURAL SLAB LEVEL	SSL
COLUMN	Col	TREE STUMP	ST
CONCRETE POST	CP	SOIL AND VENT PIPE	SVP
EAVES LEVEL	EAV	THRESHOLD LEVEL	THL
ELECTRICAL COVER	ELEC	TELEGRAPH POLE	TP
ELECTRICITY CONTROL BOX	ECB	TELEPHONE CALL BOX	TCB
ELECTRICITY POLE	EP	TOP OF KERB	TK
EARTH ROD	ER	TURNSTILE	TS
FLOWER BED	FB	TRAFFIC LIGHT	TL
FINISHED FLOOR LEVEL	FFL	TOP OF WALL	TW
FIRE HYDRANT	FH	UNABLE TO LIFT	UTL
FLOOR LEVEL	FL	UNABLE TO SURVEY	UTS
FLAG STAFF	FS	VENT PIPE	VP
GAS PIPE	GP	WATER METER	WM
GAS VALVE	GV	WATER LEVEL	WL
GULLY	G	WASH OUT	WO
GATE STOP	GS	WASTE PIPE	WP
INSPECTION COVER	IC	WATER TANK	WT
LETTER BOX	LB	WATER VALVE	WV
LAMP POST	LP		

FENCES

BARBED WIRE FENCE	BWF	LARCH LAP FENCE	LLF
CORRUGATED IRON FENCE	CIF	METAL RAILING FENCE	MRF
CLOSE BOARD FENCE	CBF	POST AND CHAIN FENCE	PCF
CHAIN LINK FENCE	CLF	PICKET FENCE	PIF
CHESTNUT PALING FENCE	CPF	POST AND RAIL FENCE	PRF
FENCE POST	FPO	POST AND WIRE FENCE	PWF
INTERWOVEN FENCE	IWF	STEEL PALISADE SECURITY FENCE	SPSF
IRON RAILING FENCE	IRF	TUBULAR STEEL RAIL FENCE	TSRF

REV.	NOTES	DWN	DATE
A	---	---	--/----/----

ISO 9001 REGISTERED FIRM — Certificate Number: GB 6562

A MEMBER OF THE THE SURVEY ASSOCIATION

ISO 14001 REGISTERED FIRM — Certificate Number: GB 11414

Notes:

Grid and levels relate to OS GPS Active Network.

Maltby Surveys Ltd

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WebSite: http://www.maltbysurveys.com

SURVEYED	NBJ	CLIENT
DRAWN	NBJ	Cushman & Wakefield LLP
CHECKED	RB	
RICS		SCALE
		1/200 (A1 Sheet)

55 Vastern Road, Reading, RG1 8BU

TOPOGRAPHICAL SURVEY

Job No	Rev	Drawing Number
16/295		16/295/100-B

Date : Oct. 2016

Appendix B Proposed Site Plan, Berkeley 446.SK.100

00 - Ground Floor

project
Vastern Road
Reading

drawing
Proposed Floor Plans
00 - Ground Floor

date	scale @ a3	drawn
August 2019	1:500	DMT

drawing number	revision
448.SK.100	/

revision	date	prepared	description

Berkeley
Designed for life

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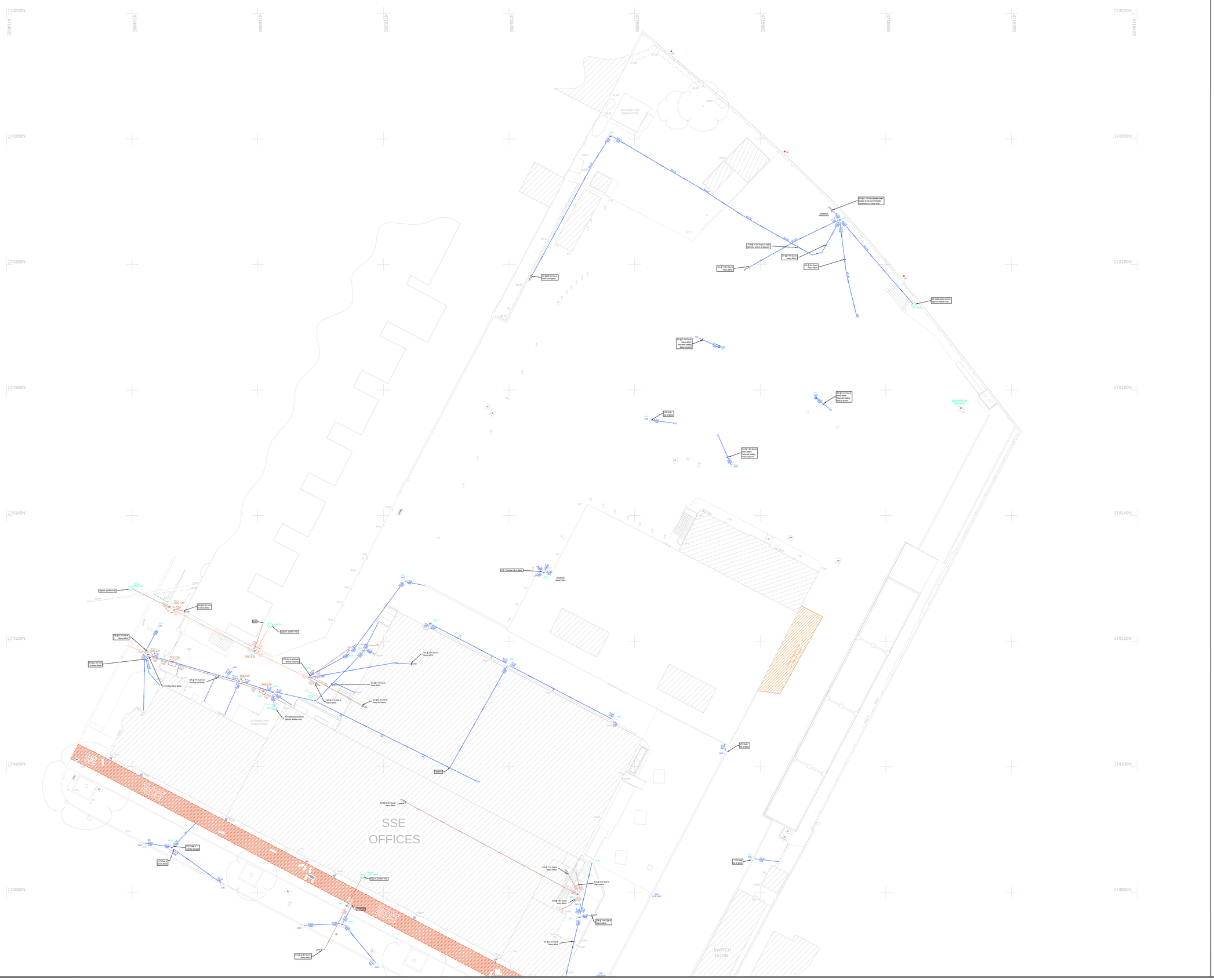
Appendix C Subscan UDS Drawing 6457 (A0-L1)-RevA and 6457 (A0-L2)-RevA



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Detection Grades

Method Used	Grade Achieved	Horizontal Accuracy	Vertical Accuracy	Detection Clarification
Ground Penetrating Radar	D	N/A	N/A	Signals passed and reflected back into ground or site.
Sub Surface/Utility Structure	U	N/A	N/A	Due to physical access or other constraints, unable to locate with equipment.
Detection	B2	N/A	N/A	Records and data evidence signals detected and recorded by survey equipment but no topography or other data available.
Detection	B3	± 300mm	± 300mm	Signals detected using non-invasive surveying technique. Confidence in accuracy and depth is a probable assumption. Dimensions have
Detection	B3	± 250mm	± 300 to Greater Depth	Signals detected using non-invasive surveying technique. Confidence in accuracy and depth is a probable assumption. Dimensions have
Detection	B3	± 100mm	± 300 to Greater Depth	Signals detected using non-invasive electronic interrogation which agree to +/50 mm or pipe/cable
Verification	A	± 50mm	± 250mm	Top of the service should be exposed and its depth and accuracy within a +/50 mm/+/ 5 depth are measured.

Topographical Survey Key

- AV Air Valve
- FH Fire Hydrant
- ST Stop Tap
- TAP/X Tap
- WM Water Meter
- SV Stop Valve
- WO Wash Out
- WV Water Valve
- W Water Cover
- D/G Drain/Gully
- KO Kerb Outlet
- TP Telecoms Cover
- CCTV Camera
- MAIL Post Box
- LP Light
- LP Lamp Post
- TS Traffic Light
- EP Electricity Pole
- ER Earth Rod
- E Electric Cover
- IC Inspection Cover
- BM Bench Mark
- Borehole
- Trial Pit
- CATV Cable TV Cover
- C Cable TV Supply
- Sign Sign
- TS Traffic Signals Cover
- MH Circular Manhole
- MH Square Manhole
- MH Triangular Manhole
- Chamber Extents
- Threshold Level
- Col Column
- G Gas Valve
- RE Rodding Eye
- Marker Post
- Bus Bus Stop
- Bol Bollard
- TP Telegraph Pole
- Trapped Outlet
- Back Drop

Sub Surface Key

- BT Cable
- CATV Cable
- Corrs Cable
- Comms Cable
- Traffic Signal Cable
- Electric Cable
- Electric LV Cable
- Electric HV Cable
- Gas Pipe
- Unidentified Service
- Water Main
- Foul Sewer
- Combined Sewer
- Private Sewer
- Foul Rising Sewer
- Surface Sewer
- Rising Main
- Trade Effluent
- GPR Anomaly
- Service Duct
- Survey Extents
- Chamber Extents
- Fibre Optic
- CCTV Cables

- DL:00 Depth (m)
- UT1 Unable To Trace
- EOT End of Trace / Signal Lost
- EOS End Of Survey
- DA Drainage Survey Abandoned
- AR Assumed Route
- TPR Taken From Records
- UTR Unable To Raise
- UTL Unable To Lift
- UTM Unable To Measure
- UTF Unable To Access Further
- M.A.R. Man Access Required
- CL Cover Level
- IL Invert Level
- U/S Underside/Soffit
- TOF Top Of Fence
- TOH Top Of Hedge
- TOW Top Of Wall
- DOC Depth Of Cover
- DOB Depth Of Bottom
- F.P. Fence Post
- N.V.P. No Visible Pipe
- N.V.V. No Visible Valve
- E.D. Empty Duct
- RWP Rain Water Pipe
- M.U.P. Multiple Pipes
- M.U.D Multiple Ducts
- M.U.C Multiple Cables
- CR Cable Riser
- OC Observed Chamber
- UC Unobserved Chamber

Letters correspond with CCTV report and indicate pipe references.

Disclaimer

Service details have been added to a previous survey unless otherwise stated. All services shown on this plan have been surveyed using approved detectors and the information obtained has been processed and presented in good faith.

Should the background, or topographical, information for the survey area be based on an Ordnance Survey file we are not liable for any loss that may arise due to a lack of accuracy in that digital data.

Location accuracy is determined by referring to manufacturer's guidelines for the detection equipment used. Unless otherwise stated, all services are considered to be located and mapped are +/-10% of the depth. Whilst this technique has proven to be successful, it is not 100% reliable and is affected by ground conditions. The accuracy of the data for the centre of the conductor and its not necessarily the depth is a depth of pipe.

Although all reasonable effort is made during site detection, the completeness of the underground services information cannot be guaranteed. An electric current will flow along the path of least resistance. This means that when a current is induced onto a pipe or cable, it will also flow along any other pipe or cable in the conducting pathway. It is possible, therefore, that features that are detected by electromagnetic means may be those of services other than those intended. Positive identification of apparatus cannot be assumed to be totally accurate. It should be borne in mind that there are other underground services which are not detected by electromagnetic fields such as power cables, or around which an electromagnetic field can be induced, such as some water pipes and some communications cables. Further intrusive investigation is required to result the exact routes of all buried services or to detect their presence.

Service information can also be shown on the drawings taken from statutory undertakers record plans. This information is shown for the sake of completeness and Subscan UDS Ltd can take no responsibility for the positional accuracy of such information. It is also to be noted that Subscan UDS Ltd can take no responsibility for information shown as dial plan information may duplicate travel routes but may be other due to the inaccuracy of the service records from which the information has been obtained.

Layout

AO-L1

AO-L2

Approximate Direction of North

NORTH

GRID & DATUM

Utility information overlaid onto previous topographical survey 10256-100 provided by Peter Brett Associates.

REV	DATE	DRAWN	DESCRIPTION	CHECKED
A	03/05/18	AS	Drainage updated following CCTV Survey.	RH

SUBSCAN
www.subscan.com Tel: 08444698 5200

CLIENT
Turner & Townsend

SITE
55 Vastern Road
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RG1 8BU

DRAWING TITLE
Underground Utilities Survey.

DRAWING REF (LAYOUT TAB)		SCALE(S)AO
6457 (AD-L1)-revA		1/200
PROJECT REF		REV
6457		A
SURVEYED	SW,JV	DRAWN SW
CHECKED	MA	DATE 12/05/2017

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Detection Grades

Method Statement Reference	Grade Quality	Horizontal Accuracy	Vertical Accuracy	Detection Clarification
Existing Records Search	D	N/A	N/A	General area of an records map, not found on site.
Site Reconnaissance	D	N/A	N/A	Site Evidence all access is a visual assessment of the site using self equipment.
Detection	B4	N/A	N/A	Records and Site Evidence again equipment but in Topography or Detection equipment.
Detection	B3	± 300mm	± 300mm	Signal Enhancement Techniques surveying technique. Confidence in the accuracy of the line is a percentage dependent on Discriminate signal.
Detection	B2	± 250mm	± 300m Depth Depth	Signal Enhancement Techniques surveying technique. Confidence in the accuracy of the line is a percentage dependent on Discriminate signal.
Detection	B1	± 100mm	± 300m Depth Depth	Signal Enhancement Techniques electron technique which agree to 100 mm or better.
Verification	A	± 50mm	± 300m	Trial Pits survey results. Confidence in the accuracy of the accuracy utilise to all GAUS & Site and Conversion.

Topographical Survey Key

- AV Air Valve
- FH Fire Hydrant
- ST Stop Tap
- TAP/X Tap
- WM Water Meter
- SV Stop Valve
- WO Wash Out
- WV Water Valve
- W Water Cover
- D/G Drain/Gully
- KO Kerb Outlet
- TP Telecoms Cover
- CCTV Camera
- MAIL Post Box
- LP Light
- LP Lamp Post
- TS Traffic Light
- EP Electricity Pole
- ER Earth Rod
- E Electric Cover
- IC Inspection Cover
- BM Bench Mark
- Borehole
- Trial Pit
- CATV Cable TV Cover
- C Cable TV Supply
- Sign Sign
- TS Traffic Signals Cover
- MH Circular Manhole
- MH Square Manhole
- MH Triangular Manhole
- Chamber Extents
- Threshold Level
- Col Column
- G Gas Valve
- RE Rodding Eye
- Marker Post
- Bus Bus Stop
- Bol Bollard
- TP Telegraph Pole
- Trapped Outlet
- Back Drop

Sub Surface Key

- BT Cable
- CATV Cable
- Corns Cable
- Comms Cable
- Traffic Signal Cable
- Electric Cable
- Electric LV Cable
- Electric HV Cable
- Gas Pipe
- Unidentified Service
- Water Main
- Foul Sewer
- Combined Sewer
- Private Sewer
- Surface Water
- Surface Sewer
- Rising Main
- Trade Effluent
- GPR Anomaly
- Service Duct
- Survey Extents
- Chamber Extents
- Fibre Optic
- CCTV Cables

EL/D	Depth (m)	TOF	Top Of Fence
UTT	Unable To Trace	TOH	Top Of Hedge
EOT	End of Trace / Signal Lost	TOW	Top Of Wall
EOS	End Of Survey	DOC	Depth Of Cover
DA	Drainage Survey Abandoned	DOB	Depth Of Bottom
AR	Assumed Route	F.T	Poor Trace
TPR	Taken From Records	N.V.P	No Visible Pipe
UTR	Unable To Raise	N.V.V	No Visible Valve
UTL	Unable To Lift	E.D	Empty Duct
UTS	Unable To Surface	B.P	Broken Pipe
UTF	Unable To Trace Further	BLKD	Blocked
M.A.R	Man Access Required	M.U.C	Multiple Ducts
CL	Cover Level	M.U.C	Multiple Cables
IL	Invert Level	CR	Cable Rise
US	Underside/Soffit	CF	Cable Fall
		DC	Drainage Channel

Letters correspond with CCTV report and indicate pipe references.

Disclaimer

Service details have been added to a previous survey unless otherwise stated. All locations are approximate. Service connections are not generally shown and the connections between manholes, if not traced, are assumed to be direct.

Should the background, or topographical, information for the survey area be based on an Ordnance Survey file we are not liable for any loss that may arise due to a change in the survey information.

Location accuracy is determined by referring to manufacturer's guidelines for the equipment used. In ideal conditions the accuracies for the underground utilities located and mapped are +/-10% of the depth. Whilst this technique has proven to be reliable, it is a fact that the depths shown are based on the measured depths obtained and for the centre of the conduit/ pipe and do not necessarily the depth to a duct or pipe.

Although all reasonable effort is made during site detection, the completeness of the underground services information cannot be guaranteed. An electric current is induced into a conductor when it is placed in a field of electric current. Current induced into a feature it will 'jump' to adjacent features if they offer a better conducting pathway. It is possible, therefore, that features that are detected by electromagnetic means may be those to which the current has jumped. The identification of operators cannot be assumed to be totally accurate. It should be noted that not all services are conductive and therefore cannot be detected by electromagnetic field, such as power cables, or around which an electromagnetic field cannot be induced, such as non-metallic pipes and non-conductive cable ducts and it cannot therefore be guaranteed to reveal the exact routes of all buried services or to detect their presence.

Service information can also be shown on the drawings taken from statutory ordinances record plans. This information is shown for the sake of completeness and should not be used for any construction purposes. Subscan cannot verify this information as this may be digitised directly from service plans provided. Information shown as sole plan information may duplicate branch routes but may be correct regarding the exis-tence of the service records from which the information have been digitised.

Layout

- A0-L1
- A0-L2

Approximate Direction of North

NORTH

GRID & DATUM

Utility information overlaid onto previous topographical survey 16295-100 provided by Peter Brett Associates.

REV	DATE	DRAWN	DESCRIPTION	CHECKED
A	03/05/18	AG	Drainage updated following CCTV Survey.	RM

SUBSCAN
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CLIENT
Turner & Townsend

SITE
55 Vastern Road
Reading
RG1 8BU

DRAWING TITLE
Underground Utilities Survey.

DRAWING REF (LAYOUT TAB) 6457 (A0-L2)-revA	SCALE@A0 1:200
PROJECT REF 6457	REV. A

SURVEYED	DM,JN	DRAWN	DW
CHECKED	MA	DATE	12/06/2017

Appendix D Greenfield Runoff Estimation and Existing Brownfield Runoff Calculation

pba peterbrett	The Old Power Station, Vastern Road Surface Water Drainage Strategy Existing Brownfield Runoff - Northern Catchment	JOB No: 47500/2001		SHEET: 1 of 1
		DATE: 03.12.2019	BY: JPS	CHECKED: PJG

Calculation based on 'Modified Rational Method', HR Wallingford.

Assumes that water travels across the site at 1m/s from the furthest point to the connection with the existing network

Data

M5-60min 18.5 mm Q=2.78CiA
r 0.40

Calculation - 1 in 1 Year

Catchment Area	Impermeable Area ha	Duration (D) min	Z1	M5-Dmin mm	Z2	M1-Dmin mm	i mm/hr	Impermeable Runoff l/s	
1	0.372	5	0.38	7.03	0.62	4.33	52.0	53.7	
							Total	**53.7**	**l/s**
							Total	144.5	l/s/ha

Note: Duration relates to time of concentration for the catchment including allowance for time of entry

D	*Z1*
5	*0.38*
10	*0.51*
15	*0.57*

M5	*Z2 for 1 in 1yr*
5	*0.620*
7.03	*0.616*
10	*0.610*

Calculation - 1 in 30 Year

Catchment Area	Impermeable Area ha	Duration (D) min	Z1	M5-Dmin mm	Z2	M100-Dmin mm	i mm/hr	Impermeable Runoff l/s	
1	0.372	5	0.38	7.03	1.48	10.43	125.2	129.5	
							Total	**129.5**	**l/s**
							Total	348.0	l/s/ha

Note: Duration relates to time of concentration for the catchment including allowance for time of entry

D	*Z1*
5	*0.38*
10	*0.51*
15	*0.57*

M5	*Z2 for 1 in 30yr**
5	*1.460*
7.03	*1.484*
10	*1.520*

* - extrapolated from Z2 values from other storm events and durations

Calculation - 1 in 100 Year

Catchment Area	Impermeable Area ha	Duration (D) min	Z1	M5-Dmin mm	Z2	M100-Dmin mm	i mm/hr	Impermeable Runoff l/s	
1	0.372	5	0.38	7.03	1.84	12.92	155.1	160.4	
							Total	**160.4**	**l/s**
							Total	431.0	l/s/ha

Note: Duration relates to time of concentration for the catchment including allowance for time of entry

D	*Z1*
5	*0.38*
10	*0.51*
15	*0.57*

M5	*Z2 for 1 in 100yr*
5	*1.790*
7.03	*1.838*
10	*1.910*

pba peterbrett	The Old Power Station, Vastern Road Surface Water Drainage Strategy Existing Brownfield Runoff - Southern Catchment	JOB No: 47500/2001		SHEET: 1 of 1
		DATE: 03.12.2019	BY: JPS	CHECKED: PJG

Calculation based on 'Modified Rational Method', HR Wallingford.

