Cala Homes (South Home Counties)

West Hoathly Brickworks, Sharpthorne

Surface Water Drainage (Condition 7)

890844-R2(1)
August 2025

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RSK GENERAL NOTES

Project No.: 890844-R2(1)

Site: West Hoathly Brickworks, Sharpthorne.

Title: Surface Water Drainage (Condition 8)

Client: Cala Homes SHC

Date: October 2025

Office: Hemel Hempstead

Status: Final

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Date:	27.08.25	Date:	30.10.25
Project manager	Andrew Muthusami		
Date:	31.10.25		

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK LDE Ltd.

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1 INTRODUCTION

RSK have been appointed by Cala Homes SHC in March 2025 to provide civil engineering detailed design services with regards to their development at West Hoathly Brickworks, Sharpthorne. The scheme was granted full planning approval under DM/23/0827 on 18th October 2024.

This technical note has been produced to support the discharge of Planning Condition 7 (Drainage) of the planning approval. The report will provide responses to the LLFA correspondence with regards to their rejection of discharging the planning condition under letter DM/25/1853 (dated 07/08/2025).

Planning condition 7 (Drainage) wording of the planning decision notice is shown in italics below:

"The development hereby permitted shall not commence, other than demolition works, unless and until details of the proposed foul and surface water drainage and means of disposal have been submitted to and approved in writing by the Local Planning Authority. No residential unit shall be occupied until all the approved drainage works have been carried out in accordance with the approved details. The details shall include a timetable for its implementation and a management and maintenance plan for the lifetime of the development which shall include arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime. Maintenance and management during the lifetime of the development should be in accordance with the approved details. No drainage systems infiltration of surface water drainage into the ground is permitted other than with the written consent of the Local Planning Authority.

Reason: To ensure that the proposal is satisfactorily drained and to accord with the NPPF requirements and Policy DP41 of the Mid Sussex District Plan."

2 SITE LOCATION AND PROPOSALS

The site is located off Hamsey Road, Sharpthorne on the former site of Ibstock Brickworks. Nearest Post code RH19 4PG, grid reference 537233, 132987.

The application site boundary measures 16.35 Hectares with the developable area consisting of 4.61 ha.

The site drainage proposals have been developed in accordance with the planning approved drainage strategy for the scheme (RSK Drawing 134285-RSK-ZZ-ZZ-DR-C-3001 Rev P03 dated 04.09.2023 - **Appendix B**).

The detailed design proposals are contained within **Appendix C** of this report.

3 DETAILED DESIGN DRAINAGE PROPOSALS

3.1 Foul Water Drainage Proposals

There is an existing Southern Water sewer that crosses the site along the western boundary that flows to the north. At the junction for Hamsey Road it is approximately 1.3m deep however as it crosses the site it is approximately 7.5m deep at the existing manhole located on site.

Due to the topography and open space margin within the centre of the site it is proposed to discharge foul water arising from the development into this existing sewer by 2no connections. The northern outfall will be to the existing manhole 1103. For the southern outfall it is proposed that a new connection point will be created via a new manhole on the existing sewer. Both sewer connections are subject to Southern Water approval under a S106 Agreement.

All adoptable foul drainage for the scheme will be subject to a S104 Agreement by the appointed NAV which for this development is IWNL (Independent Water Networks).

3.2 Surface Water Drainage Proposals

There is an existing watercourse bounding the northern boundary for the site as well as an existing sewer and above ground drainage features crossing the site centrally which connects into the “Bluebell Railway” drainage to the west which then discharges into the existing watercourse further west of the Bluebell Railway. These will require Ordinary Watercourse Consents (OWC’s) for the connection and discharge of the surface water runoff.

As per the approved planning proposals, the surface water drainage will be split into 2 catchments draining to the existing drainage to the west and into the watercourse to the north. These will discharge at the approved QBar greenfield runoff rate for the proposed impermeable area of the site 12.39 l/s. This is split up as per the proposed drainage layout and design calculations (**Appendix C & D**).

The calculations have been undertaken with the same parameters used within the approved planning strategy which include FSR rainfall data, runoff coefficient (Cv) of 1 and a MADD factor of 0 (planning approved calculations stated MADD factor of 2).

All adoptable surface water drainage for the scheme will be subject to a S104 Agreement by the appointed NAV for the scheme IWNL.

4 LLFA CORRESPONDENCE

4.1 LLFA Letter DM/25/1853 – Dated 07/08/2025 – Appendix E

The comments received within the letter are replicated below along with RSK's responses.

4.1.1 Drainage Modelling

We have concerns that there have been alterations to the drainage strategy approved at full planning stage, but these changes have not been backed up by relevant calculations and supporting documents. The calculations must follow up to date parameters (FEH2022, Cv value 1, MADD factor/additional storage 0).

RSK Response

The drainage detailed design has been developed in accordance with the full planning approved drainage strategy contained within the approved RSK FRA 680646-R1(02)-FRA. The approved calculations located within Appendix G of the FRA have the following parameters and are included within **Appendix B** of this document:

- Rainfall Model – FSR
- CV Value – 1
- MADD Factor – 2

The detailed design as per the above simulation parameters approved through planning with the exception of the removal of the MADD Factor value which has been set to 0 (refer calculations in **Appendix D**).

It is noted in the LLFA comment above that FEH2022 rainfall data should be used, however as detailed above the proposed detailed design calculations are in accordance with the parameters set out in the approved planning strategy which includes FSR data.

Reference has been made to the MSDC drainage guidance document referenced within the LLFA response. Following a review of the document it does not appear to detail that FEH data should be used for the detailed drainage calculations. It only mentions FEH or a similar approved method for the calculation of greenfield runoff rates.

With reference to the detailed design proposals presented within **Appendix C & D**, this demonstrates that the proposed drainage design is in accordance with the drainage strategy approved through planning which sets out FSR as the rainfall model that was used for the approval.

4.1.2 Rain Gardens

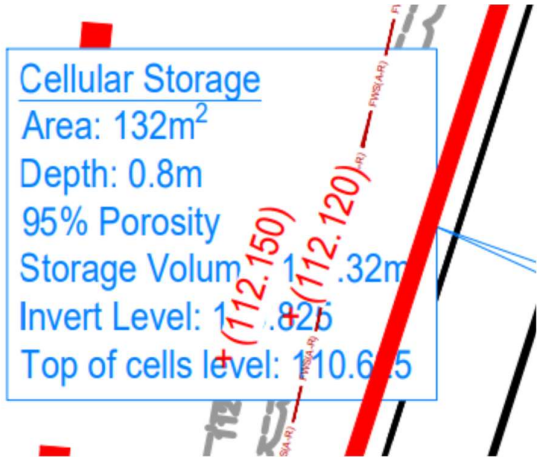
Previously there were rain gardens proposed, however these have been removed from the drainage layout in the DoC.

RSK Response

Rain gardens are still proposed however they were not detailed within the drainage drawings previously submitted for discharge of condition and were detailed in the external works layouts. These have now been incorporated within the updated drainage layouts (**Appendix C**).

4.1.3 Drainage Layout

Some of the labels are covered, therefore cannot be read:



RSK Response

Please refer to the latest site drainage layout included in this document (**Appendix C**).

4.1.4 Watercourses

The watercourses are not on the drawings.

RSK Response

Watercourses have been detailed on the latest drainage layout. Please refer to **Appendix C**.

4.1.5 Planning FRA

In the FRA approved at full planning, we believe it says that additional survey work was needed in for the access road in the south of the site. In the DoC drawing, it still says additional survey work is needed. For a DoC application, the survey work should have been completed by now to inform the detailed drainage design work. Without knowing the invert levels for the outfall we are unable to check flood risk will not increase elsewhere.

RSK Response

Please see latest site drainage layout in this document which includes the outfall to the existing watercourse along with invert levels.

4.1.6 Catchment Plan

A catchment plan drawing is required to support the calculations to be submitted.

RSK Response

Please refer to **Appendix E** for proposed catchment areas plan.

4.1.7 Drainage Construction Details

We request the Drainage Construction Details 4004-4007.

RSK Response

Please refer to **Appendix F** for the proposed drainage construction details.

5 CONCLUSION

All the points in condition 7 (drainage) and comments made by the LLFA have been addressed within this technical note.

As noted within this document. the drainage strategy has been designed in accordance with the FRA approved at full planning stage which sets out the parameters for drainage modelling and storage proposals. These have since been updated to reflect the design development of the detailed design stage and are presented within **Appendices C to F**.

The surface water drainage strategy demonstrates that there will be no flooding for all storm events up to and including 1 in 100yr + 45% climate change storm event within the central drainage network. For the northern drainage network there will be flooding for the 1 in 100yr + 45% climate change storm event totalling 5.512m^3 which will be contained within the road kerbs before being discharged into the nearest road gullies once the water level has reduced within the network.

On the basis of the information detailed within this technical note and supporting information within the appendices, discharge of condition 7 should be considered by the LLFA as it has been demonstrated that the proposed detailed design drainage is in accordance with the approved planning strategy.

APPENDIX A – RSK GROUP SERVICE CONSTRAINTS

1. This report and the Drainage design carried out in connection with the report (together the "Services") were compiled and carried out by RSK LDE Ltd (RSK) for Cala Homes (the "client") in accordance with the terms of a contract between RSK and the "client". The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable Civil Engineer at the time the Services were performed. Further, and in particular, the Services were performed by RSK considering the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.

2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.

4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date hereof, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate, or such other terms as may be agreed between RSK and the client.

6. The observations and conclusions described in this report are based solely upon the Services, which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between


the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon RSK's observations of existing physical conditions at the site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The phase II or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.

APPENDIX B – PLANNING DRAINAGE STRATEGY & CALCULATIONS



Drainage Key

Symbol	Description
150Ø 1:100 1.001	Proposed Adoptable Surface Water Sewer
	Adoptable Surface Water Manhole
	Proposed Headwall
	Proposed Highway Drain
	Proposed Perforated Pipe
	SANG Network Pipe
	Modelling Pipe
	Indicative Layout of Existing Drainage
	Proposed Below Ground Storage Tank
	Proposed Rain Garden
	Northern Ditch
	Pond Wet Area
	3.5m Watercourse Buffer Zone
	5.0m Watercourse Buffer Zone
	Overland Flow Routes
	Proposed Detention Basin
	Proposed Strategic Swale
	Indicative Location of Existing Watercourse
	Site Boundary

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:–

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. This drawing presents the site drainage layout for the proposed development at West Hoathly Brickworks Sharpthorne.
2. This drawing is to be read in conjunction with all relevant Engineer's and Architect's drawings and specifications.
3. This drawing is to be printed in COLOUR.
4. Figures quoted next to manholes / rodding eyes are cover & invert level, in Meters AOD.
5. This preliminary design is for planning purposes. It excludes details of the plot drainage road and parking drainage connections.
6. All drainage design is subject to technical approval, no connections shall be made to any public sewers without written consent from the drainage authority. All adoptable drainage to be constructed in conjunction with Design and Construction Guidance (Water UK)
7. All branch drains, or connections, are to discharge to the collectors obliquely, and in the direction of the main flow.
8. All high void ratio attenuation units to be installed strictly in accordance with manufacturer's requirements.
9. For guidance on types and distances of proposed trees away from adoptable sewers refer to Design and Construction Guidance Section B5.1.10 & 11 and B7.6.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
P03	17.08.2023	Updated to latest site layout and LLFA comments.	AM	AM	CM
P02	21.07.2023	Updated to latest site layout and LLFA comments.	AH	AM	CM
P01	23.03.2023	FIRST ISSUE	JC	AM	CM

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Client
ASHILL REGEN

Project Title
WEST HOATHLY BRICKWORKS SHARPTHORNE

Status
PRELIMINARY

Drawing Title
PROPOSED DRAINAGE STRATEGY

Drawn	Date	Checked	Date	Approved	Date
EE	21.12.22	CM	21.12.22	AM	21.12.22

Scale	Orig Size	Dimensions
1:500	A1	M

Project No. 134285
Drawing File 134285 RSK-ZZ-XX-DR-C-3001 Site Drainage.dwg

Drawing No.

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	Rev.
134285	RSK	ZZ	ZZ	DR	C	3001	P03

Scale 1:500
0 5 10 15 20 25m

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 3

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	45
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

Time Area Diagram for Surface Network 3

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.588	4-8	2.093

Total Area Contributing (ha) = 2.681

Total Pipe Volume (m³) = 18.859

Network Design Table for Surface Network 3

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	21.976	0.120	183.1	2.609	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	15.806	0.450	35.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	31.958	0.730	43.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	33.324	0.470	70.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	14.198	0.120	118.3	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)
1.000	50.00	5.50	117.120	2.609	0.0	0.0	159.0	0.74	13.1«	512.3
1.001	50.00	5.59	117.000	2.609	0.0	0.0	159.0	2.66	188.1«	512.3
1.002	50.00	5.82	116.550	2.609	0.0	0.0	159.0	2.38	168.4«	512.3
1.003	50.00	6.11	115.820	2.609	0.0	0.0	159.0	1.87	132.2«	512.3
1.004	50.00	6.28	115.350	2.609	0.0	0.0	159.0	1.44	102.1«	512.3

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18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9RT	West Hoathly Brickworks Sharpthorne Network 1 SW Calculation
Date 20/07/2023 16:56 File 134285_ SW NETWORK 1_RE...	Designed by AMuthusami Checked by
XP Solutions	Network 2020.1.3

Network Design Table for Surface Network 3

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	23.948	0.095	252.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	28.701	0.115	249.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	11.270	0.190	59.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	14.698	0.120	122.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.009	19.010	0.140	135.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	10.363	0.118	87.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	15.904	0.050	318.1	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	18.304	0.050	366.1	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.002	14.927	0.050	298.5	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.003	15.346	0.050	306.9	0.018	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.004	11.279	0.150	75.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.005	64.811	4.123	15.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.011	22.892	0.452	50.6	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)
1.005	50.00	6.68	115.230	2.609	0.0	0.0	159.0	0.99	69.7«	512.3
1.006	50.00	7.17	115.135	2.609	0.0	0.0	159.0	0.99	70.0«	512.3
1.007	50.00	7.26	115.020	2.609	0.0	0.0	159.0	2.05	144.6«	512.3
1.008	50.00	7.43	114.830	2.609	0.0	0.0	159.0	1.42	100.3«	512.3
1.009	50.00	7.67	114.710	2.609	0.0	0.0	159.0	1.35	95.2«	512.3
1.010	50.00	7.77	114.570	2.609	0.0	0.0	159.0	1.68	118.7«	512.3
2.000	50.00	5.47	119.000	0.018	0.0	0.0	1.1	0.56	9.9	3.5
2.001	50.00	6.06	118.950	0.036	0.0	0.0	2.2	0.52	9.2	7.1
2.002	50.00	6.49	118.900	0.054	0.0	0.0	3.3	0.58	10.2«	10.6
2.003	50.00	6.94	118.850	0.072	0.0	0.0	4.4	0.57	10.0«	14.1
2.004	50.00	7.11	118.800	0.072	0.0	0.0	4.4	1.16	20.5	14.1
2.005	50.00	7.53	118.650	0.072	0.0	0.0	4.4	2.55	45.1	14.1
1.011	50.00	7.94	114.452	2.681	0.0	0.0	163.4	2.21	156.5«	526.4

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Manhole Schedules for Surface Network 3

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S62	118.520	1.400	Open Manhole	1350	1.000	117.120	150				
S77	118.520	1.520	Open Manhole	1350	1.001	117.000	300	1.000	117.000	150	
S1	120.280	3.730	Open Manhole	1200	1.002	116.550	300	1.001	116.550	300	
S2	119.125	3.305	Open Manhole	1200	1.003	115.820	300	1.002	115.820	300	
S3	117.750	2.400	Open Manhole	1200	1.004	115.350	300	1.003	115.350	300	
S5	117.327	2.097	Open Manhole	1200	1.005	115.230	300	1.004	115.230	300	
S6	117.647	2.512	Open Manhole	1200	1.006	115.135	300	1.005	115.135	300	
S7	117.900	2.880	Open Manhole	1200	1.007	115.020	300	1.006	115.020	300	
S8	117.866	3.036	Open Manhole	1350	1.008	114.830	300	1.007	114.830	300	
S9	117.694	2.984	Open Manhole	1200	1.009	114.710	300	1.008	114.710	300	
S10	117.239	2.669	Open Manhole	1200	1.010	114.570	300	1.009	114.570	300	
S63	119.300	0.300	Open Manhole	1350	2.000	119.000	150				
S64	119.250	0.300	Open Manhole	1350	2.001	118.950	150	2.000	118.950	150	
S65	119.200	0.300	Open Manhole	1350	2.002	118.900	150	2.001	118.900	150	
S66	119.150	0.300	Open Manhole	1350	2.003	118.850	150	2.002	118.850	150	
S67	119.100	0.300	Open Manhole	1350	2.004	118.800	150	2.003	118.800	150	
S68	120.822	2.172	Open Manhole	1200	2.005	118.650	150	2.004	118.650	150	
S11	115.756	1.304	Open Manhole	1350	1.011	114.452	300	1.010	114.452	300	
								2.005	114.527	150	
S12	115.425	1.425	Open Manhole	0		OUTFALL		1.011	114.000	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S62	537361.640	132889.389	537361.640	132889.389	Required	
S77	537349.379	132907.627	537349.379	132907.627	Required	
S1	537345.322	132922.903	537345.322	132922.903	Required	
S2	537351.496	132954.259	537351.496	132954.259	Required	
S3	537320.572	132966.676	537320.572	132966.676	Required	

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Manhole Schedules for Surface Network 3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S5	537309.388	132975.423	537309.388	132975.423	Required	
S6	537321.435	132996.120	537321.435	132996.120	Required	
S7	537333.688	133022.074	537333.688	133022.074	Required	
S8	537335.497	133033.198	537335.497	133033.198	Required	
S9	537345.638	133043.838	537345.638	133043.838	Required	
S10	537356.523	133059.423	537356.523	133059.423	Required	
S63	537372.247	132962.866	537372.247	132962.866	Required	
S64	537377.346	132977.930	537377.346	132977.930	Required	
S65	537386.179	132993.962	537386.179	132993.962	Required	
S66	537395.036	133005.977	537395.036	133005.977	Required	
S67	537405.382	133017.311	537405.382	133017.311	Required	
S68	537408.235	133028.223	537408.235	133028.223	Required	
S11	537358.368	133069.620	537358.368	133069.620	Required	
S12	537343.891	133087.353			No Entry	

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PIPELINE SCHEDULES for Surface Network 3

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	S62	118.520	117.120	1.250	Open Manhole	1350
1.001	o	300	S77	118.520	117.000	1.220	Open Manhole	1350
1.002	o	300	S1	120.280	116.550	3.430	Open Manhole	1200
1.003	o	300	S2	119.125	115.820	3.005	Open Manhole	1200
1.004	o	300	S3	117.750	115.350	2.100	Open Manhole	1200
1.005	o	300	S5	117.327	115.230	1.797	Open Manhole	1200
1.006	o	300	S6	117.647	115.135	2.212	Open Manhole	1200
1.007	o	300	S7	117.900	115.020	2.580	Open Manhole	1200
1.008	o	300	S8	117.866	114.830	2.736	Open Manhole	1350
1.009	o	300	S9	117.694	114.710	2.684	Open Manhole	1200
1.010	o	300	S10	117.239	114.570	2.369	Open Manhole	1200
2.000	o	150	S63	119.300	119.000	0.150	Open Manhole	1350
2.001	o	150	S64	119.250	118.950	0.150	Open Manhole	1350
2.002	o	150	S65	119.200	118.900	0.150	Open Manhole	1350
2.003	o	150	S66	119.150	118.850	0.150	Open Manhole	1350
2.004	o	150	S67	119.100	118.800	0.150	Open Manhole	1350
2.005	o	150	S68	120.822	118.650	2.022	Open Manhole	1200
1.011	o	300	S11	115.756	114.452	1.004	Open Manhole	1350

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	21.976	183.1	S77	118.520	117.000	1.370	Open Manhole	1350
1.001	15.806	35.1	S1	120.280	116.550	3.430	Open Manhole	1200
1.002	31.958	43.8	S2	119.125	115.820	3.005	Open Manhole	1200
1.003	33.324	70.9	S3	117.750	115.350	2.100	Open Manhole	1200
1.004	14.198	118.3	S5	117.327	115.230	1.797	Open Manhole	1200
1.005	23.948	252.1	S6	117.647	115.135	2.212	Open Manhole	1200
1.006	28.701	249.6	S7	117.900	115.020	2.580	Open Manhole	1200
1.007	11.270	59.3	S8	117.866	114.830	2.736	Open Manhole	1350
1.008	14.698	122.5	S9	117.694	114.710	2.684	Open Manhole	1200
1.009	19.010	135.8	S10	117.239	114.570	2.369	Open Manhole	1200
1.010	10.363	87.8	S11	115.756	114.452	1.004	Open Manhole	1350
2.000	15.904	318.1	S64	119.250	118.950	0.150	Open Manhole	1350
2.001	18.304	366.1	S65	119.200	118.900	0.150	Open Manhole	1350
2.002	14.927	298.5	S66	119.150	118.850	0.150	Open Manhole	1350
2.003	15.346	306.9	S67	119.100	118.800	0.150	Open Manhole	1350
2.004	11.279	75.2	S68	120.822	118.650	2.022	Open Manhole	1200
2.005	64.811	15.7	S11	115.756	114.527	1.079	Open Manhole	1350
1.011	22.892	50.6	S12	115.425	114.000	1.125	Open Manhole	0

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Free Flowing Outfall Details for Surface Network 3

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.011	S12	115.425	114.000	0.000	0	0

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Storage Structures for Surface Network 3

Tank or Pond Manhole: S62, DS/PN: 1.000

Invert Level (m) 117.120

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	13435.0	0.400	17760.0	0.800	22281.0	1.200	22281.0
0.100	15061.0	0.500	18696.0	0.900	22281.0	1.300	22281.0
0.200	15849.0	0.600	20435.0	1.000	22281.0	1.400	22281.0
0.300	16796.0	0.700	22281.0	1.100	22281.0		

Swale Manhole: S63, DS/PN: 2.000

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	16.7
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	334.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	119.000	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

Swale Manhole: S64, DS/PN: 2.001

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	17.7
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	355.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	118.950	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

Swale Manhole: S65, DS/PN: 2.002

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	15.2
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	304.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	118.900	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

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Swale Manhole: S66, DS/PN: 2.003

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	15.2
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	304.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	118.900	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0	Include Swale Volume	Yes

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	5
Number of Online Controls	0	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)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S62	1440 Winter	1	+0%					117.164
1.001	S77	1440 Winter	1	+0%					117.021
1.002	S1	1440 Winter	1	+0%					116.572
1.003	S2	1440 Winter	1	+0%					115.847
1.004	S3	1440 Winter	1	+0%					115.383
1.005	S5	1440 Winter	1	+0%					115.267
1.006	S6	1440 Winter	1	+0%					115.172
1.007	S7	1440 Winter	1	+0%					115.050
1.008	S8	1440 Winter	1	+0%					114.863
1.009	S9	1440 Winter	1	+0%					114.743
1.010	S10	1440 Winter	1	+0%					114.603
2.000	S63	15 Winter	1	+0%					119.044
2.001	S64	30 Winter	1	+0%	100/15 Winter				119.006
2.002	S65	30 Winter	1	+0%	100/15 Summer				118.963
2.003	S66	30 Winter	1	+0%	30/15 Winter				118.923
2.004	S67	30 Winter	1	+0%					118.849
2.005	S68	30 Winter	1	+0%					118.682
1.011	S11	30 Winter	1	+0%					114.487