Assumes that water travels across the site at 1m/s from the furthest point to the connection with the existing network

Data

M5-60min 18.5 mm Q=2.78CiA
r 0.40

Calculation - 1 in 1 Year

Catchment Area	Impermeable Area ha	Duration (D) min	Z1	M5-Dmin mm	Z2	M1-Dmin mm	i mm/hr	Impermeable Runoff l/s
1	0.394	5	0.38	7.03	0.62	4.33	52.0	56.9
							Total	**56.9** l/s
							Total	144.5 l/s/ha

Note: Duration relates to time of concentration for the catchment including allowance for time of entry

D	*Z1*
5	*0.38*
10	*0.51*
15	*0.57*

M5	*Z2 for 1 in 1yr*
5	*0.620*
7.03	*0.616*
10	*0.610*

Calculation - 1 in 30 Year

Catchment Area	Impermeable Area ha	Duration (D) min	Z1	M5-Dmin mm	Z2	M100-Dmin mm	i mm/hr	Impermeable Runoff l/s
1	0.394	5	0.38	7.03	1.48	10.43	125.2	137.1
							Total	**137.1** l/s
							Total	348.0 l/s/ha

Note: Duration relates to time of concentration for the catchment including allowance for time of entry

D	*Z1*
5	*0.38*
10	*0.51*
15	*0.57*

M5	*Z2 for 1 in 30yr**
5	*1.460*
7.03	*1.484*
10	*1.520*

* - extrapolated from Z2 values from other storm events and durations

Calculation - 1 in 100 Year

Catchment Area	Impermeable Area ha	Duration (D) min	Z1	M5-Dmin mm	Z2	M100-Dmin mm	i mm/hr	Impermeable Runoff l/s
1	0.394	5	0.38	7.03	1.84	12.92	155.1	169.8
							Total	**169.8** l/s
							Total	431.0 l/s/ha

Note: Duration relates to time of concentration for the catchment including allowance for time of entry

D	*Z1*
5	*0.38*
10	*0.51*
15	*0.57*

M5	*Z2 for 1 in 100yr*
5	*1.790*
7.03	*1.838*
10	*1.910*

pba peterbrett	The Old Power Station, Vastern Road Surface Water Drainage Strategy Calculation of Greenfield Discharge Rate - Northern Catchment	JOB No: 47500/2001 DATE: 03.12.2019 / BY: JPS	SHEET: 1 of 1 CHECKED: PJG

Calculation based on 'Rainfall runoff management for developments' - Report SC030219, October 2013, Defra / Environmental Agency

	Site		
R	6		Hydrological region
S	4		SOIL type
Catchment	<200	ha	
$A_{(site)}$	0.37	ha	Size of catchment (excluding large open parkland that is to remain)
SAAR or AAR	675	mm	
SPR	0.3		For SOIL type 2
$A_{(50)}$	50	ha	Use 50ha for sites less than 50ha
$Q_{BAR(50)}$	87.33	l/s	Catchment mean annual peak flow for $A_{(50)}$ (50ha site)
Q_{BAR}	0.65	l/s	
$Q_{BAR(site)}/A_{(site)}$	1.75	l/s/ha	Mean annual peak flow per unit area (If less than 1 use 1 l/s/ha)
$Q_{throttle}$	0.00	l/s	Based on minimum litmit of discharge - refer to Page xvi, para 17
$Q_{throttle}/A_{(site)}$	0.00	l/s/ha	
$Q_{throttle}/3.5A_{(site)}$	0.00	l/s/ha	
Q_{BAR}/A	1.75	l/s/ha	Use greater value of $Q_{BAR(site)}/A_{(site)}$ and $Q_{throttle}/3.5A_{(site)}$
GC_1	0.85		Value taken from Line 11.1
GC_{30}	2.30		Value taken from Figure 1.2
GC_{100}	3.15		Value taken from Figure 1.2
Q_{1yr}	**0.6**	**l/s/ha**	
Q_{30yr}	1.5	l/s/ha	
Q_{100yr}	**2.0**	**l/s/ha**	

pba peterbrett	The Old Power Station, Vastern Road Surface Water Drainage Strategy Calculation of Greenfield Discharge Rate - Southern Catchment	JOB No: 47500/2001		SHEET: 1 of 1
		DATE: 03.12.2019	BY: JPS	CHECKED: PJG

Calculation based on 'Rainfall runoff management for developments' - Report SC030219, October 2013, Defra / Environmental Agency

	Site		
R	6		Hydrological region
S	4		SOIL type
Catchment	<200	ha	
$A_{(site)}$	0.39	ha	Size of catchment (excluding large open parkland that is to remain)
SAAR or AAR	675	mm	
SPR	0.3		For SOIL type 2
$A_{(50)}$	50	ha	Use 50ha for sites less than 50ha
$Q_{BAR(50)}$	87.33	l/s	Catchment mean annual peak flow for $A_{(50)}$ (50ha site)
Q_{BAR}	0.69	l/s	
$Q_{BAR(site)}/A_{(site)}$	1.75	l/s/ha	Mean annual peak flow per unit area (If less than 1 use 1 l/s/ha)
$Q_{throttle}$	0.00	l/s	Based on minimum litmit of discharge - refer to Page xvi, para 17
$Q_{throttle}/A_{(site)}$	0.00	l/s/ha	
$Q_{throttle}/3.5A_{(site)}$	0.00	l/s/ha	
Q_{BAR}/A	1.75	l/s/ha	Use greater value of $Q_{BAR(site)}/A_{(site)}$ and $Q_{throttle}/3.5A_{(site)}$
GC_1	0.85		Value taken from Line 11.1
GC_{30}	2.30		Value taken from Figure 1.2
GC_{100}	3.15		Value taken from Figure 1.2
Q_{1yr}	**0.6**	**l/s/ha**	
Q_{30yr}	1.6	l/s/ha	
Q_{100yr}	**2.2**	**l/s/ha**	

Appendix E PBA Drawing 47500-2001-SK001 Proposed Drainage Layout

NOTES:

1. DO NOT SCALE THIS DRAWING. IF IN DOUBT PLEASE REQUEST FURTHER INFORMATION.
2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT CONTRACT DRAWINGS, CONSTRUCTION DETAILS AND SPECIFICATIONS.

KEY:

- PROPOSED SURFACE WATER DRAIN
- PROPOSED CELLULAR STORAGE
- PROPOSED FOUL WATER DRAIN
- PROPOSED CATCHPIT
- PROPOSED BYPASS SEPARATOR

Mark	Revision	Date	Drawn	Chkd	Appd
A	MASTERPLAN UPDATED	13.12.19	JC	JPS	PJG

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

Drawing Issue Status

PLANNING

THE OLD POWER STATION
VASTERN ROAD
PROPOSED DRAINAGE LAYOUT

Client

Berkeley
Designed for life

Date of 1st Issue	Designed	Drawn
09.12.2019	JS	JC
A1 Scale	Checked	Approved
1:250	JS	PJG

Drawing Number: 47500/2001/001

Revision: A

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READING
Tel: 01189 500 761

Appendix F Proposed Surface Water Drainage Strategy MicroDrainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm North

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.700	Add Flow / Climate Change (%)	0
Ratio R	0.400	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

Network Design Table for Storm North

« - 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	8.446	0.085	99.4	0.009	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	5.763	0.060	96.1	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	21.410	0.130	164.7	0.021	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	10.248	0.060	170.8	0.014	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	14.723	0.090	163.6	0.012	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	25.016	1.575	15.9	0.024	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	4.109	0.020	205.5	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	5.617	0.025	224.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	12.956	0.055	235.6	0.012	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	5.14	37.800	0.009	0.0	0.0	0.0	1.01	17.8	1.2
1.001	50.00	5.23	37.715	0.027	0.0	0.0	0.0	1.03	18.1	3.7
1.002	50.00	5.58	37.580	0.048	0.0	0.0	0.0	1.02	40.4	6.5
1.003	50.00	5.76	37.450	0.062	0.0	0.0	0.0	1.00	39.7	8.4
1.004	50.00	6.00	37.390	0.074	0.0	0.0	0.0	1.02	40.5	10.0
2.000	50.00	5.16	38.950	0.024	0.0	0.0	0.0	2.54	44.9	3.2
1.005	50.00	6.06	37.225	0.119	0.0	0.0	0.0	1.09	77.3	16.1
1.006	50.00	6.15	37.205	0.119	0.0	0.0	0.0	1.04	73.9	16.1
1.007	50.00	6.36	37.180	0.131	0.0	0.0	0.0	1.02	72.1	17.7

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Network Design Table for Storm North

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
1.008	5.115	0.025	204.6	0.016	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	18.268	0.000	0.0	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	8.483	0.055	154.2	0.020	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	11.728	0.070	167.5	0.015	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	3.475	0.000	0.0	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.003	8.459	0.000	0.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	3.454	0.015	228.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.011	10.271	0.045	228.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.012	23.780	0.540	44.0	0.071	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.013	11.810	0.050	236.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.014	6.626	0.028	236.6	0.000	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)
1.008	50.00	6.44	37.125	0.147	0.0	0.0	0.0	1.10	77.4	19.9
1.009	50.00	8.48	37.100	0.168	0.0	0.0	0.0	0.15	10.5«	22.7
3.000	50.00	5.13	37.225	0.020	0.0	0.0	0.0	1.05	41.8	2.7
3.001	50.00	5.33	37.170	0.035	0.0	0.0	0.0	1.01	40.0	4.7
3.002	50.00	5.72	37.100	0.054	0.0	0.0	0.0	0.15	10.5	7.3
3.003	50.00	6.66	37.100	0.054	0.0	0.0	0.0	0.15	10.5	7.3
1.010	50.00	8.54	37.100	0.222	0.0	0.0	0.0	1.04	73.3	30.1
1.011	50.00	8.70	37.035	0.222	0.0	0.0	0.0	1.04	73.3	30.1
1.012	50.00	8.87	36.990	0.293	0.0	0.0	0.0	2.38	167.9	39.7
1.013	49.48	9.06	36.450	0.293	0.0	0.0	0.0	1.02	72.0	39.7
1.014	49.17	9.17	36.400	0.293	0.0	0.0	0.0	1.02	71.9	39.7

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Manhole Schedules for Storm North

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	38.500	0.700	Open Manhole	450	1.000	37.800	150				
2	38.500	0.785	Open Manhole	450	1.001	37.715	150	1.000	37.715	150	
3	38.700	1.120	Open Manhole	600	1.002	37.580	225	1.001	37.655	150	
4	38.810	1.360	Open Manhole	600	1.003	37.450	225	1.002	37.450	225	
5	38.700	1.310	Open Manhole	600	1.004	37.390	225	1.003	37.390	225	
6	39.700	0.750	Open Manhole	450	2.000	38.950	150				
7	38.600	1.375	Open Manhole	1200	1.005	37.225	300	1.004	37.300	225	
								2.000	37.375	150	
8	38.500	1.295	Open Manhole	1200	1.006	37.205	300	1.005	37.205	300	
9	38.300	1.120	Open Manhole	1200	1.007	37.180	300	1.006	37.180	300	
10	38.100	0.975	Open Manhole	1200	1.008	37.125	300	1.007	37.125	300	
11	38.100	1.000	Open Manhole	1500	1.009	37.100	300	1.008	37.100	300	
12	38.100	0.875	Open Manhole	600	3.000	37.225	225				
13	38.100	0.930	Open Manhole	600	3.001	37.170	225	3.000	37.170	225	
14	38.100	1.000	Open Manhole	1500	3.002	37.100	300	3.001	37.100	225	
TANK1	38.100	1.000	Open Manhole	1200	3.003	37.100	300	3.002	37.100	300	
TANK2	38.100	1.000	Open Manhole	1200	1.010	37.100	300	1.009	37.100	300	
								3.003	37.100	300	
15	39.175	2.140	Open Manhole	1200	1.011	37.035	300	1.010	37.085	300	50
16	40.250	3.260	Open Manhole	1500	1.012	36.990	300	1.011	36.990	300	
17	37.600	1.150	Open Manhole	1200	1.013	36.450	300	1.012	36.450	300	
18	37.600	1.200	Open Manhole	1200	1.014	36.400	300	1.013	36.400	300	
	37.400	1.028	Open Manhole	0		OUTFALL		1.014	36.372	300	

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PIPELINE SCHEDULES for Storm North

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	1	38.500	37.800	0.550	Open Manhole	450
1.001	o	150	2	38.500	37.715	0.635	Open Manhole	450
1.002	o	225	3	38.700	37.580	0.895	Open Manhole	600
1.003	o	225	4	38.810	37.450	1.135	Open Manhole	600
1.004	o	225	5	38.700	37.390	1.085	Open Manhole	600
2.000	o	150	6	39.700	38.950	0.600	Open Manhole	450
1.005	o	300	7	38.600	37.225	1.075	Open Manhole	1200
1.006	o	300	8	38.500	37.205	0.995	Open Manhole	1200
1.007	o	300	9	38.300	37.180	0.820	Open Manhole	1200
1.008	o	300	10	38.100	37.125	0.675	Open Manhole	1200
1.009	o	300	11	38.100	37.100	0.700	Open Manhole	1500
3.000	o	225	12	38.100	37.225	0.650	Open Manhole	600
3.001	o	225	13	38.100	37.170	0.705	Open Manhole	600
3.002	o	300	14	38.100	37.100	0.700	Open Manhole	1500
3.003	o	300	TANK1	38.100	37.100	0.700	Open Manhole	1200
1.010	o	300	TANK2	38.100	37.100	0.700	Open Manhole	1200
1.011	o	300	15	39.175	37.035	1.840	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	8.446	99.4	2	38.500	37.715	0.635	Open Manhole	450
1.001	5.763	96.1	3	38.700	37.655	0.895	Open Manhole	600
1.002	21.410	164.7	4	38.810	37.450	1.135	Open Manhole	600
1.003	10.248	170.8	5	38.700	37.390	1.085	Open Manhole	600
1.004	14.723	163.6	7	38.600	37.300	1.075	Open Manhole	1200
2.000	25.016	15.9	7	38.600	37.375	1.075	Open Manhole	1200
1.005	4.109	205.5	8	38.500	37.205	0.995	Open Manhole	1200
1.006	5.617	224.7	9	38.300	37.180	0.820	Open Manhole	1200
1.007	12.956	235.6	10	38.100	37.125	0.675	Open Manhole	1200
1.008	5.115	204.6	11	38.100	37.100	0.700	Open Manhole	1500
1.009	18.268	0.0	TANK2	38.100	37.100	0.700	Open Manhole	1200
3.000	8.483	154.2	13	38.100	37.170	0.705	Open Manhole	600
3.001	11.728	167.5	14	38.100	37.100	0.775	Open Manhole	1500
3.002	3.475	0.0	TANK1	38.100	37.100	0.700	Open Manhole	1200
3.003	8.459	0.0	TANK2	38.100	37.100	0.700	Open Manhole	1200
1.010	3.454	228.0	15	39.175	37.085	1.790	Open Manhole	1200
1.011	10.271	228.2	16	40.250	36.990	2.960	Open Manhole	1500

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PIPELINE SCHEDULES for Storm North

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.012	o	300	16	40.250	36.990	2.960	Open Manhole	1500
1.013	o	300	17	37.600	36.450	0.850	Open Manhole	1200
1.014	o	300	18	37.600	36.400	0.900	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.012	23.780	44.0	17	37.600	36.450	0.850	Open Manhole	1200
1.013	11.810	236.2	18	37.600	36.400	0.900	Open Manhole	1200
1.014	6.626	236.6		37.400	36.372	0.728	Open Manhole	0

Simulation Criteria for Storm North

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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	2	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)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm North

Orifice Manhole: 16, DS/PN: 1.012, Volume (m^3): 6.4

Diameter (m) 0.260 Discharge Coefficient 0.600 Invert Level (m) 36.990

Non Return Valve Manhole: 18, DS/PN: 1.014, Volume (m^3): 2.1

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Storage Structures for Storm North

Cellular Storage Manhole: TANK2, DS/PN: 1.010

Invert Level (m) 37.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	75.0	0.0	0.401	0.0	0.0
0.400	75.0	0.0			

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

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	1	15 Winter	1	+0%	100/15 Summer				37.827
1.001	2	15 Winter	1	+0%	100/15 Summer				37.762
1.002	3	15 Winter	1	+0%	100/15 Summer				37.638
1.003	4	15 Winter	1	+0%	100/15 Summer				37.520
1.004	5	15 Winter	1	+0%	100/15 Summer				37.463
2.000	6	15 Winter	1	+0%					38.977
1.005	7	15 Winter	1	+0%	100/15 Summer				37.343
1.006	8	15 Winter	1	+0%	30/15 Winter				37.335
1.007	9	15 Winter	1	+0%	30/15 Summer				37.328
1.008	10	15 Winter	1	+0%	30/15 Summer				37.317
1.009	11	15 Winter	1	+0%	30/15 Summer				37.311
3.000	12	15 Winter	1	+0%	100/15 Summer				37.267
3.001	13	15 Winter	1	+0%	100/15 Summer				37.224
3.002	14	30 Winter	1	+0%	100/15 Summer				37.206
3.003	TANK1	30 Winter	1	+0%	100/15 Summer				37.205
1.010	TANK2	30 Winter	1	+0%	100/15 Summer				37.203
1.011	15	30 Winter	1	+0%	100/15 Summer				37.151
1.012	16	30 Winter	1	+0%	100/15 Summer				37.134
1.013	17	30 Winter	1	+0%	100/15 Summer				36.556
1.014	18	30 Winter	1	+0%	100/15 Summer				36.514

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.123	0.000	0.07		1.2	OK	
1.001	2	-0.103	0.000	0.21		3.1	OK	
1.002	3	-0.167	0.000	0.15		5.4	OK	
1.003	4	-0.155	0.000	0.21		7.0	OK	
1.004	5	-0.152	0.000	0.23		8.3	OK	
2.000	6	-0.123	0.000	0.07		3.1	OK	
1.005	7	-0.182	0.000	0.27		13.3	OK	
1.006	8	-0.170	0.000	0.26		13.0	OK	
1.007	9	-0.152	0.000	0.23		13.6	OK	
1.008	10	-0.108	0.000	0.28		14.6	OK	
1.009	11	-0.089	0.000	0.83		16.5	OK	
3.000	12	-0.183	0.000	0.08		2.6	OK	
3.001	13	-0.171	0.000	0.12		4.2	OK	
3.002	14	-0.194	0.000	0.10		4.9	OK	
3.003	TANK1	-0.195	0.000	0.14		4.7	OK	
1.010	TANK2	-0.197	0.000	0.26		12.9	OK	
1.011	15	-0.184	0.000	0.23		13.0	OK	
1.012	16	-0.156	0.000	0.11		15.8	OK	
1.013	17	-0.194	0.000	0.27		15.8	OK	
1.014	18	-0.186	0.000	0.31		15.8	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

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	1	15 Winter	30	+0%	100/15 Summer				37.843
1.001	2	15 Winter	30	+0%	100/15 Summer				37.799
1.002	3	15 Winter	30	+0%	100/15 Summer				37.684
1.003	4	15 Winter	30	+0%	100/15 Summer				37.588
1.004	5	15 Winter	30	+0%	100/15 Summer				37.561
2.000	6	15 Winter	30	+0%					38.993
1.005	7	15 Winter	30	+0%	100/15 Summer				37.519
1.006	8	15 Winter	30	+0%	30/15 Winter				37.506
1.007	9	15 Winter	30	+0%	30/15 Summer				37.490
1.008	10	15 Winter	30	+0%	30/15 Summer				37.457
1.009	11	15 Winter	30	+0%	30/15 Summer				37.438
3.000	12	30 Winter	30	+0%	100/15 Summer				37.323
3.001	13	30 Winter	30	+0%	100/15 Summer				37.319
3.002	14	30 Winter	30	+0%	100/15 Summer				37.311
3.003	TANK1	30 Winter	30	+0%	100/15 Summer				37.309
1.010	TANK2	30 Winter	30	+0%	100/15 Summer				37.305
1.011	15	30 Winter	30	+0%	100/15 Summer				37.293
1.012	16	30 Winter	30	+0%	100/15 Summer				37.268
1.013	17	30 Winter	30	+0%	100/15 Summer				36.656
1.014	18	30 Winter	30	+0%	100/15 Summer				36.619

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.107	0.000	0.18		2.9	OK	
1.001	2	-0.066	0.000	0.60		9.0	OK	
1.002	3	-0.121	0.000	0.43		16.0	OK	
1.003	4	-0.087	0.000	0.60		19.8	OK	
1.004	5	-0.054	0.000	0.65		23.3	OK	
2.000	6	-0.107	0.000	0.18		7.6	OK	
1.005	7	-0.006	0.000	0.76		36.9	OK	
1.006	8	0.001	0.000	0.73		36.8	SURCHARGED	
1.007	9	0.010	0.000	0.68		40.2	SURCHARGED	
1.008	10	0.032	0.000	0.87		44.7	SURCHARGED	
1.009	11	0.038	0.000	2.53		50.0	SURCHARGED	
3.000	12	-0.127	0.000	0.15		4.8	OK	
3.001	13	-0.076	0.000	0.24		8.4	OK	
3.002	14	-0.089	0.000	0.24		11.9	OK	
3.003	TANK1	-0.091	0.000	0.34		11.4	OK	
1.010	TANK2	-0.095	0.000	0.75		37.5	OK	
1.011	15	-0.042	0.000	0.65		37.6	OK	
1.012	16	-0.022	0.000	0.30		45.3	OK	
1.013	17	-0.094	0.000	0.78		45.3	OK	
1.014	18	-0.081	0.000	0.88		45.3	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
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	1	15 Winter	100	+0%					37.850
1.001	2	15 Winter	100	+0%					37.815
1.002	3	15 Winter	100	+0%					37.714
1.003	4	15 Winter	100	+0%					37.673
1.004	5	15 Winter	100	+0%	100/15 Summer				37.640
2.000	6	15 Winter	100	+0%					38.999
1.005	7	15 Winter	100	+0%	100/15 Summer				37.581
1.006	8	15 Winter	100	+0%	100/15 Summer				37.563
1.007	9	15 Winter	100	+0%	100/15 Summer				37.542
1.008	10	15 Winter	100	+0%	100/15 Summer				37.500
1.009	11	15 Winter	100	+0%	100/15 Summer				37.470
3.000	12	30 Winter	100	+0%					37.397
3.001	13	30 Winter	100	+0%					37.392
3.002	14	30 Winter	100	+0%					37.382
3.003	TANK1	30 Winter	100	+0%					37.379
1.010	TANK2	30 Winter	100	+0%					37.374
1.011	15	30 Winter	100	+0%	100/15 Winter				37.355
1.012	16	30 Winter	100	+0%	100/15 Summer				37.322
1.013	17	30 Winter	100	+0%	100/30 Winter				36.753
1.014	18	15 Winter	100	+0%					36.700