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S62	-0.106	0.000	0.19			2.3	OK	
1.001	S77	-0.279	0.000	0.01			2.3	OK	
1.002	S1	-0.278	0.000	0.02			2.3	OK	
1.003	S2	-0.273	0.000	0.02			2.3	OK	
1.004	S3	-0.267	0.000	0.03			2.3	OK	
1.005	S5	-0.263	0.000	0.04			2.3	OK	
1.006	S6	-0.263	0.000	0.04			2.3	OK	
1.007	S7	-0.270	0.000	0.02			2.3	OK	
1.008	S8	-0.267	0.000	0.03			2.3	OK	
1.009	S9	-0.267	0.000	0.03			2.3	OK	
1.010	S10	-0.267	0.000	0.03			2.3	OK	
2.000	S63	-0.106	0.000	0.19		7	1.7	FLOOD RISK	
2.001	S64	-0.094	0.000	0.30		11	2.6	FLOOD RISK	
2.002	S65	-0.087	0.000	0.36		13	3.4	FLOOD RISK	
2.003	S66	-0.077	0.000	0.48		12	4.4	FLOOD RISK	
2.004	S67	-0.101	0.000	0.24			4.4	FLOOD RISK	
2.005	S68	-0.118	0.000	0.10			4.4	OK	
1.011	S11	-0.265	0.000	0.03			4.6	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	5
Number of Online Controls	0	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)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S62	1440 Winter	30	+35%					117.226
1.001	S77	1440 Winter	30	+35%					117.050
1.002	S1	1440 Winter	30	+35%					116.601
1.003	S2	1440 Winter	30	+35%					115.879
1.004	S3	1440 Winter	30	+35%					115.420
1.005	S5	1440 Winter	30	+35%					115.312
1.006	S6	1440 Winter	30	+35%					115.216
1.007	S7	1440 Winter	30	+35%					115.082
1.008	S8	1440 Winter	30	+35%					114.900
1.009	S9	1440 Winter	30	+35%					114.780
1.010	S10	1440 Winter	30	+35%					114.639
2.000	S63	15 Winter	30	+35%					119.091
2.001	S64	30 Winter	30	+35%	100/15 Winter				119.076
2.002	S65	30 Winter	30	+35%	100/15 Summer				119.049
2.003	S66	30 Winter	30	+35%	30/15 Winter				119.011
2.004	S67	30 Winter	30	+35%					118.883
2.005	S68	30 Winter	30	+35%					118.700
1.011	S11	60 Winter	30	+35%					114.515

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S62	-0.044	0.000	0.84			10.4	OK	
1.001	S77	-0.250	0.000	0.07			10.4	OK	
1.002	S1	-0.249	0.000	0.07			10.4	OK	
1.003	S2	-0.241	0.000	0.09			10.4	OK	
1.004	S3	-0.230	0.000	0.12			10.4	OK	
1.005	S5	-0.218	0.000	0.17			10.4	OK	
1.006	S6	-0.219	0.000	0.16			10.4	OK	
1.007	S7	-0.238	0.000	0.10			10.4	OK	
1.008	S8	-0.230	0.000	0.12			10.4	OK	
1.009	S9	-0.230	0.000	0.13			10.4	OK	
1.010	S10	-0.231	0.000	0.12			10.4	OK	
2.000	S63	-0.059	0.000	0.56		9	5.1	FLOOD RISK	
2.001	S64	-0.024	0.000	0.80		14	6.9	FLOOD RISK	
2.002	S65	-0.001	0.000	0.88		16	8.3	FLOOD RISK	
2.003	S66	0.011	0.000	1.17		17	10.9	FLOOD RISK	
2.004	S67	-0.067	0.000	0.59			10.9	FLOOD RISK	
2.005	S68	-0.100	0.000	0.25			10.9	OK	
1.011	S11	-0.237	0.000	0.10			13.5	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	5
Number of Online Controls	0	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)	20.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S62	1440 Winter	100	+45%					117.263
1.001	S77	1440 Winter	100	+45%					117.055
1.002	S1	1440 Winter	100	+45%					116.606
1.003	S2	1440 Winter	100	+45%					115.884
1.004	S3	1440 Winter	100	+45%					115.426
1.005	S5	1440 Winter	100	+45%					115.321
1.006	S6	1440 Winter	100	+45%					115.224
1.007	S7	1440 Winter	100	+45%					115.087
1.008	S8	1440 Winter	100	+45%					114.906
1.009	S9	1440 Winter	100	+45%					114.787
1.010	S10	1440 Winter	100	+45%					114.645
2.000	S63	30 Winter	100	+45%					119.137
2.001	S64	30 Winter	100	+45%	100/15 Winter				119.122
2.002	S65	30 Winter	100	+45%	100/15 Summer				119.092
2.003	S66	30 Winter	100	+45%	30/15 Winter				119.044
2.004	S67	30 Winter	100	+45%					118.894
2.005	S68	30 Winter	100	+45%					118.706
1.011	S11	120 Winter	100	+45%					114.524

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S62	-0.007	0.000	1.00			12.4	OK	
1.001	S77	-0.245	0.000	0.08			12.4	OK	
1.002	S1	-0.244	0.000	0.08			12.4	OK	
1.003	S2	-0.236	0.000	0.10			12.4	OK	
1.004	S3	-0.224	0.000	0.15			12.4	OK	
1.005	S5	-0.209	0.000	0.20			12.4	OK	
1.006	S6	-0.211	0.000	0.19			12.4	OK	
1.007	S7	-0.233	0.000	0.11			12.4	OK	
1.008	S8	-0.224	0.000	0.15			12.4	OK	
1.009	S9	-0.223	0.000	0.15			12.4	OK	
1.010	S10	-0.225	0.000	0.14			12.4	OK	
2.000	S63	-0.013	0.000	0.52		15	4.8	FLOOD RISK	
2.001	S64	0.022	0.000	0.81		17	6.9	FLOOD RISK	
2.002	S65	0.042	0.000	1.02		20	9.6	FLOOD RISK	
2.003	S66	0.044	0.000	1.42		21	13.2	FLOOD RISK	
2.004	S67	-0.056	0.000	0.72			13.2	FLOOD RISK	
2.005	S68	-0.094	0.000	0.30			13.2	OK	
1.011	S11	-0.228	0.000	0.13			18.5	OK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	45
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

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.657	4-8	0.673

Total Area Contributing (ha) = 1.330

Total Pipe Volume (m³) = 49.986

Network Design Table for Surface Network 2

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	41.521	1.236	33.6	0.138	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	33.238	1.415	23.5	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	12.240	0.083	147.5	0.120	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.001	29.085	0.065	447.5	0.034	0.00	0.0	0.600	o	375	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	5.31	118.671	0.138	0.0	0.0	8.4	2.26	90.1	27.1
1.001	50.00	5.48	117.360	0.147	0.0	0.0	9.0	3.26	230.3	28.9
2.000	50.00	5.16	116.168	0.120	0.0	0.0	7.3	1.29	91.4	23.6
2.001	50.00	5.73	116.010	0.154	0.0	0.0	9.4	0.85	93.9	30.2

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
3.000	30.149	0.099	304.5	0.092	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	18.416	0.045	409.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	14.964	0.125	119.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	59.786	3.685	16.2	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	38.390	2.119	18.1	0.106	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.000	32.211	0.622	51.8	0.126	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	6.699	0.306	21.9	0.057	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	12.351	0.584	21.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	19.584	0.190	103.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	11.047	0.500	22.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	14.467	0.075	192.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.000	35.818	2.496	14.4	0.098	5.00	0.0	0.600	o	225	Pipe/Conduit	
7.000	13.063	0.065	201.0	0.040	5.00	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)
3.000	50.00	5.56	116.044	0.092	0.0	0.0	5.6	0.90	63.3	18.1
1.002	50.00	6.13	115.545	0.393	0.0	0.0	23.9	0.77	54.5«	77.2
1.003	50.00	6.30	115.500	0.393	0.0	0.0	23.9	1.44	101.5	77.2
1.004	50.00	6.55	115.375	0.405	0.0	0.0	24.7	3.92	277.3	79.5
4.000	50.00	5.21	114.849	0.106	0.0	0.0	6.5	3.09	122.8	20.8
5.000	50.00	5.29	113.352	0.126	0.0	0.0	7.7	1.82	72.4	24.7
4.001	50.00	5.33	112.655	0.289	0.0	0.0	17.6	3.37	238.6	56.7
4.002	50.00	5.39	112.349	0.289	0.0	0.0	17.6	3.43	242.7	56.7
1.005	50.00	6.74	111.690	0.694	0.0	0.0	42.3	1.78	197.1	136.3
1.006	50.00	6.78	111.500	0.694	0.0	0.0	42.3	3.87	427.4	136.3
1.007	50.00	6.97	111.000	0.694	0.0	0.0	42.3	1.30	143.7	136.3
6.000	50.00	5.17	114.804	0.098	0.0	0.0	6.0	3.47	138.1	19.2
7.000	50.00	5.24	112.373	0.040	0.0	0.0	2.4	0.92	36.5	7.9

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
6.001	46.211	0.231	200.0	0.147	0.00	0.0	0.600	o	375	Pipe/Conduit	
8.000	12.844	1.384	9.3	0.078	5.00	0.0	0.600	o	300	Pipe/Conduit	
6.002	29.515	0.148	199.4	0.030	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.003	18.788	0.479	39.2	0.058	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.004	22.318	0.375	59.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
9.000	21.641	0.175	123.7	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	10.908	0.055	198.3	0.017	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.002	14.365	0.072	199.5	0.027	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.003	9.717	0.049	198.3	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
10.000	26.355	1.483	17.8	0.069	5.00	0.0	0.600	o	225	Pipe/Conduit	
9.004	24.042	0.100	240.4	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	20.191	0.150	134.6	0.023	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	20.924	0.200	104.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.010	11.310	2.850	4.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.001	50.00	5.84	112.158	0.285	0.0	0.0	17.4	1.28	141.1	56.0
8.000	50.00	5.04	113.386	0.078	0.0	0.0	4.8	5.19	366.9	15.3
6.002	50.00	6.22	111.927	0.393	0.0	0.0	23.9	1.28	141.3	77.2
6.003	50.00	6.33	111.779	0.451	0.0	0.0	27.5	2.90	320.4	88.6
6.004	50.00	6.49	111.300	0.451	0.0	0.0	27.5	2.35	259.8	88.6
9.000	50.00	5.40	111.600	0.033	0.0	0.0	2.0	0.90	15.9	6.5
9.001	50.00	5.60	111.350	0.050	0.0	0.0	3.0	0.92	36.8	9.8
9.002	50.00	5.86	111.295	0.077	0.0	0.0	4.7	0.92	36.7	15.1
9.003	50.00	6.03	111.224	0.083	0.0	0.0	5.1	0.92	36.8	16.3
10.000	50.00	5.14	112.658	0.069	0.0	0.0	4.2	3.12	124.0	13.5
9.004	50.00	6.43	111.100	0.162	0.0	0.0	9.9	1.01	71.4	31.8
1.008	50.00	7.16	110.850	1.330	0.0	0.0	81.0	1.75	278.4	261.1
1.009	50.00	7.52	110.700	1.330	0.0	0.0	81.0	0.98	17.4«	261.1
1.010	50.00	7.55	110.500	1.330	0.0	0.0	81.0	5.10	90.0«	261.1

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Manhole Schedules for Surface Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S13	119.970	1.299	Open Manhole	1350	1.000	118.671	225				
S14	119.550	2.190	Open Manhole	1350	1.001	117.360	300	1.000	117.435	225	
S15	117.417	1.249	Open Manhole	1350	2.000	116.168	300				
S16	117.281	1.271	Open Manhole	1350	2.001	116.010	375	2.000	116.085	300	
S17	117.469	1.425	Open Manhole	1350	3.000	116.044	300				
S18	117.650	2.105	Open Manhole	1350	1.002	115.545	300	1.001	115.945	300	400
								2.001	115.945	375	475
								3.000	115.945	300	400
S57	117.700	2.200	Open Manhole	1350	1.003	115.500	300	1.002	115.500	300	
S19	116.800	1.425	Open Manhole	1350	1.004	115.375	300	1.003	115.375	300	
S27	116.342	1.493	Open Manhole	1350	4.000	114.849	225				
S28	115.008	1.656	Open Manhole	1350	5.000	113.352	225				
S29	114.722	2.067	Open Manhole	1200	4.001	112.655	300	4.000	112.730	225	
								5.000	112.730	225	
S59	114.480	2.131	Open Manhole	1200	4.002	112.349	300	4.001	112.349	300	
S30	114.469	2.779	Open Manhole	1350	1.005	111.690	375	1.004	111.690	300	
								4.002	111.765	300	
S69	112.900	1.400	Open Manhole	1350	1.006	111.500	375	1.005	111.500	375	
S70	112.350	1.350	Open Manhole	1350	1.007	111.000	375	1.006	111.000	375	
S20	116.311	1.507	Open Manhole	1350	6.000	114.804	225				
S21	113.888	1.515	Open Manhole	1350	7.000	112.373	225				
S23	113.950	1.792	Open Manhole	1350	6.001	112.158	375	6.000	112.308	225	
								7.000	112.308	225	
S24	115.186	1.800	Open Manhole	1350	8.000	113.386	300				
S25	114.622	2.695	Open Manhole	1200	6.002	111.927	375	6.001	111.927	375	
								8.000	112.002	300	
S26	114.517	2.738	Open Manhole	1200	6.003	111.779	375	6.002	111.779	375	
S58	112.700	1.400	Open Manhole	1350	6.004	111.300	375	6.003	111.300	375	
S74	112.582	0.982	Open Manhole	1350	9.000	111.600	150				
S73	112.674	1.324	Open Manhole	1350	9.001	111.350	225	9.000	111.425	150	
S72	112.709	1.414	Open Manhole	1350	9.002	111.295	225	9.001	111.295	225	
S71	113.074	1.851	Open Manhole	1200	9.003	111.224	225	9.002	111.223	225	
S75	114.083	1.425	Open Manhole	1350	10.000	112.658	225				
S31	113.313	2.213	Open Manhole	1200	9.004	111.100	300	9.003	111.175	225	
								10.000	111.175	225	
S32	112.350	1.500	Open Manhole	1350	1.008	110.850	450	1.007	110.925	375	
								6.004	110.925	375	
								9.004	111.000	300	

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Manhole Schedules for Surface Network 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S33	112.400	1.700	Open Manhole	1200	1.009	110.700	150	1.008	110.700	450	
S34	112.200	1.700	Open Manhole	1200	1.010	110.500	150	1.009	110.500	150	
S76	108.030	0.380	Open Manhole	1350		OUTFALL		1.010	107.650	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S13	537377.110	132998.617	537377.110	132998.617	Required	
S14	537360.843	132960.415	537360.843	132960.415	Required	
S15	537310.920	132986.334	537310.920	132986.334	Required	
S16	537307.284	132974.647	537307.284	132974.647	Required	
S17	537305.100	132934.964	537305.100	132934.964	Required	
S18	537328.156	132954.390	537328.156	132954.390	Required	
S57	537310.486	132959.580	537310.486	132959.580	Required	
S19	537296.689	132965.373	537296.689	132965.373	Required	
S27	537282.735	132959.559	537282.735	132959.559	Required	
S28	537242.065	132930.767	537242.065	132930.767	Required	
S29	537244.489	132962.886	537244.489	132962.886	Required	
S59	537239.999	132967.856	537239.999	132967.856	Required	

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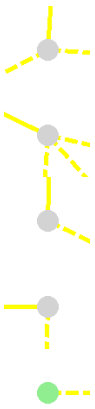
Manhole Schedules for Surface Network 2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S30	537238.757	132980.145	537238.757	132980.145	Required	
S69	537220.057	132974.326	537220.057	132974.326	Required	
S70	537210.189	132979.291	537210.189	132979.291	Required	
S20	537303.881	133044.785	537303.881	133044.785	Required	
S21	537277.012	133071.515	537277.012	133071.515	Required	
S23	537271.338	133059.748	537271.338	133059.748	Required	
S24	537263.273	133012.778	537263.273	133012.778	Required	
S25	537251.537	133017.994	537251.537	133017.994	Required	
S26	537240.171	132990.755	537240.171	132990.755	Required	
S58	537222.271	132985.047	537222.271	132985.047	Required	
S74	537190.082	132920.614	537190.082	132920.614	Required	
S73	537192.051	132942.166	537192.051	132942.166	Required	
S72	537183.505	132948.944	537183.505	132948.944	Required	
S71	537190.350	132961.574	537190.350	132961.574	Required	
S75	537225.267	132964.355	537225.267	132964.355	Required	

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Manhole Schedules for Surface Network 2

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S31	537198.967	132966.063	537198.967	132966.063	Required	
S32	537200.522	132990.054	537200.522	132990.054	Required	
S33	537182.360	132998.877	537182.360	132998.877	Required	
S34	537182.913	133019.793	537182.913	133019.793	Required	
S76	537171.603	133019.893			No Entry	



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PIPELINE SCHEDULES for Surface Network 2

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	225	S13	119.970	118.671	1.074	Open Manhole	1350
1.001	o	300	S14	119.550	117.360	1.890	Open Manhole	1350
2.000	o	300	S15	117.417	116.168	0.949	Open Manhole	1350
2.001	o	375	S16	117.281	116.010	0.896	Open Manhole	1350
3.000	o	300	S17	117.469	116.044	1.125	Open Manhole	1350
1.002	o	300	S18	117.650	115.545	1.805	Open Manhole	1350
1.003	o	300	S57	117.700	115.500	1.900	Open Manhole	1350
1.004	o	300	S19	116.800	115.375	1.125	Open Manhole	1350
4.000	o	225	S27	116.342	114.849	1.268	Open Manhole	1350
5.000	o	225	S28	115.008	113.352	1.431	Open Manhole	1350
4.001	o	300	S29	114.722	112.655	1.767	Open Manhole	1200
4.002	o	300	S59	114.480	112.349	1.831	Open Manhole	1200
1.005	o	375	S30	114.469	111.690	2.404	Open Manhole	1350
1.006	o	375	S69	112.900	111.500	1.025	Open Manhole	1350

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	41.521	33.6	S14	119.550	117.435	1.890	Open Manhole	1350
1.001	33.238	23.5	S18	117.650	115.945	1.405	Open Manhole	1350
2.000	12.240	147.5	S16	117.281	116.085	0.896	Open Manhole	1350
2.001	29.085	447.5	S18	117.650	115.945	1.330	Open Manhole	1350
3.000	30.149	304.5	S18	117.650	115.945	1.405	Open Manhole	1350
1.002	18.416	409.2	S57	117.700	115.500	1.900	Open Manhole	1350
1.003	14.964	119.7	S19	116.800	115.375	1.125	Open Manhole	1350
1.004	59.786	16.2	S30	114.469	111.690	2.479	Open Manhole	1350
4.000	38.390	18.1	S29	114.722	112.730	1.767	Open Manhole	1200
5.000	32.211	51.8	S29	114.722	112.730	1.767	Open Manhole	1200
4.001	6.699	21.9	S59	114.480	112.349	1.831	Open Manhole	1200
4.002	12.351	21.1	S30	114.469	111.765	2.404	Open Manhole	1350
1.005	19.584	103.1	S69	112.900	111.500	1.025	Open Manhole	1350
1.006	11.047	22.1	S70	112.350	111.000	0.975	Open Manhole	1350

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PIPELINE SCHEDULES for Surface Network 2

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)
1.007	o	375	S70	112.350	111.000	0.975	Open Manhole	1350
6.000	o	225	S20	116.311	114.804	1.282	Open Manhole	1350
7.000	o	225	S21	113.888	112.373	1.290	Open Manhole	1350
6.001	o	375	S23	113.950	112.158	1.417	Open Manhole	1350
8.000	o	300	S24	115.186	113.386	1.500	Open Manhole	1350
6.002	o	375	S25	114.622	111.927	2.320	Open Manhole	1200
6.003	o	375	S26	114.517	111.779	2.363	Open Manhole	1200
6.004	o	375	S58	112.700	111.300	1.025	Open Manhole	1350
9.000	o	150	S74	112.582	111.600	0.832	Open Manhole	1350
9.001	o	225	S73	112.674	111.350	1.099	Open Manhole	1350
9.002	o	225	S72	112.709	111.295	1.189	Open Manhole	1350
9.003	o	225	S71	113.074	111.224	1.625	Open Manhole	1200
10.000	o	225	S75	114.083	112.658	1.200	Open Manhole	1350

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)
1.007	14.467	192.9	S32	112.350	110.925	1.050	Open Manhole	1350
6.000	35.818	14.4	S23	113.950	112.308	1.417	Open Manhole	1350
7.000	13.063	201.0	S23	113.950	112.308	1.417	Open Manhole	1350
6.001	46.211	200.0	S25	114.622	111.927	2.320	Open Manhole	1200
8.000	12.844	9.3	S25	114.622	112.002	2.320	Open Manhole	1200
6.002	29.515	199.4	S26	114.517	111.779	2.363	Open Manhole	1200
6.003	18.788	39.2	S58	112.700	111.300	1.025	Open Manhole	1350
6.004	22.318	59.5	S32	112.350	110.925	1.050	Open Manhole	1350
9.000	21.641	123.7	S73	112.674	111.425	1.099	Open Manhole	1350
9.001	10.908	198.3	S72	112.709	111.295	1.189	Open Manhole	1350
9.002	14.365	199.5	S71	113.074	111.223	1.626	Open Manhole	1200
9.003	9.717	198.3	S31	113.313	111.175	1.913	Open Manhole	1200
10.000	26.355	17.8	S31	113.313	111.175	1.913	Open Manhole	1200

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PIPELINE SCHEDULES for Surface Network 2

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)
9.004	o	300	S31	113.313	111.100	1.913	Open Manhole	1200
1.008	o	450	S32	112.350	110.850	1.050	Open Manhole	1350
1.009	o	150	S33	112.400	110.700	1.550	Open Manhole	1200
1.010	o	150	S34	112.200	110.500	1.550	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)
9.004	24.042	240.4	S32	112.350	111.000	1.050	Open Manhole	1350
1.008	20.191	134.6	S33	112.400	110.700	1.250	Open Manhole	1200
1.009	20.924	104.6	S34	112.200	110.500	1.550	Open Manhole	1200
1.010	11.310	4.0	S76	108.030	107.650	0.230	Open Manhole	1350

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010	S76	108.030	107.650	0.000	1350	0

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Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: S57, DS/PN: 1.003, Volume (m³): 4.4

Unit Reference	MD-SHE-0077-3300-1700-3300
Design Head (m)	1.700
Design Flow (l/s)	3.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	77
Invert Level (m)	115.500
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	3.3
Flush-Flo™	0.338	2.7
Kick-Flo®	0.687	2.2
Mean Flow over Head Range	-	2.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.2	1.200	2.8	3.000	4.3	7.000	6.4
0.200	2.6	1.400	3.0	3.500	4.6	7.500	6.6
0.300	2.7	1.600	3.2	4.000	4.9	8.000	6.8
0.400	2.7	1.800	3.4	4.500	5.2	8.500	7.0
0.500	2.6	2.000	3.6	5.000	5.4	9.000	7.2
0.600	2.5	2.200	3.7	5.500	5.7	9.500	7.4
0.800	2.3	2.400	3.9	6.000	5.9		
1.000	2.6	2.600	4.0	6.500	6.2		

Hydro-Brake® Optimum Manhole: S33, DS/PN: 1.009, Volume (m³): 4.9

Unit Reference	MD-SHE-0126-8200-1500-8200
Design Head (m)	1.500
Design Flow (l/s)	8.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	126
Invert Level (m)	110.700
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: S33, DS/PN: 1.009, Volume (m³): 4.9

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	8.2
Flush-Flo™	0.439	8.2
Kick-Flo®	0.922	6.5
Mean Flow over Head Range	-	7.2

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.5	1.200	7.4	3.000	11.4	7.000	17.0
0.200	7.4	1.400	7.9	3.500	12.2	7.500	17.6
0.300	8.0	1.600	8.4	4.000	13.0	8.000	18.1
0.400	8.2	1.800	8.9	4.500	13.8	8.500	18.7
0.500	8.2	2.000	9.4	5.000	14.5	9.000	19.2
0.600	8.0	2.200	9.8	5.500	15.2	9.500	19.7
0.800	7.4	2.400	10.2	6.000	15.8		
1.000	6.8	2.600	10.6	6.500	16.4		

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Storage Structures for Surface Network 2

Complex Manhole: S18, DS/PN: 1.002

Cellular Storage

Invert Level (m) 115.545 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	165.0	165.0	1.300	0.1	209.2
0.100	165.0	170.1	1.400	0.1	209.4
0.200	165.0	175.3	1.500	0.1	209.5
0.300	165.0	180.4	1.600	0.1	209.6
0.400	165.0	185.6	1.700	0.1	209.7
0.500	165.0	190.7	1.800	0.1	209.9
0.600	165.0	195.8	1.900	0.1	210.0
0.700	165.0	201.0	2.000	0.1	210.1
0.800	165.0	206.1	2.100	0.1	210.3
0.900	0.1	208.7	2.200	0.1	210.4
1.000	0.1	208.9	2.300	0.1	210.5
1.100	0.1	209.0	2.400	0.1	210.6
1.200	0.1	209.1	2.500	0.1	210.8

Infiltration Blanket

Infiltration Coefficient Base (m/hr) 0.00000 Diameter/Width (m) 10.0
Safety Factor 2.0 Length (m) 12.5
Porosity 0.30 Cap Volume Depth (m) 1.000
Invert Level (m) 116.345

Tank or Pond

Invert Level (m) 116.695

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	250.4	0.301	315.1	0.601	384.7	0.901	459.1
0.101	271.4	0.401	337.8	0.701	409.0	1.000	484.8
0.201	293.0	0.501	361.0	0.801	433.8	1.001	485.0

Tank or Pond Manhole: S32, DS/PN: 1.008

Invert Level (m) 110.850

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	346.8	0.201	394.0	0.401	443.5	0.601	495.2
0.101	370.1	0.301	418.4	0.501	469.0	0.701	521.9

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Tank or Pond Manhole: S32, DS/PN: 1.008

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.801	549.1	1.101	634.3	1.401	724.5		
0.901	576.9	1.201	663.8	1.500	755.3		
1.001	605.3	1.301	693.8	1.501	755.7		

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	2
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)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S13	15 Summer	1	+0%	100/15 Summer			
1.001	S14	15 Summer	1	+0%				
2.000	S15	15 Summer	1	+0%	30/15 Summer			
2.001	S16	15 Summer	1	+0%	30/60 Summer			
3.000	S17	15 Summer	1	+0%	30/60 Summer			
1.002	S18	240 Summer	1	+0%	1/240 Summer			
1.003	S57	240 Summer	1	+0%	1/60 Summer			
1.004	S19	30 Summer	1	+0%				
4.000	S27	15 Summer	1	+0%				
5.000	S28	15 Summer	1	+0%	30/15 Summer			
4.001	S29	15 Summer	1	+0%	30/15 Summer			
4.002	S59	15 Summer	1	+0%	100/15 Summer			
1.005	S30	15 Summer	1	+0%	30/15 Summer			
1.006	S69	15 Summer	1	+0%	30/360 Summer			
1.007	S70	15 Summer	1	+0%	30/15 Summer			
6.000	S20	15 Summer	1	+0%				
7.000	S21	15 Summer	1	+0%	30/15 Summer	100/15 Summer		
6.001	S23	15 Summer	1	+0%	30/15 Summer			
8.000	S24	15 Summer	1	+0%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S13	118.753	-0.143	0.000	0.28			24.2	OK
1.001	S14	117.430	-0.230	0.000	0.12			25.6	OK
2.000	S15	116.279	-0.189	0.000	0.29			21.2	OK
2.001	S16	116.156	-0.229	0.000	0.32			26.3	OK
3.000	S17	116.153	-0.191	0.000	0.28			16.3	OK
1.002	S18	115.857	0.012	0.000	0.09		205	4.0	SURCHARGED
1.003	S57	115.910	0.110	0.000	0.03			2.7	SURCHARGED
1.004	S19	115.397	-0.278	0.000	0.02			4.0	OK
4.000	S27	114.909	-0.165	0.000	0.16			18.8	OK
5.000	S28	113.441	-0.136	0.000	0.32			22.0	OK
4.001	S29	112.779	-0.176	0.000	0.35			48.9	OK
4.002	S59	112.453	-0.196	0.000	0.26			49.2	OK
1.005	S30	111.836	-0.229	0.000	0.32			52.8	OK
1.006	S69	111.610	-0.265	0.000	0.19			52.7	OK
1.007	S70	111.186	-0.189	0.000	0.49			52.3	OK
6.000	S20	114.859	-0.170	0.000	0.13			17.3	OK
7.000	S21	112.445	-0.153	0.000	0.22			7.0	OK
6.001	S23	112.313	-0.220	0.000	0.35			45.6	OK
8.000	S24	113.428	-0.258	0.000	0.05			13.8	OK

PN	US/MH Name	Level Exceeded
1.000	S13	
1.001	S14	
2.000	S15	
2.001	S16	
3.000	S17	
1.002	S18	
1.003	S57	
1.004	S19	
4.000	S27	
5.000	S28	
4.001	S29	
4.002	S59	
1.005	S30	
1.006	S69	
1.007	S70	
6.000	S20	
7.000	S21	1
6.001	S23	
8.000	S24	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.002	S25	15 Summer	1	+0%	30/15 Summer				112.116
6.003	S26	15 Summer	1	+0%	100/15 Summer				111.911
6.004	S58	15 Summer	1	+0%	30/15 Summer				111.446
9.000	S74	15 Summer	1	+0%	30/15 Summer				111.665
9.001	S73	15 Summer	1	+0%	30/15 Summer				111.430
9.002	S72	15 Summer	1	+0%	30/15 Summer				111.392
9.003	S71	15 Summer	1	+0%	30/15 Summer				111.327
10.000	S75	15 Summer	1	+0%					112.707
9.004	S31	15 Summer	1	+0%	30/15 Summer				111.235
1.008	S32	240 Summer	1	+0%	30/15 Summer				111.159
1.009	S33	240 Summer	1	+0%	1/15 Summer				111.156
1.010	S34	960 Summer	1	+0%					110.532

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
6.002	S25	-0.186	0.000	0.50			62.3	OK	
6.003	S26	-0.243	0.000	0.26			70.0	OK	
6.004	S58	-0.229	0.000	0.32			70.5	OK	
9.000	S74	-0.085	0.000	0.38			5.8	OK	
9.001	S73	-0.145	0.000	0.27			8.3	OK	
9.002	S72	-0.128	0.000	0.38			12.2	OK	
9.003	S71	-0.122	0.000	0.43			13.1	OK	
10.000	S75	-0.176	0.000	0.11			12.2	OK	
9.004	S31	-0.165	0.000	0.42			26.4	OK	
1.008	S32	-0.141	0.000	0.04			9.0	OK	
1.009	S33	0.306	0.000	0.50			8.2	SURCHARGED	
1.010	S34	-0.118	0.000	0.10			8.2	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	2
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)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S13	15 Summer	30	+35%	100/15 Summer			
1.001	S14	15 Summer	30	+35%				
2.000	S15	480 Winter	30	+35%	30/15 Summer			
2.001	S16	480 Winter	30	+35%	30/60 Summer			
3.000	S17	480 Winter	30	+35%	30/60 Summer			
1.002	S18	480 Winter	30	+35%	1/240 Summer			
1.003	S57	480 Winter	30	+35%	1/60 Summer			
1.004	S19	15 Summer	30	+35%				
4.000	S27	15 Summer	30	+35%				
5.000	S28	15 Summer	30	+35%	30/15 Summer			
4.001	S29	15 Summer	30	+35%	30/15 Summer			
4.002	S59	15 Summer	30	+35%	100/15 Summer			
1.005	S30	15 Summer	30	+35%	30/15 Summer			
1.006	S69	480 Winter	30	+35%	30/360 Summer			
1.007	S70	480 Winter	30	+35%	30/15 Summer			
6.000	S20	15 Summer	30	+35%				
7.000	S21	15 Summer	30	+35%	30/15 Summer	100/15 Summer		
6.001	S23	15 Summer	30	+35%	30/15 Summer			
8.000	S24	15 Summer	30	+35%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S13	118.845	-0.051	0.000	0.93			80.0	OK
1.001	S14	117.494	-0.166	0.000	0.40			85.2	OK
2.000	S15	116.839	0.371	0.000	0.10			7.3	SURCHARGED
2.001	S16	116.838	0.453	0.000	0.11			9.0	FLOOD RISK
3.000	S17	116.839	0.495	0.000	0.09			5.3	SURCHARGED
1.002	S18	116.838	0.993	0.000	0.11		683	5.0	SURCHARGED
1.003	S57	116.961	1.161	0.000	0.03			2.9	SURCHARGED
1.004	S19	115.413	-0.262	0.000	0.04			10.5	OK
4.000	S27	114.967	-0.107	0.000	0.53			62.2	OK
5.000	S28	113.747	0.170	0.000	1.04			70.9	SURCHARGED
4.001	S29	113.084	0.129	0.000	1.19			165.1	SURCHARGED
4.002	S59	112.566	-0.083	0.000	0.87			165.6	OK
1.005	S30	112.083	0.018	0.000	1.07			175.7	SURCHARGED
1.006	S69	111.901	0.026	0.000	0.08			20.8	SURCHARGED
1.007	S70	111.899	0.524	0.000	0.19			20.4	SURCHARGED
6.000	S20	114.909	-0.120	0.000	0.44			57.5	OK
7.000	S21	113.020	0.422	0.000	0.83			26.1	SURCHARGED
6.001	S23	112.982	0.449	0.000	1.23			159.5	SURCHARGED
8.000	S24	113.465	-0.221	0.000	0.16			45.8	OK

PN	US/MH Name	Level Exceeded
1.000	S13	
1.001	S14	
2.000	S15	
2.001	S16	
3.000	S17	
1.002	S18	
1.003	S57	
1.004	S19	
4.000	S27	
5.000	S28	
4.001	S29	
4.002	S59	
1.005	S30	
1.006	S69	
1.007	S70	
6.000	S20	
7.000	S21	1
6.001	S23	
8.000	S24	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.002	S25	15 Summer	30	+35%	30/15 Summer				112.601
6.003	S26	15 Summer	30	+35%	100/15 Summer				112.124
6.004	S58	480 Winter	30	+35%	30/15 Summer				111.898
9.000	S74	15 Summer	30	+35%	30/15 Summer				111.981
9.001	S73	480 Winter	30	+35%	30/15 Summer				111.899
9.002	S72	480 Winter	30	+35%	30/15 Summer				111.899
9.003	S71	480 Winter	30	+35%	30/15 Summer				111.898
10.000	S75	15 Summer	30	+35%					112.751
9.004	S31	480 Winter	30	+35%	30/15 Summer				111.898
1.008	S32	480 Winter	30	+35%	30/15 Summer				111.897
1.009	S33	480 Winter	30	+35%	1/15 Summer				111.920
1.010	S34	15 Summer	30	+35%					110.532

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
6.002	S25	0.299	0.000	1.74			216.6	SURCHARGED	
6.003	S26	-0.030	0.000	0.90			239.5	OK	
6.004	S58	0.223	0.000	0.12			27.2	SURCHARGED	
9.000	S74	0.231	0.000	1.15			17.4	SURCHARGED	
9.001	S73	0.324	0.000	0.10			3.0	SURCHARGED	
9.002	S72	0.379	0.000	0.14			4.6	SURCHARGED	
9.003	S71	0.449	0.000	0.16			4.9	SURCHARGED	
10.000	S75	-0.132	0.000	0.35			40.5	OK	
9.004	S31	0.498	0.000	0.15			9.6	SURCHARGED	
1.008	S32	0.597	0.000	0.04			9.6	SURCHARGED	
1.009	S33	1.070	0.000	0.50			8.2	SURCHARGED	
1.010	S34	-0.118	0.000	0.10			8.2	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	2
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)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S13	15 Summer	100	+45%	100/15 Summer			
1.001	S14	15 Summer	100	+45%				
2.000	S15	480 Winter	100	+45%	30/15 Summer			
2.001	S16	480 Winter	100	+45%	30/60 Summer			
3.000	S17	480 Winter	100	+45%	30/60 Summer			
1.002	S18	480 Winter	100	+45%	1/240 Summer			
1.003	S57	240 Summer	100	+45%	1/60 Summer			
1.004	S19	15 Summer	100	+45%				
4.000	S27	15 Summer	100	+45%				
5.000	S28	15 Summer	100	+45%	30/15 Summer			
4.001	S29	15 Summer	100	+45%	30/15 Summer			
4.002	S59	15 Summer	100	+45%	100/15 Summer			
1.005	S30	960 Winter	100	+45%	30/15 Summer			
1.006	S69	960 Winter	100	+45%	30/360 Summer			
1.007	S70	960 Winter	100	+45%	30/15 Summer			
6.000	S20	15 Summer	100	+45%				
7.000	S21	15 Summer	100	+45%	30/15 Summer	100/15 Summer		
6.001	S23	15 Summer	100	+45%	30/15 Summer			
8.000	S24	15 Summer	100	+45%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S13	119.478	0.582	0.000	1.20			102.6	SURCHARGED
1.001	S14	117.514	-0.146	0.000	0.51			108.1	OK
2.000	S15	117.114	0.646	0.000	0.14			10.0	FLOOD RISK
2.001	S16	117.113	0.728	0.000	0.15			12.4	FLOOD RISK
3.000	S17	117.113	0.769	0.000	0.13			7.4	FLOOD RISK
1.002	S18	117.112	1.267	0.000	0.14		860	6.1	SURCHARGED
1.003	S57	117.386	1.586	0.000	0.04			3.1	FLOOD RISK
1.004	S19	115.419	-0.256	0.000	0.05			13.7	OK
4.000	S27	114.995	-0.079	0.000	0.75			86.7	OK
5.000	S28	114.795	1.218	0.000	1.35			91.8	FLOOD RISK
4.001	S29	113.673	0.718	0.000	1.53			211.9	SURCHARGED
4.002	S59	112.946	0.297	0.000	1.10			209.9	SURCHARGED
1.005	S30	112.253	0.188	0.000	0.11			17.4	SURCHARGED
1.006	S69	112.250	0.375	0.000	0.06			17.0	SURCHARGED
1.007	S70	112.248	0.873	0.000	0.16			16.8	FLOOD RISK
6.000	S20	114.933	-0.096	0.000	0.62			80.2	OK
7.000	S21	113.890	1.292	2.675	1.79			56.7	FLOOD
6.001	S23	113.909	1.376	0.000	1.48			191.8	FLOOD RISK
8.000	S24	113.508	-0.178	0.000	0.22			63.9	OK

PN	US/MH Name	Level Exceeded
1.000	S13	
1.001	S14	
2.000	S15	
2.001	S16	
3.000	S17	
1.002	S18	
1.003	S57	
1.004	S19	
4.000	S27	
5.000	S28	
4.001	S29	
4.002	S59	
1.005	S30	
1.006	S69	
1.007	S70	
6.000	S20	
7.000	S21	1
6.001	S23	
8.000	S24	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
6.002	S25	15 Summer	100	+45%	30/15 Summer				113.438
6.003	S26	15 Summer	100	+45%	100/15 Summer				112.736
6.004	S58	960 Winter	100	+45%	30/15 Summer				112.247
9.000	S74	15 Summer	100	+45%	30/15 Summer				112.471
9.001	S73	960 Winter	100	+45%	30/15 Summer				112.248
9.002	S72	960 Winter	100	+45%	30/15 Summer				112.248
9.003	S71	960 Winter	100	+45%	30/15 Summer				112.247
10.000	S75	15 Summer	100	+45%					112.770
9.004	S31	960 Winter	100	+45%	30/15 Summer				112.247
1.008	S32	960 Winter	100	+45%	30/15 Summer				112.246
1.009	S33	960 Winter	100	+45%	1/15 Summer				112.267
1.010	S34	960 Winter	100	+45%					110.532

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
6.002	S25	1.136	0.000	2.17			270.5	SURCHARGED	
6.003	S26	0.582	0.000	1.17			310.9	SURCHARGED	
6.004	S58	0.572	0.000	0.10			22.0	SURCHARGED	
9.000	S74	0.721	0.000	1.56			23.5	FLOOD RISK	
9.001	S73	0.673	0.000	0.07			2.1	FLOOD RISK	
9.002	S72	0.728	0.000	0.10			3.3	SURCHARGED	
9.003	S71	0.798	0.000	0.11			3.5	SURCHARGED	
10.000	S75	-0.113	0.000	0.49			56.5	OK	
9.004	S31	0.847	0.000	0.11			7.2	SURCHARGED	
1.008	S32	0.946	0.000	0.04			9.3	FLOOD RISK	
1.009	S33	1.417	0.000	0.51			8.3	FLOOD RISK	
1.010	S34	-0.118	0.000	0.10			8.3	OK	

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	45
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

Time Area Diagram for Surface Network 1

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.500	4-8	0.174

Total Area Contributing (ha) = 0.674

Total Pipe Volume (m³) = 34.216

Network Design Table for Surface Network 1

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	31.038	0.290	107.0	0.063	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	33.466	0.270	123.9	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	16.768	0.180	93.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	13.503	0.200	67.5	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	17.009	0.875	19.4	0.030	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	9.412	0.215	43.8	0.023	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	5.34	110.675	0.063	0.0	0.0	3.8	1.52	107.4	12.4
1.001	50.00	5.74	110.385	0.103	0.0	0.0	6.3	1.41	99.7	20.2
1.002	50.00	5.91	110.115	0.103	0.0	0.0	6.3	1.63	115.2	20.2
1.003	50.00	6.02	109.935	0.125	0.0	0.0	7.6	1.92	135.5	24.5
2.000	50.00	5.10	110.900	0.030	0.0	0.0	1.8	2.98	118.6	5.9
2.001	50.00	5.16	109.950	0.053	0.0	0.0	3.2	2.38	168.4	10.4

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Network Design Table for Surface Network 1

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
1.004	18.179	0.240	75.7	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	16.297	0.180	90.5	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	27.283	1.200	22.7	0.042	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.007	9.900	0.530	18.7	0.005	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.008	22.909	0.345	66.4	0.023	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.000	34.498	1.817	19.0	0.087	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	34.280	1.723	19.9	0.041	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.000	19.561	0.650	30.1	0.085	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	26.836	1.500	17.9	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.003	21.129	2.071	10.2	0.018	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.004	20.457	0.324	63.1	0.028	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.000	14.340	0.125	114.7	0.050	5.00	0.0	0.600	o	225	Pipe/Conduit	
5.001	25.045	1.062	23.6	0.006	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	11.290	0.452	25.0	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.003	13.005	0.200	65.0	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.004	14.451	0.240	60.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.005	25.884	1.695	15.3	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)
1.004	50.00	6.19	109.735	0.187	0.0	0.0	11.4	1.81	127.8	36.7
1.005	50.00	6.36	109.495	0.210	0.0	0.0	12.8	1.65	116.8	41.2
1.006	50.00	6.48	109.240	0.252	0.0	0.0	15.4	3.81	421.3	49.5
1.007	50.00	6.52	108.040	0.257	0.0	0.0	15.7	4.21	464.9	50.5
1.008	50.00	6.69	107.510	0.280	0.0	0.0	17.1	2.23	245.9	55.0
3.000	50.00	5.19	115.125	0.087	0.0	0.0	5.3	3.02	120.0	17.1
3.001	50.00	5.38	113.308	0.128	0.0	0.0	7.8	2.95	117.2	25.1
4.000	50.00	5.14	112.310	0.085	0.0	0.0	5.2	2.39	95.2	16.7
3.002	50.00	5.50	111.585	0.239	0.0	0.0	14.6	3.73	264.0	46.9
3.003	50.00	5.58	110.085	0.257	0.0	0.0	15.7	4.95	349.9	50.5
3.004	50.00	5.72	107.939	0.285	0.0	0.0	17.4	2.28	252.2	56.0
5.000	50.00	5.20	111.539	0.050	0.0	0.0	3.0	1.22	48.5	9.8
5.001	50.00	5.35	111.414	0.056	0.0	0.0	3.4	2.71	107.6	11.0
5.002	50.00	5.41	110.277	0.066	0.0	0.0	4.0	3.16	223.3	13.0
5.003	50.00	5.52	109.825	0.093	0.0	0.0	5.7	1.95	138.0	18.3
5.004	50.00	5.64	109.625	0.093	0.0	0.0	5.7	2.03	143.5	18.3
5.005	50.00	5.75	109.385	0.093	0.0	0.0	5.7	4.04	285.8	18.3

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Network Design Table for Surface Network 1

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
3.005	6.501	0.315	20.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.006	7.436	0.135	55.1	0.016	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.009	6.665	0.445	15.0	0.000	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)
3.005	50.00	5.77	107.615	0.378	0.0	0.0	23.0	4.00	442.2	74.2
3.006	50.00	5.82	107.300	0.394	0.0	0.0	24.0	2.45	270.1	77.4
1.009	50.00	6.72	107.165	0.674	0.0	0.0	41.1	3.40	135.1	132.3

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Manhole Schedules for Surface Network 1

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S35	112.691	2.016	Open Manhole	1200	1.000	110.675	300				
S36	111.999	1.614	Open Manhole	1350	1.001	110.385	300	1.000	110.385	300	
S37	112.230	2.115	Open Manhole	1200	1.002	110.115	300	1.001	110.115	300	
S38	112.130	2.195	Open Manhole	1200	1.003	109.935	300	1.002	109.935	300	
S40	112.703	1.803	Open Manhole	1350	2.000	110.900	225				
S41	112.511	2.561	Open Manhole	1350	2.001	109.950	300	2.000	110.025	225	
S42	112.429	2.694	Open Manhole	1200	1.004	109.735	300	1.003	109.735	300	
								2.001	109.735	300	
S43	112.226	2.731	Open Manhole	1200	1.005	109.495	300	1.004	109.495	300	
S44	112.040	2.800	Open Manhole	1350	1.006	109.240	375	1.005	109.315	300	
S45	109.940	1.900	Open Manhole	1350	1.007	108.040	375	1.006	108.040	375	
S46	109.141	1.631	Open Manhole	1200	1.008	107.510	375	1.007	107.510	375	
S80	116.900	1.775	Open Manhole	1200	3.000	115.125	225				
S47	115.376	2.068	Open Manhole	1350	3.001	113.308	225	3.000	113.308	225	
S48	113.713	1.403	Open Manhole	1350	4.000	112.310	225				
S49	113.649	2.064	Open Manhole	1350	3.002	111.585	300	3.001	111.585	225	
								4.000	111.660	225	
S50	111.897	1.812	Open Manhole	1350	3.003	110.085	300	3.002	110.085	300	
S53	110.678	2.739	Open Manhole	1350	3.004	107.939	375	3.003	108.014	300	
S39	112.964	1.425	Open Manhole	1350	5.000	111.539	225				
S60	112.839	1.425	Open Manhole	1350	5.001	111.414	225	5.000	111.414	225	
S61	112.018	1.741	Open Manhole	1350	5.002	110.277	300	5.001	110.352	225	
S51	111.610	1.785	Open Manhole	1350	5.003	109.825	300	5.002	109.825	300	
S52	111.154	1.529	Open Manhole	1350	5.004	109.625	300	5.003	109.625	300	
S78	110.885	1.500	Open Manhole	1350	5.005	109.385	300	5.004	109.385	300	
S79	109.447	1.832	Open Manhole	1350	3.005	107.615	375	3.004	107.615	375	
								5.005	107.690	300	
S54	109.078	1.778	Open Manhole	1200	3.006	107.300	375	3.005	107.300	375	
S55	108.900	1.735	Open Manhole	1350	1.009	107.165	225	1.008	107.165	375	
								3.006	107.165	375	
S56	107.000	0.280	Open Manhole	0		OUTFALL		1.009	106.720	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S35	537221.695	133027.628	537221.695	133027.628	Required	

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Manhole Schedules for Surface Network 1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S36	537190.771	133030.286	537190.771	133030.286	Required	
S37	537193.303	133063.656	537193.303	133063.656	Required	
S38	537195.151	133080.322	537195.151	133080.322	Required	
S40	537221.702	133080.721	537221.702	133080.721	Required	
S41	537204.802	133082.643	537204.802	133082.643	Required	
S42	537202.368	133091.735	537202.368	133091.735	Required	
S43	537202.690	133109.912	537202.690	133109.912	Required	
S44	537206.859	133125.667	537206.859	133125.667	Required	
S45	537216.296	133151.265	537216.296	133151.265	Required	
S46	537220.305	133160.317	537220.305	133160.317	Required	
S80	537355.663	133067.277	537355.663	133067.277	Required	
S47	537328.928	133089.079	537328.928	133089.079	Required	
S48	537288.352	133095.313	537288.352	133095.313	Required	
S49	537301.569	133109.733	537301.569	133109.733	Required	
S50	537280.002	133125.702	537280.002	133125.702	Required	

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Manhole Schedules for Surface Network 1