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.100	0.000	0.24		3.7	OK	
1.001	2	-0.050	0.000	0.77		11.6	OK	
1.002	3	-0.091	0.000	0.56		20.6	OK	
1.003	4	-0.002	0.000	0.74		24.6	OK	
1.004	5	0.025	0.000	0.82		29.1	SURCHARGED	
2.000	6	-0.101	0.000	0.23		9.9	OK	
1.005	7	0.056	0.000	0.96		46.3	SURCHARGED	
1.006	8	0.058	0.000	0.91		46.1	SURCHARGED	
1.007	9	0.062	0.000	0.85		50.3	SURCHARGED	
1.008	10	0.075	0.000	1.08		56.0	SURCHARGED	
1.009	11	0.070	0.000	3.18		62.9	SURCHARGED	
3.000	12	-0.053	0.000	0.19		6.1	OK	
3.001	13	-0.003	0.000	0.30		10.1	OK	
3.002	14	-0.018	0.000	0.29		14.4	OK	
3.003	TANK1	-0.021	0.000	0.40		13.7	OK	
1.010	TANK2	-0.026	0.000	0.98		48.8	OK	
1.011	15	0.020	0.000	0.85		49.1	SURCHARGED	
1.012	16	0.032	0.000	0.39		58.9	SURCHARGED	
1.013	17	0.003	0.000	1.01		58.8	SURCHARGED	
1.014	18	0.000	0.000	1.08		55.4	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

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	1	15 Winter	100	+40%	100/15 Summer				38.085
1.001	2	15 Winter	100	+40%	100/15 Summer				38.070
1.002	3	15 Winter	100	+40%	100/15 Summer				38.018
1.003	4	15 Winter	100	+40%	100/15 Summer				37.960
1.004	5	15 Winter	100	+40%	100/15 Summer				37.905
2.000	6	15 Winter	100	+40%					39.009
1.005	7	15 Winter	100	+40%	100/15 Summer				37.803
1.006	8	15 Winter	100	+40%	30/15 Winter				37.744
1.007	9	15 Winter	100	+40%	30/15 Summer				37.707
1.008	10	15 Winter	100	+40%	30/15 Summer				37.639
1.009	11	15 Winter	100	+40%	30/15 Summer				37.567
3.000	12	30 Winter	100	+40%	100/15 Summer				37.527
3.001	13	30 Winter	100	+40%	100/15 Summer				37.520
3.002	14	30 Winter	100	+40%	100/15 Summer				37.507
3.003	TANK1	30 Winter	100	+40%	100/15 Summer				37.503
1.010	TANK2	30 Winter	100	+40%	100/15 Summer				37.495
1.011	15	30 Winter	100	+40%	100/15 Summer				37.467
1.012	16	30 Winter	100	+40%	100/15 Summer				37.419
1.013	17	30 Winter	100	+40%	100/15 Summer				36.841
1.014	18	30 Winter	100	+40%	100/15 Summer				36.749

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.135	0.000	0.32		5.1	SURCHARGED	
1.001	2	0.205	0.000	0.95		14.2	SURCHARGED	
1.002	3	0.213	0.000	0.67		24.5	SURCHARGED	
1.003	4	0.285	0.000	0.95		31.6	SURCHARGED	
1.004	5	0.290	0.000	1.06		37.7	SURCHARGED	
2.000	6	-0.091	0.000	0.32		13.9	OK	
1.005	7	0.278	0.000	1.27		61.3	SURCHARGED	
1.006	8	0.239	0.000	1.20		60.8	SURCHARGED	
1.007	9	0.227	0.000	1.13		66.6	SURCHARGED	
1.008	10	0.214	0.000	1.44		74.3	SURCHARGED	
1.009	11	0.167	0.000	4.22		83.4	SURCHARGED	
3.000	12	0.077	0.000	0.26		8.5	SURCHARGED	
3.001	13	0.125	0.000	0.42		14.5	SURCHARGED	
3.002	14	0.107	0.000	0.43		21.2	SURCHARGED	
3.003	TANK1	0.103	0.000	0.59		20.3	SURCHARGED	
1.010	TANK2	0.095	0.000	1.23		61.4	SURCHARGED	
1.011	15	0.132	0.000	1.07		61.7	SURCHARGED	
1.012	16	0.129	0.000	0.51		76.0	SURCHARGED	
1.013	17	0.091	0.000	1.31		76.0	SURCHARGED	
1.014	18	0.049	0.000	1.48		76.0	SURCHARGED	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm South

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.700	Add Flow / Climate Change (%)	0
Ratio R	0.400	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

Network Design Table for Storm South

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
S1.000	16.800	0.170	98.8	0.023	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	10.398	0.105	99.0	0.041	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	3.022	0.000	0.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	22.507	0.095	236.9	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	16.097	0.095	169.4	0.027	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.001	14.088	0.085	165.7	0.030	0.00	0.0	0.600	o	225	Pipe/Conduit	
S4.000	27.635	0.165	167.5	0.040	5.00	0.0	0.600	o	225	Pipe/Conduit	
S4.001	20.919	0.125	167.0	0.034	0.00	0.0	0.600	o	225	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)
S1.000	50.00	5.28	37.575	0.023	0.0	0.0	0.0	1.01	17.9	3.1
S1.001	50.00	5.45	37.405	0.064	0.0	0.0	0.0	1.01	17.8	8.7
S2.000	50.00	5.34	37.150	0.000	0.0	0.0	0.0	0.15	10.5	0.0
S1.002	50.00	5.82	37.150	0.104	0.0	0.0	0.0	1.02	71.9	14.1
S3.000	50.00	5.27	37.345	0.027	0.0	0.0	0.0	1.00	39.8	3.7
S3.001	50.00	5.50	37.250	0.057	0.0	0.0	0.0	1.01	40.3	7.7
S4.000	50.00	5.46	37.455	0.040	0.0	0.0	0.0	1.01	40.1	5.4
S4.001	50.00	5.80	37.290	0.074	0.0	0.0	0.0	1.01	40.1	10.0

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Network Design Table for Storm South

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
S3.002	5.536	0.035	158.2	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	16.575	0.070	236.8	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	2.251	0.010	225.1	0.055	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	3.656	0.015	243.7	0.000	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)
S3.002	50.00	5.88	37.090	0.145	0.0	0.0	0.0	1.25	88.2	19.6
S1.003	50.00	6.15	37.055	0.275	0.0	0.0	0.0	1.02	71.9	37.2
S1.004	50.00	6.18	36.985	0.330	0.0	0.0	0.0	1.04	73.8	44.7
S1.005	50.00	6.24	36.925	0.330	0.0	0.0	0.0	1.00	70.9	44.7

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Manhole Schedules for Storm South

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backd (mm
S31	38.500	0.925	Open Manhole	450	S1.000	37.575	150				
S32	38.500	1.095	Open Manhole	450	S1.001	37.405	150	S1.000	37.405	150	
STANK	38.500	1.350	Open Manhole	1200	S2.000	37.150	300				
S33	38.500	1.350	Open Manhole	1500	S1.002	37.150	300	S1.001	37.300	150	
								S2.000	37.150	300	
S34	38.500	1.155	Open Manhole	600	S3.000	37.345	225				
S35	38.450	1.200	Open Manhole	600	S3.001	37.250	225	S3.000	37.250	225	
S36	38.500	1.045	Open Manhole	600	S4.000	37.455	225				
S37	38.500	1.210	Open Manhole	600	S4.001	37.290	225	S4.000	37.290	225	
S38	38.425	1.335	Open Manhole	1200	S3.002	37.090	300	S3.001	37.165	225	
								S4.001	37.165	225	
S39	38.400	1.345	Open Manhole	1500	S1.003	37.055	300	S1.002	37.055	300	
								S3.002	37.055	300	
S40	38.300	1.315	Open Manhole	1500	S1.004	36.985	300	S1.003	36.985	300	
SSeparator	38.250	1.325	Open Manhole	1200	S1.005	36.925	300	S1.004	36.975	300	
S	38.200	1.290	Open Manhole	0		OUTFALL		S1.005	36.910	300	

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PIPELINE SCHEDULES for Storm South

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	150	S31	38.500	37.575	0.775	Open Manhole	450
S1.001	o	150	S32	38.500	37.405	0.945	Open Manhole	450
S2.000	o	300	STANK	38.500	37.150	1.050	Open Manhole	1200
S1.002	o	300	S33	38.500	37.150	1.050	Open Manhole	1500
S3.000	o	225	S34	38.500	37.345	0.930	Open Manhole	600
S3.001	o	225	S35	38.450	37.250	0.975	Open Manhole	600
S4.000	o	225	S36	38.500	37.455	0.820	Open Manhole	600
S4.001	o	225	S37	38.500	37.290	0.985	Open Manhole	600
S3.002	o	300	S38	38.425	37.090	1.035	Open Manhole	1200
S1.003	o	300	S39	38.400	37.055	1.045	Open Manhole	1500
S1.004	o	300	S40	38.300	36.985	1.015	Open Manhole	1500
S1.005	o	300	SSeparator	38.250	36.925	1.025	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	16.800	98.8	S32	38.500	37.405	0.945	Open Manhole	450
S1.001	10.398	99.0	S33	38.500	37.300	1.050	Open Manhole	1500
S2.000	3.022	0.0	S33	38.500	37.150	1.050	Open Manhole	1500
S1.002	22.507	236.9	S39	38.400	37.055	1.045	Open Manhole	1500
S3.000	16.097	169.4	S35	38.450	37.250	0.975	Open Manhole	600
S3.001	14.088	165.7	S38	38.425	37.165	1.035	Open Manhole	1200
S4.000	27.635	167.5	S37	38.500	37.290	0.985	Open Manhole	600
S4.001	20.919	167.0	S38	38.425	37.165	1.035	Open Manhole	1200
S3.002	5.536	158.2	S39	38.400	37.055	1.045	Open Manhole	1500
S1.003	16.575	236.8	S40	38.300	36.985	1.015	Open Manhole	1500
S1.004	2.251	225.1	SSeparator	38.250	36.975	0.975	Open Manhole	1200
S1.005	3.656	243.7	S	38.200	36.910	0.990	Open Manhole	0

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Simulation Criteria for Storm South

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
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)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for Storm South

Orifice Manhole: S40, DS/PN: S1.004, Volume (m^3): 3.4

Diameter (m) 0.270 Discharge Coefficient 0.600 Invert Level (m) 36.985

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Storage Structures for Storm South

Cellular Storage Manhole: STANK, DS/PN: S2.000

Invert Level (m) 37.150 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	88.0	0.0	0.401	0.0	0.0
0.400	88.0	0.0			

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S31	15 Winter	1	+0%	100/15 Summer			
S1.001	S32	15 Winter	1	+0%	30/15 Summer			
S2.000	STANK	60 Winter	1	+0%	100/15 Summer			
S1.002	S33	15 Winter	1	+0%	30/15 Summer			
S3.000	S34	15 Winter	1	+0%	100/15 Summer			
S3.001	S35	15 Winter	1	+0%	30/15 Summer			
S4.000	S36	15 Winter	1	+0%	100/15 Summer			
S4.001	S37	15 Winter	1	+0%	30/15 Summer			
S3.002	S38	15 Winter	1	+0%	30/15 Summer			
S1.003	S39	15 Winter	1	+0%	30/15 Summer			
S1.004	S40	15 Winter	1	+0%	1/15 Summer			
S1.005	SSeparator	15 Winter	1	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	37.618	-0.107	0.000	0.18		3.0	OK	
S1.001	S32	37.478	-0.077	0.000	0.47		7.4	OK	
S2.000	STANK	37.262	-0.188	0.000	0.07		3.8	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.274	-0.176	0.000	0.07		4.2	OK	
S3.000	S34	37.393	-0.177	0.000	0.10		3.5	OK	
S3.001	S35	37.330	-0.145	0.000	0.19		6.6	OK	
S4.000	S36	37.511	-0.169	0.000	0.14		5.1	OK	
S4.001	S37	37.365	-0.150	0.000	0.24		8.8	OK	
S3.002	S38	37.309	-0.080	0.000	0.27		16.4	OK	
S1.003	S39	37.302	-0.052	0.000	0.24		14.9	OK	
S1.004	S40	37.288	0.003	0.000	0.38		20.4	SURCHARGED	
S1.005	SSeparator	37.059	-0.166	0.000	0.41		20.4	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S31	15 Winter	30	+0%	100/15 Summer			
S1.001	S32	15 Winter	30	+0%	30/15 Summer			
S2.000	STANK	60 Winter	30	+0%	100/15 Summer			
S1.002	S33	15 Winter	30	+0%	30/15 Summer			
S3.000	S34	15 Winter	30	+0%	100/15 Summer			
S3.001	S35	15 Winter	30	+0%	30/15 Summer			
S4.000	S36	15 Winter	30	+0%	100/15 Summer			
S4.001	S37	15 Winter	30	+0%	30/15 Summer			
S3.002	S38	15 Winter	30	+0%	30/15 Summer			
S1.003	S39	15 Winter	30	+0%	30/15 Summer			
S1.004	S40	15 Winter	30	+0%	1/15 Summer			
S1.005	SSeparator	30 Winter	30	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	37.675	-0.050	0.000	0.43		7.2	OK	
S1.001	S32	37.644	0.089	0.000	1.24		19.8	SURCHARGED	
S2.000	STANK	37.350	-0.100	0.000	0.13		6.8	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.478	0.028	0.000	0.14		9.2	SURCHARGED	
S3.000	S34	37.549	-0.021	0.000	0.23		8.1	OK	
S3.001	S35	37.534	0.059	0.000	0.46		16.3	SURCHARGED	
S4.000	S36	37.579	-0.101	0.000	0.33		12.2	OK	
S4.001	S37	37.550	0.035	0.000	0.59		21.7	SURCHARGED	
S3.002	S38	37.505	0.115	0.000	0.70		42.3	SURCHARGED	
S1.003	S39	37.489	0.134	0.000	0.73		44.5	SURCHARGED	
S1.004	S40	37.447	0.162	0.000	1.12		59.5	SURCHARGED	
S1.005	SSeparator	37.225	0.000	0.000	1.02		50.2	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
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.
S1.000	S31	15 Winter	100	+0%	100/15 Summer			
S1.001	S32	15 Winter	100	+0%	100/15 Summer			
S2.000	STANK	30 Winter	100	+0%				
S1.002	S33	15 Winter	100	+0%	100/15 Summer			
S3.000	S34	15 Winter	100	+0%	100/15 Summer			
S3.001	S35	15 Winter	100	+0%	100/15 Summer			
S4.000	S36	15 Winter	100	+0%	100/15 Summer			
S4.001	S37	15 Winter	100	+0%	100/15 Summer			
S3.002	S38	15 Winter	100	+0%	100/15 Summer			
S1.003	S39	15 Winter	100	+0%	100/15 Summer			
S1.004	S40	15 Winter	100	+0%	100/15 Summer			
S1.005	SSeparator	15 Winter	100	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	37.852	0.127	0.000	0.57		9.4	SURCHARGED	
S1.001	S32	37.801	0.246	0.000	1.62		25.8	SURCHARGED	
S2.000	STANK	37.414	-0.036	0.000	0.28		14.5	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.512	0.062	0.000	0.32		20.5	SURCHARGED	
S3.000	S34	37.659	0.089	0.000	0.31		10.9	SURCHARGED	
S3.001	S35	37.638	0.163	0.000	0.65		22.8	SURCHARGED	
S4.000	S36	37.714	0.034	0.000	0.42		15.8	SURCHARGED	
S4.001	S37	37.676	0.161	0.000	0.79		28.7	SURCHARGED	
S3.002	S38	37.596	0.206	0.000	0.95		57.0	SURCHARGED	
S1.003	S39	37.565	0.210	0.000	0.75		45.7	SURCHARGED	
S1.004	S40	37.522	0.237	0.000	1.23		65.5	SURCHARGED	
S1.005	SSeparator	37.265	0.040	0.000	1.33		65.8	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S31	15 Winter	100	+40%	100/15 Summer			
S1.001	S32	15 Winter	100	+40%	30/15 Summer			
S2.000	STANK	30 Winter	100	+40%	100/15 Summer			
S1.002	S33	30 Winter	100	+40%	30/15 Summer			
S3.000	S34	15 Winter	100	+40%	100/15 Summer			
S3.001	S35	15 Winter	100	+40%	30/15 Summer			
S4.000	S36	15 Winter	100	+40%	100/15 Summer			
S4.001	S37	15 Winter	100	+40%	30/15 Summer			
S3.002	S38	15 Winter	100	+40%	30/15 Summer			
S1.003	S39	15 Winter	100	+40%	30/15 Summer			
S1.004	S40	15 Winter	100	+40%	1/15 Summer			
S1.005	SSeparator	15 Winter	100	+40%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	38.240	0.515	0.000	0.80		13.3	FLOOD RISK	
S1.001	S32	38.147	0.592	0.000	2.24		35.7	FLOOD RISK	
S2.000	STANK	37.669	0.219	0.000	0.60		30.4	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.669	0.219	0.000	0.53		33.7	SURCHARGED	
S3.000	S34	37.899	0.329	0.000	0.43		15.3	SURCHARGED	
S3.001	S35	37.871	0.396	0.000	0.90		31.8	SURCHARGED	
S4.000	S36	38.013	0.333	0.000	0.59		22.1	SURCHARGED	
S4.001	S37	37.956	0.441	0.000	1.10		40.3	SURCHARGED	
S3.002	S38	37.798	0.408	0.000	1.33		80.0	SURCHARGED	
S1.003	S39	37.696	0.342	0.000	0.89		54.4	SURCHARGED	
S1.004	S40	37.643	0.358	0.000	1.58		84.5	SURCHARGED	
S1.005	SSeparator	37.311	0.086	0.000	1.71		84.8	SURCHARGED	

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Appendix G Proposed Surface Water Drainage Strategy MicroDrainage Calculations – with Surcharged Outfall

Surcharged Outfall Details for Storm North

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.014		37.400	36.372	0.000	0	0

Datum (m) 36.422 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)
1	0.668	42	0.668	83	0.668	124	0.668	165	0.668	206	0.668
2	0.668	43	0.668	84	0.668	125	0.668	166	0.668	207	0.668
3	0.668	44	0.668	85	0.668	126	0.668	167	0.668	208	0.668
4	0.668	45	0.668	86	0.668	127	0.668	168	0.668	209	0.668
5	0.668	46	0.668	87	0.668	128	0.668	169	0.668	210	0.668
6	0.668	47	0.668	88	0.668	129	0.668	170	0.668	211	0.668
7	0.668	48	0.668	89	0.668	130	0.668	171	0.668	212	0.668
8	0.668	49	0.668	90	0.668	131	0.668	172	0.668	213	0.668
9	0.668	50	0.668	91	0.668	132	0.668	173	0.668	214	0.668
10	0.668	51	0.668	92	0.668	133	0.668	174	0.668	215	0.668
11	0.668	52	0.668	93	0.668	134	0.668	175	0.668	216	0.668
12	0.668	53	0.668	94	0.668	135	0.668	176	0.668	217	0.668
13	0.668	54	0.668	95	0.668	136	0.668	177	0.668	218	0.668
14	0.668	55	0.668	96	0.668	137	0.668	178	0.668	219	0.668
15	0.668	56	0.668	97	0.668	138	0.668	179	0.668	220	0.668
16	0.668	57	0.668	98	0.668	139	0.668	180	0.668	221	0.668
17	0.668	58	0.668	99	0.668	140	0.668	181	0.668	222	0.668
18	0.668	59	0.668	100	0.668	141	0.668	182	0.668	223	0.668
19	0.668	60	0.668	101	0.668	142	0.668	183	0.668	224	0.668
20	0.668	61	0.668	102	0.668	143	0.668	184	0.668	225	0.668
21	0.668	62	0.668	103	0.668	144	0.668	185	0.668	226	0.668
22	0.668	63	0.668	104	0.668	145	0.668	186	0.668	227	0.668
23	0.668	64	0.668	105	0.668	146	0.668	187	0.668	228	0.668
24	0.668	65	0.668	106	0.668	147	0.668	188	0.668	229	0.668
25	0.668	66	0.668	107	0.668	148	0.668	189	0.668	230	0.668
26	0.668	67	0.668	108	0.668	149	0.668	190	0.668	231	0.668
27	0.668	68	0.668	109	0.668	150	0.668	191	0.668	232	0.668
28	0.668	69	0.668	110	0.668	151	0.668	192	0.668	233	0.668
29	0.668	70	0.668	111	0.668	152	0.668	193	0.668	234	0.668
30	0.668	71	0.668	112	0.668	153	0.668	194	0.668	235	0.668
31	0.668	72	0.668	113	0.668	154	0.668	195	0.668	236	0.668
32	0.668	73	0.668	114	0.668	155	0.668	196	0.668	237	0.668
33	0.668	74	0.668	115	0.668	156	0.668	197	0.668	238	0.668
34	0.668	75	0.668	116	0.668	157	0.668	198	0.668	239	0.668
35	0.668	76	0.668	117	0.668	158	0.668	199	0.668	240	0.668
36	0.668	77	0.668	118	0.668	159	0.668	200	0.668	241	0.668
37	0.668	78	0.668	119	0.668	160	0.668	201	0.668	242	0.668
38	0.668	79	0.668	120	0.668	161	0.668	202	0.668	243	0.668
39	0.668	80	0.668	121	0.668	162	0.668	203	0.668	244	0.668
40	0.668	81	0.668	122	0.668	163	0.668	204	0.668	245	0.668
41	0.668	82	0.668	123	0.668	164	0.668	205	0.668	246	0.668

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Surcharged Outfall Details for Storm North

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
247	0.668	297	0.668	347	0.668	397	0.668	447	0.668	497	0.668
248	0.668	298	0.668	348	0.668	398	0.668	448	0.668	498	0.668
249	0.668	299	0.668	349	0.668	399	0.668	449	0.668	499	0.668
250	0.668	300	0.668	350	0.668	400	0.668	450	0.668	500	0.668
251	0.668	301	0.668	351	0.668	401	0.668	451	0.668	501	0.668
252	0.668	302	0.668	352	0.668	402	0.668	452	0.668	502	0.668
253	0.668	303	0.668	353	0.668	403	0.668	453	0.668	503	0.668
254	0.668	304	0.668	354	0.668	404	0.668	454	0.668	504	0.668
255	0.668	305	0.668	355	0.668	405	0.668	455	0.668	505	0.668
256	0.668	306	0.668	356	0.668	406	0.668	456	0.668	506	0.668
257	0.668	307	0.668	357	0.668	407	0.668	457	0.668	507	0.668
258	0.668	308	0.668	358	0.668	408	0.668	458	0.668	508	0.668
259	0.668	309	0.668	359	0.668	409	0.668	459	0.668	509	0.668
260	0.668	310	0.668	360	0.668	410	0.668	460	0.668	510	0.668
261	0.668	311	0.668	361	0.668	411	0.668	461	0.668	511	0.668
262	0.668	312	0.668	362	0.668	412	0.668	462	0.668	512	0.668
263	0.668	313	0.668	363	0.668	413	0.668	463	0.668	513	0.668
264	0.668	314	0.668	364	0.668	414	0.668	464	0.668	514	0.668
265	0.668	315	0.668	365	0.668	415	0.668	465	0.668	515	0.668
266	0.668	316	0.668	366	0.668	416	0.668	466	0.668	516	0.668
267	0.668	317	0.668	367	0.668	417	0.668	467	0.668	517	0.668
268	0.668	318	0.668	368	0.668	418	0.668	468	0.668	518	0.668
269	0.668	319	0.668	369	0.668	419	0.668	469	0.668	519	0.668
270	0.668	320	0.668	370	0.668	420	0.668	470	0.668	520	0.668
271	0.668	321	0.668	371	0.668	421	0.668	471	0.668	521	0.668
272	0.668	322	0.668	372	0.668	422	0.668	472	0.668	522	0.668
273	0.668	323	0.668	373	0.668	423	0.668	473	0.668	523	0.668
274	0.668	324	0.668	374	0.668	424	0.668	474	0.668	524	0.668
275	0.668	325	0.668	375	0.668	425	0.668	475	0.668	525	0.668
276	0.668	326	0.668	376	0.668	426	0.668	476	0.668	526	0.668
277	0.668	327	0.668	377	0.668	427	0.668	477	0.668	527	0.668
278	0.668	328	0.668	378	0.668	428	0.668	478	0.668	528	0.668
279	0.668	329	0.668	379	0.668	429	0.668	479	0.668	529	0.668
280	0.668	330	0.668	380	0.668	430	0.668	480	0.668	530	0.668
281	0.668	331	0.668	381	0.668	431	0.668	481	0.668	531	0.668
282	0.668	332	0.668	382	0.668	432	0.668	482	0.668	532	0.668
283	0.668	333	0.668	383	0.668	433	0.668	483	0.668	533	0.668
284	0.668	334	0.668	384	0.668	434	0.668	484	0.668	534	0.668
285	0.668	335	0.668	385	0.668	435	0.668	485	0.668	535	0.668
286	0.668	336	0.668	386	0.668	436	0.668	486	0.668	536	0.668
287	0.668	337	0.668	387	0.668	437	0.668	487	0.668	537	0.668
288	0.668	338	0.668	388	0.668	438	0.668	488	0.668	538	0.668
289	0.668	339	0.668	389	0.668	439	0.668	489	0.668	539	0.668
290	0.668	340	0.668	390	0.668	440	0.668	490	0.668	540	0.668
291	0.668	341	0.668	391	0.668	441	0.668	491	0.668	541	0.668
292	0.668	342	0.668	392	0.668	442	0.668	492	0.668	542	0.668
293	0.668	343	0.668	393	0.668	443	0.668	493	0.668	543	0.668
294	0.668	344	0.668	394	0.668	444	0.668	494	0.668	544	0.668
295	0.668	345	0.668	395	0.668	445	0.668	495	0.668	545	0.668
296	0.668	346	0.668	396	0.668	446	0.668	496	0.668	546	0.668

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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)
547	0.668	597	0.668	647	0.668	697	0.668	747	0.668	797	0.668
548	0.668	598	0.668	648	0.668	698	0.668	748	0.668	798	0.668
549	0.668	599	0.668	649	0.668	699	0.668	749	0.668	799	0.668
550	0.668	600	0.668	650	0.668	700	0.668	750	0.668	800	0.668
551	0.668	601	0.668	651	0.668	701	0.668	751	0.668	801	0.668
552	0.668	602	0.668	652	0.668	702	0.668	752	0.668	802	0.668
553	0.668	603	0.668	653	0.668	703	0.668	753	0.668	803	0.668
554	0.668	604	0.668	654	0.668	704	0.668	754	0.668	804	0.668
555	0.668	605	0.668	655	0.668	705	0.668	755	0.668	805	0.668
556	0.668	606	0.668	656	0.668	706	0.668	756	0.668	806	0.668
557	0.668	607	0.668	657	0.668	707	0.668	757	0.668	807	0.668
558	0.668	608	0.668	658	0.668	708	0.668	758	0.668	808	0.668
559	0.668	609	0.668	659	0.668	709	0.668	759	0.668	809	0.668
560	0.668	610	0.668	660	0.668	710	0.668	760	0.668	810	0.668
561	0.668	611	0.668	661	0.668	711	0.668	761	0.668	811	0.668
562	0.668	612	0.668	662	0.668	712	0.668	762	0.668	812	0.668
563	0.668	613	0.668	663	0.668	713	0.668	763	0.668	813	0.668
564	0.668	614	0.668	664	0.668	714	0.668	764	0.668	814	0.668
565	0.668	615	0.668	665	0.668	715	0.668	765	0.668	815	0.668
566	0.668	616	0.668	666	0.668	716	0.668	766	0.668	816	0.668
567	0.668	617	0.668	667	0.668	717	0.668	767	0.668	817	0.668
568	0.668	618	0.668	668	0.668	718	0.668	768	0.668	818	0.668
569	0.668	619	0.668	669	0.668	719	0.668	769	0.668	819	0.668
570	0.668	620	0.668	670	0.668	720	0.668	770	0.668	820	0.668
571	0.668	621	0.668	671	0.668	721	0.668	771	0.668	821	0.668
572	0.668	622	0.668	672	0.668	722	0.668	772	0.668	822	0.668
573	0.668	623	0.668	673	0.668	723	0.668	773	0.668	823	0.668
574	0.668	624	0.668	674	0.668	724	0.668	774	0.668	824	0.668
575	0.668	625	0.668	675	0.668	725	0.668	775	0.668	825	0.668
576	0.668	626	0.668	676	0.668	726	0.668	776	0.668	826	0.668
577	0.668	627	0.668	677	0.668	727	0.668	777	0.668	827	0.668
578	0.668	628	0.668	678	0.668	728	0.668	778	0.668	828	0.668
579	0.668	629	0.668	679	0.668	729	0.668	779	0.668	829	0.668
580	0.668	630	0.668	680	0.668	730	0.668	780	0.668	830	0.668
581	0.668	631	0.668	681	0.668	731	0.668	781	0.668	831	0.668
582	0.668	632	0.668	682	0.668	732	0.668	782	0.668	832	0.668
583	0.668	633	0.668	683	0.668	733	0.668	783	0.668	833	0.668
584	0.668	634	0.668	684	0.668	734	0.668	784	0.668	834	0.668
585	0.668	635	0.668	685	0.668	735	0.668	785	0.668	835	0.668
586	0.668	636	0.668	686	0.668	736	0.668	786	0.668	836	0.668
587	0.668	637	0.668	687	0.668	737	0.668	787	0.668	837	0.668
588	0.668	638	0.668	688	0.668	738	0.668	788	0.668	838	0.668
589	0.668	639	0.668	689	0.668	739	0.668	789	0.668	839	0.668
590	0.668	640	0.668	690	0.668	740	0.668	790	0.668	840	0.668
591	0.668	641	0.668	691	0.668	741	0.668	791	0.668	841	0.668
592	0.668	642	0.668	692	0.668	742	0.668	792	0.668	842	0.668
593	0.668	643	0.668	693	0.668	743	0.668	793	0.668	843	0.668
594	0.668	644	0.668	694	0.668	744	0.668	794	0.668	844	0.668
595	0.668	645	0.668	695	0.668	745	0.668	795	0.668	845	0.668
596	0.668	646	0.668	696	0.668	746	0.668	796	0.668	846	0.668

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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)
847	0.668	897	0.668	947	0.668	997	0.668	1047	0.668	1097	0.668
848	0.668	898	0.668	948	0.668	998	0.668	1048	0.668	1098	0.668
849	0.668	899	0.668	949	0.668	999	0.668	1049	0.668	1099	0.668
850	0.668	900	0.668	950	0.668	1000	0.668	1050	0.668	1100	0.668
851	0.668	901	0.668	951	0.668	1001	0.668	1051	0.668	1101	0.668
852	0.668	902	0.668	952	0.668	1002	0.668	1052	0.668	1102	0.668
853	0.668	903	0.668	953	0.668	1003	0.668	1053	0.668	1103	0.668
854	0.668	904	0.668	954	0.668	1004	0.668	1054	0.668	1104	0.668
855	0.668	905	0.668	955	0.668	1005	0.668	1055	0.668	1105	0.668
856	0.668	906	0.668	956	0.668	1006	0.668	1056	0.668	1106	0.668
857	0.668	907	0.668	957	0.668	1007	0.668	1057	0.668	1107	0.668
858	0.668	908	0.668	958	0.668	1008	0.668	1058	0.668	1108	0.668
859	0.668	909	0.668	959	0.668	1009	0.668	1059	0.668	1109	0.668
860	0.668	910	0.668	960	0.668	1010	0.668	1060	0.668	1110	0.668
861	0.668	911	0.668	961	0.668	1011	0.668	1061	0.668	1111	0.668
862	0.668	912	0.668	962	0.668	1012	0.668	1062	0.668	1112	0.668
863	0.668	913	0.668	963	0.668	1013	0.668	1063	0.668	1113	0.668
864	0.668	914	0.668	964	0.668	1014	0.668	1064	0.668	1114	0.668
865	0.668	915	0.668	965	0.668	1015	0.668	1065	0.668	1115	0.668
866	0.668	916	0.668	966	0.668	1016	0.668	1066	0.668	1116	0.668
867	0.668	917	0.668	967	0.668	1017	0.668	1067	0.668	1117	0.668
868	0.668	918	0.668	968	0.668	1018	0.668	1068	0.668	1118	0.668
869	0.668	919	0.668	969	0.668	1019	0.668	1069	0.668	1119	0.668
870	0.668	920	0.668	970	0.668	1020	0.668	1070	0.668	1120	0.668
871	0.668	921	0.668	971	0.668	1021	0.668	1071	0.668	1121	0.668
872	0.668	922	0.668	972	0.668	1022	0.668	1072	0.668	1122	0.668
873	0.668	923	0.668	973	0.668	1023	0.668	1073	0.668	1123	0.668
874	0.668	924	0.668	974	0.668	1024	0.668	1074	0.668	1124	0.668
875	0.668	925	0.668	975	0.668	1025	0.668	1075	0.668	1125	0.668
876	0.668	926	0.668	976	0.668	1026	0.668	1076	0.668	1126	0.668
877	0.668	927	0.668	977	0.668	1027	0.668	1077	0.668	1127	0.668
878	0.668	928	0.668	978	0.668	1028	0.668	1078	0.668	1128	0.668
879	0.668	929	0.668	979	0.668	1029	0.668	1079	0.668	1129	0.668
880	0.668	930	0.668	980	0.668	1030	0.668	1080	0.668	1130	0.668
881	0.668	931	0.668	981	0.668	1031	0.668	1081	0.668	1131	0.668
882	0.668	932	0.668	982	0.668	1032	0.668	1082	0.668	1132	0.668
883	0.668	933	0.668	983	0.668	1033	0.668	1083	0.668	1133	0.668
884	0.668	934	0.668	984	0.668	1034	0.668	1084	0.668	1134	0.668
885	0.668	935	0.668	985	0.668	1035	0.668	1085	0.668	1135	0.668
886	0.668	936	0.668	986	0.668	1036	0.668	1086	0.668	1136	0.668
887	0.668	937	0.668	987	0.668	1037	0.668	1087	0.668	1137	0.668
888	0.668	938	0.668	988	0.668	1038	0.668	1088	0.668	1138	0.668
889	0.668	939	0.668	989	0.668	1039	0.668	1089	0.668	1139	0.668
890	0.668	940	0.668	990	0.668	1040	0.668	1090	0.668	1140	0.668
891	0.668	941	0.668	991	0.668	1041	0.668	1091	0.668	1141	0.668
892	0.668	942	0.668	992	0.668	1042	0.668	1092	0.668	1142	0.668
893	0.668	943	0.668	993	0.668	1043	0.668	1093	0.668	1143	0.668
894	0.668	944	0.668	994	0.668	1044	0.668	1094	0.668	1144	0.668
895	0.668	945	0.668	995	0.668	1045	0.668	1095	0.668	1145	0.668
896	0.668	946	0.668	996	0.668	1046	0.668	1096	0.668	1146	0.668

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1147	0.668	1197	0.668	1247	0.668	1297	0.668	1347	0.668	1397	0.668
1148	0.668	1198	0.668	1248	0.668	1298	0.668	1348	0.668	1398	0.668
1149	0.668	1199	0.668	1249	0.668	1299	0.668	1349	0.668	1399	0.668
1150	0.668	1200	0.668	1250	0.668	1300	0.668	1350	0.668	1400	0.668
1151	0.668	1201	0.668	1251	0.668	1301	0.668	1351	0.668	1401	0.668
1152	0.668	1202	0.668	1252	0.668	1302	0.668	1352	0.668	1402	0.668
1153	0.668	1203	0.668	1253	0.668	1303	0.668	1353	0.668	1403	0.668
1154	0.668	1204	0.668	1254	0.668	1304	0.668	1354	0.668	1404	0.668
1155	0.668	1205	0.668	1255	0.668	1305	0.668	1355	0.668	1405	0.668
1156	0.668	1206	0.668	1256	0.668	1306	0.668	1356	0.668	1406	0.668
1157	0.668	1207	0.668	1257	0.668	1307	0.668	1357	0.668	1407	0.668
1158	0.668	1208	0.668	1258	0.668	1308	0.668	1358	0.668	1408	0.668
1159	0.668	1209	0.668	1259	0.668	1309	0.668	1359	0.668	1409	0.668
1160	0.668	1210	0.668	1260	0.668	1310	0.668	1360	0.668	1410	0.668
1161	0.668	1211	0.668	1261	0.668	1311	0.668	1361	0.668	1411	0.668
1162	0.668	1212	0.668	1262	0.668	1312	0.668	1362	0.668	1412	0.668
1163	0.668	1213	0.668	1263	0.668	1313	0.668	1363	0.668	1413	0.668
1164	0.668	1214	0.668	1264	0.668	1314	0.668	1364	0.668	1414	0.668
1165	0.668	1215	0.668	1265	0.668	1315	0.668	1365	0.668	1415	0.668
1166	0.668	1216	0.668	1266	0.668	1316	0.668	1366	0.668	1416	0.668
1167	0.668	1217	0.668	1267	0.668	1317	0.668	1367	0.668	1417	0.668
1168	0.668	1218	0.668	1268	0.668	1318	0.668	1368	0.668	1418	0.668
1169	0.668	1219	0.668	1269	0.668	1319	0.668	1369	0.668	1419	0.668
1170	0.668	1220	0.668	1270	0.668	1320	0.668	1370	0.668	1420	0.668
1171	0.668	1221	0.668	1271	0.668	1321	0.668	1371	0.668	1421	0.668
1172	0.668	1222	0.668	1272	0.668	1322	0.668	1372	0.668	1422	0.668
1173	0.668	1223	0.668	1273	0.668	1323	0.668	1373	0.668	1423	0.668
1174	0.668	1224	0.668	1274	0.668	1324	0.668	1374	0.668	1424	0.668
1175	0.668	1225	0.668	1275	0.668	1325	0.668	1375	0.668	1425	0.668
1176	0.668	1226	0.668	1276	0.668	1326	0.668	1376	0.668	1426	0.668
1177	0.668	1227	0.668	1277	0.668	1327	0.668	1377	0.668	1427	0.668
1178	0.668	1228	0.668	1278	0.668	1328	0.668	1378	0.668	1428	0.668
1179	0.668	1229	0.668	1279	0.668	1329	0.668	1379	0.668	1429	0.668
1180	0.668	1230	0.668	1280	0.668	1330	0.668	1380	0.668	1430	0.668
1181	0.668	1231	0.668	1281	0.668	1331	0.668	1381	0.668	1431	0.668
1182	0.668	1232	0.668	1282	0.668	1332	0.668	1382	0.668	1432	0.668
1183	0.668	1233	0.668	1283	0.668	1333	0.668	1383	0.668	1433	0.668
1184	0.668	1234	0.668	1284	0.668	1334	0.668	1384	0.668	1434	0.668
1185	0.668	1235	0.668	1285	0.668	1335	0.668	1385	0.668	1435	0.668
1186	0.668	1236	0.668	1286	0.668	1336	0.668	1386	0.668	1436	0.668
1187	0.668	1237	0.668	1287	0.668	1337	0.668	1387	0.668	1437	0.668
1188	0.668	1238	0.668	1288	0.668	1338	0.668	1388	0.668	1438	0.668
1189	0.668	1239	0.668	1289	0.668	1339	0.668	1389	0.668	1439	0.668
1190	0.668	1240	0.668	1290	0.668	1340	0.668	1390	0.668	1440	0.668
1191	0.668	1241	0.668	1291	0.668	1341	0.668	1391	0.668	1441	0.668
1192	0.668	1242	0.668	1292	0.668	1342	0.668	1392	0.668	1442	0.668
1193	0.668	1243	0.668	1293	0.668	1343	0.668	1393	0.668	1443	0.668
1194	0.668	1244	0.668	1294	0.668	1344	0.668	1394	0.668	1444	0.668
1195	0.668	1245	0.668	1295	0.668	1345	0.668	1395	0.668	1445	0.668
1196	0.668	1246	0.668	1296	0.668	1346	0.668	1396	0.668	1446	0.668