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S53	537264.799	133140.375	537264.799	133140.375	Required	
S39	537243.459	133070.501	537243.459	133070.501	Required	
S60	537231.523	133078.450	537231.523	133078.450	Required	
S61	537234.541	133103.313	537234.541	133103.313	Required	
S51	537238.964	133113.700	537238.964	133113.700	Required	
S52	537244.912	133125.265	537244.912	133125.265	Required	
S78	537233.546	133134.189	537233.546	133134.189	Required	
S79	537249.825	133154.313	537249.825	133154.313	Required	
S54	537245.052	133158.727	537245.052	133158.727	Required	
S55	537242.565	133165.734	537242.565	133165.734	Required	
S56	537248.428	133168.905			No Entry	

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PIPELINE SCHEDULES for Surface Network 1

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	300	S35	112.691	110.675	1.716	Open Manhole	1200
1.001	o	300	S36	111.999	110.385	1.314	Open Manhole	1350
1.002	o	300	S37	112.230	110.115	1.815	Open Manhole	1200
1.003	o	300	S38	112.130	109.935	1.895	Open Manhole	1200
2.000	o	225	S40	112.703	110.900	1.578	Open Manhole	1350
2.001	o	300	S41	112.511	109.950	2.261	Open Manhole	1350
1.004	o	300	S42	112.429	109.735	2.394	Open Manhole	1200
1.005	o	300	S43	112.226	109.495	2.431	Open Manhole	1200
1.006	o	375	S44	112.040	109.240	2.425	Open Manhole	1350
1.007	o	375	S45	109.940	108.040	1.525	Open Manhole	1350
1.008	o	375	S46	109.141	107.510	1.256	Open Manhole	1200
3.000	o	225	S80	116.900	115.125	1.550	Open Manhole	1200
3.001	o	225	S47	115.376	113.308	1.843	Open Manhole	1350
4.000	o	225	S48	113.713	112.310	1.178	Open Manhole	1350
3.002	o	300	S49	113.649	111.585	1.764	Open Manhole	1350
3.003	o	300	S50	111.897	110.085	1.512	Open Manhole	1350

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	31.038	107.0	S36	111.999	110.385	1.314	Open Manhole	1350
1.001	33.466	123.9	S37	112.230	110.115	1.815	Open Manhole	1200
1.002	16.768	93.2	S38	112.130	109.935	1.895	Open Manhole	1200
1.003	13.503	67.5	S42	112.429	109.735	2.394	Open Manhole	1200
2.000	17.009	19.4	S41	112.511	110.025	2.261	Open Manhole	1350
2.001	9.412	43.8	S42	112.429	109.735	2.394	Open Manhole	1200
1.004	18.179	75.7	S43	112.226	109.495	2.431	Open Manhole	1200
1.005	16.297	90.5	S44	112.040	109.315	2.425	Open Manhole	1350
1.006	27.283	22.7	S45	109.940	108.040	1.525	Open Manhole	1350
1.007	9.900	18.7	S46	109.141	107.510	1.256	Open Manhole	1200
1.008	22.909	66.4	S55	108.900	107.165	1.360	Open Manhole	1350
3.000	34.498	19.0	S47	115.376	113.308	1.843	Open Manhole	1350
3.001	34.280	19.9	S49	113.649	111.585	1.839	Open Manhole	1350
4.000	19.561	30.1	S49	113.649	111.660	1.764	Open Manhole	1350
3.002	26.836	17.9	S50	111.897	110.085	1.512	Open Manhole	1350
3.003	21.129	10.2	S53	110.678	108.014	2.364	Open Manhole	1350

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PIPELINE SCHEDULES for Surface Network 1

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)
3.004	o	375	S53	110.678	107.939	2.364	Open Manhole	1350
5.000	o	225	S39	112.964	111.539	1.200	Open Manhole	1350
5.001	o	225	S60	112.839	111.414	1.200	Open Manhole	1350
5.002	o	300	S61	112.018	110.277	1.441	Open Manhole	1350
5.003	o	300	S51	111.610	109.825	1.485	Open Manhole	1350
5.004	o	300	S52	111.154	109.625	1.229	Open Manhole	1350
5.005	o	300	S78	110.885	109.385	1.200	Open Manhole	1350
3.005	o	375	S79	109.447	107.615	1.457	Open Manhole	1350
3.006	o	375	S54	109.078	107.300	1.403	Open Manhole	1200
1.009	o	225	S55	108.900	107.165	1.510	Open Manhole	1350

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)
3.004	20.457	63.1	S79	109.447	107.615	1.457	Open Manhole	1350
5.000	14.340	114.7	S60	112.839	111.414	1.200	Open Manhole	1350
5.001	25.045	23.6	S61	112.018	110.352	1.441	Open Manhole	1350
5.002	11.290	25.0	S51	111.610	109.825	1.485	Open Manhole	1350
5.003	13.005	65.0	S52	111.154	109.625	1.229	Open Manhole	1350
5.004	14.451	60.2	S78	110.885	109.385	1.200	Open Manhole	1350
5.005	25.884	15.3	S79	109.447	107.690	1.457	Open Manhole	1350
3.005	6.501	20.6	S54	109.078	107.300	1.403	Open Manhole	1200
3.006	7.436	55.1	S55	108.900	107.165	1.360	Open Manhole	1350
1.009	6.665	15.0	S56	107.000	106.720	0.055	Open Manhole	0

Free Flowing Outfall Details for Surface Network 1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	S56	107.000	106.720	0.000	0	0

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Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S42, DS/PN: 1.004, Volume (m³): 4.5

Unit Reference	MD-SHE-0094-5000-1800-5000
Design Head (m)	1.800
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	94
Invert Level (m)	109.735
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.800	5.0
Flush-Flo™	0.411	4.4
Kick-Flo®	0.838	3.5
Mean Flow over Head Range	-	4.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	1.200	4.1	3.000	6.3	7.000	9.5
0.200	4.0	1.400	4.4	3.500	6.8	7.500	9.8
0.300	4.3	1.600	4.7	4.000	7.3	8.000	10.1
0.400	4.4	1.800	5.0	4.500	7.7	8.500	10.4
0.500	4.4	2.000	5.2	5.000	8.1	9.000	10.7
0.600	4.3	2.200	5.5	5.500	8.4	9.500	11.0
0.800	3.7	2.400	5.7	6.000	8.8		
1.000	3.8	2.600	5.9	6.500	9.1		

Hydro-Brake® Optimum Manhole: S47, DS/PN: 3.001, Volume (m³): 4.3

Unit Reference	MD-SHE-0061-1800-1200-1800
Design Head (m)	1.200
Design Flow (l/s)	1.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	61
Invert Level (m)	113.308
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: S47, DS/PN: 3.001, Volume (m³): 4.3

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	1.8
Flush-Flo™	0.265	1.5
Kick-Flo®	0.542	1.3
Mean Flow over Head Range	-	1.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.3	1.200	1.8	3.000	2.7	7.000	4.1
0.200	1.5	1.400	1.9	3.500	2.9	7.500	4.2
0.300	1.5	1.600	2.0	4.000	3.1	8.000	4.3
0.400	1.5	1.800	2.2	4.500	3.3	8.500	4.4
0.500	1.4	2.000	2.3	5.000	3.5	9.000	4.6
0.600	1.3	2.200	2.4	5.500	3.6	9.500	4.7
0.800	1.5	2.400	2.5	6.000	3.8		
1.000	1.7	2.600	2.6	6.500	3.9		

Hydro-Brake® Optimum Manhole: S49, DS/PN: 3.002, Volume (m³): 5.0

Unit Reference	MD-SHE-0042-1000-1600-1000
Design Head (m)	1.600
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	42
Invert Level (m)	111.585
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	1.0
Flush-Flo™	0.185	0.6
Kick-Flo®	0.373	0.5
Mean Flow over Head Range	-	0.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	0.300	0.6	0.500	0.6	0.800	0.7
0.200	0.6	0.400	0.5	0.600	0.6	1.000	0.8

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Hydro-Brake® Optimum Manhole: S49, DS/PN: 3.002, Volume (m³): 5.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	0.9	2.400	1.2	5.000	1.7	8.000	2.1
1.400	0.9	2.600	1.2	5.500	1.7	8.500	2.1
1.600	1.0	3.000	1.3	6.000	1.8	9.000	2.2
1.800	1.1	3.500	1.4	6.500	1.9	9.500	2.3
2.000	1.1	4.000	1.5	7.000	2.0		
2.200	1.1	4.500	1.6	7.500	2.0		

Hydro-Brake® Optimum Manhole: S53, DS/PN: 3.004, Volume (m³): 5.3

Unit Reference	MD-SHE-0044-1000-1250-1000
Design Head (m)	1.250
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	44
Invert Level (m)	107.939
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.250	1.0
Flush-Flo™	0.196	0.7
Kick-Flo®	0.394	0.6
Mean Flow over Head Range	-	0.8

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.0	3.000	1.5	7.000	2.2
0.200	0.7	1.400	1.0	3.500	1.6	7.500	2.3
0.300	0.7	1.600	1.1	4.000	1.7	8.000	2.3
0.400	0.6	1.800	1.2	4.500	1.8	8.500	2.4
0.500	0.7	2.000	1.2	5.000	1.9	9.000	2.5
0.600	0.7	2.200	1.3	5.500	2.0	9.500	2.5
0.800	0.8	2.400	1.3	6.000	2.0		
1.000	0.9	2.600	1.4	6.500	2.1		

Hydro-Brake® Optimum Manhole: S51, DS/PN: 5.003, Volume (m³): 3.3

Unit Reference	MD-SHE-0045-1000-1200-1000
Design Head (m)	1.200
Design Flow (l/s)	1.0
Flush-Flo™	Calculated

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Hydro-Brake® Optimum Manhole: S51, DS/PN: 5.003, Volume (m³): 3.3

Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	45
Invert Level (m)	109.825
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	1.0
Flush-Flo™	0.196	0.7
Kick-Flo®	0.398	0.6
Mean Flow over Head Range	-	0.8

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.0	3.000	1.5	7.000	2.2
0.200	0.7	1.400	1.1	3.500	1.6	7.500	2.3
0.300	0.7	1.600	1.1	4.000	1.7	8.000	2.4
0.400	0.6	1.800	1.2	4.500	1.8	8.500	2.4
0.500	0.7	2.000	1.3	5.000	1.9	9.000	2.5
0.600	0.7	2.200	1.3	5.500	2.0	9.500	2.6
0.800	0.8	2.400	1.4	6.000	2.1		
1.000	0.9	2.600	1.4	6.500	2.2		

Hydro-Brake® Optimum Manhole: S55, DS/PN: 1.009, Volume (m³): 5.6

Unit Reference	MD-SHE-0085-3700-1400-3700
Design Head (m)	1.400
Design Flow (l/s)	3.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	107.165
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	3.7
Flush-Flo™	0.376	3.5
Kick-Flo®	0.763	2.8
Mean Flow over Head Range	-	3.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a

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Hydro-Brake® Optimum Manhole: S55, DS/PN: 1.009, Volume (m³): 5.6

Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	3.4	3.000	5.3	7.000	7.9
0.200	3.3	1.400	3.7	3.500	5.7	7.500	8.1
0.300	3.4	1.600	3.9	4.000	6.0	8.000	8.4
0.400	3.5	1.800	4.2	4.500	6.4	8.500	8.6
0.500	3.4	2.000	4.4	5.000	6.7	9.000	8.9
0.600	3.3	2.200	4.6	5.500	7.0	9.500	9.1
0.800	2.9	2.400	4.7	6.000	7.3		
1.000	3.2	2.600	4.9	6.500	7.6		

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Storage Structures for Surface Network 1

Cellular Storage Manhole: S41, DS/PN: 2.001

Invert Level (m) 109.950 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	60.7	60.7	1.300	0.1	99.7
0.100	60.7	63.8	1.400	0.1	99.8
0.200	60.7	66.9	1.500	0.1	100.0
0.300	60.7	70.0	1.600	0.1	100.1
0.400	60.7	73.2	1.700	0.1	100.2
0.500	60.7	76.3	1.800	0.1	100.4
0.600	60.7	79.4	1.900	0.1	100.5
0.700	60.7	82.5	2.000	0.1	100.6
0.800	60.7	85.6	2.100	0.1	100.7
0.900	60.7	88.7	2.200	0.1	100.9
1.000	60.7	91.9	2.300	0.1	101.0
1.100	60.7	95.0	2.400	0.1	101.1
1.200	60.7	98.1	2.500	0.1	101.2

Cellular Storage Manhole: S47, DS/PN: 3.001

Invert Level (m) 113.320 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	71.3	71.3	1.300	0.1	113.6
0.100	71.3	74.7	1.400	0.1	113.7
0.200	71.3	78.1	1.500	0.1	113.8
0.300	71.3	81.4	1.600	0.1	114.0
0.400	71.3	84.8	1.700	0.1	114.1
0.500	71.3	88.2	1.800	0.1	114.2
0.600	71.3	91.6	1.900	0.1	114.3
0.700	71.3	94.9	2.000	0.1	114.5
0.800	71.3	98.3	2.100	0.1	114.6
0.900	71.3	101.7	2.200	0.1	114.7
1.000	71.3	105.1	2.300	0.1	114.8
1.100	71.3	108.5	2.400	0.1	115.0
1.200	71.3	111.8	2.500	0.1	115.1

Cellular Storage Manhole: S49, DS/PN: 3.002

Invert Level (m) 111.985 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

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Cellular Storage Manhole: S49, DS/PN: 3.002

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	141.8	141.8	1.300	0.1	201.4
0.100	141.8	146.6	1.400	0.1	201.5
0.200	141.8	151.3	1.500	0.1	201.7
0.300	141.8	156.1	1.600	0.1	201.8
0.400	141.8	160.9	1.700	0.1	201.9
0.500	141.8	165.6	1.800	0.1	202.0
0.600	141.8	170.4	1.900	0.1	202.2
0.700	141.8	175.1	2.000	0.1	202.3
0.800	141.8	179.9	2.100	0.1	202.4
0.900	141.8	184.7	2.200	0.1	202.5
1.000	141.8	189.4	2.300	0.1	202.7
1.100	141.8	194.2	2.400	0.1	202.8
1.200	141.8	199.0	2.500	0.1	202.9

Cellular Storage Manhole: S53, DS/PN: 3.004

Invert Level (m) 107.939 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	115.0	115.0	1.300	0.1	168.7
0.100	115.0	119.3	1.400	0.1	168.8
0.200	115.0	123.6	1.500	0.1	168.9
0.300	115.0	127.9	1.600	0.1	169.1
0.400	115.0	132.2	1.700	0.1	169.2
0.500	115.0	136.4	1.800	0.1	169.3
0.600	115.0	140.7	1.900	0.1	169.4
0.700	115.0	145.0	2.000	0.1	169.6
0.800	115.0	149.3	2.100	0.1	169.7
0.900	115.0	153.6	2.200	0.1	169.8
1.000	115.0	157.9	2.300	0.1	169.9
1.100	115.0	162.2	2.400	0.1	170.1
1.200	115.0	166.5	2.500	0.1	170.2

Cellular Storage Manhole: S51, DS/PN: 5.003

Invert Level (m) 109.825 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	129.0	129.0	0.600	129.0	156.3
0.100	129.0	133.5	0.700	129.0	160.8
0.200	129.0	138.1	0.800	129.0	165.3
0.300	129.0	142.6	0.900	0.1	167.7
0.400	129.0	147.2	1.000	0.1	167.8
0.500	129.0	151.7	1.100	0.1	167.9

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Cellular Storage Manhole: S51, DS/PN: 5.003

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
1.200	0.1	168.1	1.900	0.1	168.9
1.300	0.1	168.2	2.000	0.1	169.1
1.400	0.1	168.3	2.100	0.1	169.2
1.500	0.1	168.4	2.200	0.1	169.3
1.600	0.1	168.6	2.300	0.1	169.5
1.700	0.1	168.7	2.400	0.1	169.6
1.800	0.1	168.8	2.500	0.1	169.7

Complex Manhole: S55, DS/PN: 1.009

Cellular Storage

Invert Level (m) 107.165 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	142.5	142.5	1.300	0.1	202.2
0.100	142.5	147.3	1.400	0.1	202.4
0.200	142.5	152.0	1.500	0.1	202.5
0.300	142.5	156.8	1.600	0.1	202.6
0.400	142.5	161.6	1.700	0.1	202.8
0.500	142.5	166.4	1.800	0.1	202.9
0.600	142.5	171.1	1.900	0.1	203.0
0.700	142.5	175.9	2.000	0.1	203.1
0.800	142.5	180.7	2.100	0.1	203.3
0.900	142.5	185.5	2.200	0.1	203.4
1.000	142.5	190.2	2.300	0.1	203.5
1.100	142.5	195.0	2.400	0.1	203.6
1.200	142.5	199.8	2.500	0.1	203.8

Cellular Storage

Invert Level (m) 107.165 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	40.0	40.0	0.900	0.1	61.6
0.100	40.0	42.5	1.000	0.1	61.7
0.200	40.0	45.1	1.100	0.1	61.8
0.300	40.0	47.6	1.200	0.1	61.9
0.400	40.0	50.1	1.300	0.1	62.1
0.500	40.0	52.6	1.400	0.1	62.2
0.600	40.0	55.2	1.500	0.1	62.3
0.700	40.0	57.7	1.600	0.1	62.5
0.800	40.0	60.2	1.700	0.1	62.6

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Cellular Storage

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
1.800	0.1	62.7	2.200	0.1	63.2
1.900	0.1	62.8	2.300	0.1	63.3
2.000	0.1	63.0	2.400	0.1	63.5
2.100	0.1	63.1	2.500	0.1	63.6

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

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	6
Number of Online Controls	6	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)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S35	15 Summer	1	+0%	100/15 Summer			
1.001	S36	15 Summer	1	+0%	30/15 Summer	100/120 Summer		
1.002	S37	15 Summer	1	+0%	30/15 Summer			
1.003	S38	15 Summer	1	+0%	30/15 Summer			
2.000	S40	15 Summer	1	+0%	100/60 Summer			
2.001	S41	60 Summer	1	+0%	30/15 Summer			
1.004	S42	15 Summer	1	+0%	1/15 Summer			
1.005	S43	15 Summer	1	+0%				
1.006	S44	15 Summer	1	+0%				
1.007	S45	15 Summer	1	+0%	100/960 Summer			
1.008	S46	15 Summer	1	+0%	30/360 Summer			
3.000	S80	15 Summer	1	+0%				
3.001	S47	120 Summer	1	+0%	30/15 Summer			
4.000	S48	15 Summer	1	+0%	30/240 Summer			
3.002	S49	480 Winter	1	+0%	1/15 Summer	100/1440 Summer		
3.003	S50	15 Summer	1	+0%				
3.004	S53	1440 Summer	1	+0%	30/360 Summer			
5.000	S39	15 Summer	1	+0%				
5.001	S60	15 Summer	1	+0%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S35	110.742	-0.233	0.000	0.11			11.0	OK
1.001	S36	110.473	-0.212	0.000	0.18			16.9	OK
1.002	S37	110.242	-0.173	0.000	0.17			16.3	OK
1.003	S38	110.231	-0.004	0.000	0.13			15.0	OK
2.000	S40	110.932	-0.193	0.000	0.05			5.3	OK
2.001	S41	110.120	-0.130	0.000	0.03		36	3.8	OK
1.004	S42	110.204	0.169	0.000	0.04			4.4	SURCHARGED
1.005	S43	109.551	-0.244	0.000	0.08			7.8	OK
1.006	S44	109.287	-0.328	0.000	0.04			14.0	OK
1.007	S45	108.095	-0.320	0.000	0.05			14.7	OK
1.008	S46	107.585	-0.300	0.000	0.09			18.1	OK
3.000	S80	115.180	-0.170	0.000	0.14			15.4	OK
3.001	S47	113.514	-0.019	0.000	0.01		101	1.5	OK
4.000	S48	112.373	-0.162	0.000	0.17			15.0	OK
3.002	S49	112.243	0.358	0.000	0.00		537	0.7	SURCHARGED
3.003	S50	110.100	-0.285	0.000	0.01			3.2	OK
3.004	S53	108.084	-0.230	0.000	0.00		911	0.7	OK
5.000	S39	111.609	-0.155	0.000	0.21			8.8	OK
5.001	S60	111.461	-0.178	0.000	0.10			9.7	OK

PN	US/MH Name	Level Exceeded
1.000	S35	
1.001	S36	2
1.002	S37	
1.003	S38	
2.000	S40	
2.001	S41	
1.004	S42	
1.005	S43	
1.006	S44	
1.007	S45	
1.008	S46	
3.000	S80	
3.001	S47	
4.000	S48	
3.002	S49	2
3.003	S50	
3.004	S53	
5.000	S39	
5.001	S60	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
5.002	S61	15 Summer	1	+0%					110.328
5.003	S51	360 Summer	1	+0%	30/120 Summer				109.931
5.004	S52	480 Summer	1	+0%					109.633
5.005	S78	480 Summer	1	+0%					109.389
3.005	S79	480 Summer	1	+0%	30/960 Summer				107.626
3.006	S54	480 Summer	1	+0%	30/120 Summer				107.405
1.009	S55	480 Summer	1	+0%	1/240 Summer				107.404

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.002	S61	-0.249	0.000	0.07			11.2	OK	
5.003	S51	-0.194	0.000	0.01		243	0.7	OK	
5.004	S52	-0.292	0.000	0.01			0.7	OK	
5.005	S78	-0.296	0.000	0.00			0.7	OK	
3.005	S79	-0.364	0.000	0.01			1.4	OK	
3.006	S54	-0.270	0.000	0.01			1.8	OK	
1.009	S55	0.014	0.000	0.04		282	3.3	SURCHARGED	

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

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	6
Number of Online Controls	6	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)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S35	30 Summer	30	+35%	100/15 Summer			
1.001	S36	120 Winter	30	+35%	30/15 Summer	100/120 Summer		
1.002	S37	120 Winter	30	+35%	30/15 Summer			
1.003	S38	120 Winter	30	+35%	30/15 Summer			
2.000	S40	15 Summer	30	+35%	100/60 Summer			
2.001	S41	120 Winter	30	+35%	30/15 Summer			
1.004	S42	120 Winter	30	+35%	1/15 Summer			
1.005	S43	15 Summer	30	+35%				
1.006	S44	15 Summer	30	+35%				
1.007	S45	15 Summer	30	+35%	100/960 Summer			
1.008	S46	960 Winter	30	+35%	30/360 Summer			
3.000	S80	15 Summer	30	+35%				
3.001	S47	240 Winter	30	+35%	30/15 Summer			
4.000	S48	1440 Winter	30	+35%	30/240 Summer			
3.002	S49	1440 Winter	30	+35%	1/15 Summer	100/1440 Summer		
3.003	S50	15 Summer	30	+35%				
3.004	S53	1440 Winter	30	+35%	30/360 Summer			
5.000	S39	15 Summer	30	+35%				
5.001	S60	15 Summer	30	+35%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S35	110.906	-0.069	0.000	0.34			33.0	OK
1.001	S36	110.878	0.193	0.000	0.19			17.6	SURCHARGED
1.002	S37	110.875	0.460	0.000	0.15			15.1	SURCHARGED
1.003	S38	110.872	0.637	0.000	0.16			18.3	SURCHARGED
2.000	S40	110.962	-0.163	0.000	0.17			17.6	OK
2.001	S41	110.871	0.621	0.000	0.03		153	3.8	SURCHARGED
1.004	S42	110.870	0.835	0.000	0.04			4.4	SURCHARGED
1.005	S43	109.585	-0.210	0.000	0.20			19.4	OK
1.006	S44	109.329	-0.286	0.000	0.13			47.0	OK
1.007	S45	108.146	-0.269	0.000	0.18			50.4	OK
1.008	S46	108.051	0.166	0.000	0.04			7.6	SURCHARGED
3.000	S80	115.231	-0.119	0.000	0.45			51.1	OK
3.001	S47	114.147	0.614	0.000	0.01		355	1.5	SURCHARGED
4.000	S48	112.956	0.421	0.000	0.02			2.1	SURCHARGED
3.002	S49	112.956	1.071	0.000	0.00			0.9	SURCHARGED
3.003	S50	110.124	-0.261	0.000	0.04			12.4	OK
3.004	S53	108.532	0.218	0.000	0.00			0.7	SURCHARGED
5.000	S39	111.678	-0.086	0.000	0.69			29.3	OK
5.001	S60	111.504	-0.135	0.000	0.33			33.0	OK