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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)
1447	0.668	1497	0.668	1547	0.668	1597	0.668	1647	0.668	1697	0.668
1448	0.668	1498	0.668	1548	0.668	1598	0.668	1648	0.668	1698	0.668
1449	0.668	1499	0.668	1549	0.668	1599	0.668	1649	0.668	1699	0.668
1450	0.668	1500	0.668	1550	0.668	1600	0.668	1650	0.668	1700	0.668
1451	0.668	1501	0.668	1551	0.668	1601	0.668	1651	0.668	1701	0.668
1452	0.668	1502	0.668	1552	0.668	1602	0.668	1652	0.668	1702	0.668
1453	0.668	1503	0.668	1553	0.668	1603	0.668	1653	0.668	1703	0.668
1454	0.668	1504	0.668	1554	0.668	1604	0.668	1654	0.668	1704	0.668
1455	0.668	1505	0.668	1555	0.668	1605	0.668	1655	0.668	1705	0.668
1456	0.668	1506	0.668	1556	0.668	1606	0.668	1656	0.668	1706	0.668
1457	0.668	1507	0.668	1557	0.668	1607	0.668	1657	0.668	1707	0.668
1458	0.668	1508	0.668	1558	0.668	1608	0.668	1658	0.668	1708	0.668
1459	0.668	1509	0.668	1559	0.668	1609	0.668	1659	0.668	1709	0.668
1460	0.668	1510	0.668	1560	0.668	1610	0.668	1660	0.668	1710	0.668
1461	0.668	1511	0.668	1561	0.668	1611	0.668	1661	0.668	1711	0.668
1462	0.668	1512	0.668	1562	0.668	1612	0.668	1662	0.668	1712	0.668
1463	0.668	1513	0.668	1563	0.668	1613	0.668	1663	0.668	1713	0.668
1464	0.668	1514	0.668	1564	0.668	1614	0.668	1664	0.668	1714	0.668
1465	0.668	1515	0.668	1565	0.668	1615	0.668	1665	0.668	1715	0.668
1466	0.668	1516	0.668	1566	0.668	1616	0.668	1666	0.668	1716	0.668
1467	0.668	1517	0.668	1567	0.668	1617	0.668	1667	0.668	1717	0.668
1468	0.668	1518	0.668	1568	0.668	1618	0.668	1668	0.668	1718	0.668
1469	0.668	1519	0.668	1569	0.668	1619	0.668	1669	0.668	1719	0.668
1470	0.668	1520	0.668	1570	0.668	1620	0.668	1670	0.668	1720	0.668
1471	0.668	1521	0.668	1571	0.668	1621	0.668	1671	0.668	1721	0.668
1472	0.668	1522	0.668	1572	0.668	1622	0.668	1672	0.668	1722	0.668
1473	0.668	1523	0.668	1573	0.668	1623	0.668	1673	0.668	1723	0.668
1474	0.668	1524	0.668	1574	0.668	1624	0.668	1674	0.668	1724	0.668
1475	0.668	1525	0.668	1575	0.668	1625	0.668	1675	0.668	1725	0.668
1476	0.668	1526	0.668	1576	0.668	1626	0.668	1676	0.668	1726	0.668
1477	0.668	1527	0.668	1577	0.668	1627	0.668	1677	0.668	1727	0.668
1478	0.668	1528	0.668	1578	0.668	1628	0.668	1678	0.668	1728	0.668
1479	0.668	1529	0.668	1579	0.668	1629	0.668	1679	0.668	1729	0.668
1480	0.668	1530	0.668	1580	0.668	1630	0.668	1680	0.668	1730	0.668
1481	0.668	1531	0.668	1581	0.668	1631	0.668	1681	0.668	1731	0.668
1482	0.668	1532	0.668	1582	0.668	1632	0.668	1682	0.668	1732	0.668
1483	0.668	1533	0.668	1583	0.668	1633	0.668	1683	0.668	1733	0.668
1484	0.668	1534	0.668	1584	0.668	1634	0.668	1684	0.668	1734	0.668
1485	0.668	1535	0.668	1585	0.668	1635	0.668	1685	0.668	1735	0.668
1486	0.668	1536	0.668	1586	0.668	1636	0.668	1686	0.668	1736	0.668
1487	0.668	1537	0.668	1587	0.668	1637	0.668	1687	0.668	1737	0.668
1488	0.668	1538	0.668	1588	0.668	1638	0.668	1688	0.668	1738	0.668
1489	0.668	1539	0.668	1589	0.668	1639	0.668	1689	0.668	1739	0.668
1490	0.668	1540	0.668	1590	0.668	1640	0.668	1690	0.668	1740	0.668
1491	0.668	1541	0.668	1591	0.668	1641	0.668	1691	0.668	1741	0.668
1492	0.668	1542	0.668	1592	0.668	1642	0.668	1692	0.668	1742	0.668
1493	0.668	1543	0.668	1593	0.668	1643	0.668	1693	0.668	1743	0.668
1494	0.668	1544	0.668	1594	0.668	1644	0.668	1694	0.668	1744	0.668
1495	0.668	1545	0.668	1595	0.668	1645	0.668	1695	0.668	1745	0.668
1496	0.668	1546	0.668	1596	0.668	1646	0.668	1696	0.668	1746	0.668

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Surcharged Outfall Details for Storm North

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1747	0.668	1797	0.668	1847	0.668	1897	0.668	1947	0.668	1997	0.668
1748	0.668	1798	0.668	1848	0.668	1898	0.668	1948	0.668	1998	0.668
1749	0.668	1799	0.668	1849	0.668	1899	0.668	1949	0.668	1999	0.668
1750	0.668	1800	0.668	1850	0.668	1900	0.668	1950	0.668	2000	0.668
1751	0.668	1801	0.668	1851	0.668	1901	0.668	1951	0.668	2001	0.668
1752	0.668	1802	0.668	1852	0.668	1902	0.668	1952	0.668	2002	0.668
1753	0.668	1803	0.668	1853	0.668	1903	0.668	1953	0.668	2003	0.668
1754	0.668	1804	0.668	1854	0.668	1904	0.668	1954	0.668	2004	0.668
1755	0.668	1805	0.668	1855	0.668	1905	0.668	1955	0.668	2005	0.668
1756	0.668	1806	0.668	1856	0.668	1906	0.668	1956	0.668	2006	0.668
1757	0.668	1807	0.668	1857	0.668	1907	0.668	1957	0.668	2007	0.668
1758	0.668	1808	0.668	1858	0.668	1908	0.668	1958	0.668	2008	0.668
1759	0.668	1809	0.668	1859	0.668	1909	0.668	1959	0.668	2009	0.668
1760	0.668	1810	0.668	1860	0.668	1910	0.668	1960	0.668	2010	0.668
1761	0.668	1811	0.668	1861	0.668	1911	0.668	1961	0.668	2011	0.668
1762	0.668	1812	0.668	1862	0.668	1912	0.668	1962	0.668	2012	0.668
1763	0.668	1813	0.668	1863	0.668	1913	0.668	1963	0.668	2013	0.668
1764	0.668	1814	0.668	1864	0.668	1914	0.668	1964	0.668	2014	0.668
1765	0.668	1815	0.668	1865	0.668	1915	0.668	1965	0.668	2015	0.668
1766	0.668	1816	0.668	1866	0.668	1916	0.668	1966	0.668	2016	0.668
1767	0.668	1817	0.668	1867	0.668	1917	0.668	1967	0.668	2017	0.668
1768	0.668	1818	0.668	1868	0.668	1918	0.668	1968	0.668	2018	0.668
1769	0.668	1819	0.668	1869	0.668	1919	0.668	1969	0.668	2019	0.668
1770	0.668	1820	0.668	1870	0.668	1920	0.668	1970	0.668	2020	0.668
1771	0.668	1821	0.668	1871	0.668	1921	0.668	1971	0.668	2021	0.668
1772	0.668	1822	0.668	1872	0.668	1922	0.668	1972	0.668	2022	0.668
1773	0.668	1823	0.668	1873	0.668	1923	0.668	1973	0.668	2023	0.668
1774	0.668	1824	0.668	1874	0.668	1924	0.668	1974	0.668	2024	0.668
1775	0.668	1825	0.668	1875	0.668	1925	0.668	1975	0.668	2025	0.668
1776	0.668	1826	0.668	1876	0.668	1926	0.668	1976	0.668	2026	0.668
1777	0.668	1827	0.668	1877	0.668	1927	0.668	1977	0.668	2027	0.668
1778	0.668	1828	0.668	1878	0.668	1928	0.668	1978	0.668	2028	0.668
1779	0.668	1829	0.668	1879	0.668	1929	0.668	1979	0.668	2029	0.668
1780	0.668	1830	0.668	1880	0.668	1930	0.668	1980	0.668	2030	0.668
1781	0.668	1831	0.668	1881	0.668	1931	0.668	1981	0.668	2031	0.668
1782	0.668	1832	0.668	1882	0.668	1932	0.668	1982	0.668	2032	0.668
1783	0.668	1833	0.668	1883	0.668	1933	0.668	1983	0.668	2033	0.668
1784	0.668	1834	0.668	1884	0.668	1934	0.668	1984	0.668	2034	0.668
1785	0.668	1835	0.668	1885	0.668	1935	0.668	1985	0.668	2035	0.668
1786	0.668	1836	0.668	1886	0.668	1936	0.668	1986	0.668	2036	0.668
1787	0.668	1837	0.668	1887	0.668	1937	0.668	1987	0.668	2037	0.668
1788	0.668	1838	0.668	1888	0.668	1938	0.668	1988	0.668	2038	0.668
1789	0.668	1839	0.668	1889	0.668	1939	0.668	1989	0.668	2039	0.668
1790	0.668	1840	0.668	1890	0.668	1940	0.668	1990	0.668	2040	0.668
1791	0.668	1841	0.668	1891	0.668	1941	0.668	1991	0.668	2041	0.668
1792	0.668	1842	0.668	1892	0.668	1942	0.668	1992	0.668	2042	0.668
1793	0.668	1843	0.668	1893	0.668	1943	0.668	1993	0.668	2043	0.668
1794	0.668	1844	0.668	1894	0.668	1944	0.668	1994	0.668	2044	0.668
1795	0.668	1845	0.668	1895	0.668	1945	0.668	1995	0.668	2045	0.668
1796	0.668	1846	0.668	1896	0.668	1946	0.668	1996	0.668	2046	0.668

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Surcharged Outfall Details for Storm North

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
2047	0.668	2097	0.668	2147	0.668	2197	0.668	2247	0.668	2297	0.668
2048	0.668	2098	0.668	2148	0.668	2198	0.668	2248	0.668	2298	0.668
2049	0.668	2099	0.668	2149	0.668	2199	0.668	2249	0.668	2299	0.668
2050	0.668	2100	0.668	2150	0.668	2200	0.668	2250	0.668	2300	0.668
2051	0.668	2101	0.668	2151	0.668	2201	0.668	2251	0.668	2301	0.668
2052	0.668	2102	0.668	2152	0.668	2202	0.668	2252	0.668	2302	0.668
2053	0.668	2103	0.668	2153	0.668	2203	0.668	2253	0.668	2303	0.668
2054	0.668	2104	0.668	2154	0.668	2204	0.668	2254	0.668	2304	0.668
2055	0.668	2105	0.668	2155	0.668	2205	0.668	2255	0.668	2305	0.668
2056	0.668	2106	0.668	2156	0.668	2206	0.668	2256	0.668	2306	0.668
2057	0.668	2107	0.668	2157	0.668	2207	0.668	2257	0.668	2307	0.668
2058	0.668	2108	0.668	2158	0.668	2208	0.668	2258	0.668	2308	0.668
2059	0.668	2109	0.668	2159	0.668	2209	0.668	2259	0.668	2309	0.668
2060	0.668	2110	0.668	2160	0.668	2210	0.668	2260	0.668	2310	0.668
2061	0.668	2111	0.668	2161	0.668	2211	0.668	2261	0.668	2311	0.668
2062	0.668	2112	0.668	2162	0.668	2212	0.668	2262	0.668	2312	0.668
2063	0.668	2113	0.668	2163	0.668	2213	0.668	2263	0.668	2313	0.668
2064	0.668	2114	0.668	2164	0.668	2214	0.668	2264	0.668	2314	0.668
2065	0.668	2115	0.668	2165	0.668	2215	0.668	2265	0.668	2315	0.668
2066	0.668	2116	0.668	2166	0.668	2216	0.668	2266	0.668	2316	0.668
2067	0.668	2117	0.668	2167	0.668	2217	0.668	2267	0.668	2317	0.668
2068	0.668	2118	0.668	2168	0.668	2218	0.668	2268	0.668	2318	0.668
2069	0.668	2119	0.668	2169	0.668	2219	0.668	2269	0.668	2319	0.668
2070	0.668	2120	0.668	2170	0.668	2220	0.668	2270	0.668	2320	0.668
2071	0.668	2121	0.668	2171	0.668	2221	0.668	2271	0.668	2321	0.668
2072	0.668	2122	0.668	2172	0.668	2222	0.668	2272	0.668	2322	0.668
2073	0.668	2123	0.668	2173	0.668	2223	0.668	2273	0.668	2323	0.668
2074	0.668	2124	0.668	2174	0.668	2224	0.668	2274	0.668	2324	0.668
2075	0.668	2125	0.668	2175	0.668	2225	0.668	2275	0.668	2325	0.668
2076	0.668	2126	0.668	2176	0.668	2226	0.668	2276	0.668	2326	0.668
2077	0.668	2127	0.668	2177	0.668	2227	0.668	2277	0.668	2327	0.668
2078	0.668	2128	0.668	2178	0.668	2228	0.668	2278	0.668	2328	0.668
2079	0.668	2129	0.668	2179	0.668	2229	0.668	2279	0.668	2329	0.668
2080	0.668	2130	0.668	2180	0.668	2230	0.668	2280	0.668	2330	0.668
2081	0.668	2131	0.668	2181	0.668	2231	0.668	2281	0.668	2331	0.668
2082	0.668	2132	0.668	2182	0.668	2232	0.668	2282	0.668	2332	0.668
2083	0.668	2133	0.668	2183	0.668	2233	0.668	2283	0.668	2333	0.668
2084	0.668	2134	0.668	2184	0.668	2234	0.668	2284	0.668	2334	0.668
2085	0.668	2135	0.668	2185	0.668	2235	0.668	2285	0.668	2335	0.668
2086	0.668	2136	0.668	2186	0.668	2236	0.668	2286	0.668	2336	0.668
2087	0.668	2137	0.668	2187	0.668	2237	0.668	2287	0.668	2337	0.668
2088	0.668	2138	0.668	2188	0.668	2238	0.668	2288	0.668	2338	0.668
2089	0.668	2139	0.668	2189	0.668	2239	0.668	2289	0.668	2339	0.668
2090	0.668	2140	0.668	2190	0.668	2240	0.668	2290	0.668	2340	0.668
2091	0.668	2141	0.668	2191	0.668	2241	0.668	2291	0.668	2341	0.668
2092	0.668	2142	0.668	2192	0.668	2242	0.668	2292	0.668	2342	0.668
2093	0.668	2143	0.668	2193	0.668	2243	0.668	2293	0.668	2343	0.668
2094	0.668	2144	0.668	2194	0.668	2244	0.668	2294	0.668	2344	0.668
2095	0.668	2145	0.668	2195	0.668	2245	0.668	2295	0.668	2345	0.668
2096	0.668	2146	0.668	2196	0.668	2246	0.668	2296	0.668	2346	0.668

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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)
2347	0.668	2397	0.668	2447	0.668	2497	0.668	2547	0.668	2597	0.668
2348	0.668	2398	0.668	2448	0.668	2498	0.668	2548	0.668	2598	0.668
2349	0.668	2399	0.668	2449	0.668	2499	0.668	2549	0.668	2599	0.668
2350	0.668	2400	0.668	2450	0.668	2500	0.668	2550	0.668	2600	0.668
2351	0.668	2401	0.668	2451	0.668	2501	0.668	2551	0.668	2601	0.668
2352	0.668	2402	0.668	2452	0.668	2502	0.668	2552	0.668	2602	0.668
2353	0.668	2403	0.668	2453	0.668	2503	0.668	2553	0.668	2603	0.668
2354	0.668	2404	0.668	2454	0.668	2504	0.668	2554	0.668	2604	0.668
2355	0.668	2405	0.668	2455	0.668	2505	0.668	2555	0.668	2605	0.668
2356	0.668	2406	0.668	2456	0.668	2506	0.668	2556	0.668	2606	0.668
2357	0.668	2407	0.668	2457	0.668	2507	0.668	2557	0.668	2607	0.668
2358	0.668	2408	0.668	2458	0.668	2508	0.668	2558	0.668	2608	0.668
2359	0.668	2409	0.668	2459	0.668	2509	0.668	2559	0.668	2609	0.668
2360	0.668	2410	0.668	2460	0.668	2510	0.668	2560	0.668	2610	0.668
2361	0.668	2411	0.668	2461	0.668	2511	0.668	2561	0.668	2611	0.668
2362	0.668	2412	0.668	2462	0.668	2512	0.668	2562	0.668	2612	0.668
2363	0.668	2413	0.668	2463	0.668	2513	0.668	2563	0.668	2613	0.668
2364	0.668	2414	0.668	2464	0.668	2514	0.668	2564	0.668	2614	0.668
2365	0.668	2415	0.668	2465	0.668	2515	0.668	2565	0.668	2615	0.668
2366	0.668	2416	0.668	2466	0.668	2516	0.668	2566	0.668	2616	0.668
2367	0.668	2417	0.668	2467	0.668	2517	0.668	2567	0.668	2617	0.668
2368	0.668	2418	0.668	2468	0.668	2518	0.668	2568	0.668	2618	0.668
2369	0.668	2419	0.668	2469	0.668	2519	0.668	2569	0.668	2619	0.668
2370	0.668	2420	0.668	2470	0.668	2520	0.668	2570	0.668	2620	0.668
2371	0.668	2421	0.668	2471	0.668	2521	0.668	2571	0.668	2621	0.668
2372	0.668	2422	0.668	2472	0.668	2522	0.668	2572	0.668	2622	0.668
2373	0.668	2423	0.668	2473	0.668	2523	0.668	2573	0.668	2623	0.668
2374	0.668	2424	0.668	2474	0.668	2524	0.668	2574	0.668	2624	0.668
2375	0.668	2425	0.668	2475	0.668	2525	0.668	2575	0.668	2625	0.668
2376	0.668	2426	0.668	2476	0.668	2526	0.668	2576	0.668	2626	0.668
2377	0.668	2427	0.668	2477	0.668	2527	0.668	2577	0.668	2627	0.668
2378	0.668	2428	0.668	2478	0.668	2528	0.668	2578	0.668	2628	0.668
2379	0.668	2429	0.668	2479	0.668	2529	0.668	2579	0.668	2629	0.668
2380	0.668	2430	0.668	2480	0.668	2530	0.668	2580	0.668	2630	0.668
2381	0.668	2431	0.668	2481	0.668	2531	0.668	2581	0.668	2631	0.668
2382	0.668	2432	0.668	2482	0.668	2532	0.668	2582	0.668	2632	0.668
2383	0.668	2433	0.668	2483	0.668	2533	0.668	2583	0.668	2633	0.668
2384	0.668	2434	0.668	2484	0.668	2534	0.668	2584	0.668	2634	0.668
2385	0.668	2435	0.668	2485	0.668	2535	0.668	2585	0.668	2635	0.668
2386	0.668	2436	0.668	2486	0.668	2536	0.668	2586	0.668	2636	0.668
2387	0.668	2437	0.668	2487	0.668	2537	0.668	2587	0.668	2637	0.668
2388	0.668	2438	0.668	2488	0.668	2538	0.668	2588	0.668	2638	0.668
2389	0.668	2439	0.668	2489	0.668	2539	0.668	2589	0.668	2639	0.668
2390	0.668	2440	0.668	2490	0.668	2540	0.668	2590	0.668	2640	0.668
2391	0.668	2441	0.668	2491	0.668	2541	0.668	2591	0.668	2641	0.668
2392	0.668	2442	0.668	2492	0.668	2542	0.668	2592	0.668	2642	0.668
2393	0.668	2443	0.668	2493	0.668	2543	0.668	2593	0.668	2643	0.668
2394	0.668	2444	0.668	2494	0.668	2544	0.668	2594	0.668	2644	0.668
2395	0.668	2445	0.668	2495	0.668	2545	0.668	2595	0.668	2645	0.668
2396	0.668	2446	0.668	2496	0.668	2546	0.668	2596	0.668	2646	0.668

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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)
2647	0.668	2673	0.668	2699	0.668	2725	0.668	2751	0.668	2777	0.668
2648	0.668	2674	0.668	2700	0.668	2726	0.668	2752	0.668	2778	0.668
2649	0.668	2675	0.668	2701	0.668	2727	0.668	2753	0.668	2779	0.668
2650	0.668	2676	0.668	2702	0.668	2728	0.668	2754	0.668	2780	0.668
2651	0.668	2677	0.668	2703	0.668	2729	0.668	2755	0.668	2781	0.668
2652	0.668	2678	0.668	2704	0.668	2730	0.668	2756	0.668	2782	0.668
2653	0.668	2679	0.668	2705	0.668	2731	0.668	2757	0.668	2783	0.668
2654	0.668	2680	0.668	2706	0.668	2732	0.668	2758	0.668	2784	0.668
2655	0.668	2681	0.668	2707	0.668	2733	0.668	2759	0.668	2785	0.668
2656	0.668	2682	0.668	2708	0.668	2734	0.668	2760	0.668	2786	0.668
2657	0.668	2683	0.668	2709	0.668	2735	0.668	2761	0.668	2787	0.668
2658	0.668	2684	0.668	2710	0.668	2736	0.668	2762	0.668	2788	0.668
2659	0.668	2685	0.668	2711	0.668	2737	0.668	2763	0.668	2789	0.668
2660	0.668	2686	0.668	2712	0.668	2738	0.668	2764	0.668	2790	0.668
2661	0.668	2687	0.668	2713	0.668	2739	0.668	2765	0.668	2791	0.668
2662	0.668	2688	0.668	2714	0.668	2740	0.668	2766	0.668	2792	0.668
2663	0.668	2689	0.668	2715	0.668	2741	0.668	2767	0.668	2793	0.668
2664	0.668	2690	0.668	2716	0.668	2742	0.668	2768	0.668	2794	0.668
2665	0.668	2691	0.668	2717	0.668	2743	0.668	2769	0.668	2795	0.668
2666	0.668	2692	0.668	2718	0.668	2744	0.668	2770	0.668	2796	0.668
2667	0.668	2693	0.668	2719	0.668	2745	0.668	2771	0.668	2797	0.668
2668	0.668	2694	0.668	2720	0.668	2746	0.668	2772	0.668	2798	0.668
2669	0.668	2695	0.668	2721	0.668	2747	0.668	2773	0.668	2799	0.668
2670	0.668	2696	0.668	2722	0.668	2748	0.668	2774	0.668	2800	0.668
2671	0.668	2697	0.668	2723	0.668	2749	0.668	2775	0.668		
2672	0.668	2698	0.668	2724	0.668	2750	0.668	2776	0.668		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	1	+0%	100/15 Summer			
1.001	2	15 Winter	1	+0%	100/15 Summer			
1.002	3	15 Winter	1	+0%	100/15 Summer			
1.003	4	15 Winter	1	+0%	100/15 Summer			
1.004	5	15 Winter	1	+0%	100/15 Summer			
2.000	6	15 Winter	1	+0%				
1.005	7	15 Winter	1	+0%	100/15 Summer			
1.006	8	15 Winter	1	+0%	30/15 Winter			
1.007	9	15 Winter	1	+0%	30/15 Summer			
1.008	10	15 Winter	1	+0%	30/15 Summer			
1.009	11	15 Winter	1	+0%	30/15 Summer			
3.000	12	15 Winter	1	+0%	100/15 Summer			
3.001	13	60 Winter	1	+0%	100/15 Summer			
3.002	14	60 Winter	1	+0%	100/15 Summer			
3.003	TANK1	60 Winter	1	+0%	100/15 Summer			
1.010	TANK2	60 Winter	1	+0%	100/15 Summer			
1.011	15	60 Winter	1	+0%	100/15 Summer			
1.012	16	120 Winter	1	+0%	30/30 Winter			
1.013	17	120 Winter	1	+0%	1/15 Summer	100/360 Summer		
1.014	18	480 Winter	1	+0%	1/15 Summer	30/240 Winter		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	37.827	-0.123	0.000	0.07		1.2	OK	
1.001	2	37.762	-0.103	0.000	0.21		3.1	OK	
1.002	3	37.638	-0.167	0.000	0.15		5.4	OK	
1.003	4	37.520	-0.155	0.000	0.21		7.0	OK	
1.004	5	37.463	-0.152	0.000	0.23		8.3	OK	
2.000	6	38.977	-0.123	0.000	0.07		3.1	OK	
1.005	7	37.343	-0.182	0.000	0.27		13.3	OK	
1.006	8	37.335	-0.170	0.000	0.26		13.0	OK	
1.007	9	37.328	-0.152	0.000	0.23		13.6	OK	
1.008	10	37.317	-0.108	0.000	0.28		14.6	OK	
1.009	11	37.311	-0.089	0.000	0.83		16.5	OK	
3.000	12	37.267	-0.183	0.000	0.08		2.6	OK	
3.001	13	37.259	-0.136	0.000	0.07		2.2	OK	
3.002	14	37.257	-0.143	0.000	0.06		3.1	OK	
3.003	TANK1	37.257	-0.143	0.000	0.09		2.9	OK	
1.010	TANK2	37.256	-0.144	0.000	0.14		6.8	OK	
1.011	15	37.254	-0.081	0.000	0.12		6.9	OK	
1.012	16	37.250	-0.040	0.000	0.06		8.3	OK	
1.013	17	37.102	0.352	0.000	0.14		8.0	SURCHARGED	
1.014	18	37.102	0.402	0.000	0.12		6.3	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	30	+0%	100/15 Summer			
1.001	2	15 Winter	30	+0%	100/15 Summer			
1.002	3	15 Winter	30	+0%	100/15 Summer			
1.003	4	15 Winter	30	+0%	100/15 Summer			
1.004	5	15 Winter	30	+0%	100/15 Summer			
2.000	6	15 Winter	30	+0%				
1.005	7	15 Winter	30	+0%	100/15 Summer			
1.006	8	15 Winter	30	+0%	30/15 Winter			
1.007	9	15 Winter	30	+0%	30/15 Summer			
1.008	10	15 Winter	30	+0%	30/15 Summer			
1.009	11	15 Winter	30	+0%	30/15 Summer			
3.000	12	30 Winter	30	+0%	100/15 Summer			
3.001	13	30 Winter	30	+0%	100/15 Summer			
3.002	14	30 Winter	30	+0%	100/15 Summer			
3.003	TANK1	30 Winter	30	+0%	100/15 Summer			
1.010	TANK2	30 Winter	30	+0%	100/15 Summer			
1.011	15	30 Winter	30	+0%	100/15 Summer			
1.012	16	30 Winter	30	+0%	30/30 Winter			
1.013	17	30 Winter	30	+0%	1/15 Summer	100/360 Summer		
1.014	18	960 Winter	30	+0%	1/15 Summer	30/240 Winter		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	37.843	-0.107	0.000	0.18		2.9	OK	
1.001	2	37.799	-0.066	0.000	0.60		9.0	OK	
1.002	3	37.684	-0.121	0.000	0.43		16.0	OK	
1.003	4	37.588	-0.087	0.000	0.60		19.8	OK	
1.004	5	37.561	-0.054	0.000	0.65		23.3	OK	
2.000	6	38.993	-0.107	0.000	0.18		7.6	OK	
1.005	7	37.519	-0.006	0.000	0.76		36.9	OK	
1.006	8	37.506	0.001	0.000	0.73		36.8	SURCHARGED	
1.007	9	37.490	0.010	0.000	0.68		40.2	SURCHARGED	
1.008	10	37.457	0.032	0.000	0.87		44.7	SURCHARGED	
1.009	11	37.438	0.038	0.000	2.53		50.0	SURCHARGED	
3.000	12	37.349	-0.101	0.000	0.14		4.7	OK	
3.001	13	37.346	-0.049	0.000	0.23		7.8	OK	
3.002	14	37.338	-0.062	0.000	0.22		11.0	OK	
3.003	TANK1	37.336	-0.064	0.000	0.30		10.4	OK	
1.010	TANK2	37.332	-0.068	0.000	0.75		37.3	OK	
1.011	15	37.321	-0.014	0.000	0.65		37.5	OK	
1.012	16	37.296	0.006	0.000	0.30		44.5	SURCHARGED	
1.013	17	37.146	0.396	0.000	0.77		44.5	SURCHARGED	
1.014	18	37.187	0.487	0.000	0.38		19.3	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
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	1	15 Winter	100	+0%				
1.001	2	15 Winter	100	+0%				
1.002	3	15 Winter	100	+0%				
1.003	4	15 Winter	100	+0%				
1.004	5	15 Winter	100	+0%	100/15 Summer			
2.000	6	15 Winter	100	+0%				
1.005	7	15 Winter	100	+0%	100/15 Summer			
1.006	8	15 Winter	100	+0%	100/15 Summer			
1.007	9	15 Winter	100	+0%	100/15 Summer			
1.008	10	15 Winter	100	+0%	100/15 Summer			
1.009	11	15 Winter	100	+0%	100/15 Summer			
3.000	12	30 Winter	100	+0%				
3.001	13	30 Winter	100	+0%	100/15 Winter			
3.002	14	30 Winter	100	+0%	100/30 Winter			
3.003	TANK1	30 Winter	100	+0%	100/30 Winter			
1.010	TANK2	30 Winter	100	+0%	100/30 Winter			
1.011	15	30 Winter	100	+0%	100/15 Summer			
1.012	16	30 Winter	100	+0%	100/15 Summer			
1.013	17	30 Winter	100	+0%	100/15 Summer			
1.014	18	960 Summer	100	+0%	100/15 Summer	100/360 Summer		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	37.850	-0.100	0.000	0.24		3.7	OK	
1.001	2	37.815	-0.050	0.000	0.77		11.6	OK	
1.002	3	37.714	-0.091	0.000	0.56		20.6	OK	
1.003	4	37.673	-0.002	0.000	0.74		24.6	OK	
1.004	5	37.640	0.025	0.000	0.82		29.1	SURCHARGED	
2.000	6	38.999	-0.101	0.000	0.23		9.9	OK	
1.005	7	37.581	0.056	0.000	0.96		46.3	SURCHARGED	
1.006	8	37.563	0.058	0.000	0.91		46.1	SURCHARGED	
1.007	9	37.542	0.062	0.000	0.85		50.3	SURCHARGED	
1.008	10	37.500	0.075	0.000	1.08		56.0	SURCHARGED	
1.009	11	37.470	0.070	0.000	3.18		62.9	SURCHARGED	
3.000	12	37.432	-0.018	0.000	0.18		6.0	OK	
3.001	13	37.428	0.033	0.000	0.29		9.8	SURCHARGED	
3.002	14	37.418	0.018	0.000	0.29		14.4	SURCHARGED	
3.003	TANK1	37.415	0.015	0.000	0.40		13.5	SURCHARGED	
1.010	TANK2	37.410	0.010	0.000	0.90		45.1	SURCHARGED	
1.011	15	37.394	0.059	0.000	0.79		45.3	SURCHARGED	
1.012	16	37.364	0.074	0.000	0.36		53.6	SURCHARGED	
1.013	17	37.164	0.414	0.000	0.92		53.6	SURCHARGED	
1.014	18	37.168	0.468	0.000	0.37		19.2	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 2 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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	1	15 Winter	100	+40%	100/15 Summer			
1.001	2	15 Winter	100	+40%	100/15 Summer			
1.002	3	15 Winter	100	+40%	100/15 Summer			
1.003	4	15 Winter	100	+40%	100/15 Summer			
1.004	5	15 Winter	100	+40%	100/15 Summer			
2.000	6	15 Winter	100	+40%				
1.005	7	30 Winter	100	+40%	100/15 Summer			
1.006	8	30 Winter	100	+40%	30/15 Winter			
1.007	9	30 Winter	100	+40%	30/15 Summer			
1.008	10	30 Winter	100	+40%	30/15 Summer			
1.009	11	30 Winter	100	+40%	30/15 Summer			
3.000	12	30 Winter	100	+40%	100/15 Summer			
3.001	13	30 Winter	100	+40%	100/15 Summer			
3.002	14	30 Winter	100	+40%	100/15 Summer			
3.003	TANK1	30 Winter	100	+40%	100/15 Summer			
1.010	TANK2	30 Winter	100	+40%	100/15 Summer			
1.011	15	30 Winter	100	+40%	100/15 Summer			
1.012	16	30 Winter	100	+40%	30/30 Winter			
1.013	17	30 Winter	100	+40%	1/15 Summer	100/360 Summer		
1.014	18	30 Winter	100	+40%	1/15 Summer	30/240 Winter		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm North

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	38.085	0.135	0.000	0.32		5.0	SURCHARGED	
1.001	2	38.070	0.205	0.000	0.95		14.2	SURCHARGED	
1.002	3	38.018	0.213	0.000	0.67		24.5	SURCHARGED	
1.003	4	37.960	0.285	0.000	0.95		31.6	SURCHARGED	
1.004	5	37.905	0.290	0.000	1.06		37.7	SURCHARGED	
2.000	6	39.009	-0.091	0.000	0.32		13.9	OK	
1.005	7	37.826	0.301	0.000	1.02		49.3	SURCHARGED	
1.006	8	37.814	0.309	0.000	0.96		48.4	SURCHARGED	
1.007	9	37.801	0.321	0.000	0.89		52.9	SURCHARGED	
1.008	10	37.774	0.349	0.000	1.14		59.0	FLOOD RISK	
1.009	11	37.759	0.359	0.000	3.38		66.8	FLOOD RISK	
3.000	12	37.748	0.298	0.000	0.25		8.4	FLOOD RISK	
3.001	13	37.742	0.347	0.000	0.42		14.3	FLOOD RISK	
3.002	14	37.728	0.328	0.000	0.43		21.3	FLOOD RISK	
3.003	TANK1	37.724	0.324	0.000	0.59		20.3	FLOOD RISK	
1.010	TANK2	37.716	0.316	0.000	1.15		57.5	FLOOD RISK	
1.011	15	37.690	0.355	0.000	1.01		58.0	SURCHARGED	
1.012	16	37.647	0.357	0.000	0.49		73.8	SURCHARGED	
1.013	17	37.265	0.515	0.000	1.27		73.7	FLOOD RISK	
1.014	18	37.177	0.477	0.000	1.43		73.6	SURCHARGED	

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Surcharged Outfall Details for Storm South

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.005	S	38.200	36.910	0.000	0	0

Datum (m) 36.300 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)
1	1.000	42	1.000	83	1.000	124	1.000	165	1.000	206	1.000
2	1.000	43	1.000	84	1.000	125	1.000	166	1.000	207	1.000
3	1.000	44	1.000	85	1.000	126	1.000	167	1.000	208	1.000
4	1.000	45	1.000	86	1.000	127	1.000	168	1.000	209	1.000
5	1.000	46	1.000	87	1.000	128	1.000	169	1.000	210	1.000
6	1.000	47	1.000	88	1.000	129	1.000	170	1.000	211	1.000
7	1.000	48	1.000	89	1.000	130	1.000	171	1.000	212	1.000
8	1.000	49	1.000	90	1.000	131	1.000	172	1.000	213	1.000
9	1.000	50	1.000	91	1.000	132	1.000	173	1.000	214	1.000
10	1.000	51	1.000	92	1.000	133	1.000	174	1.000	215	1.000
11	1.000	52	1.000	93	1.000	134	1.000	175	1.000	216	1.000
12	1.000	53	1.000	94	1.000	135	1.000	176	1.000	217	1.000
13	1.000	54	1.000	95	1.000	136	1.000	177	1.000	218	1.000
14	1.000	55	1.000	96	1.000	137	1.000	178	1.000	219	1.000
15	1.000	56	1.000	97	1.000	138	1.000	179	1.000	220	1.000
16	1.000	57	1.000	98	1.000	139	1.000	180	1.000	221	1.000
17	1.000	58	1.000	99	1.000	140	1.000	181	1.000	222	1.000
18	1.000	59	1.000	100	1.000	141	1.000	182	1.000	223	1.000
19	1.000	60	1.000	101	1.000	142	1.000	183	1.000	224	1.000
20	1.000	61	1.000	102	1.000	143	1.000	184	1.000	225	1.000
21	1.000	62	1.000	103	1.000	144	1.000	185	1.000	226	1.000
22	1.000	63	1.000	104	1.000	145	1.000	186	1.000	227	1.000
23	1.000	64	1.000	105	1.000	146	1.000	187	1.000	228	1.000
24	1.000	65	1.000	106	1.000	147	1.000	188	1.000	229	1.000
25	1.000	66	1.000	107	1.000	148	1.000	189	1.000	230	1.000
26	1.000	67	1.000	108	1.000	149	1.000	190	1.000	231	1.000
27	1.000	68	1.000	109	1.000	150	1.000	191	1.000	232	1.000
28	1.000	69	1.000	110	1.000	151	1.000	192	1.000	233	1.000
29	1.000	70	1.000	111	1.000	152	1.000	193	1.000	234	1.000
30	1.000	71	1.000	112	1.000	153	1.000	194	1.000	235	1.000
31	1.000	72	1.000	113	1.000	154	1.000	195	1.000	236	1.000
32	1.000	73	1.000	114	1.000	155	1.000	196	1.000	237	1.000
33	1.000	74	1.000	115	1.000	156	1.000	197	1.000	238	1.000
34	1.000	75	1.000	116	1.000	157	1.000	198	1.000	239	1.000
35	1.000	76	1.000	117	1.000	158	1.000	199	1.000	240	1.000
36	1.000	77	1.000	118	1.000	159	1.000	200	1.000	241	1.000
37	1.000	78	1.000	119	1.000	160	1.000	201	1.000	242	1.000
38	1.000	79	1.000	120	1.000	161	1.000	202	1.000	243	1.000
39	1.000	80	1.000	121	1.000	162	1.000	203	1.000	244	1.000
40	1.000	81	1.000	122	1.000	163	1.000	204	1.000	245	1.000
41	1.000	82	1.000	123	1.000	164	1.000	205	1.000	246	1.000

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Surcharged Outfall Details for Storm South

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
247	1.000	297	1.000	347	1.000	397	1.000	447	1.000	497	1.000
248	1.000	298	1.000	348	1.000	398	1.000	448	1.000	498	1.000
249	1.000	299	1.000	349	1.000	399	1.000	449	1.000	499	1.000
250	1.000	300	1.000	350	1.000	400	1.000	450	1.000	500	1.000
251	1.000	301	1.000	351	1.000	401	1.000	451	1.000	501	1.000
252	1.000	302	1.000	352	1.000	402	1.000	452	1.000	502	1.000
253	1.000	303	1.000	353	1.000	403	1.000	453	1.000	503	1.000
254	1.000	304	1.000	354	1.000	404	1.000	454	1.000	504	1.000
255	1.000	305	1.000	355	1.000	405	1.000	455	1.000	505	1.000
256	1.000	306	1.000	356	1.000	406	1.000	456	1.000	506	1.000
257	1.000	307	1.000	357	1.000	407	1.000	457	1.000	507	1.000
258	1.000	308	1.000	358	1.000	408	1.000	458	1.000	508	1.000
259	1.000	309	1.000	359	1.000	409	1.000	459	1.000	509	1.000
260	1.000	310	1.000	360	1.000	410	1.000	460	1.000	510	1.000
261	1.000	311	1.000	361	1.000	411	1.000	461	1.000	511	1.000
262	1.000	312	1.000	362	1.000	412	1.000	462	1.000	512	1.000
263	1.000	313	1.000	363	1.000	413	1.000	463	1.000	513	1.000
264	1.000	314	1.000	364	1.000	414	1.000	464	1.000	514	1.000
265	1.000	315	1.000	365	1.000	415	1.000	465	1.000	515	1.000
266	1.000	316	1.000	366	1.000	416	1.000	466	1.000	516	1.000
267	1.000	317	1.000	367	1.000	417	1.000	467	1.000	517	1.000
268	1.000	318	1.000	368	1.000	418	1.000	468	1.000	518	1.000
269	1.000	319	1.000	369	1.000	419	1.000	469	1.000	519	1.000
270	1.000	320	1.000	370	1.000	420	1.000	470	1.000	520	1.000
271	1.000	321	1.000	371	1.000	421	1.000	471	1.000	521	1.000
272	1.000	322	1.000	372	1.000	422	1.000	472	1.000	522	1.000
273	1.000	323	1.000	373	1.000	423	1.000	473	1.000	523	1.000
274	1.000	324	1.000	374	1.000	424	1.000	474	1.000	524	1.000
275	1.000	325	1.000	375	1.000	425	1.000	475	1.000	525	1.000
276	1.000	326	1.000	376	1.000	426	1.000	476	1.000	526	1.000
277	1.000	327	1.000	377	1.000	427	1.000	477	1.000	527	1.000
278	1.000	328	1.000	378	1.000	428	1.000	478	1.000	528	1.000
279	1.000	329	1.000	379	1.000	429	1.000	479	1.000	529	1.000
280	1.000	330	1.000	380	1.000	430	1.000	480	1.000	530	1.000
281	1.000	331	1.000	381	1.000	431	1.000	481	1.000	531	1.000
282	1.000	332	1.000	382	1.000	432	1.000	482	1.000	532	1.000
283	1.000	333	1.000	383	1.000	433	1.000	483	1.000	533	1.000
284	1.000	334	1.000	384	1.000	434	1.000	484	1.000	534	1.000
285	1.000	335	1.000	385	1.000	435	1.000	485	1.000	535	1.000
286	1.000	336	1.000	386	1.000	436	1.000	486	1.000	536	1.000
287	1.000	337	1.000	387	1.000	437	1.000	487	1.000	537	1.000
288	1.000	338	1.000	388	1.000	438	1.000	488	1.000	538	1.000
289	1.000	339	1.000	389	1.000	439	1.000	489	1.000	539	1.000
290	1.000	340	1.000	390	1.000	440	1.000	490	1.000	540	1.000
291	1.000	341	1.000	391	1.000	441	1.000	491	1.000	541	1.000
292	1.000	342	1.000	392	1.000	442	1.000	492	1.000	542	1.000
293	1.000	343	1.000	393	1.000	443	1.000	493	1.000	543	1.000
294	1.000	344	1.000	394	1.000	444	1.000	494	1.000	544	1.000
295	1.000	345	1.000	395	1.000	445	1.000	495	1.000	545	1.000
296	1.000	346	1.000	396	1.000	446	1.000	496	1.000	546	1.000

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Surcharged Outfall Details for Storm South

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
547	1.000	597	1.000	647	1.000	697	1.000	747	1.000	797	1.000
548	1.000	598	1.000	648	1.000	698	1.000	748	1.000	798	1.000
549	1.000	599	1.000	649	1.000	699	1.000	749	1.000	799	1.000
550	1.000	600	1.000	650	1.000	700	1.000	750	1.000	800	1.000
551	1.000	601	1.000	651	1.000	701	1.000	751	1.000	801	1.000
552	1.000	602	1.000	652	1.000	702	1.000	752	1.000	802	1.000
553	1.000	603	1.000	653	1.000	703	1.000	753	1.000	803	1.000
554	1.000	604	1.000	654	1.000	704	1.000	754	1.000	804	1.000
555	1.000	605	1.000	655	1.000	705	1.000	755	1.000	805	1.000
556	1.000	606	1.000	656	1.000	706	1.000	756	1.000	806	1.000
557	1.000	607	1.000	657	1.000	707	1.000	757	1.000	807	1.000
558	1.000	608	1.000	658	1.000	708	1.000	758	1.000	808	1.000
559	1.000	609	1.000	659	1.000	709	1.000	759	1.000	809	1.000
560	1.000	610	1.000	660	1.000	710	1.000	760	1.000	810	1.000
561	1.000	611	1.000	661	1.000	711	1.000	761	1.000	811	1.000
562	1.000	612	1.000	662	1.000	712	1.000	762	1.000	812	1.000
563	1.000	613	1.000	663	1.000	713	1.000	763	1.000	813	1.000
564	1.000	614	1.000	664	1.000	714	1.000	764	1.000	814	1.000
565	1.000	615	1.000	665	1.000	715	1.000	765	1.000	815	1.000
566	1.000	616	1.000	666	1.000	716	1.000	766	1.000	816	1.000
567	1.000	617	1.000	667	1.000	717	1.000	767	1.000	817	1.000
568	1.000	618	1.000	668	1.000	718	1.000	768	1.000	818	1.000
569	1.000	619	1.000	669	1.000	719	1.000	769	1.000	819	1.000
570	1.000	620	1.000	670	1.000	720	1.000	770	1.000	820	1.000
571	1.000	621	1.000	671	1.000	721	1.000	771	1.000	821	1.000
572	1.000	622	1.000	672	1.000	722	1.000	772	1.000	822	1.000
573	1.000	623	1.000	673	1.000	723	1.000	773	1.000	823	1.000
574	1.000	624	1.000	674	1.000	724	1.000	774	1.000	824	1.000
575	1.000	625	1.000	675	1.000	725	1.000	775	1.000	825	1.000
576	1.000	626	1.000	676	1.000	726	1.000	776	1.000	826	1.000
577	1.000	627	1.000	677	1.000	727	1.000	777	1.000	827	1.000
578	1.000	628	1.000	678	1.000	728	1.000	778	1.000	828	1.000
579	1.000	629	1.000	679	1.000	729	1.000	779	1.000	829	1.000
580	1.000	630	1.000	680	1.000	730	1.000	780	1.000	830	1.000
581	1.000	631	1.000	681	1.000	731	1.000	781	1.000	831	1.000
582	1.000	632	1.000	682	1.000	732	1.000	782	1.000	832	1.000
583	1.000	633	1.000	683	1.000	733	1.000	783	1.000	833	1.000
584	1.000	634	1.000	684	1.000	734	1.000	784	1.000	834	1.000
585	1.000	635	1.000	685	1.000	735	1.000	785	1.000	835	1.000
586	1.000	636	1.000	686	1.000	736	1.000	786	1.000	836	1.000
587	1.000	637	1.000	687	1.000	737	1.000	787	1.000	837	1.000
588	1.000	638	1.000	688	1.000	738	1.000	788	1.000	838	1.000
589	1.000	639	1.000	689	1.000	739	1.000	789	1.000	839	1.000
590	1.000	640	1.000	690	1.000	740	1.000	790	1.000	840	1.000
591	1.000	641	1.000	691	1.000	741	1.000	791	1.000	841	1.000
592	1.000	642	1.000	692	1.000	742	1.000	792	1.000	842	1.000
593	1.000	643	1.000	693	1.000	743	1.000	793	1.000	843	1.000
594	1.000	644	1.000	694	1.000	744	1.000	794	1.000	844	1.000
595	1.000	645	1.000	695	1.000	745	1.000	795	1.000	845	1.000
596	1.000	646	1.000	696	1.000	746	1.000	796	1.000	846	1.000