PN	US/MH Name	Level Exceeded
1.000	S35	
1.001	S36	2
1.002	S37	
1.003	S38	
2.000	S40	
2.001	S41	
1.004	S42	
1.005	S43	
1.006	S44	
1.007	S45	
1.008	S46	
3.000	S80	
3.001	S47	
4.000	S48	
3.002	S49	2
3.003	S50	
3.004	S53	
5.000	S39	
5.001	S60	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
5.002	S61	15 Summer	30	+35%					110.376
5.003	S51	480 Winter	30	+35%	30/120 Summer				110.221
5.004	S52	1440 Summer	30	+35%					109.634
5.005	S78	15 Winter	30	+35%					109.389
3.005	S79	960 Winter	30	+35%	30/960 Summer				108.051
3.006	S54	960 Winter	30	+35%	30/120 Summer				108.050
1.009	S55	960 Winter	30	+35%	1/240 Summer				108.050

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.002	S61	-0.201	0.000	0.23			39.3	OK	
5.003	S51	0.096	0.000	0.01		610	0.7	SURCHARGED	
5.004	S52	-0.291	0.000	0.01			0.7	OK	
5.005	S78	-0.296	0.000	0.00			0.7	OK	
3.005	S79	0.061	0.000	0.01			1.5	SURCHARGED	
3.006	S54	0.375	0.000	0.01			1.9	SURCHARGED	
1.009	S55	0.660	0.000	0.04		839	3.3	SURCHARGED	

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

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	6
Number of Online Controls	6	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)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	450.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia 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, 35, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	S35	120 Winter	100	+45%	100/15 Summer			
1.001	S36	120 Winter	100	+45%	30/15 Summer	100/120 Summer		
1.002	S37	120 Winter	100	+45%	30/15 Summer			
1.003	S38	120 Winter	100	+45%	30/15 Summer			
2.000	S40	120 Winter	100	+45%	100/60 Summer			
2.001	S41	120 Winter	100	+45%	30/15 Summer			
1.004	S42	120 Winter	100	+45%	1/15 Summer			
1.005	S43	15 Summer	100	+45%				
1.006	S44	15 Summer	100	+45%				
1.007	S45	1440 Winter	100	+45%	100/960 Summer			
1.008	S46	1440 Winter	100	+45%	30/360 Summer			
3.000	S80	15 Summer	100	+45%				
3.001	S47	240 Winter	100	+45%	30/15 Summer			
4.000	S48	1440 Winter	100	+45%	30/240 Summer			
3.002	S49	1440 Winter	100	+45%	1/15 Summer	100/1440 Summer		
3.003	S50	15 Summer	100	+45%				
3.004	S53	1440 Winter	100	+45%	30/360 Summer			
5.000	S39	15 Summer	100	+45%				
5.001	S60	15 Summer	100	+45%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	S35	112.005	1.030	0.000	0.16			15.2	SURCHARGED
1.001	S36	112.003	1.318	3.539	0.23			20.9	FLOOD
1.002	S37	112.000	1.585	0.000	0.21			20.3	FLOOD RISK
1.003	S38	111.999	1.764	0.000	0.22			24.7	FLOOD RISK
2.000	S40	112.006	0.881	0.000	0.07			7.4	SURCHARGED
2.001	S41	112.001	1.751	0.000	0.03		247	4.0	SURCHARGED
1.004	S42	111.998	1.963	0.000	0.05			5.6	FLOOD RISK
1.005	S43	109.597	-0.198	0.000	0.25			25.2	OK
1.006	S44	109.344	-0.271	0.000	0.17			63.8	OK
1.007	S45	108.887	0.472	0.000	0.02			6.8	SURCHARGED
1.008	S46	108.885	1.000	0.000	0.04			7.6	FLOOD RISK
3.000	S80	115.255	-0.095	0.000	0.63			71.2	OK
3.001	S47	114.555	1.022	0.000	0.02		459	1.8	SURCHARGED
4.000	S48	113.651	1.116	0.000	0.03			2.9	FLOOD RISK
3.002	S49	113.651	1.766	1.603	0.00			1.1	FLOOD
3.003	S50	110.130	-0.255	0.000	0.06			17.1	OK
3.004	S53	108.817	0.503	0.000	0.00			0.9	SURCHARGED
5.000	S39	111.715	-0.049	0.000	0.96			40.8	OK
5.001	S60	111.523	-0.116	0.000	0.46			45.9	OK

PN	US/MH Name	Level Exceeded
1.000	S35	
1.001	S36	2
1.002	S37	
1.003	S38	
2.000	S40	
2.001	S41	
1.004	S42	
1.005	S43	
1.006	S44	
1.007	S45	
1.008	S46	
3.000	S80	
3.001	S47	
4.000	S48	
3.002	S49	2
3.003	S50	
3.004	S53	
5.000	S39	
5.001	S60	

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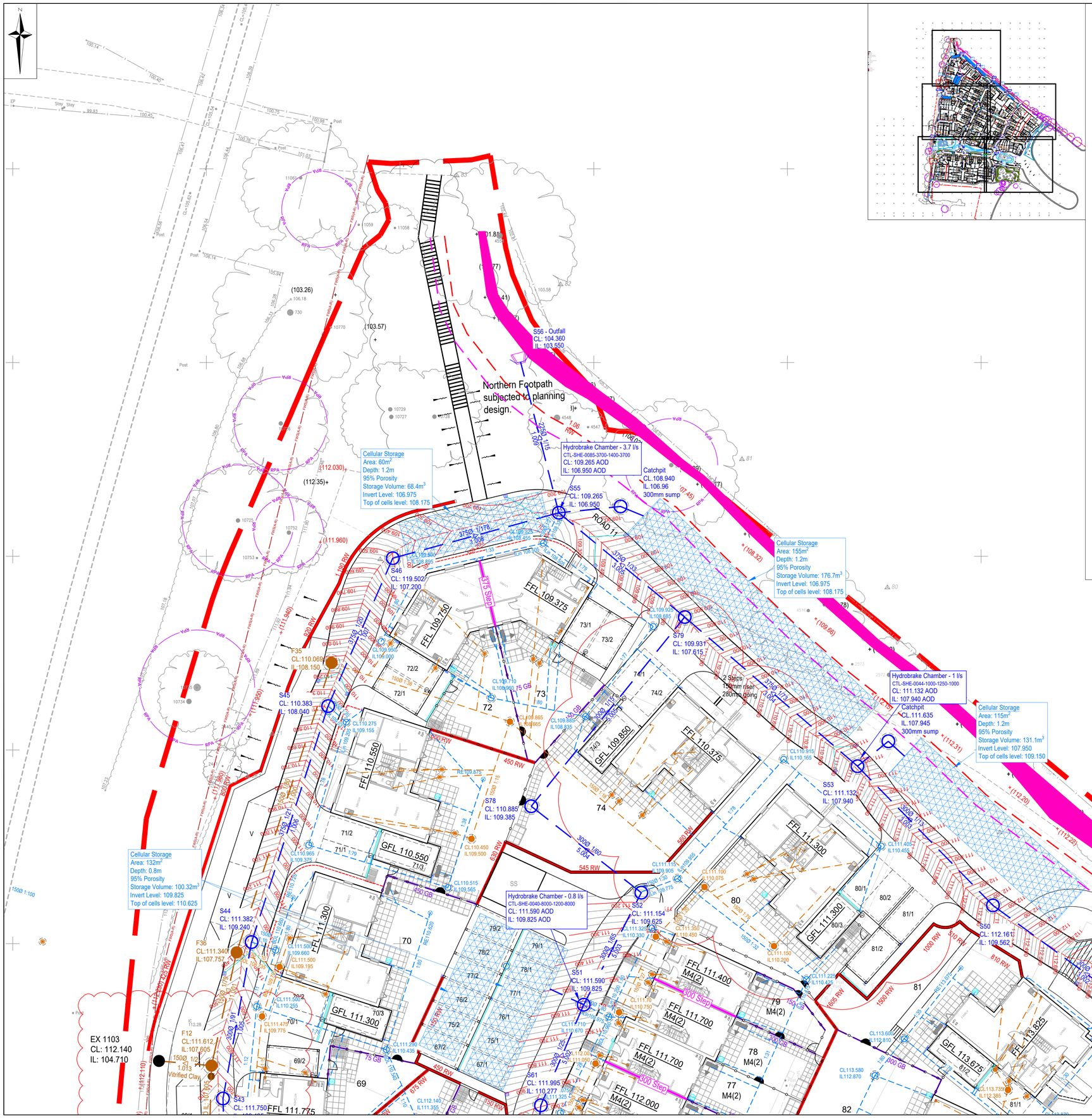
100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
5.002	S61	480 Winter	100	+45%					110.407
5.003	S51	480 Winter	100	+45%	30/120 Summer				110.407
5.004	S52	480 Winter	100	+45%					109.634
5.005	S78	480 Winter	100	+45%					109.389
3.005	S79	1440 Winter	100	+45%	30/960 Summer				108.883
3.006	S54	1440 Winter	100	+45%	30/120 Summer				108.883
1.009	S55	1440 Winter	100	+45%	1/240 Summer				108.883

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
5.002	S61	-0.170	0.000	0.03			5.6	OK	
5.003	S51	0.282	0.000	0.01		915	0.7	SURCHARGED	
5.004	S52	-0.291	0.000	0.01			0.7	OK	
5.005	S78	-0.296	0.000	0.00			0.7	OK	
3.005	S79	0.893	0.000	0.01			1.6	SURCHARGED	
3.006	S54	1.208	0.000	0.01			1.9	FLOOD RISK	
1.009	S55	1.493	0.000	0.04		1289	4.1	FLOOD RISK	

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APPENDIX C – DETAILED DESIGN DRAINAGE LAYOUT



Drainage Key

- (150Ø 1:100) — Existing Surface water sewer
- 150Ø 1:100 / 1.001 — Proposed Adoptable Surface Water Sewer
- Adoptable Surface Water Manhole
- G — Surface Water Gully & Connection
- 150Ø 1:100 / 1.001 — Proposed Private Surface Water Sewer
- Private Surface Water Manhole
- Private Surface Water Ø600mm PPIC
- Private Surface Water Ø450mm PPIC
- RE — Rodding Eye
- RWP — Rain Water Pipe Position
- YG — Yard Gully
- Linear Drainage Channel
- Below Ground Storage Tank
- (300Ø) FWS(A-R) — Existing Foul Water Sewer
- 150Ø 1:100 / 1.001 — Proposed Adoptable Foul Water Sewer
- Adoptable Foul Water Manhole
- 150Ø 1:100 / 1.001 — Proposed Private Foul Water Sewer
- Private Foul Water Manhole
- Private Foul Water Ø600mm PPIC
- Private Foul Water Ø450mm PPIC
- Private Foul Water Ø250mm PPIC
- SVP — Soil Vent Pipe Position
- G — Foul Water Gully
- S104 Easement
- Site Boundary
- Ownership Boundary
- Existing Tree RPA
- Pond Wet Area
- Dummy Manhole (Not to be built)
- 150Ø 1:100 / 1.001 — Dummy Pipe (Not to be built)
- Existing Watercourse
- Rain gardens

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. This drawing presents the site drainage layout for the proposed development at West Hoathly, Ibstock Brickworks.
2. This drawing is to be read in conjunction with all relevant Engineer's and Architect's drawings and specifications.
3. This drawing is to be printed in COLOUR.
4. For Drainage Construction Details refer to the following drawing 4004 - 4007.
5. Figures quoted next to manholes / rodding eyes are the chamber reference numbers, cover levels and invert levels. All levels are in m (AOD).
6. Footpaths are to be laid with a crossfall to allow drainage to soft landscaped areas.
7. All drainage design is subject to technical approval. No connections shall be made to any existing public sewers without written consent from the drainage authority. All adoptable drainage is to be constructed in accordance with Design and Construction Guidance (Sewerage Sector Guidance App C, Water UK).
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Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: SITE DRAINAGE (SHEET 1 OF 6)

Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage.dwg

Drawing No.							Rev.
890844	RSK	ZZ	XX	DR	C	3000	T04
Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	

Scale 1:200
0 2 4 6 8 10m



Drainage Key

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G	Surface Water Gully & Connection
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	Site Boundary
	Ownership Boundary
	Existing Tree RPA
	Pond Wet Area
	Dummy Manhole (Not to be built)
150Ø 1:100 1.001	Dummy Pipe (Not to be built)
	Existing Watercourse
	Rain gardens

Hydrobrake Chamber - 5 l/s
CTL-SHE-0094-5000-1800-5000
CL: 111.973 AOD
IL: 109.735 AOD

Cellular Storage
Area: 60.75m²
Depth: 1.2m
95% Porosity
Storage Volume: 69.26m³
Invert Level: 109.95
Top of cells level: 111.15

Hydrobrake Chamber - 8.4 l/s
CTL-SHE-0127-8400-1500-8400
CL: 112.400 AOD
IL: 110.700 AOD

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: SITE DRAINAGE (SHEET 2 OF 6)

Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

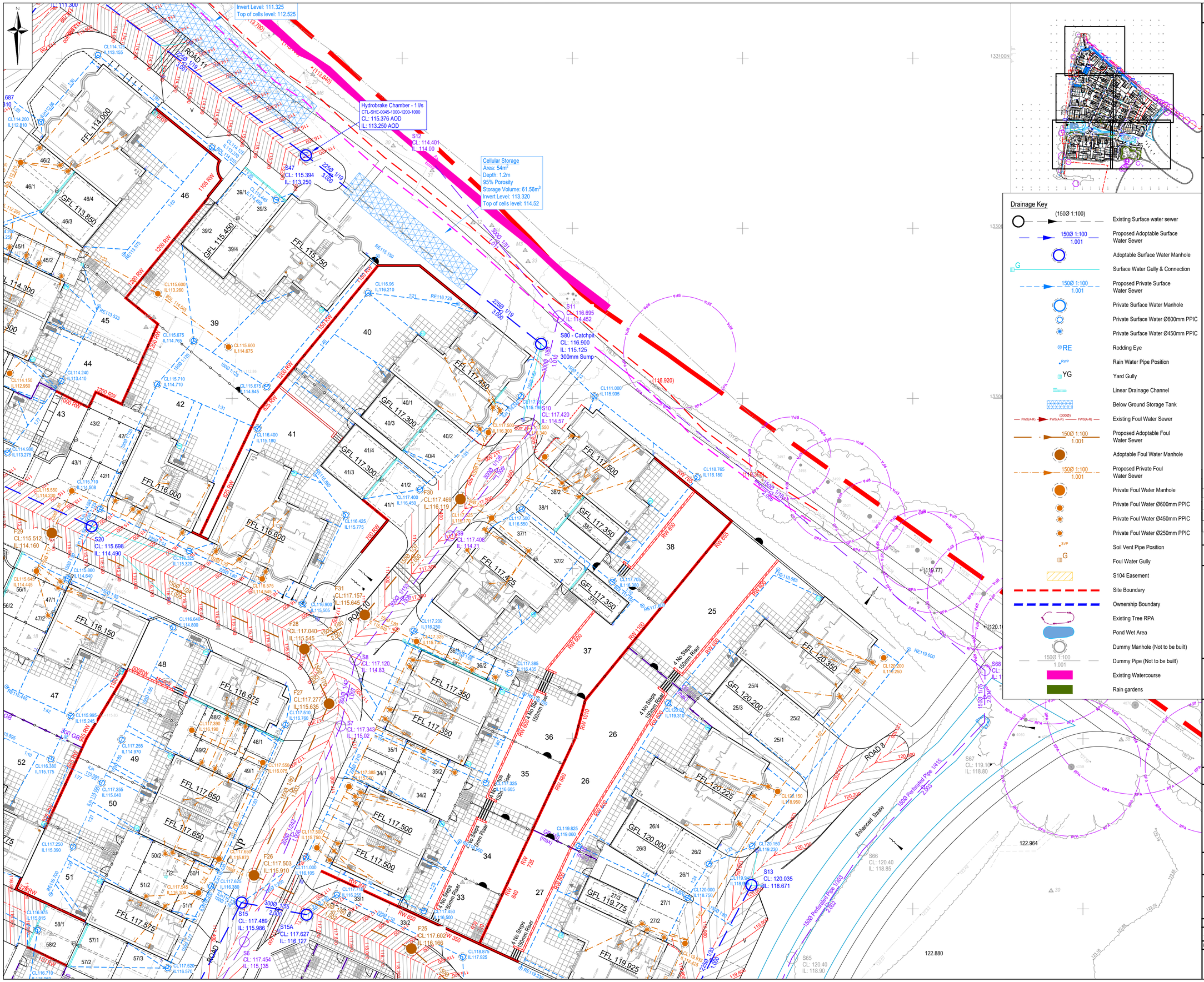
Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage.dwg

Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 3001 | Rev. T04

(Project | Orig. | Vol./Sys. | Lev./Loc. | Type | Role | Draw. No.)

Scale 1:200
0 2 4 6 8 10m



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- S104 Easement
- Site Boundary
- Ownership Boundary
- Existing Tree RPA
- Pond Wet Area
- Dummy Manhole (Not to be built)
- 150Ø 1:100 1.001 — Dummy Pipe (Not to be built)
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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: SITE DRAINAGE (SHEET 3 OF 6)

Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage.dwg

Drawing No.: 890844 | RSK (Orig.) | ZZ (Vol./Sys.) | XX (Lev./Loc.) | DR (Type) | C (Role) | 3002 (Draw. No.) | Rev. T04

Scale 1:200
0 2 4 6 8 10m



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Pond - Attenuation Basin
Base IL of attenuation: 110.850m AOD
Depth:1.5m
Top of Bank: 112.35m AOD
Approximate Volume: 840.20m³

Pond - Permanent Wet Feature
Approximate Area: 244m²
Proposed Depth: 0.6m (over-dig from base of attenuation)

Granular Filter Strip
Variable granular depth with 375Ø perforated pipe in 1m wide granular trench.

Granular Filter Strip
Variable granular depth with 375Ø perforated pipe in 1m wide granular trench.

2400mm (wide) x 1500mm (high) Box Culvert Approx 1:53

Pipe 4.002 to be connected at the side of the culvert

Permanent Wet Area

Gravel Strip

Buried Gabion Box

FFL 112.975
FFL 112.675
FFL 112.525
FFL 112.300
FFL 113.800
FFL 114.850 M4(2)
FFL 115.075 M4(2)
FFL 114.775
FFL 115.275
FFL 115.800
FFL 116.100
FFL 116.550
FFL 115.225 M4(2)
FFL 115.225 M4(3)
FFL 116.250
FFL 115.450 M4(2)
FFL 115.650 M4(2)
GFL 112.525
GFL 112.150

ROAD 1

PS1 CL:111.602 IL: 110.175
PS2 CL:111.225 IL: 109.230
PS3 CL:110.735 IL: 109.015

4 Steps 150mm riser 280mm going Railing Required

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: SITE DRAINAGE (SHEET 4 OF 6)

Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 890844
Drawing File: 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage.dwg

Drawing No.							Rev.
890844	RSK	ZZ	XX	DR	C	3003	T04
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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: SITE DRAINAGE (SHEET 5 OF 6)

Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage.dwg

Drawing No.							Rev.
890844	RSK	ZZ	XX	DR	C	3004	T04
Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	

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10. All drains and connections to be 100mm diameter, unless shown otherwise.
11. All branch drains, or connections, are to discharge to the collectors obliquely, and in the direction of the main flow.
12. All high void ratio attenuation units to be installed strictly in accordance with manufacturer's requirements.
13. All services should be laid below any permeable paving construction and coordinated around the proposed drainage on site. Where the service trench crosses the permeable paving the ducting will need to be sealed to ensure no egress of surface water runoff into the service ducting.
14. For guidance on types and distances of proposed trees away from adoptable sewers refer to Design and Construction Guidance Section B5.1.10 & 11 and B7.6.
15. SVP and WC pipes should be connected to the center of the inspection chamber.
16. All drainage pipes to be compliant with DCG section E2.19 for concrete pipes, E2.18 for vitrified clay pipes and E2.22 for structured wall thermoplastic pipes. Subject to Water Authority approval through S104 Agreement.
17. Pipe connection to public sewer should be construed using Vitrified Clay pipe.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T04	31.10.2025	Drawing updated to LLFA Comment.	YP	AM	-
T03	18.08.2025	Drawing updated to S106 Comment.	YP	-	-
T02	06.08.2025	Drawing updated to clients groundworks comments.	YP	AM	RD
T01	11.07.2025	Issued for Tender.	LN	AM	RD
P01	30.06.2025	Preliminary Tender Issue. Issued for Clients Comments.	YP	-	-

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: SITE DRAINAGE (SHEET 6 OF 6)

Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale: 1:500 | Orig Size: A0 | Dimensions: M

Project No.: 890844

Drawing File: 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage.dwg

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	Rev.
890844	RSK	ZZ	XX	DR	C	3005	T04

Scale 1:500
0 5 10 15 20 25m

APPENDIX D – DETAILED DESIGN SW CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	45	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S13	0.072	5.00	120.027	Manhole	Adoptable	1350	537381.032	133002.801	1.356
S13A	0.020	5.00	119.525	Manhole	Adoptable	1350	537371.566	132984.968	1.469
S14	0.004	5.00	118.810	Manhole	Adoptable	1350	537359.889	132958.035	1.450
S15A	0.028	5.00	117.627	Manhole	Adoptable	1350	537328.762	132999.324	1.500
S15	0.070	5.00	117.486	Manhole	Adoptable	1350	537321.123	133000.743	1.500
S16	0.035	5.00	117.281	Manhole	Adoptable	1350	537307.284	132974.647	1.575
S17A	0.037	5.00	117.780	Manhole	Adoptable	1350	537303.519	132922.000	1.500
S17	0.077	5.00	117.479	Manhole	Adoptable	1350	537305.100	132934.964	1.435
S18	0.050	5.00	117.650	Manhole	Adoptable	1350	537328.156	132954.390	2.105
S57	0.005	5.00	117.700	Manhole	Adoptable	1200	537310.486	132959.580	2.200
S19			116.800	Manhole	Adoptable	1350	537296.689	132965.373	1.425
S27	0.030	5.00	116.243	Manhole	Adoptable	1350	537280.409	132959.761	1.394
S28	0.115	5.00	115.024	Manhole	Adoptable	1350	537242.032	132929.479	1.672
S29	0.065	5.00	114.787	Manhole	Adoptable	1200	537244.489	132962.886	2.132
S59			114.517	Manhole	Adoptable	1200	537239.999	132967.856	2.168
S30	0.031	5.00	114.407	Manhole	Adoptable	1350	537241.219	132979.710	2.717
S69			112.900	Manhole	Adoptable	1350	537220.057	132974.326	1.400
S70			112.350	Manhole	Adoptable	1350	537210.189	132979.291	1.350
S20	0.159	5.00	115.715	Manhole	Adoptable	1350	537303.881	133044.785	1.300
S21	0.043	5.00	113.993	Manhole	Adoptable	1500	537277.012	133071.515	1.770
S23	0.067	5.00	114.213	Manhole	Adoptable	1350	537271.338	133059.748	2.055
S24B	0.020	5.00	116.379	Manhole	Adoptable	1350	537286.212	133003.134	1.425
S24A	0.061	5.00	115.797	Manhole	Adoptable	1350	537275.154	133006.593	1.425
S24	0.024	5.00	115.154	Manhole	Adoptable	1200	537263.273	133012.778	1.949
S25	0.101	5.00	114.704	Manhole	Adoptable	1350	537251.537	133017.994	2.777
S26	0.025	5.00	114.431	Manhole	Adoptable	1350	537240.171	132990.755	2.652
S58			112.700	Manhole	Adoptable	1350	537222.271	132985.047	1.400
S74	0.057	5.00	112.584	Manhole	Adoptable	1350	537190.082	132920.614	1.059
S73	0.034	5.00	116.684	Manhole	Adoptable	1350	537192.051	132942.166	5.334
S72	0.000	5.00	112.709	Manhole	Adoptable	1350	537183.505	132948.944	1.414
S71	0.000	5.00	113.075	Manhole	Adoptable	1200	537190.350	132961.574	1.852
S75	0.058	5.00	114.143	Manhole	Adoptable	1350	537225.267	132964.355	1.485
S31	0.044	5.00	113.319	Manhole	Adoptable	1200	537198.967	132966.063	2.219
S32	0.047	5.00	112.350	Manhole	Adoptable	1350	537200.522	132990.054	1.500
S33			112.400	Manhole	Adoptable	1500	537186.104	132996.874	1.700
S34			112.200	Manhole	Adoptable	1200	537182.913	133019.793	1.700
S76			108.030	Manhole	Adoptable	1350	537171.603	133019.893	0.380