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Surcharged Outfall Details for Storm South

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
847	1.000	897	1.000	947	1.000	997	1.000	1047	1.000	1097	1.000
848	1.000	898	1.000	948	1.000	998	1.000	1048	1.000	1098	1.000
849	1.000	899	1.000	949	1.000	999	1.000	1049	1.000	1099	1.000
850	1.000	900	1.000	950	1.000	1000	1.000	1050	1.000	1100	1.000
851	1.000	901	1.000	951	1.000	1001	1.000	1051	1.000	1101	1.000
852	1.000	902	1.000	952	1.000	1002	1.000	1052	1.000	1102	1.000
853	1.000	903	1.000	953	1.000	1003	1.000	1053	1.000	1103	1.000
854	1.000	904	1.000	954	1.000	1004	1.000	1054	1.000	1104	1.000
855	1.000	905	1.000	955	1.000	1005	1.000	1055	1.000	1105	1.000
856	1.000	906	1.000	956	1.000	1006	1.000	1056	1.000	1106	1.000
857	1.000	907	1.000	957	1.000	1007	1.000	1057	1.000	1107	1.000
858	1.000	908	1.000	958	1.000	1008	1.000	1058	1.000	1108	1.000
859	1.000	909	1.000	959	1.000	1009	1.000	1059	1.000	1109	1.000
860	1.000	910	1.000	960	1.000	1010	1.000	1060	1.000	1110	1.000
861	1.000	911	1.000	961	1.000	1011	1.000	1061	1.000	1111	1.000
862	1.000	912	1.000	962	1.000	1012	1.000	1062	1.000	1112	1.000
863	1.000	913	1.000	963	1.000	1013	1.000	1063	1.000	1113	1.000
864	1.000	914	1.000	964	1.000	1014	1.000	1064	1.000	1114	1.000
865	1.000	915	1.000	965	1.000	1015	1.000	1065	1.000	1115	1.000
866	1.000	916	1.000	966	1.000	1016	1.000	1066	1.000	1116	1.000
867	1.000	917	1.000	967	1.000	1017	1.000	1067	1.000	1117	1.000
868	1.000	918	1.000	968	1.000	1018	1.000	1068	1.000	1118	1.000
869	1.000	919	1.000	969	1.000	1019	1.000	1069	1.000	1119	1.000
870	1.000	920	1.000	970	1.000	1020	1.000	1070	1.000	1120	1.000
871	1.000	921	1.000	971	1.000	1021	1.000	1071	1.000	1121	1.000
872	1.000	922	1.000	972	1.000	1022	1.000	1072	1.000	1122	1.000
873	1.000	923	1.000	973	1.000	1023	1.000	1073	1.000	1123	1.000
874	1.000	924	1.000	974	1.000	1024	1.000	1074	1.000	1124	1.000
875	1.000	925	1.000	975	1.000	1025	1.000	1075	1.000	1125	1.000
876	1.000	926	1.000	976	1.000	1026	1.000	1076	1.000	1126	1.000
877	1.000	927	1.000	977	1.000	1027	1.000	1077	1.000	1127	1.000
878	1.000	928	1.000	978	1.000	1028	1.000	1078	1.000	1128	1.000
879	1.000	929	1.000	979	1.000	1029	1.000	1079	1.000	1129	1.000
880	1.000	930	1.000	980	1.000	1030	1.000	1080	1.000	1130	1.000
881	1.000	931	1.000	981	1.000	1031	1.000	1081	1.000	1131	1.000
882	1.000	932	1.000	982	1.000	1032	1.000	1082	1.000	1132	1.000
883	1.000	933	1.000	983	1.000	1033	1.000	1083	1.000	1133	1.000
884	1.000	934	1.000	984	1.000	1034	1.000	1084	1.000	1134	1.000
885	1.000	935	1.000	985	1.000	1035	1.000	1085	1.000	1135	1.000
886	1.000	936	1.000	986	1.000	1036	1.000	1086	1.000	1136	1.000
887	1.000	937	1.000	987	1.000	1037	1.000	1087	1.000	1137	1.000
888	1.000	938	1.000	988	1.000	1038	1.000	1088	1.000	1138	1.000
889	1.000	939	1.000	989	1.000	1039	1.000	1089	1.000	1139	1.000
890	1.000	940	1.000	990	1.000	1040	1.000	1090	1.000	1140	1.000
891	1.000	941	1.000	991	1.000	1041	1.000	1091	1.000	1141	1.000
892	1.000	942	1.000	992	1.000	1042	1.000	1092	1.000	1142	1.000
893	1.000	943	1.000	993	1.000	1043	1.000	1093	1.000	1143	1.000
894	1.000	944	1.000	994	1.000	1044	1.000	1094	1.000	1144	1.000
895	1.000	945	1.000	995	1.000	1045	1.000	1095	1.000	1145	1.000
896	1.000	946	1.000	996	1.000	1046	1.000	1096	1.000	1146	1.000

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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)
1147	1.000	1197	1.000	1247	1.000	1297	1.000	1347	1.000	1397	1.000
1148	1.000	1198	1.000	1248	1.000	1298	1.000	1348	1.000	1398	1.000
1149	1.000	1199	1.000	1249	1.000	1299	1.000	1349	1.000	1399	1.000
1150	1.000	1200	1.000	1250	1.000	1300	1.000	1350	1.000	1400	1.000
1151	1.000	1201	1.000	1251	1.000	1301	1.000	1351	1.000	1401	1.000
1152	1.000	1202	1.000	1252	1.000	1302	1.000	1352	1.000	1402	1.000
1153	1.000	1203	1.000	1253	1.000	1303	1.000	1353	1.000	1403	1.000
1154	1.000	1204	1.000	1254	1.000	1304	1.000	1354	1.000	1404	1.000
1155	1.000	1205	1.000	1255	1.000	1305	1.000	1355	1.000	1405	1.000
1156	1.000	1206	1.000	1256	1.000	1306	1.000	1356	1.000	1406	1.000
1157	1.000	1207	1.000	1257	1.000	1307	1.000	1357	1.000	1407	1.000
1158	1.000	1208	1.000	1258	1.000	1308	1.000	1358	1.000	1408	1.000
1159	1.000	1209	1.000	1259	1.000	1309	1.000	1359	1.000	1409	1.000
1160	1.000	1210	1.000	1260	1.000	1310	1.000	1360	1.000	1410	1.000
1161	1.000	1211	1.000	1261	1.000	1311	1.000	1361	1.000	1411	1.000
1162	1.000	1212	1.000	1262	1.000	1312	1.000	1362	1.000	1412	1.000
1163	1.000	1213	1.000	1263	1.000	1313	1.000	1363	1.000	1413	1.000
1164	1.000	1214	1.000	1264	1.000	1314	1.000	1364	1.000	1414	1.000
1165	1.000	1215	1.000	1265	1.000	1315	1.000	1365	1.000	1415	1.000
1166	1.000	1216	1.000	1266	1.000	1316	1.000	1366	1.000	1416	1.000
1167	1.000	1217	1.000	1267	1.000	1317	1.000	1367	1.000	1417	1.000
1168	1.000	1218	1.000	1268	1.000	1318	1.000	1368	1.000	1418	1.000
1169	1.000	1219	1.000	1269	1.000	1319	1.000	1369	1.000	1419	1.000
1170	1.000	1220	1.000	1270	1.000	1320	1.000	1370	1.000	1420	1.000
1171	1.000	1221	1.000	1271	1.000	1321	1.000	1371	1.000	1421	1.000
1172	1.000	1222	1.000	1272	1.000	1322	1.000	1372	1.000	1422	1.000
1173	1.000	1223	1.000	1273	1.000	1323	1.000	1373	1.000	1423	1.000
1174	1.000	1224	1.000	1274	1.000	1324	1.000	1374	1.000	1424	1.000
1175	1.000	1225	1.000	1275	1.000	1325	1.000	1375	1.000	1425	1.000
1176	1.000	1226	1.000	1276	1.000	1326	1.000	1376	1.000	1426	1.000
1177	1.000	1227	1.000	1277	1.000	1327	1.000	1377	1.000	1427	1.000
1178	1.000	1228	1.000	1278	1.000	1328	1.000	1378	1.000	1428	1.000
1179	1.000	1229	1.000	1279	1.000	1329	1.000	1379	1.000	1429	1.000
1180	1.000	1230	1.000	1280	1.000	1330	1.000	1380	1.000	1430	1.000
1181	1.000	1231	1.000	1281	1.000	1331	1.000	1381	1.000	1431	1.000
1182	1.000	1232	1.000	1282	1.000	1332	1.000	1382	1.000	1432	1.000
1183	1.000	1233	1.000	1283	1.000	1333	1.000	1383	1.000	1433	1.000
1184	1.000	1234	1.000	1284	1.000	1334	1.000	1384	1.000	1434	1.000
1185	1.000	1235	1.000	1285	1.000	1335	1.000	1385	1.000	1435	1.000
1186	1.000	1236	1.000	1286	1.000	1336	1.000	1386	1.000	1436	1.000
1187	1.000	1237	1.000	1287	1.000	1337	1.000	1387	1.000	1437	1.000
1188	1.000	1238	1.000	1288	1.000	1338	1.000	1388	1.000	1438	1.000
1189	1.000	1239	1.000	1289	1.000	1339	1.000	1389	1.000	1439	1.000
1190	1.000	1240	1.000	1290	1.000	1340	1.000	1390	1.000	1440	1.000
1191	1.000	1241	1.000	1291	1.000	1341	1.000	1391	1.000	1441	1.000
1192	1.000	1242	1.000	1292	1.000	1342	1.000	1392	1.000	1442	1.000
1193	1.000	1243	1.000	1293	1.000	1343	1.000	1393	1.000	1443	1.000
1194	1.000	1244	1.000	1294	1.000	1344	1.000	1394	1.000	1444	1.000
1195	1.000	1245	1.000	1295	1.000	1345	1.000	1395	1.000	1445	1.000
1196	1.000	1246	1.000	1296	1.000	1346	1.000	1396	1.000	1446	1.000

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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)
1447	1.000	1497	1.000	1547	1.000	1597	1.000	1647	1.000	1697	1.000
1448	1.000	1498	1.000	1548	1.000	1598	1.000	1648	1.000	1698	1.000
1449	1.000	1499	1.000	1549	1.000	1599	1.000	1649	1.000	1699	1.000
1450	1.000	1500	1.000	1550	1.000	1600	1.000	1650	1.000	1700	1.000
1451	1.000	1501	1.000	1551	1.000	1601	1.000	1651	1.000	1701	1.000
1452	1.000	1502	1.000	1552	1.000	1602	1.000	1652	1.000	1702	1.000
1453	1.000	1503	1.000	1553	1.000	1603	1.000	1653	1.000	1703	1.000
1454	1.000	1504	1.000	1554	1.000	1604	1.000	1654	1.000	1704	1.000
1455	1.000	1505	1.000	1555	1.000	1605	1.000	1655	1.000	1705	1.000
1456	1.000	1506	1.000	1556	1.000	1606	1.000	1656	1.000	1706	1.000
1457	1.000	1507	1.000	1557	1.000	1607	1.000	1657	1.000	1707	1.000
1458	1.000	1508	1.000	1558	1.000	1608	1.000	1658	1.000	1708	1.000
1459	1.000	1509	1.000	1559	1.000	1609	1.000	1659	1.000	1709	1.000
1460	1.000	1510	1.000	1560	1.000	1610	1.000	1660	1.000	1710	1.000
1461	1.000	1511	1.000	1561	1.000	1611	1.000	1661	1.000	1711	1.000
1462	1.000	1512	1.000	1562	1.000	1612	1.000	1662	1.000	1712	1.000
1463	1.000	1513	1.000	1563	1.000	1613	1.000	1663	1.000	1713	1.000
1464	1.000	1514	1.000	1564	1.000	1614	1.000	1664	1.000	1714	1.000
1465	1.000	1515	1.000	1565	1.000	1615	1.000	1665	1.000	1715	1.000
1466	1.000	1516	1.000	1566	1.000	1616	1.000	1666	1.000	1716	1.000
1467	1.000	1517	1.000	1567	1.000	1617	1.000	1667	1.000	1717	1.000
1468	1.000	1518	1.000	1568	1.000	1618	1.000	1668	1.000	1718	1.000
1469	1.000	1519	1.000	1569	1.000	1619	1.000	1669	1.000	1719	1.000
1470	1.000	1520	1.000	1570	1.000	1620	1.000	1670	1.000	1720	1.000
1471	1.000	1521	1.000	1571	1.000	1621	1.000	1671	1.000	1721	1.000
1472	1.000	1522	1.000	1572	1.000	1622	1.000	1672	1.000	1722	1.000
1473	1.000	1523	1.000	1573	1.000	1623	1.000	1673	1.000	1723	1.000
1474	1.000	1524	1.000	1574	1.000	1624	1.000	1674	1.000	1724	1.000
1475	1.000	1525	1.000	1575	1.000	1625	1.000	1675	1.000	1725	1.000
1476	1.000	1526	1.000	1576	1.000	1626	1.000	1676	1.000	1726	1.000
1477	1.000	1527	1.000	1577	1.000	1627	1.000	1677	1.000	1727	1.000
1478	1.000	1528	1.000	1578	1.000	1628	1.000	1678	1.000	1728	1.000
1479	1.000	1529	1.000	1579	1.000	1629	1.000	1679	1.000	1729	1.000
1480	1.000	1530	1.000	1580	1.000	1630	1.000	1680	1.000	1730	1.000
1481	1.000	1531	1.000	1581	1.000	1631	1.000	1681	1.000	1731	1.000
1482	1.000	1532	1.000	1582	1.000	1632	1.000	1682	1.000	1732	1.000
1483	1.000	1533	1.000	1583	1.000	1633	1.000	1683	1.000	1733	1.000
1484	1.000	1534	1.000	1584	1.000	1634	1.000	1684	1.000	1734	1.000
1485	1.000	1535	1.000	1585	1.000	1635	1.000	1685	1.000	1735	1.000
1486	1.000	1536	1.000	1586	1.000	1636	1.000	1686	1.000	1736	1.000
1487	1.000	1537	1.000	1587	1.000	1637	1.000	1687	1.000	1737	1.000
1488	1.000	1538	1.000	1588	1.000	1638	1.000	1688	1.000	1738	1.000
1489	1.000	1539	1.000	1589	1.000	1639	1.000	1689	1.000	1739	1.000
1490	1.000	1540	1.000	1590	1.000	1640	1.000	1690	1.000	1740	1.000
1491	1.000	1541	1.000	1591	1.000	1641	1.000	1691	1.000	1741	1.000
1492	1.000	1542	1.000	1592	1.000	1642	1.000	1692	1.000	1742	1.000
1493	1.000	1543	1.000	1593	1.000	1643	1.000	1693	1.000	1743	1.000
1494	1.000	1544	1.000	1594	1.000	1644	1.000	1694	1.000	1744	1.000
1495	1.000	1545	1.000	1595	1.000	1645	1.000	1695	1.000	1745	1.000
1496	1.000	1546	1.000	1596	1.000	1646	1.000	1696	1.000	1746	1.000

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Surcharged Outfall Details for Storm South

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1747	1.000	1797	1.000	1847	1.000	1897	1.000	1947	1.000	1997	1.000
1748	1.000	1798	1.000	1848	1.000	1898	1.000	1948	1.000	1998	1.000
1749	1.000	1799	1.000	1849	1.000	1899	1.000	1949	1.000	1999	1.000
1750	1.000	1800	1.000	1850	1.000	1900	1.000	1950	1.000	2000	1.000
1751	1.000	1801	1.000	1851	1.000	1901	1.000	1951	1.000	2001	1.000
1752	1.000	1802	1.000	1852	1.000	1902	1.000	1952	1.000	2002	1.000
1753	1.000	1803	1.000	1853	1.000	1903	1.000	1953	1.000	2003	1.000
1754	1.000	1804	1.000	1854	1.000	1904	1.000	1954	1.000	2004	1.000
1755	1.000	1805	1.000	1855	1.000	1905	1.000	1955	1.000	2005	1.000
1756	1.000	1806	1.000	1856	1.000	1906	1.000	1956	1.000	2006	1.000
1757	1.000	1807	1.000	1857	1.000	1907	1.000	1957	1.000	2007	1.000
1758	1.000	1808	1.000	1858	1.000	1908	1.000	1958	1.000	2008	1.000
1759	1.000	1809	1.000	1859	1.000	1909	1.000	1959	1.000	2009	1.000
1760	1.000	1810	1.000	1860	1.000	1910	1.000	1960	1.000	2010	1.000
1761	1.000	1811	1.000	1861	1.000	1911	1.000	1961	1.000	2011	1.000
1762	1.000	1812	1.000	1862	1.000	1912	1.000	1962	1.000	2012	1.000
1763	1.000	1813	1.000	1863	1.000	1913	1.000	1963	1.000	2013	1.000
1764	1.000	1814	1.000	1864	1.000	1914	1.000	1964	1.000	2014	1.000
1765	1.000	1815	1.000	1865	1.000	1915	1.000	1965	1.000	2015	1.000
1766	1.000	1816	1.000	1866	1.000	1916	1.000	1966	1.000	2016	1.000
1767	1.000	1817	1.000	1867	1.000	1917	1.000	1967	1.000	2017	1.000
1768	1.000	1818	1.000	1868	1.000	1918	1.000	1968	1.000	2018	1.000
1769	1.000	1819	1.000	1869	1.000	1919	1.000	1969	1.000	2019	1.000
1770	1.000	1820	1.000	1870	1.000	1920	1.000	1970	1.000	2020	1.000
1771	1.000	1821	1.000	1871	1.000	1921	1.000	1971	1.000	2021	1.000
1772	1.000	1822	1.000	1872	1.000	1922	1.000	1972	1.000	2022	1.000
1773	1.000	1823	1.000	1873	1.000	1923	1.000	1973	1.000	2023	1.000
1774	1.000	1824	1.000	1874	1.000	1924	1.000	1974	1.000	2024	1.000
1775	1.000	1825	1.000	1875	1.000	1925	1.000	1975	1.000	2025	1.000
1776	1.000	1826	1.000	1876	1.000	1926	1.000	1976	1.000	2026	1.000
1777	1.000	1827	1.000	1877	1.000	1927	1.000	1977	1.000	2027	1.000
1778	1.000	1828	1.000	1878	1.000	1928	1.000	1978	1.000	2028	1.000
1779	1.000	1829	1.000	1879	1.000	1929	1.000	1979	1.000	2029	1.000
1780	1.000	1830	1.000	1880	1.000	1930	1.000	1980	1.000	2030	1.000
1781	1.000	1831	1.000	1881	1.000	1931	1.000	1981	1.000	2031	1.000
1782	1.000	1832	1.000	1882	1.000	1932	1.000	1982	1.000	2032	1.000
1783	1.000	1833	1.000	1883	1.000	1933	1.000	1983	1.000	2033	1.000
1784	1.000	1834	1.000	1884	1.000	1934	1.000	1984	1.000	2034	1.000
1785	1.000	1835	1.000	1885	1.000	1935	1.000	1985	1.000	2035	1.000
1786	1.000	1836	1.000	1886	1.000	1936	1.000	1986	1.000	2036	1.000
1787	1.000	1837	1.000	1887	1.000	1937	1.000	1987	1.000	2037	1.000
1788	1.000	1838	1.000	1888	1.000	1938	1.000	1988	1.000	2038	1.000
1789	1.000	1839	1.000	1889	1.000	1939	1.000	1989	1.000	2039	1.000
1790	1.000	1840	1.000	1890	1.000	1940	1.000	1990	1.000	2040	1.000
1791	1.000	1841	1.000	1891	1.000	1941	1.000	1991	1.000	2041	1.000
1792	1.000	1842	1.000	1892	1.000	1942	1.000	1992	1.000	2042	1.000
1793	1.000	1843	1.000	1893	1.000	1943	1.000	1993	1.000	2043	1.000
1794	1.000	1844	1.000	1894	1.000	1944	1.000	1994	1.000	2044	1.000
1795	1.000	1845	1.000	1895	1.000	1945	1.000	1995	1.000	2045	1.000
1796	1.000	1846	1.000	1896	1.000	1946	1.000	1996	1.000	2046	1.000

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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)
2047	1.000	2097	1.000	2147	1.000	2197	1.000	2247	1.000	2297	1.000
2048	1.000	2098	1.000	2148	1.000	2198	1.000	2248	1.000	2298	1.000
2049	1.000	2099	1.000	2149	1.000	2199	1.000	2249	1.000	2299	1.000
2050	1.000	2100	1.000	2150	1.000	2200	1.000	2250	1.000	2300	1.000
2051	1.000	2101	1.000	2151	1.000	2201	1.000	2251	1.000	2301	1.000
2052	1.000	2102	1.000	2152	1.000	2202	1.000	2252	1.000	2302	1.000
2053	1.000	2103	1.000	2153	1.000	2203	1.000	2253	1.000	2303	1.000
2054	1.000	2104	1.000	2154	1.000	2204	1.000	2254	1.000	2304	1.000
2055	1.000	2105	1.000	2155	1.000	2205	1.000	2255	1.000	2305	1.000
2056	1.000	2106	1.000	2156	1.000	2206	1.000	2256	1.000	2306	1.000
2057	1.000	2107	1.000	2157	1.000	2207	1.000	2257	1.000	2307	1.000
2058	1.000	2108	1.000	2158	1.000	2208	1.000	2258	1.000	2308	1.000
2059	1.000	2109	1.000	2159	1.000	2209	1.000	2259	1.000	2309	1.000
2060	1.000	2110	1.000	2160	1.000	2210	1.000	2260	1.000	2310	1.000
2061	1.000	2111	1.000	2161	1.000	2211	1.000	2261	1.000	2311	1.000
2062	1.000	2112	1.000	2162	1.000	2212	1.000	2262	1.000	2312	1.000
2063	1.000	2113	1.000	2163	1.000	2213	1.000	2263	1.000	2313	1.000
2064	1.000	2114	1.000	2164	1.000	2214	1.000	2264	1.000	2314	1.000
2065	1.000	2115	1.000	2165	1.000	2215	1.000	2265	1.000	2315	1.000
2066	1.000	2116	1.000	2166	1.000	2216	1.000	2266	1.000	2316	1.000
2067	1.000	2117	1.000	2167	1.000	2217	1.000	2267	1.000	2317	1.000
2068	1.000	2118	1.000	2168	1.000	2218	1.000	2268	1.000	2318	1.000
2069	1.000	2119	1.000	2169	1.000	2219	1.000	2269	1.000	2319	1.000
2070	1.000	2120	1.000	2170	1.000	2220	1.000	2270	1.000	2320	1.000
2071	1.000	2121	1.000	2171	1.000	2221	1.000	2271	1.000	2321	1.000
2072	1.000	2122	1.000	2172	1.000	2222	1.000	2272	1.000	2322	1.000
2073	1.000	2123	1.000	2173	1.000	2223	1.000	2273	1.000	2323	1.000
2074	1.000	2124	1.000	2174	1.000	2224	1.000	2274	1.000	2324	1.000
2075	1.000	2125	1.000	2175	1.000	2225	1.000	2275	1.000	2325	1.000
2076	1.000	2126	1.000	2176	1.000	2226	1.000	2276	1.000	2326	1.000
2077	1.000	2127	1.000	2177	1.000	2227	1.000	2277	1.000	2327	1.000
2078	1.000	2128	1.000	2178	1.000	2228	1.000	2278	1.000	2328	1.000
2079	1.000	2129	1.000	2179	1.000	2229	1.000	2279	1.000	2329	1.000
2080	1.000	2130	1.000	2180	1.000	2230	1.000	2280	1.000	2330	1.000
2081	1.000	2131	1.000	2181	1.000	2231	1.000	2281	1.000	2331	1.000
2082	1.000	2132	1.000	2182	1.000	2232	1.000	2282	1.000	2332	1.000
2083	1.000	2133	1.000	2183	1.000	2233	1.000	2283	1.000	2333	1.000
2084	1.000	2134	1.000	2184	1.000	2234	1.000	2284	1.000	2334	1.000
2085	1.000	2135	1.000	2185	1.000	2235	1.000	2285	1.000	2335	1.000
2086	1.000	2136	1.000	2186	1.000	2236	1.000	2286	1.000	2336	1.000
2087	1.000	2137	1.000	2187	1.000	2237	1.000	2287	1.000	2337	1.000
2088	1.000	2138	1.000	2188	1.000	2238	1.000	2288	1.000	2338	1.000
2089	1.000	2139	1.000	2189	1.000	2239	1.000	2289	1.000	2339	1.000
2090	1.000	2140	1.000	2190	1.000	2240	1.000	2290	1.000	2340	1.000
2091	1.000	2141	1.000	2191	1.000	2241	1.000	2291	1.000	2341	1.000
2092	1.000	2142	1.000	2192	1.000	2242	1.000	2292	1.000	2342	1.000
2093	1.000	2143	1.000	2193	1.000	2243	1.000	2293	1.000	2343	1.000
2094	1.000	2144	1.000	2194	1.000	2244	1.000	2294	1.000	2344	1.000
2095	1.000	2145	1.000	2195	1.000	2245	1.000	2295	1.000	2345	1.000
2096	1.000	2146	1.000	2196	1.000	2246	1.000	2296	1.000	2346	1.000

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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)
2347	1.000	2397	1.000	2447	1.000	2497	1.000	2547	1.000	2597	1.000
2348	1.000	2398	1.000	2448	1.000	2498	1.000	2548	1.000	2598	1.000
2349	1.000	2399	1.000	2449	1.000	2499	1.000	2549	1.000	2599	1.000
2350	1.000	2400	1.000	2450	1.000	2500	1.000	2550	1.000	2600	1.000
2351	1.000	2401	1.000	2451	1.000	2501	1.000	2551	1.000	2601	1.000
2352	1.000	2402	1.000	2452	1.000	2502	1.000	2552	1.000	2602	1.000
2353	1.000	2403	1.000	2453	1.000	2503	1.000	2553	1.000	2603	1.000
2354	1.000	2404	1.000	2454	1.000	2504	1.000	2554	1.000	2604	1.000
2355	1.000	2405	1.000	2455	1.000	2505	1.000	2555	1.000	2605	1.000
2356	1.000	2406	1.000	2456	1.000	2506	1.000	2556	1.000	2606	1.000
2357	1.000	2407	1.000	2457	1.000	2507	1.000	2557	1.000	2607	1.000
2358	1.000	2408	1.000	2458	1.000	2508	1.000	2558	1.000	2608	1.000
2359	1.000	2409	1.000	2459	1.000	2509	1.000	2559	1.000	2609	1.000
2360	1.000	2410	1.000	2460	1.000	2510	1.000	2560	1.000	2610	1.000
2361	1.000	2411	1.000	2461	1.000	2511	1.000	2561	1.000	2611	1.000
2362	1.000	2412	1.000	2462	1.000	2512	1.000	2562	1.000	2612	1.000
2363	1.000	2413	1.000	2463	1.000	2513	1.000	2563	1.000	2613	1.000
2364	1.000	2414	1.000	2464	1.000	2514	1.000	2564	1.000	2614	1.000
2365	1.000	2415	1.000	2465	1.000	2515	1.000	2565	1.000	2615	1.000
2366	1.000	2416	1.000	2466	1.000	2516	1.000	2566	1.000	2616	1.000
2367	1.000	2417	1.000	2467	1.000	2517	1.000	2567	1.000	2617	1.000
2368	1.000	2418	1.000	2468	1.000	2518	1.000	2568	1.000	2618	1.000
2369	1.000	2419	1.000	2469	1.000	2519	1.000	2569	1.000	2619	1.000
2370	1.000	2420	1.000	2470	1.000	2520	1.000	2570	1.000	2620	1.000
2371	1.000	2421	1.000	2471	1.000	2521	1.000	2571	1.000	2621	1.000
2372	1.000	2422	1.000	2472	1.000	2522	1.000	2572	1.000	2622	1.000
2373	1.000	2423	1.000	2473	1.000	2523	1.000	2573	1.000	2623	1.000
2374	1.000	2424	1.000	2474	1.000	2524	1.000	2574	1.000	2624	1.000
2375	1.000	2425	1.000	2475	1.000	2525	1.000	2575	1.000	2625	1.000
2376	1.000	2426	1.000	2476	1.000	2526	1.000	2576	1.000	2626	1.000
2377	1.000	2427	1.000	2477	1.000	2527	1.000	2577	1.000	2627	1.000
2378	1.000	2428	1.000	2478	1.000	2528	1.000	2578	1.000	2628	1.000
2379	1.000	2429	1.000	2479	1.000	2529	1.000	2579	1.000	2629	1.000
2380	1.000	2430	1.000	2480	1.000	2530	1.000	2580	1.000	2630	1.000
2381	1.000	2431	1.000	2481	1.000	2531	1.000	2581	1.000	2631	1.000
2382	1.000	2432	1.000	2482	1.000	2532	1.000	2582	1.000	2632	1.000
2383	1.000	2433	1.000	2483	1.000	2533	1.000	2583	1.000	2633	1.000
2384	1.000	2434	1.000	2484	1.000	2534	1.000	2584	1.000	2634	1.000
2385	1.000	2435	1.000	2485	1.000	2535	1.000	2585	1.000	2635	1.000
2386	1.000	2436	1.000	2486	1.000	2536	1.000	2586	1.000	2636	1.000
2387	1.000	2437	1.000	2487	1.000	2537	1.000	2587	1.000	2637	1.000
2388	1.000	2438	1.000	2488	1.000	2538	1.000	2588	1.000	2638	1.000
2389	1.000	2439	1.000	2489	1.000	2539	1.000	2589	1.000	2639	1.000
2390	1.000	2440	1.000	2490	1.000	2540	1.000	2590	1.000	2640	1.000
2391	1.000	2441	1.000	2491	1.000	2541	1.000	2591	1.000	2641	1.000
2392	1.000	2442	1.000	2492	1.000	2542	1.000	2592	1.000	2642	1.000
2393	1.000	2443	1.000	2493	1.000	2543	1.000	2593	1.000	2643	1.000
2394	1.000	2444	1.000	2494	1.000	2544	1.000	2594	1.000	2644	1.000
2395	1.000	2445	1.000	2495	1.000	2545	1.000	2595	1.000	2645	1.000
2396	1.000	2446	1.000	2496	1.000	2546	1.000	2596	1.000	2646	1.000

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Surcharged Outfall Details for Storm South

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
2647	1.000	2686	1.000	2725	1.000	2764	1.000	2803	1.000	2842	1.000
2648	1.000	2687	1.000	2726	1.000	2765	1.000	2804	1.000	2843	1.000
2649	1.000	2688	1.000	2727	1.000	2766	1.000	2805	1.000	2844	1.000
2650	1.000	2689	1.000	2728	1.000	2767	1.000	2806	1.000	2845	1.000
2651	1.000	2690	1.000	2729	1.000	2768	1.000	2807	1.000	2846	1.000
2652	1.000	2691	1.000	2730	1.000	2769	1.000	2808	1.000	2847	1.000
2653	1.000	2692	1.000	2731	1.000	2770	1.000	2809	1.000	2848	1.000
2654	1.000	2693	1.000	2732	1.000	2771	1.000	2810	1.000	2849	1.000
2655	1.000	2694	1.000	2733	1.000	2772	1.000	2811	1.000	2850	1.000
2656	1.000	2695	1.000	2734	1.000	2773	1.000	2812	1.000	2851	1.000
2657	1.000	2696	1.000	2735	1.000	2774	1.000	2813	1.000	2852	1.000
2658	1.000	2697	1.000	2736	1.000	2775	1.000	2814	1.000	2853	1.000
2659	1.000	2698	1.000	2737	1.000	2776	1.000	2815	1.000	2854	1.000
2660	1.000	2699	1.000	2738	1.000	2777	1.000	2816	1.000	2855	1.000
2661	1.000	2700	1.000	2739	1.000	2778	1.000	2817	1.000	2856	1.000
2662	1.000	2701	1.000	2740	1.000	2779	1.000	2818	1.000	2857	1.000
2663	1.000	2702	1.000	2741	1.000	2780	1.000	2819	1.000	2858	1.000
2664	1.000	2703	1.000	2742	1.000	2781	1.000	2820	1.000	2859	1.000
2665	1.000	2704	1.000	2743	1.000	2782	1.000	2821	1.000	2860	1.000
2666	1.000	2705	1.000	2744	1.000	2783	1.000	2822	1.000	2861	1.000
2667	1.000	2706	1.000	2745	1.000	2784	1.000	2823	1.000	2862	1.000
2668	1.000	2707	1.000	2746	1.000	2785	1.000	2824	1.000	2863	1.000
2669	1.000	2708	1.000	2747	1.000	2786	1.000	2825	1.000	2864	1.000
2670	1.000	2709	1.000	2748	1.000	2787	1.000	2826	1.000	2865	1.000
2671	1.000	2710	1.000	2749	1.000	2788	1.000	2827	1.000	2866	1.000
2672	1.000	2711	1.000	2750	1.000	2789	1.000	2828	1.000	2867	1.000
2673	1.000	2712	1.000	2751	1.000	2790	1.000	2829	1.000	2868	1.000
2674	1.000	2713	1.000	2752	1.000	2791	1.000	2830	1.000	2869	1.000
2675	1.000	2714	1.000	2753	1.000	2792	1.000	2831	1.000	2870	1.000
2676	1.000	2715	1.000	2754	1.000	2793	1.000	2832	1.000	2871	1.000
2677	1.000	2716	1.000	2755	1.000	2794	1.000	2833	1.000	2872	1.000
2678	1.000	2717	1.000	2756	1.000	2795	1.000	2834	1.000	2873	1.000
2679	1.000	2718	1.000	2757	1.000	2796	1.000	2835	1.000	2874	1.000
2680	1.000	2719	1.000	2758	1.000	2797	1.000	2836	1.000	2875	1.000
2681	1.000	2720	1.000	2759	1.000	2798	1.000	2837	1.000	2876	1.000
2682	1.000	2721	1.000	2760	1.000	2799	1.000	2838	1.000	2877	1.000
2683	1.000	2722	1.000	2761	1.000	2800	1.000	2839	1.000	2878	1.000
2684	1.000	2723	1.000	2762	1.000	2801	1.000	2840	1.000	2879	1.000
2685	1.000	2724	1.000	2763	1.000	2802	1.000	2841	1.000	2880	1.000

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S31	15 Winter	1	+0%	100/15 Summer			
S1.001	S32	15 Winter	1	+0%	30/15 Summer			
S2.000	STANK	120 Winter	1	+0%	100/15 Summer			
S1.002	S33	120 Winter	1	+0%	30/15 Summer			
S3.000	S34	15 Winter	1	+0%	30/15 Summer			
S3.001	S35	15 Winter	1	+0%	30/15 Summer			
S4.000	S36	15 Winter	1	+0%	100/15 Summer			
S4.001	S37	15 Winter	1	+0%	30/15 Summer			
S3.002	S38	15 Winter	1	+0%	30/15 Summer			
S1.003	S39	15 Winter	1	+0%	30/15 Summer			
S1.004	S40	15 Winter	1	+0%	1/15 Summer			
S1.005	SSeparator	15 Winter	1	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	37.618	-0.107	0.000	0.18		3.0	OK	
S1.001	S32	37.478	-0.077	0.000	0.47		7.4	OK	
S2.000	STANK	37.330	-0.120	0.000	0.03		1.5	OK	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.331	-0.119	0.000	0.05		3.0	OK	
S3.000	S34	37.395	-0.175	0.000	0.10		3.5	OK	
S3.001	S35	37.365	-0.110	0.000	0.17		5.9	OK	
S4.000	S36	37.511	-0.169	0.000	0.14		5.1	OK	
S4.001	S37	37.378	-0.137	0.000	0.23		8.6	OK	
S3.002	S38	37.355	-0.035	0.000	0.25		15.2	OK	
S1.003	S39	37.349	-0.006	0.000	0.17		10.6	OK	
S1.004	S40	37.338	0.053	0.000	0.29		15.6	SURCHARGED	
S1.005	SSeparator	37.305	0.080	0.000	0.32		15.7	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S31	15 Winter	30	+0%	100/15 Summer			
S1.001	S32	15 Winter	30	+0%	30/15 Summer			
S2.000	STANK	120 Summer	30	+0%	100/15 Summer			
S1.002	S33	15 Winter	30	+0%	30/15 Summer			
S3.000	S34	15 Winter	30	+0%	30/15 Summer			
S3.001	S35	15 Winter	30	+0%	30/15 Summer			
S4.000	S36	15 Winter	30	+0%	100/15 Summer			
S4.001	S37	15 Winter	30	+0%	30/15 Summer			
S3.002	S38	15 Winter	30	+0%	30/15 Summer			
S1.003	S39	15 Winter	30	+0%	30/15 Summer			
S1.004	S40	15 Winter	30	+0%	1/15 Summer			
S1.005	SSeparator	15 Winter	30	+0%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	37.690	-0.035	0.000	0.44		7.3	OK	
S1.001	S32	37.659	0.104	0.000	1.26		20.1	SURCHARGED	
S2.000	STANK	37.404	-0.046	0.000	0.11		5.4	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.484	0.034	0.000	0.10		6.5	SURCHARGED	
S3.000	S34	37.578	0.008	0.000	0.24		8.4	SURCHARGED	
S3.001	S35	37.562	0.087	0.000	0.50		17.6	SURCHARGED	
S4.000	S36	37.607	-0.073	0.000	0.33		12.2	OK	
S4.001	S37	37.576	0.061	0.000	0.61		22.4	SURCHARGED	
S3.002	S38	37.529	0.139	0.000	0.73		43.7	SURCHARGED	
S1.003	S39	37.511	0.156	0.000	0.65		39.9	SURCHARGED	
S1.004	S40	37.473	0.188	0.000	1.05		56.0	SURCHARGED	
S1.005	SSeparator	37.326	0.101	0.000	1.14		56.1	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
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.
S1.000	S31	15 Winter	100	+0%	100/15 Summer			
S1.001	S32	15 Winter	100	+0%	100/15 Summer			
S2.000	STANK	30 Winter	100	+0%	100/30 Winter			
S1.002	S33	15 Winter	100	+0%	100/15 Summer			
S3.000	S34	15 Winter	100	+0%	100/15 Summer			
S3.001	S35	15 Winter	100	+0%	100/15 Summer			
S4.000	S36	15 Winter	100	+0%	100/15 Summer			
S4.001	S37	15 Winter	100	+0%	100/15 Summer			
S3.002	S38	15 Winter	100	+0%	100/15 Summer			
S1.003	S39	15 Winter	100	+0%	100/15 Summer			
S1.004	S40	15 Winter	100	+0%	100/15 Summer			
S1.005	SSeparator	15 Winter	100	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	37.863	0.138	0.000	0.57		9.5	SURCHARGED	
S1.001	S32	37.812	0.257	0.000	1.62		25.9	SURCHARGED	
S2.000	STANK	37.456	0.006	0.000	0.26		13.4	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.523	0.073	0.000	0.25		16.1	SURCHARGED	
S3.000	S34	37.680	0.110	0.000	0.31		11.0	SURCHARGED	
S3.001	S35	37.660	0.185	0.000	0.65		22.9	SURCHARGED	
S4.000	S36	37.738	0.058	0.000	0.43		15.9	SURCHARGED	
S4.001	S37	37.700	0.185	0.000	0.80		29.1	SURCHARGED	
S3.002	S38	37.618	0.228	0.000	0.96		57.6	SURCHARGED	
S1.003	S39	37.586	0.231	0.000	0.68		41.3	SURCHARGED	
S1.004	S40	37.547	0.262	0.000	1.17		62.2	SURCHARGED	
S1.005	SSeparator	37.364	0.139	0.000	1.27		62.6	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
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 0.400
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.700 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 400.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S31	15 Winter	100	+40%	100/15 Summer			
S1.001	S32	15 Winter	100	+40%	30/15 Summer			
S2.000	STANK	30 Winter	100	+40%	100/15 Summer			
S1.002	S33	30 Winter	100	+40%	30/15 Summer			
S3.000	S34	15 Winter	100	+40%	30/15 Summer			
S3.001	S35	15 Winter	100	+40%	30/15 Summer			
S4.000	S36	15 Winter	100	+40%	100/15 Summer			
S4.001	S37	15 Winter	100	+40%	30/15 Summer			
S3.002	S38	15 Winter	100	+40%	30/15 Summer			
S1.003	S39	30 Winter	100	+40%	30/15 Summer			
S1.004	S40	30 Winter	100	+40%	1/15 Summer			
S1.005	SSeparator	30 Winter	100	+40%	1/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S31	38.260	0.535	0.000	0.80		13.2	FLOOD RISK	
S1.001	S32	38.167	0.612	0.000	2.24		35.7	FLOOD RISK	
S2.000	STANK	37.807	0.357	0.000	0.46		23.3	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm South

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	S33	37.807	0.357	0.000	0.44		28.2	SURCHARGED	
S3.000	S34	37.934	0.364	0.000	0.43		15.3	SURCHARGED	
S3.001	S35	37.905	0.430	0.000	0.91		31.9	SURCHARGED	
S4.000	S36	38.049	0.369	0.000	0.59		22.1	SURCHARGED	
S4.001	S37	37.991	0.476	0.000	1.11		40.4	SURCHARGED	
S3.002	S38	37.832	0.442	0.000	1.33		80.2	SURCHARGED	
S1.003	S39	37.780	0.425	0.000	1.10		67.3	SURCHARGED	
S1.004	S40	37.694	0.409	0.000	1.49		79.7	SURCHARGED	
S1.005	SSeparator	37.404	0.179	0.000	1.62		79.8	SURCHARGED	

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Appendix H Exceedance Flooding Drawing and Calculations

- PBA Drawing 47500-2001-SK001 Proposed Drainage Layout
- MicroDrainage Calculations – Exceedance Event