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
1.000	S13	S13A	20.190	0.600	118.671	118.056	0.615	32.8	225	1 STANDARD	5.15
1.001	S13A	S14	29.355	0.600	118.056	117.435	0.621	47.3	225	1 STANDARD	5.40
1.002	S14	S18	31.941	0.600	117.360	115.945	1.415	22.6	300	1 STANDARD	5.56
2.000	S15A	S15	7.769	0.600	116.127	115.986	0.141	55.1	300	1 STANDARD	5.06
2.001	S15	S16	29.539	0.600	115.986	115.781	0.205	144.1	300	1 STANDARD	5.44
2.002	S16	S18	29.085	0.600	115.706	115.545	0.161	180.7	375	1 STANDARD	5.80
3.000	S17A	S17	13.060	0.600	116.280	116.044	0.236	55.3	300	1 STANDARD	5.10
3.001	S17	S18	30.149	0.600	116.044	115.945	0.099	304.5	300	1 STANDARD	5.66
1.003	S18	S57	18.416	0.600	115.545	115.500	0.045	409.2	300	1 STANDARD	6.20
1.004	S57	S19	14.964	0.600	115.500	115.375	0.125	119.7	300	1 STANDARD	6.37
1.005	S19	S30	57.293	0.600	115.375	111.690	3.685	15.5	300	1 STANDARD	6.61
4.000	S27	S29	36.056	0.600	114.849	112.730	2.119	17.0	225	1 STANDARD	5.19
5.000	S28	S29	33.497	0.600	113.352	112.730	0.622	53.9	225	1 STANDARD	5.31
4.001	S29	S59	6.699	0.600	112.655	112.349	0.306	21.9	300	1 STANDARD	5.35
4.002	S59	S30	11.916	0.600	112.349	111.765	0.584	20.4	300	1 STANDARD	5.40
1.006	S30	S69	21.836	0.600	111.690	111.500	0.190	114.9	375	1 STANDARD	6.82
1.007	S69	S70	11.047	0.600	111.500	111.000	0.500	22.1	375	1 STANDARD	6.87
1.008	S70	S32	14.467	0.600	111.000	110.925	0.075	192.9	375	1 STANDARD	7.06
6.000	S20	S23	35.818	0.600	114.415	112.233	2.182	16.4	300	1 STANDARD	5.15
7.000	S21	S23	13.063	0.600	112.223	112.158	0.065	201.0	375	1 STANDARD	5.17
6.001	S23	S25	46.211	0.600	112.158	111.927	0.231	200.0	375	1 STANDARD	5.77
8.000	S24B	S24A	11.586	0.600	114.954	114.372	0.582	19.9	225	1 STANDARD	5.07
8.001	S24A	S24	13.394	0.600	114.372	113.280	1.092	12.3	225	1 STANDARD	5.12
8.002	S24	S25	12.844	0.600	113.205	112.002	1.203	10.7	300	1 STANDARD	5.17
6.002	S25	S26	29.515	0.600	111.927	111.779	0.148	199.4	375	1 STANDARD	6.16
6.003	S26	S58	18.788	0.600	111.779	111.300	0.479	39.2	375	1 STANDARD	6.27
6.004	S58	S32	22.318	0.600	111.300	110.925	0.375	59.5	375	1 STANDARD	6.42
9.000	S74	S73	21.641	0.600	111.525	111.350	0.175	123.7	225	1 STANDARD	5.31
9.001	S73	S72	10.908	0.600	111.350	111.295	0.055	198.3	225	1 STANDARD	5.50
9.002	S72	S71	14.365	0.600	111.295	111.223	0.072	199.5	225	1 STANDARD	5.76
9.003	S71	S31	9.717	0.600	111.223	111.175	0.048	202.4	225	1 STANDARD	5.94
10.000	S75	S31	26.355	0.600	112.658	111.175	1.483	17.8	225	1 STANDARD	5.14
9.004	S31	S32	24.042	0.600	111.100	111.000	0.100	240.4	300	1 STANDARD	6.34
1.009	S32	S33	15.949	0.600	110.850	110.700	0.150	106.3	450	1 STANDARD	7.19
1.010	S33	S34	23.140	0.600	110.700	110.500	0.200	115.7	150	1 STANDARD	7.60
1.011	S34	S76	11.310	0.600	110.500	107.650	2.850	4.0	150	1 STANDARD	7.64

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	20.190	32.8	225	1 STANDARD	120.027	118.671	1.131	119.525	118.056	1.244
1.001	29.355	47.3	225	1 STANDARD	119.525	118.056	1.244	118.810	117.435	1.150
1.002	31.941	22.6	300	1 STANDARD	118.810	117.360	1.150	117.650	115.945	1.405
2.000	7.769	55.1	300	1 STANDARD	117.627	116.127	1.200	117.486	115.986	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S13	1350	Manhole	Adoptable	S13A	1350	Manhole	Adoptable
1.001	S13A	1350	Manhole	Adoptable	S14	1350	Manhole	Adoptable
1.002	S14	1350	Manhole	Adoptable	S18	1350	Manhole	Adoptable
2.000	S15A	1350	Manhole	Adoptable	S15	1350	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.001	29.539	144.1	300	1 STANDARD	117.486	115.986	1.200	117.281	115.781	1.200
2.002	29.085	180.7	375	1 STANDARD	117.281	115.706	1.200	117.650	115.545	1.730
3.000	13.060	55.3	300	1 STANDARD	117.780	116.280	1.200	117.479	116.044	1.135
3.001	30.149	304.5	300	1 STANDARD	117.479	116.044	1.135	117.650	115.945	1.405
1.003	18.416	409.2	300	1 STANDARD	117.650	115.545	1.805	117.700	115.500	1.900
1.004	14.964	119.7	300	1 STANDARD	117.700	115.500	1.900	116.800	115.375	1.125
1.005	57.293	15.5	300	1 STANDARD	116.800	115.375	1.125	114.407	111.690	2.417
4.000	36.056	17.0	225	1 STANDARD	116.243	114.849	1.169	114.787	112.730	1.832
5.000	33.497	53.9	225	1 STANDARD	115.024	113.352	1.447	114.787	112.730	1.832
4.001	6.699	21.9	300	1 STANDARD	114.787	112.655	1.832	114.517	112.349	1.868
4.002	11.916	20.4	300	1 STANDARD	114.517	112.349	1.868	114.407	111.765	2.342
1.006	21.836	114.9	375	1 STANDARD	114.407	111.690	2.342	112.900	111.500	1.025
1.007	11.047	22.1	375	1 STANDARD	112.900	111.500	1.025	112.350	111.000	0.975
1.008	14.467	192.9	375	1 STANDARD	112.350	111.000	0.975	112.350	110.925	1.050
6.000	35.818	16.4	300	1 STANDARD	115.715	114.415	1.000	114.213	112.233	1.680
7.000	13.063	201.0	375	1 STANDARD	113.993	112.223	1.395	114.213	112.158	1.680
6.001	46.211	200.0	375	1 STANDARD	114.213	112.158	1.680	114.704	111.927	2.402
8.000	11.586	19.9	225	1 STANDARD	116.379	114.954	1.200	115.797	114.372	1.200
8.001	13.394	12.3	225	1 STANDARD	115.797	114.372	1.200	115.154	113.280	1.649
8.002	12.844	10.7	300	1 STANDARD	115.154	113.205	1.649	114.704	112.002	2.402
6.002	29.515	199.4	375	1 STANDARD	114.704	111.927	2.402	114.431	111.779	2.277
6.003	18.788	39.2	375	1 STANDARD	114.431	111.779	2.277	112.700	111.300	1.025
6.004	22.318	59.5	375	1 STANDARD	112.700	111.300	1.025	112.350	110.925	1.050
9.000	21.641	123.7	225	1 STANDARD	112.584	111.525	0.834	116.684	111.350	5.109
9.001	10.908	198.3	225	1 STANDARD	116.684	111.350	5.109	112.709	111.295	1.189

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.001	S15	1350	Manhole	Adoptable	S16	1350	Manhole	Adoptable
2.002	S16	1350	Manhole	Adoptable	S18	1350	Manhole	Adoptable
3.000	S17A	1350	Manhole	Adoptable	S17	1350	Manhole	Adoptable
3.001	S17	1350	Manhole	Adoptable	S18	1350	Manhole	Adoptable
1.003	S18	1350	Manhole	Adoptable	S57	1200	Manhole	Adoptable
1.004	S57	1200	Manhole	Adoptable	S19	1350	Manhole	Adoptable
1.005	S19	1350	Manhole	Adoptable	S30	1350	Manhole	Adoptable
4.000	S27	1350	Manhole	Adoptable	S29	1200	Manhole	Adoptable
5.000	S28	1350	Manhole	Adoptable	S29	1200	Manhole	Adoptable
4.001	S29	1200	Manhole	Adoptable	S59	1200	Manhole	Adoptable
4.002	S59	1200	Manhole	Adoptable	S30	1350	Manhole	Adoptable
1.006	S30	1350	Manhole	Adoptable	S69	1350	Manhole	Adoptable
1.007	S69	1350	Manhole	Adoptable	S70	1350	Manhole	Adoptable
1.008	S70	1350	Manhole	Adoptable	S32	1350	Manhole	Adoptable
6.000	S20	1350	Manhole	Adoptable	S23	1350	Manhole	Adoptable
7.000	S21	1500	Manhole	Adoptable	S23	1350	Manhole	Adoptable
6.001	S23	1350	Manhole	Adoptable	S25	1350	Manhole	Adoptable
8.000	S24B	1350	Manhole	Adoptable	S24A	1350	Manhole	Adoptable
8.001	S24A	1350	Manhole	Adoptable	S24	1200	Manhole	Adoptable
8.002	S24	1200	Manhole	Adoptable	S25	1350	Manhole	Adoptable
6.002	S25	1350	Manhole	Adoptable	S26	1350	Manhole	Adoptable
6.003	S26	1350	Manhole	Adoptable	S58	1350	Manhole	Adoptable
6.004	S58	1350	Manhole	Adoptable	S32	1350	Manhole	Adoptable
9.000	S74	1350	Manhole	Adoptable	S73	1350	Manhole	Adoptable
9.001	S73	1350	Manhole	Adoptable	S72	1350	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
9.002	14.365	199.5	225	1 STANDARD	112.709	111.295	1.189	113.075	111.223	1.627
9.003	9.717	202.4	225	1 STANDARD	113.075	111.223	1.627	113.319	111.175	1.919
10.000	26.355	17.8	225	1 STANDARD	114.143	112.658	1.260	113.319	111.175	1.919
9.004	24.042	240.4	300	1 STANDARD	113.319	111.100	1.919	112.350	111.000	1.050
1.009	15.949	106.3	450	1 STANDARD	112.350	110.850	1.050	112.400	110.700	1.250
1.010	23.140	115.7	150	1 STANDARD	112.400	110.700	1.550	112.200	110.500	1.550
1.011	11.310	4.0	150	1 STANDARD	112.200	110.500	1.550	108.030	107.650	0.230

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
9.002	S72	1350	Manhole	Adoptable	S71	1200	Manhole	Adoptable
9.003	S71	1200	Manhole	Adoptable	S31	1200	Manhole	Adoptable
10.000	S75	1350	Manhole	Adoptable	S31	1200	Manhole	Adoptable
9.004	S31	1200	Manhole	Adoptable	S32	1350	Manhole	Adoptable
1.009	S32	1350	Manhole	Adoptable	S33	1500	Manhole	Adoptable
1.010	S33	1500	Manhole	Adoptable	S34	1200	Manhole	Adoptable
1.011	S34	1200	Manhole	Adoptable	S76	1350	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S13	537381.032	133002.801	120.027	1.356	1350	Manhole	0	1.000	118.671	225	1 STANDARD
S13A	537371.566	132984.968	119.525	1.469	1350	Manhole	1	1.000	118.056	225	1 STANDARD
							0	1.001	118.056	225	1 STANDARD
S14	537359.889	132958.035	118.810	1.450	1350	Manhole	1	1.001	117.435	225	1 STANDARD
							0	1.002	117.360	300	1 STANDARD
S15A	537328.762	132999.324	117.627	1.500	1350	Manhole	0	2.000	116.127	300	1 STANDARD
S15	537321.123	133000.743	117.486	1.500	1350	Manhole	1	2.000	115.986	300	1 STANDARD
							0	2.001	115.986	300	1 STANDARD
S16	537307.284	132974.647	117.281	1.575	1350	Manhole	1	2.001	115.781	300	1 STANDARD
							0	2.002	115.706	375	1 STANDARD
S17A	537303.519	132922.000	117.780	1.500	1350	Manhole	0	3.000	116.280	300	1 STANDARD

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S17	537305.100	132934.964	117.479	1.435	1350	Manhole	1	3.000	116.044	300	1 STANDARD
							0	3.001	116.044	300	1 STANDARD
S18	537328.156	132954.390	117.650	2.105	1350	Manhole	1	3.001	115.945	300	1 STANDARD
							2	2.002	115.545	375	1 STANDARD
							3	1.002	115.945	300	1 STANDARD
							0	1.003	115.545	300	1 STANDARD
S57	537310.486	132959.580	117.700	2.200	1200	Manhole	1	1.003	115.500	300	1 STANDARD
							0	1.004	115.500	300	1 STANDARD
S19	537296.689	132965.373	116.800	1.425	1350	Manhole	1	1.004	115.375	300	1 STANDARD
							0	1.005	115.375	300	1 STANDARD
S27	537280.409	132959.761	116.243	1.394	1350	Manhole	0	4.000	114.849	225	1 STANDARD
S28	537242.032	132929.479	115.024	1.672	1350	Manhole	0	5.000	113.352	225	1 STANDARD
S29	537244.489	132962.886	114.787	2.132	1200	Manhole	1	5.000	112.730	225	1 STANDARD
							2	4.000	112.730	225	1 STANDARD
							0	4.001	112.655	300	1 STANDARD
S59	537239.999	132967.856	114.517	2.168	1200	Manhole	1	4.001	112.349	300	1 STANDARD
							0	4.002	112.349	300	1 STANDARD
S30	537241.219	132979.710	114.407	2.717	1350	Manhole	1	4.002	111.765	300	1 STANDARD
							2	1.005	111.690	300	1 STANDARD
							0	1.006	111.690	375	1 STANDARD
S69	537220.057	132974.326	112.900	1.400	1350	Manhole	1	1.006	111.500	375	1 STANDARD
							0	1.007	111.500	375	1 STANDARD
S70	537210.189	132979.291	112.350	1.350	1350	Manhole	1	1.007	111.000	375	1 STANDARD
							0	1.008	111.000	375	1 STANDARD
S20	537303.881	133044.785	115.715	1.300	1350	Manhole	0	6.000	114.415	300	1 STANDARD
S21	537277.012	133071.515	113.993	1.770	1500	Manhole	0	7.000	112.223	375	1 STANDARD

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S23	537271.338	133059.748	114.213	2.055	1350	Manhole	1	7.000	112.158	375	1 STANDARD
							2	6.000	112.233	300	1 STANDARD
							0	6.001	112.158	375	1 STANDARD
S24B	537286.212	133003.134	116.379	1.425	1350	Manhole	0	8.000	114.954	225	1 STANDARD
S24A	537275.154	133006.593	115.797	1.425	1350	Manhole	1	8.000	114.372	225	1 STANDARD
							0	8.001	114.372	225	1 STANDARD
S24	537263.273	133012.778	115.154	1.949	1200	Manhole	1	8.001	113.280	225	1 STANDARD
							0	8.002	113.205	300	1 STANDARD
S25	537251.537	133017.994	114.704	2.777	1350	Manhole	1	8.002	112.002	300	1 STANDARD
							2	6.001	111.927	375	1 STANDARD
							0	6.002	111.927	375	1 STANDARD
S26	537240.171	132990.755	114.431	2.652	1350	Manhole	1	6.002	111.779	375	1 STANDARD
							0	6.003	111.779	375	1 STANDARD
S58	537222.271	132985.047	112.700	1.400	1350	Manhole	1	6.003	111.300	375	1 STANDARD
							0	6.004	111.300	375	1 STANDARD
S74	537190.082	132920.614	112.584	1.059	1350	Manhole	0	9.000	111.525	225	1 STANDARD
S73	537192.051	132942.166	116.684	5.334	1350	Manhole	1	9.000	111.350	225	1 STANDARD
							0	9.001	111.350	225	1 STANDARD
S72	537183.505	132948.944	112.709	1.414	1350	Manhole	1	9.001	111.295	225	1 STANDARD
							0	9.002	111.295	225	1 STANDARD
S71	537190.350	132961.574	113.075	1.852	1200	Manhole	1	9.002	111.223	225	1 STANDARD
							0	9.003	111.223	225	1 STANDARD
S75	537225.267	132964.355	114.143	1.485	1350	Manhole	0	10.000	112.658	225	1 STANDARD
S31	537198.967	132966.063	113.319	2.219	1200	Manhole	1	10.000	111.175	225	1 STANDARD
							2	9.003	111.175	225	1 STANDARD
							0	9.004	111.100	300	1 STANDARD

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S32	537200.522	132990.054	112.350	1.500	1350	Manhole	1	9.004	111.000	300	1 STANDARD
							2	6.004	110.925	375	1 STANDARD
							3	1.008	110.925	375	1 STANDARD
							0	1.009	110.850	450	1 STANDARD
S33	537186.104	132996.874	112.400	1.700	1500	Manhole	1	1.009	110.700	450	1 STANDARD
							0	1.010	110.700	150	1 STANDARD
S34	537182.913	133019.793	112.200	1.700	1200	Manhole	1	1.010	110.500	150	1 STANDARD
							0	1.011	110.500	150	1 STANDARD
S76	537171.603	133019.893	108.030	0.380	1350	Manhole	1	1.011	107.650	150	1 STANDARD

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	1440
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
5	0	0	0
30	0	0	0
30	35	0	0
100	0	0	0
100	45	0	0

Node S57 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	115.500	Product Number	CTL-SHE-0079-3500-1700-3500
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

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Node S33 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	110.700	Product Number	CTL-SHE-0127-8400-1500-8400
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	8.4	Min Node Diameter (mm)	1500

Node S18 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	116.650
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	160

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	250.7	0.0	0.300	315.1	0.0	0.600	385.1	0.0	0.900	460.1	0.0
0.100	271.3	0.0	0.400	337.9	0.0	0.700	409.5	0.0	1.000	486.2	0.0
0.200	292.9	0.0	0.500	361.2	0.0	0.800	434.5	0.0			

Node S32 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	361.9	0.0	0.400	461.1	0.0	0.800	569.8	0.0	1.200	687.5	0.0
0.100	385.5	0.0	0.500	487.4	0.0	0.900	598.4	0.0	1.300	718.4	0.0
0.200	410.1	0.0	0.600	514.3	0.0	1.000	627.5	0.0	1.400	749.8	0.0
0.300	435.3	0.0	0.700	541.8	0.0	1.100	657.2	0.0	1.500	781.8	0.0

Node S18 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	116.345
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	1072

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	125.0	0.0	0.300	125.0	0.0	0.301	0.0	0.0

Node S18 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	115.545
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	1584

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	165.0	0.0	0.800	165.0	0.0	0.801	0.0	0.0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S13	10	118.728	0.057	12.9	0.0813	0.0000	OK
15 minute summer	S13A	10	118.126	0.070	16.4	0.1005	0.0000	OK
15 minute summer	S14	11	117.414	0.054	16.8	0.0774	0.0000	OK
15 minute summer	S15A	10	116.164	0.037	5.0	0.0533	0.0000	OK
15 minute summer	S15	10	116.073	0.087	17.5	0.1242	0.0000	OK
240 minute summer	S16	180	115.844	0.138	6.7	0.1972	0.0000	OK
15 minute summer	S17A	10	116.323	0.043	6.6	0.0609	0.0000	OK
15 minute summer	S17	10	116.158	0.114	20.3	0.1626	0.0000	OK
240 minute summer	S18	184	115.843	0.298	20.0	47.1001	0.0000	OK
240 minute summer	S57	184	115.843	0.343	3.1	0.3875	0.0000	SURCHARGED
240 minute summer	S19	184	115.397	0.022	2.9	0.0308	0.0000	OK
15 minute summer	S27	10	114.880	0.031	5.4	0.0449	0.0000	OK
15 minute summer	S28	10	113.434	0.082	20.6	0.1174	0.0000	OK
15 minute summer	S29	10	112.735	0.080	37.2	0.0902	0.0000	OK
15 minute summer	S59	10	112.427	0.078	37.1	0.0882	0.0000	OK
15 minute summer	S30	11	111.814	0.124	43.6	0.1776	0.0000	OK
15 minute summer	S69	11	111.581	0.080	44.0	0.1152	0.0000	OK
240 minute winter	S70	224	111.169	0.168	10.9	0.2411	0.0000	OK
15 minute summer	S20	10	114.480	0.064	28.4	0.0923	0.0000	OK
15 minute summer	S21	11	112.302	0.079	7.7	0.1398	0.0000	OK
15 minute summer	S23	11	112.304	0.146	47.3	0.2094	0.0000	OK
15 minute summer	S24B	10	114.981	0.027	3.6	0.0386	0.0000	OK
15 minute summer	S24A	10	114.419	0.047	14.5	0.0674	0.0000	OK
15 minute summer	S24	10	113.252	0.047	18.7	0.0535	0.0000	OK
15 minute summer	S25	11	112.129	0.202	83.0	0.2885	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S13	1.000	S13A	12.8	1.396	0.141	0.1859	
15 minute summer	S13A	1.001	S14	16.1	1.531	0.212	0.3094	
15 minute summer	S14	1.002	S18	16.9	1.957	0.072	0.2755	
15 minute summer	S15A	2.000	S15	5.0	0.476	0.033	0.0850	
15 minute summer	S15	2.001	S16	17.1	1.020	0.185	0.4972	
240 minute summer	S16	2.002	S18	6.7	0.613	0.045	1.8972	
15 minute summer	S17A	3.000	S17	6.6	0.457	0.044	0.1993	
15 minute summer	S17	3.001	S18	20.0	0.849	0.315	0.7090	
240 minute summer	S18	1.003	S57	2.9	0.157	0.053	1.2961	
240 minute summer	S57	1.004	S19	2.9	0.835	0.029	0.0531	
240 minute summer	S19	1.005	S30	2.9	0.888	0.010	0.4420	
15 minute summer	S27	4.000	S29	5.3	1.586	0.042	0.1203	
15 minute summer	S28	5.000	S29	20.3	1.555	0.286	0.4371	
15 minute summer	S29	4.001	S59	37.1	2.515	0.156	0.0989	
15 minute summer	S59	4.002	S30	36.9	2.547	0.150	0.1729	
15 minute summer	S30	1.006	S69	44.0	1.812	0.236	0.5361	
15 minute summer	S69	1.007	S70	44.1	1.629	0.103	0.3036	
240 minute winter	S70	1.008	S32	10.9	0.761	0.076	0.8951	
15 minute summer	S20	6.000	S23	28.3	2.485	0.103	0.4239	
15 minute summer	S21	7.000	S23	8.1	0.300	0.058	0.3702	
15 minute summer	S23	6.001	S25	46.8	0.942	0.332	2.3140	
15 minute summer	S24B	8.000	S24A	3.6	0.840	0.031	0.0504	
15 minute summer	S24A	8.001	S24	14.4	2.395	0.096	0.0804	
15 minute summer	S24	8.002	S25	18.6	1.786	0.054	0.2260	
15 minute summer	S25	6.002	S26	82.3	1.741	0.582	1.3986	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S26	11	111.911	0.131	86.6	0.1881	0.0000	OK
15 minute summer	S58	11	111.447	0.147	86.6	0.2105	0.0000	OK
15 minute summer	S74	10	111.596	0.071	10.2	0.1010	0.0000	OK
15 minute summer	S73	10	111.453	0.103	16.2	0.1470	0.0000	OK
15 minute summer	S72	11	111.398	0.103	15.9	0.1470	0.0000	OK
15 minute summer	S71	11	111.327	0.104	16.0	0.1171	0.0000	OK
15 minute summer	S75	10	112.702	0.044	10.4	0.0627	0.0000	OK
15 minute summer	S31	11	111.243	0.143	33.5	0.1615	0.0000	OK
240 minute winter	S32	228	111.169	0.319	66.9	128.0623	0.0000	OK
240 minute winter	S33	200	111.217	0.517	55.5	0.9133	0.0000	SURCHARGED
240 minute winter	S34	212	110.531	0.031	8.4	0.0351	0.0000	OK
240 minute winter	S76	220	107.681	0.031	8.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S26	6.003	S58	86.6	2.326	0.270	0.6996	
15 minute summer	S58	6.004	S32	86.6	2.163	0.333	0.8939	
15 minute summer	S74	9.000	S73	10.1	0.717	0.216	0.3058	
15 minute summer	S73	9.001	S72	15.9	0.906	0.433	0.1917	
15 minute summer	S72	9.002	S71	16.0	0.900	0.436	0.2548	
15 minute summer	S71	9.003	S31	16.1	0.901	0.441	0.1732	
15 minute summer	S75	10.000	S31	10.3	1.714	0.083	0.2021	
15 minute summer	S31	9.004	S32	33.8	1.029	0.473	0.7892	
240 minute winter	S32	1.009	S33	55.5	0.669	0.177	2.2194	
240 minute winter	S33	1.010	S34	8.4	1.389	0.507	0.1434	
240 minute winter	S34	1.011	S76	8.4	3.205	0.093	0.0295	269.1

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Results for 5 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S13	10	118.745	0.074	21.6	0.1060	0.0000	OK
15 minute summer	S13A	10	118.149	0.093	27.5	0.1325	0.0000	OK
15 minute summer	S14	11	117.430	0.070	28.3	0.0996	0.0000	OK
15 minute summer	S15A	10	116.175	0.048	8.4	0.0684	0.0000	OK
15 minute summer	S15	10	116.100	0.114	29.4	0.1635	0.0000	OK
240 minute winter	S16	232	116.050	0.344	6.9	0.4917	0.0000	OK
15 minute summer	S17A	10	116.335	0.055	11.1	0.0784	0.0000	OK
15 minute summer	S17	10	116.196	0.152	34.1	0.2170	0.0000	OK
240 minute winter	S18	232	116.050	0.504	19.6	79.7956	0.0000	SURCHARGED
240 minute winter	S57	232	116.049	0.549	3.1	0.6213	0.0000	SURCHARGED
30 minute summer	S19	29	115.397	0.022	2.9	0.0308	0.0000	OK
15 minute summer	S27	10	114.889	0.040	9.0	0.0577	0.0000	OK
15 minute summer	S28	10	113.461	0.109	34.4	0.1563	0.0000	OK
15 minute summer	S29	10	112.759	0.104	62.4	0.1178	0.0000	OK
15 minute summer	S59	10	112.451	0.102	62.3	0.1152	0.0000	OK
15 minute summer	S30	10	111.851	0.161	73.5	0.2298	0.0000	OK
15 minute summer	S69	11	111.604	0.104	73.0	0.1486	0.0000	OK
240 minute winter	S70	240	111.359	0.359	15.4	0.5142	0.0000	OK
15 minute summer	S20	10	114.499	0.084	47.6	0.1196	0.0000	OK
15 minute summer	S21	11	112.352	0.129	12.9	0.2278	0.0000	OK
15 minute summer	S23	11	112.354	0.196	79.1	0.2803	0.0000	OK
15 minute summer	S24B	10	114.989	0.034	6.0	0.0493	0.0000	OK
15 minute summer	S24A	10	114.433	0.061	24.3	0.0874	0.0000	OK
15 minute summer	S24	10	113.266	0.061	31.3	0.0689	0.0000	OK
15 minute summer	S25	11	112.208	0.281	139.1	0.4015	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S13	1.000	S13A	21.5	1.610	0.236	0.2700	
15 minute summer	S13A	1.001	S14	27.1	1.764	0.357	0.4507	
15 minute summer	S14	1.002	S18	28.2	2.276	0.120	0.3953	
15 minute summer	S15A	2.000	S15	8.4	0.545	0.056	0.1236	
15 minute summer	S15	2.001	S16	28.8	1.179	0.312	0.7252	
240 minute winter	S16	2.002	S18	6.4	0.626	0.043	3.1430	
15 minute summer	S17A	3.000	S17	11.0	0.519	0.074	0.2905	
15 minute summer	S17	3.001	S18	33.5	0.989	0.529	1.0240	
240 minute winter	S18	1.003	S57	2.9	0.201	0.054	1.2968	
240 minute winter	S57	1.004	S19	2.9	0.836	0.029	0.0532	
30 minute summer	S19	1.005	S30	2.9	0.891	0.010	1.0913	
15 minute summer	S27	4.000	S29	8.9	1.850	0.070	0.1732	
15 minute summer	S28	5.000	S29	34.0	1.784	0.479	0.6384	
15 minute summer	S29	4.001	S59	62.3	2.912	0.261	0.1433	
15 minute summer	S59	4.002	S30	62.1	2.950	0.251	0.2508	
15 minute summer	S30	1.006	S69	73.0	2.109	0.392	0.7619	
15 minute summer	S69	1.007	S70	73.2	1.859	0.171	0.4397	
240 minute winter	S70	1.008	S32	15.2	0.775	0.106	1.5840	
15 minute summer	S20	6.000	S23	47.4	2.664	0.172	0.7579	
15 minute summer	S21	7.000	S23	12.2	0.302	0.087	0.5991	
15 minute summer	S23	6.001	S25	78.4	1.065	0.556	3.3893	
15 minute summer	S24B	8.000	S24A	6.0	0.972	0.051	0.0725	
15 minute summer	S24A	8.001	S24	24.1	2.782	0.162	0.1162	
15 minute summer	S24	8.002	S25	31.3	1.866	0.091	0.3945	
15 minute summer	S25	6.002	S26	140.7	2.010	0.996	2.0481	

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Results for 5 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S26	11	111.954	0.175	147.8	0.2501	0.0000	OK
15 minute summer	S58	11	111.498	0.198	145.4	0.2833	0.0000	OK
15 minute summer	S74	10	111.618	0.093	17.1	0.1331	0.0000	OK
15 minute summer	S73	10	111.491	0.141	27.1	0.2013	0.0000	OK
15 minute summer	S72	11	111.435	0.140	26.7	0.2005	0.0000	OK
15 minute summer	S71	11	111.363	0.140	26.7	0.1582	0.0000	OK
15 minute summer	S75	10	112.715	0.057	17.4	0.0810	0.0000	OK
240 minute winter	S31	232	111.359	0.259	10.0	0.2933	0.0000	OK
360 minute winter	S32	344	111.359	0.509	61.9	216.8931	0.0000	SURCHARGED
240 minute winter	S33	240	111.379	0.679	56.3	1.2000	0.0000	SURCHARGED
60 minute winter	S34	149	110.531	0.031	8.4	0.0352	0.0000	OK
60 minute winter	S76	149	107.681	0.031	8.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S26	6.003	S58	145.4	2.661	0.454	1.0268	
15 minute summer	S58	6.004	S32	146.2	2.478	0.563	1.3168	
15 minute summer	S74	9.000	S73	16.9	0.814	0.363	0.4499	
15 minute summer	S73	9.001	S72	26.7	1.028	0.727	0.2834	
15 minute summer	S72	9.002	S71	26.7	1.030	0.729	0.3728	
15 minute summer	S71	9.003	S31	26.9	1.051	0.740	0.2489	
15 minute summer	S75	10.000	S31	17.3	1.733	0.140	0.3829	
240 minute winter	S31	9.004	S32	10.0	0.703	0.140	1.6246	
360 minute winter	S32	1.009	S33	50.8	0.681	0.162	2.5270	
240 minute winter	S33	1.010	S34	8.4	1.389	0.509	0.1436	
60 minute winter	S34	1.011	S76	8.4	3.208	0.093	0.0296	283.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S13	10	118.762	0.091	31.6	0.1299	0.0000	OK
15 minute summer	S13A	10	118.171	0.115	40.3	0.1648	0.0000	OK
15 minute summer	S14	10	117.445	0.085	41.5	0.1210	0.0000	OK
360 minute winter	S15A	352	116.414	0.287	1.6	0.4102	0.0000	OK
360 minute winter	S15	352	116.414	0.428	5.6	0.6120	0.0000	SURCHARGED
360 minute winter	S16	352	116.414	0.708	7.5	1.0126	0.0000	SURCHARGED
360 minute winter	S17A	352	116.414	0.134	2.1	0.1912	0.0000	OK
360 minute winter	S17	352	116.414	0.370	6.4	0.5290	0.0000	SURCHARGED
360 minute winter	S18	352	116.414	0.869	20.9	129.3124	0.0000	SURCHARGED
360 minute winter	S57	352	116.414	0.913	3.1	1.0332	0.0000	SURCHARGED
15 minute summer	S19	97	115.397	0.022	2.9	0.0308	0.0000	OK
15 minute summer	S27	10	114.898	0.049	13.2	0.0697	0.0000	OK
15 minute summer	S28	10	113.490	0.138	50.5	0.1979	0.0000	OK
15 minute summer	S29	10	112.783	0.128	91.5	0.1447	0.0000	OK
15 minute summer	S59	10	112.474	0.125	91.2	0.1415	0.0000	OK
15 minute summer	S30	11	111.889	0.199	107.0	0.2847	0.0000	OK
360 minute winter	S69	352	111.644	0.144	16.4	0.2061	0.0000	OK
360 minute winter	S70	352	111.634	0.634	22.4	0.9073	0.0000	SURCHARGED
15 minute summer	S20	10	114.517	0.102	69.8	0.1459	0.0000	OK
15 minute summer	S21	11	112.411	0.188	18.9	0.3327	0.0000	OK
15 minute summer	S23	11	112.411	0.253	116.3	0.3614	0.0000	OK
15 minute summer	S24B	10	114.996	0.042	8.8	0.0595	0.0000	OK
15 minute summer	S24A	10	114.446	0.074	35.5	0.1065	0.0000	OK
15 minute summer	S24	10	113.279	0.074	45.9	0.0833	0.0000	OK
15 minute summer	S25	11	112.320	0.393	204.7	0.5620	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S13	1.000	S13A	31.5	1.779	0.345	0.3574	
15 minute summer	S13A	1.001	S14	39.7	1.948	0.524	0.5986	
15 minute summer	S14	1.002	S18	41.3	2.541	0.176	0.5186	
360 minute winter	S15A	2.000	S15	2.9	0.342	0.019	0.5429	
360 minute winter	S15	2.001	S16	5.5	0.688	0.059	2.0801	
360 minute winter	S16	2.002	S18	6.4	0.641	0.043	3.2080	
360 minute winter	S17A	3.000	S17	2.1	0.324	0.014	0.6578	
360 minute winter	S17	3.001	S18	6.4	0.612	0.101	2.1231	
360 minute winter	S18	1.003	S57	2.9	0.171	0.053	1.2968	
360 minute winter	S57	1.004	S19	2.9	0.836	0.029	0.0532	
15 minute summer	S19	1.005	S30	2.9	0.891	0.010	1.4824	
15 minute summer	S27	4.000	S29	13.1	2.007	0.103	0.2420	
15 minute summer	S28	5.000	S29	49.9	1.953	0.702	0.8556	
15 minute summer	S29	4.001	S59	91.2	3.231	0.382	0.1891	
15 minute summer	S59	4.002	S30	90.9	3.275	0.368	0.3308	
15 minute summer	S30	1.006	S69	106.1	2.320	0.569	1.0023	
360 minute winter	S69	1.007	S70	22.4	1.120	0.052	0.8244	
360 minute winter	S70	1.008	S32	25.1	0.722	0.175	1.5957	
15 minute summer	S20	6.000	S23	69.5	2.596	0.252	1.1520	
15 minute summer	S21	7.000	S23	18.6	0.301	0.132	0.8772	
15 minute summer	S23	6.001	S25	114.6	1.196	0.813	4.3721	
15 minute summer	S24B	8.000	S24A	8.8	1.085	0.075	0.0954	
15 minute summer	S24A	8.001	S24	35.4	3.099	0.237	0.1530	
15 minute summer	S24	8.002	S25	45.8	1.912	0.134	0.5360	
15 minute summer	S25	6.002	S26	198.1	2.255	1.402	2.5968	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S26	10	111.995	0.216	209.1	0.3097	0.0000	OK
480 minute winter	S58	464	111.623	0.323	28.6	0.4621	0.0000	OK
15 minute summer	S74	10	111.641	0.116	25.0	0.1654	0.0000	OK
480 minute winter	S73	464	111.623	0.272	4.1	0.3899	0.0000	SURCHARGED
480 minute winter	S72	464	111.623	0.328	4.1	0.4688	0.0000	SURCHARGED
480 minute winter	S71	464	111.623	0.400	4.1	0.4520	0.0000	SURCHARGED
15 minute summer	S75	10	112.727	0.069	25.5	0.0985	0.0000	OK
480 minute winter	S31	464	111.623	0.523	8.7	0.5912	0.0000	SURCHARGED
480 minute winter	S32	464	111.623	0.773	61.8	355.7339	0.0000	SURCHARGED
480 minute winter	S33	456	111.647	0.947	59.0	1.6733	0.0000	SURCHARGED
30 minute summer	S34	266	110.531	0.031	8.4	0.0352	0.0000	OK
30 minute summer	S76	266	107.681	0.031	8.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S26	6.003	S58	207.7	2.895	0.648	1.3473	
480 minute winter	S58	6.004	S32	29.7	1.122	0.114	2.3576	
15 minute summer	S74	9.000	S73	24.8	0.879	0.531	0.6081	
480 minute winter	S73	9.001	S72	4.1	0.619	0.112	0.4338	
480 minute winter	S72	9.002	S71	4.1	0.617	0.112	0.5713	
480 minute winter	S71	9.003	S31	4.1	0.599	0.112	0.3865	
15 minute summer	S75	10.000	S31	25.4	1.701	0.205	0.5856	
480 minute winter	S31	9.004	S32	8.0	0.607	0.112	1.6930	
480 minute winter	S32	1.009	S33	59.0	0.689	0.188	2.5270	
480 minute winter	S33	1.010	S34	8.4	1.389	0.509	0.1436	
30 minute summer	S34	1.011	S76	8.4	3.208	0.093	0.0296	340.1

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S13	10	118.779	0.107	42.7	0.1538	0.0000	OK
15 minute summer	S13A	10	118.195	0.139	54.3	0.1988	0.0000	OK
15 minute summer	S14	10	117.459	0.099	56.0	0.1414	0.0000	OK
360 minute winter	S15A	352	116.828	0.701	2.1	1.0035	0.0000	SURCHARGED
360 minute winter	S15	352	116.828	0.842	7.3	1.2053	0.0000	SURCHARGED
360 minute winter	S16	352	116.828	1.122	9.4	1.6060	0.0000	SURCHARGED
360 minute winter	S17A	352	116.828	0.548	2.8	0.7846	0.0000	SURCHARGED
360 minute winter	S17	352	116.828	0.784	8.7	1.1223	0.0000	SURCHARGED
360 minute winter	S18	352	116.828	1.283	27.8	186.7316	0.0000	SURCHARGED
360 minute winter	S57	352	116.828	1.328	3.4	1.5021	0.0000	SURCHARGED
360 minute winter	S19	352	115.397	0.022	3.1	0.0317	0.0000	OK
15 minute summer	S27	10	114.906	0.057	17.8	0.0810	0.0000	OK
15 minute summer	S28	10	113.525	0.173	68.1	0.2476	0.0000	OK
15 minute summer	S29	10	112.807	0.152	123.4	0.1717	0.0000	OK
15 minute summer	S59	10	112.497	0.148	123.1	0.1675	0.0000	OK
15 minute summer	S30	11	111.930	0.240	144.0	0.3436	0.0000	OK
480 minute winter	S69	456	111.933	0.433	34.5	0.6194	0.0000	SURCHARGED
720 minute winter	S70	705	111.926	0.926	26.8	1.3248	0.0000	SURCHARGED
15 minute summer	S20	10	114.535	0.120	94.2	0.1713	0.0000	OK
15 minute summer	S21	11	112.897	0.674	25.5	1.1912	0.0000	SURCHARGED
15 minute summer	S23	11	112.893	0.735	160.9	1.0514	0.0000	SURCHARGED
15 minute summer	S24B	10	115.002	0.048	11.8	0.0687	0.0000	OK
15 minute summer	S24A	10	114.459	0.087	47.8	0.1247	0.0000	OK
15 minute summer	S24	10	113.291	0.086	61.9	0.0969	0.0000	OK
15 minute summer	S25	11	112.620	0.693	269.1	0.9914	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S13	1.000	S13A	42.5	1.912	0.467	0.4486	
15 minute summer	S13A	1.001	S14	53.6	2.090	0.707	0.7539	
15 minute summer	S14	1.002	S18	55.6	2.764	0.237	0.7037	
360 minute winter	S15A	2.000	S15	2.1	0.365	0.014	0.5471	
360 minute winter	S15	2.001	S16	6.9	0.685	0.074	2.0801	
360 minute winter	S16	2.002	S18	9.1	0.671	0.061	3.2080	
360 minute winter	S17A	3.000	S17	2.8	0.347	0.019	0.9197	
360 minute winter	S17	3.001	S18	8.4	0.635	0.132	2.1231	
360 minute winter	S18	1.003	S57	3.1	0.137	0.057	1.2968	
360 minute winter	S57	1.004	S19	3.1	0.852	0.030	0.0554	
360 minute winter	S19	1.005	S30	3.1	0.934	0.011	1.5493	
15 minute summer	S27	4.000	S29	17.7	1.962	0.140	0.3565	
15 minute summer	S28	5.000	S29	67.2	2.061	0.946	1.0954	
15 minute summer	S29	4.001	S59	123.1	3.496	0.516	0.2359	
15 minute summer	S59	4.002	S30	122.8	3.378	0.497	0.4423	
15 minute summer	S30	1.006	S69	142.2	2.479	0.762	1.2514	
480 minute winter	S69	1.007	S70	28.9	1.062	0.068	1.2185	
720 minute winter	S70	1.008	S32	31.0	0.649	0.215	1.5957	
15 minute summer	S20	6.000	S23	93.9	2.547	0.341	1.7306	
15 minute summer	S21	7.000	S23	29.3	0.307	0.208	1.4408	
15 minute summer	S23	6.001	S25	152.3	1.381	1.080	5.0969	
15 minute summer	S24B	8.000	S24A	11.8	1.175	0.100	0.1180	
15 minute summer	S24A	8.001	S24	47.7	3.366	0.319	0.1897	
15 minute summer	S24	8.002	S25	61.8	1.858	0.181	0.5587	
15 minute summer	S25	6.002	S26	268.2	2.541	1.899	2.8908	

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S26	11	112.051	0.272	282.3	0.3891	0.0000	OK
720 minute winter	S58	705	111.916	0.616	22.2	0.8810	0.0000	SURCHARGED
720 minute winter	S74	705	111.916	0.391	2.5	0.5589	0.0000	SURCHARGED
720 minute winter	S73	705	111.916	0.565	4.0	0.8092	0.0000	SURCHARGED
720 minute winter	S72	705	111.916	0.620	3.8	0.8879	0.0000	SURCHARGED
720 minute winter	S71	705	111.916	0.693	3.7	0.7833	0.0000	SURCHARGED
15 minute summer	S75	10	112.739	0.081	34.4	0.1152	0.0000	OK
720 minute winter	S31	705	111.916	0.816	7.8	0.9224	0.0000	SURCHARGED
720 minute winter	S32	705	111.915	1.065	59.2	533.0558	0.0000	SURCHARGED
600 minute winter	S33	585	111.930	1.230	54.3	2.1730	0.0000	SURCHARGED
180 minute winter	S34	1348	110.531	0.031	8.4	0.0352	0.0000	OK
180 minute winter	S76	1348	107.681	0.031	8.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S26	6.003	S58	281.9	3.003	0.880	1.7917	
720 minute winter	S58	6.004	S32	26.6	0.979	0.102	2.4616	
720 minute winter	S74	9.000	S73	2.5	0.478	0.054	0.8607	
720 minute winter	S73	9.001	S72	3.8	0.601	0.103	0.4338	
720 minute winter	S72	9.002	S71	3.7	0.578	0.100	0.5713	
720 minute winter	S71	9.003	S31	3.5	0.559	0.096	0.3865	
15 minute summer	S75	10.000	S31	34.3	1.697	0.276	0.6920	
720 minute winter	S31	9.004	S32	7.6	0.552	0.107	1.6930	
720 minute winter	S32	1.009	S33	58.8	0.659	0.188	2.5270	
600 minute winter	S33	1.010	S34	8.4	1.389	0.509	0.1436	
180 minute winter	S34	1.011	S76	8.4	3.208	0.093	0.0296	729.7

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S13	10	118.776	0.105	41.0	0.1502	0.0000	OK
15 minute summer	S13A	10	118.191	0.135	52.2	0.1937	0.0000	OK
15 minute summer	S14	10	117.457	0.097	53.8	0.1385	0.0000	OK
360 minute winter	S15A	352	116.793	0.666	2.0	0.9532	0.0000	SURCHARGED
360 minute winter	S15	352	116.793	0.807	7.1	1.1550	0.0000	SURCHARGED
360 minute winter	S16	352	116.793	1.087	9.2	1.5557	0.0000	SURCHARGED
360 minute winter	S17A	352	116.793	0.513	2.7	0.7342	0.0000	SURCHARGED
360 minute winter	S17	352	116.793	0.749	8.3	1.0720	0.0000	SURCHARGED
360 minute winter	S18	352	116.793	1.248	26.8	176.6797	0.0000	SURCHARGED
360 minute winter	S57	352	116.793	1.293	3.8	1.4624	0.0000	SURCHARGED
360 minute winter	S19	352	115.397	0.022	3.0	0.0315	0.0000	OK
15 minute summer	S27	10	114.905	0.055	17.1	0.0794	0.0000	OK
15 minute summer	S28	10	113.519	0.167	65.5	0.2394	0.0000	OK
15 minute summer	S29	10	112.803	0.148	118.6	0.1679	0.0000	OK
15 minute summer	S59	10	112.494	0.145	118.4	0.1638	0.0000	OK
15 minute summer	S30	11	111.924	0.234	138.5	0.3347	0.0000	OK
600 minute winter	S69	540	111.900	0.400	29.3	0.5724	0.0000	SURCHARGED
600 minute winter	S70	570	111.888	0.888	39.5	1.2707	0.0000	SURCHARGED
15 minute summer	S20	10	114.532	0.117	90.6	0.1677	0.0000	OK
15 minute summer	S21	11	112.825	0.602	24.5	1.0642	0.0000	SURCHARGED
15 minute summer	S23	11	112.824	0.666	152.0	0.9526	0.0000	SURCHARGED
15 minute summer	S24B	10	115.001	0.047	11.4	0.0675	0.0000	OK
15 minute summer	S24A	10	114.457	0.085	46.0	0.1221	0.0000	OK
15 minute summer	S24	10	113.289	0.084	59.6	0.0951	0.0000	OK
15 minute summer	S25	11	112.570	0.643	257.5	0.9195	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S13	1.000	S13A	40.8	1.894	0.448	0.4350	
15 minute summer	S13A	1.001	S14	51.5	2.072	0.680	0.7310	
15 minute summer	S14	1.002	S18	53.5	2.734	0.228	0.6260	
360 minute winter	S15A	2.000	S15	2.0	0.358	0.013	0.5471	
360 minute winter	S15	2.001	S16	6.6	0.704	0.072	2.0801	
360 minute winter	S16	2.002	S18	9.4	0.675	0.063	3.2080	
360 minute winter	S17A	3.000	S17	2.7	0.343	0.018	0.9197	
360 minute winter	S17	3.001	S18	8.1	0.642	0.128	2.1231	
360 minute winter	S18	1.003	S57	3.6	0.133	0.066	1.2968	
360 minute winter	S57	1.004	S19	3.0	0.849	0.030	0.0549	
360 minute winter	S19	1.005	S30	3.0	0.931	0.011	1.2008	
15 minute summer	S27	4.000	S29	17.0	1.992	0.134	0.3393	
15 minute summer	S28	5.000	S29	64.7	2.050	0.911	1.0585	
15 minute summer	S29	4.001	S59	118.4	3.462	0.496	0.2291	
15 minute summer	S59	4.002	S30	118.1	3.376	0.478	0.4253	
15 minute summer	S30	1.006	S69	136.8	2.460	0.733	1.2145	
600 minute winter	S69	1.007	S70	39.5	1.006	0.093	1.2185	
600 minute winter	S70	1.008	S32	43.6	0.657	0.303	1.5957	
15 minute summer	S20	6.000	S23	90.3	2.555	0.328	1.7175	
15 minute summer	S21	7.000	S23	28.9	0.304	0.205	1.4408	
15 minute summer	S23	6.001	S25	145.3	1.317	1.030	5.0969	
15 minute summer	S24B	8.000	S24A	11.4	1.166	0.097	0.1148	
15 minute summer	S24A	8.001	S24	45.9	3.331	0.307	0.1844	
15 minute summer	S24	8.002	S25	59.5	1.843	0.174	0.5558	
15 minute summer	S25	6.002	S26	257.4	2.464	1.822	2.8384	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S26	11	112.041	0.261	270.9	0.3741	0.0000	OK
480 minute winter	S58	472	111.872	0.572	29.0	0.8186	0.0000	SURCHARGED
480 minute winter	S74	472	111.869	0.344	3.3	0.4918	0.0000	SURCHARGED
480 minute winter	S73	472	111.869	0.519	5.3	0.7421	0.0000	SURCHARGED
480 minute winter	S72	472	111.868	0.573	5.3	0.8206	0.0000	SURCHARGED
480 minute winter	S71	472	111.868	0.645	5.1	0.7297	0.0000	SURCHARGED
15 minute summer	S75	10	112.737	0.079	33.0	0.1127	0.0000	OK
600 minute winter	S31	585	111.868	0.768	8.6	0.8688	0.0000	SURCHARGED
600 minute winter	S32	585	111.868	1.018	71.3	502.8917	0.0000	SURCHARGED
480 minute summer	S33	464	111.871	1.171	59.1	2.0688	0.0000	SURCHARGED
720 minute summer	S34	1935	110.531	0.031	8.4	0.0352	0.0000	OK
720 minute summer	S76	1935	107.681	0.031	8.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S26	6.003	S58	270.0	2.969	0.843	1.7185	
480 minute winter	S58	6.004	S32	28.0	1.062	0.108	2.4616	
480 minute winter	S74	9.000	S73	3.3	0.522	0.071	0.8607	
480 minute winter	S73	9.001	S72	5.3	0.659	0.144	0.4338	
480 minute winter	S72	9.002	S71	5.1	0.637	0.138	0.5713	
480 minute winter	S71	9.003	S31	4.6	0.621	0.127	0.3865	
15 minute summer	S75	10.000	S31	32.9	1.685	0.265	0.6871	
600 minute winter	S31	9.004	S32	8.4	0.578	0.117	1.6930	
600 minute winter	S32	1.009	S33	54.4	0.558	0.173	2.5270	
480 minute summer	S33	1.010	S34	8.4	1.389	0.509	0.1436	
720 minute summer	S34	1.011	S76	8.4	3.208	0.093	0.0296	942.7

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S13	10	118.802	0.131	59.5	0.1879	0.0000	OK
15 minute summer	S13A	10	118.235	0.179	75.8	0.2562	0.0000	OK
15 minute summer	S14	10	117.478	0.118	78.5	0.1691	0.0000	OK
480 minute winter	S15A	464	117.125	0.998	2.4	1.4282	0.0000	SURCHARGED
480 minute winter	S15	464	117.125	1.139	8.6	1.6300	0.0000	SURCHARGED
480 minute winter	S16	472	117.125	1.419	11.6	2.0306	0.0000	FLOOD RISK
480 minute winter	S17A	472	117.125	0.845	3.1	1.2092	0.0000	SURCHARGED
480 minute winter	S17	472	117.125	1.081	9.7	1.5470	0.0000	SURCHARGED
480 minute winter	S18	472	117.125	1.580	33.1	282.5364	0.0000	SURCHARGED
480 minute winter	S57	472	117.125	1.625	3.7	1.8377	0.0000	SURCHARGED
480 minute winter	S19	472	115.398	0.023	3.4	0.0331	0.0000	OK
15 minute summer	S27	10	114.916	0.067	24.8	0.0959	0.0000	OK
15 minute summer	S28	10	113.990	0.638	95.0	0.9130	0.0000	SURCHARGED
15 minute summer	S29	10	112.841	0.186	170.1	0.2098	0.0000	OK
15 minute summer	S59	10	112.529	0.180	169.6	0.2040	0.0000	OK
720 minute winter	S30	705	112.276	0.586	17.6	0.8383	0.0000	SURCHARGED
720 minute winter	S69	705	112.276	0.776	39.6	1.1100	0.0000	SURCHARGED
720 minute winter	S70	705	112.276	1.276	44.8	1.8254	0.0000	FLOOD RISK
15 minute summer	S20	11	114.598	0.183	131.3	0.2613	0.0000	OK
15 minute summer	S21	11	113.966	1.743	35.5	3.0807	0.0000	FLOOD RISK
15 minute summer	S23	11	113.972	1.814	204.6	2.5952	0.0000	FLOOD RISK
15 minute summer	S24B	10	115.011	0.057	16.5	0.0813	0.0000	OK
15 minute summer	S24A	10	114.477	0.105	66.8	0.1501	0.0000	OK
15 minute summer	S24	11	113.601	0.396	86.4	0.4481	0.0000	SURCHARGED
15 minute summer	S25	11	113.538	1.611	351.1	2.3053	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S13	1.000	S13A	59.3	2.039	0.651	0.5849	
15 minute summer	S13A	1.001	S14	75.2	2.185	0.992	1.0672	
15 minute summer	S14	1.002	S18	77.7	3.032	0.331	1.3348	
480 minute winter	S15A	2.000	S15	3.0	0.347	0.020	0.5471	
480 minute winter	S15	2.001	S16	8.7	0.642	0.094	2.0801	
480 minute winter	S16	2.002	S18	11.3	0.661	0.076	3.2080	
480 minute winter	S17A	3.000	S17	3.2	0.347	0.021	0.9197	
480 minute winter	S17	3.001	S18	9.5	0.618	0.150	2.1231	
480 minute winter	S18	1.003	S57	3.4	0.133	0.062	1.2968	
480 minute winter	S57	1.004	S19	3.4	0.879	0.033	0.0591	
480 minute winter	S19	1.005	S30	3.4	0.936	0.012	2.0881	
15 minute summer	S27	4.000	S29	24.7	1.949	0.195	0.5280	
15 minute summer	S28	5.000	S29	92.3	2.321	1.300	1.3187	
15 minute summer	S29	4.001	S59	169.6	3.771	0.711	0.3014	
15 minute summer	S59	4.002	S30	169.2	3.451	0.685	0.6229	
720 minute winter	S30	1.006	S69	39.6	1.319	0.213	2.4084	
720 minute winter	S69	1.007	S70	44.8	0.971	0.105	1.2185	
720 minute winter	S70	1.008	S32	45.5	0.631	0.316	1.5957	
15 minute summer	S20	6.000	S23	127.3	2.515	0.462	2.0650	
15 minute summer	S21	7.000	S23	39.2	0.374	0.279	1.4408	
15 minute summer	S23	6.001	S25	195.7	1.775	1.388	5.0969	
15 minute summer	S24B	8.000	S24A	16.4	1.283	0.140	0.1505	
15 minute summer	S24A	8.001	S24	66.6	3.678	0.446	0.3841	
15 minute summer	S24	8.002	S25	82.6	1.964	0.242	0.9045	
15 minute summer	S25	6.002	S26	345.2	3.130	2.443	3.2554	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S26	12	112.633	0.854	364.9	1.2224	0.0000	SURCHARGED
720 minute winter	S58	705	112.276	0.976	30.4	1.3960	0.0000	SURCHARGED
15 minute summer	S74	11	112.455	0.930	47.1	1.3303	0.0000	FLOOD RISK
15 minute summer	S73	11	112.300	0.949	69.7	1.3587	0.0000	SURCHARGED
720 minute winter	S72	705	112.276	0.981	5.3	1.4032	0.0000	SURCHARGED
720 minute winter	S71	705	112.276	1.053	5.2	1.1904	0.0000	SURCHARGED
15 minute summer	S75	10	112.754	0.096	47.9	0.1379	0.0000	OK
720 minute winter	S31	705	112.276	1.176	11.3	1.3295	0.0000	SURCHARGED
720 minute winter	S32	705	112.276	1.426	88.4	786.3041	0.0000	FLOOD RISK
600 minute winter	S33	600	112.286	1.586	54.4	2.8020	0.0000	FLOOD RISK
720 minute winter	S34	705	110.531	0.031	8.4	0.0352	0.0000	OK
720 minute winter	S76	705	107.681	0.031	8.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S26	6.003	S58	360.0	3.264	1.124	2.0723	
720 minute winter	S58	6.004	S32	36.4	0.965	0.140	2.4616	
15 minute summer	S74	9.000	S73	42.9	1.078	0.918	0.8607	
15 minute summer	S73	9.001	S72	67.8	1.704	1.843	0.4338	
720 minute winter	S72	9.002	S71	5.2	0.597	0.142	0.5713	
720 minute winter	S71	9.003	S31	5.1	0.571	0.140	0.3865	
15 minute summer	S75	10.000	S31	47.7	1.688	0.385	0.7379	
720 minute winter	S31	9.004	S32	11.0	0.548	0.154	1.6930	
720 minute winter	S32	1.009	S33	52.9	0.661	0.169	2.5270	
600 minute winter	S33	1.010	S34	8.4	1.389	0.508	0.1435	
720 minute winter	S34	1.011	S76	8.4	3.208	0.093	0.0296	967.7

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	45	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S35	0.077	5.00	113.056	Manhole	Adoptable	1200	537221.695	133027.628	2.381
S36	0.027	5.00	112.015	Manhole	Adoptable	1350	537190.771	133030.286	1.630
S37	0.011	5.00	112.242	Manhole	Adoptable	1200	537194.323	133063.525	2.127
S38			112.188	Manhole	Adoptable	1200	537197.796	133080.226	2.253
S40	0.051	5.00	112.545	Manhole	Adoptable	1200	537221.833	133084.189	1.645
S41			112.156	Manhole	Adoptable	1200	537205.472	133085.679	2.206
S42	0.018	5.00	111.973	Manhole	Adoptable	1200	537202.101	133091.342	2.238
S43			111.751	Manhole	Adoptable	1200	537201.714	133104.018	2.256
S44	0.044	5.00	111.382	Manhole	Adoptable	1350	537204.667	133120.163	2.142
S45	0.038	5.00	110.383	Manhole	Adoptable	1350	537212.569	133144.530	2.343
S46	0.014	5.00	109.502	Manhole	Adoptable	1500	537219.251	133159.800	2.302
S80	0.059	5.00	116.900	Manhole	Adoptable	1200	537356.315	133066.410	1.775
S47	0.027	5.00	115.390	Manhole	Adoptable	1200	537328.632	133088.593	2.140
S48	0.073	5.00	113.687	Manhole	Adoptable	1350	537290.728	133097.662	1.377
S49	0.035	5.00	113.550	Manhole	Adoptable	1200	537300.132	133110.112	2.250
S50	0.013	5.00	112.161	Manhole	Adoptable	1200	537281.222	133123.952	2.599
S53			111.132	Manhole	Adoptable	1350	537267.237	133138.326	3.192
S39	0.013	5.00	113.168	Manhole	Adoptable	1350	537244.690	133072.410	1.629
S60	0.046	5.00	112.795	Manhole	Adoptable	1350	537231.842	133080.675	1.381
S61	0.005	5.00	111.995	Manhole	Adoptable	1350	537234.541	133103.313	1.718
S51	0.039	5.00	111.590	Manhole	Adoptable	1350	537238.964	133113.700	1.765
S52	0.063	5.00	111.161	Manhole	Adoptable	1350	537244.912	133125.265	1.536
S78			110.885	Manhole	Adoptable	1350	537233.546	133134.189	1.500
S79	0.013	5.00	109.931	Manhole	Adoptable	1500	537249.394	133153.723	2.316
S55	0.038	5.00	109.265	Manhole	Adoptable	1500	537236.390	133164.490	2.315
S56 - Outfall			104.360	Junction		20	537232.448	133180.054	0.810

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
1.000	S35	S36	31.038	0.600	110.675	110.385	0.290	107.0	300	1 STANDARD	5.34
1.001	S36	S37	33.428	0.600	110.385	110.115	0.270	123.8	300	1 STANDARD	5.74
1.002	S37	S38	17.058	0.600	110.115	109.935	0.180	94.8	300	1 STANDARD	5.91
1.003	S38	S42	11.921	0.600	109.935	109.735	0.200	59.6	300	1 STANDARD	6.01
2.000	S40	S41	16.429	0.600	110.900	110.025	0.875	18.8	225	1 STANDARD	5.09
2.001	S41	S42	6.590	0.600	109.950	109.735	0.215	30.7	300	1 STANDARD	5.13
1.004	S42	S43	12.682	0.600	109.735	109.495	0.240	52.8	300	1 STANDARD	6.11
1.005	S43	S44	16.413	0.600	109.495	109.315	0.180	91.2	300	1 STANDARD	6.27
1.006	S44	S45	25.616	0.600	109.240	108.040	1.200	21.3	375	1 STANDARD	6.38
1.007	S45	S46	16.668	0.600	108.040	107.200	0.840	19.8	525	1 STANDARD	6.44

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Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
1.008	S46	S55	17.769	0.600	107.200	106.950	0.250	71.1	525	1 STANDARD	6.55
3.000	S80	S47	35.474	0.600	115.125	113.250	1.875	18.9	225	1 STANDARD	5.20
3.001	S47	S49	35.712	0.600	113.250	111.375	1.875	19.0	225	1 STANDARD	5.39
4.000	S48	S49	15.602	0.600	112.310	111.375	0.935	16.7	225	1 STANDARD	5.08
3.002	S49	S50	23.434	0.600	111.300	109.562	1.738	13.5	300	1 STANDARD	5.48
3.003	S50	S53	20.055	0.600	109.562	108.015	1.547	13.0	300	1 STANDARD	5.56
3.004	S53	S79	23.568	0.600	107.940	107.615	0.325	72.5	375	1 STANDARD	5.74
5.000	S39	S60	15.277	0.600	111.539	111.414	0.125	122.2	225	1 STANDARD	5.22
5.001	S60	S61	22.798	0.600	111.414	110.352	1.062	21.5	225	1 STANDARD	5.35
5.002	S61	S51	11.289	0.600	110.277	109.825	0.452	25.0	300	1 STANDARD	5.41
5.003	S51	S52	13.005	0.600	109.825	109.625	0.200	65.0	300	1 STANDARD	5.52
5.004	S52	S78	14.451	0.600	109.625	109.385	0.240	60.2	300	1 STANDARD	5.64
5.005	S78	S79	25.154	0.600	109.385	107.690	1.695	14.8	300	1 STANDARD	5.74
3.005	S79	S55	16.883	0.600	107.615	106.950	0.665	25.4	525	1 STANDARD	5.81
1.009	S55	S56 - Outfall	16.055	0.600	106.950	103.550	3.400	4.7	225	1 STANDARD	6.59

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	31.038	107.0	300	1 STANDARD	113.056	110.675	2.081	112.015	110.385	1.330
1.001	33.428	123.8	300	1 STANDARD	112.015	110.385	1.330	112.242	110.115	1.827
1.002	17.058	94.8	300	1 STANDARD	112.242	110.115	1.827	112.188	109.935	1.953
1.003	11.921	59.6	300	1 STANDARD	112.188	109.935	1.953	111.973	109.735	1.938
2.000	16.429	18.8	225	1 STANDARD	112.545	110.900	1.420	112.156	110.025	1.906
2.001	6.590	30.7	300	1 STANDARD	112.156	109.950	1.906	111.973	109.735	1.938
1.004	12.682	52.8	300	1 STANDARD	111.973	109.735	1.938	111.751	109.495	1.956
1.005	16.413	91.2	300	1 STANDARD	111.751	109.495	1.956	111.382	109.315	1.767
1.006	25.616	21.3	375	1 STANDARD	111.382	109.240	1.767	110.383	108.040	1.968
1.007	16.668	19.8	525	1 STANDARD	110.383	108.040	1.818	109.502	107.200	1.777
1.008	17.769	71.1	525	1 STANDARD	109.502	107.200	1.777	109.265	106.950	1.790
3.000	35.474	18.9	225	1 STANDARD	116.900	115.125	1.550	115.390	113.250	1.915
3.001	35.712	19.0	225	1 STANDARD	115.390	113.250	1.915	113.550	111.375	1.950
4.000	15.602	16.7	225	1 STANDARD	113.687	112.310	1.152	113.550	111.375	1.950
3.002	23.434	13.5	300	1 STANDARD	113.550	111.300	1.950	112.161	109.562	2.299

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S35	1200	Manhole	Adoptable	S36	1350	Manhole	Adoptable
1.001	S36	1350	Manhole	Adoptable	S37	1200	Manhole	Adoptable
1.002	S37	1200	Manhole	Adoptable	S38	1200	Manhole	Adoptable
1.003	S38	1200	Manhole	Adoptable	S42	1200	Manhole	Adoptable
2.000	S40	1200	Manhole	Adoptable	S41	1200	Manhole	Adoptable
2.001	S41	1200	Manhole	Adoptable	S42	1200	Manhole	Adoptable
1.004	S42	1200	Manhole	Adoptable	S43	1200	Manhole	Adoptable
1.005	S43	1200	Manhole	Adoptable	S44	1350	Manhole	Adoptable
1.006	S44	1350	Manhole	Adoptable	S45	1350	Manhole	Adoptable
1.007	S45	1350	Manhole	Adoptable	S46	1500	Manhole	Adoptable
1.008	S46	1500	Manhole	Adoptable	S55	1500	Manhole	Adoptable
3.000	S80	1200	Manhole	Adoptable	S47	1200	Manhole	Adoptable
3.001	S47	1200	Manhole	Adoptable	S49	1200	Manhole	Adoptable
4.000	S48	1350	Manhole	Adoptable	S49	1200	Manhole	Adoptable
3.002	S49	1200	Manhole	Adoptable	S50	1200	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.003	20.055	13.0	300	1 STANDARD	112.161	109.562	2.299	111.132	108.015	2.817
3.004	23.568	72.5	375	1 STANDARD	111.132	107.940	2.817	109.931	107.615	1.941
5.000	15.277	122.2	225	1 STANDARD	113.168	111.539	1.404	112.795	111.414	1.156
5.001	22.798	21.5	225	1 STANDARD	112.795	111.414	1.156	111.995	110.352	1.418
5.002	11.289	25.0	300	1 STANDARD	111.995	110.277	1.418	111.590	109.825	1.465
5.003	13.005	65.0	300	1 STANDARD	111.590	109.825	1.465	111.161	109.625	1.236
5.004	14.451	60.2	300	1 STANDARD	111.161	109.625	1.236	110.885	109.385	1.200
5.005	25.154	14.8	300	1 STANDARD	110.885	109.385	1.200	109.931	107.690	1.941
3.005	16.883	25.4	525	1 STANDARD	109.931	107.615	1.791	109.265	106.950	1.790
1.009	16.055	4.7	225	1 STANDARD	109.265	106.950	2.090	104.360	103.550	0.585

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.003	S50	1200	Manhole	Adoptable	S53	1350	Manhole	Adoptable
3.004	S53	1350	Manhole	Adoptable	S79	1500	Manhole	Adoptable
5.000	S39	1350	Manhole	Adoptable	S60	1350	Manhole	Adoptable
5.001	S60	1350	Manhole	Adoptable	S61	1350	Manhole	Adoptable
5.002	S61	1350	Manhole	Adoptable	S51	1350	Manhole	Adoptable
5.003	S51	1350	Manhole	Adoptable	S52	1350	Manhole	Adoptable
5.004	S52	1350	Manhole	Adoptable	S78	1350	Manhole	Adoptable
5.005	S78	1350	Manhole	Adoptable	S79	1500	Manhole	Adoptable
3.005	S79	1500	Manhole	Adoptable	S55	1500	Manhole	Adoptable
1.009	S55	1500	Manhole	Adoptable	S56 - Outfall	20	Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S35	537221.695	133027.628	113.056	2.381	1200	Manhole					
							0	1.000	110.675	300	1 STANDARD
S36	537190.771	133030.286	112.015	1.630	1350	Manhole		1	1.000	110.385	300	1 STANDARD
								0	1.001	110.385	300	1 STANDARD
S37	537194.323	133063.525	112.242	2.127	1200	Manhole		1	1.001	110.115	300	1 STANDARD
								0	1.002	110.115	300	1 STANDARD
S38	537197.796	133080.226	112.188	2.253	1200	Manhole		1	1.002	109.935	300	1 STANDARD
								0	1.003	109.935	300	1 STANDARD
S40	537221.833	133084.189	112.545	1.645	1200	Manhole					
							0	2.000	110.900	225	1 STANDARD
S41	537205.472	133085.679	112.156	2.206	1200	Manhole		1	2.000	110.025	225	1 STANDARD
								0	2.001	109.950	300	1 STANDARD

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S42	537202.101	133091.342	111.973	2.238	1200	Manhole	1	2.001	109.735	300	1 STANDARD
							2	1.003	109.735	300	1 STANDARD
							0	1.004	109.735	300	1 STANDARD
S43	537201.714	133104.018	111.751	2.256	1200	Manhole	1	1.004	109.495	300	1 STANDARD
							0	1.005	109.495	300	1 STANDARD
S44	537204.667	133120.163	111.382	2.142	1350	Manhole	1	1.005	109.315	300	1 STANDARD
							0	1.006	109.240	375	1 STANDARD
S45	537212.569	133144.530	110.383	2.343	1350	Manhole	1	1.006	108.040	375	1 STANDARD
							0	1.007	108.040	525	1 STANDARD
S46	537219.251	133159.800	109.502	2.302	1500	Manhole	1	1.007	107.200	525	1 STANDARD
							0	1.008	107.200	525	1 STANDARD
S80	537356.315	133066.410	116.900	1.775	1200	Manhole	0	3.000	115.125	225	1 STANDARD
S47	537328.632	133088.593	115.390	2.140	1200	Manhole	1	3.000	113.250	225	1 STANDARD
							0	3.001	113.250	225	1 STANDARD
S48	537290.728	133097.662	113.687	1.377	1350	Manhole	0	4.000	112.310	225	1 STANDARD
S49	537300.132	133110.112	113.550	2.250	1200	Manhole	1	4.000	111.375	225	1 STANDARD
							2	3.001	111.375	225	1 STANDARD
							0	3.002	111.300	300	1 STANDARD
S50	537281.222	133123.952	112.161	2.599	1200	Manhole	1	3.002	109.562	300	1 STANDARD
							0	3.003	109.562	300	1 STANDARD
S53	537267.237	133138.326	111.132	3.192	1350	Manhole	1	3.003	108.015	300	1 STANDARD
							0	3.004	107.940	375	1 STANDARD
S39	537244.690	133072.410	113.168	1.629	1350	Manhole	0	5.000	111.539	225	1 STANDARD
S60	537231.842	133080.675	112.795	1.381	1350	Manhole	1	5.000	111.414	225	1 STANDARD
							0	5.001	111.414	225	1 STANDARD

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S61	537234.541	133103.313	111.995	1.718	1350	Manhole	1	5.001	110.352	225	1 STANDARD
							0	5.002	110.277	300	1 STANDARD
S51	537238.964	133113.700	111.590	1.765	1350	Manhole	1	5.002	109.825	300	1 STANDARD
							0	5.003	109.825	300	1 STANDARD
S52	537244.912	133125.265	111.161	1.536	1350	Manhole	1	5.003	109.625	300	1 STANDARD
							0	5.004	109.625	300	1 STANDARD
S78	537233.546	133134.189	110.885	1.500	1350	Manhole	1	5.004	109.385	300	1 STANDARD
							0	5.005	109.385	300	1 STANDARD
S79	537249.394	133153.723	109.931	2.316	1500	Manhole	1	5.005	107.690	300	1 STANDARD
							2	3.004	107.615	375	1 STANDARD
							0	3.005	107.615	525	1 STANDARD
S55	537236.390	133164.490	109.265	2.315	1500	Manhole	1	3.005	106.950	525	1 STANDARD
							2	1.008	106.950	525	1 STANDARD
							0	1.009	106.950	225	1 STANDARD
S56 - Outfall	537232.448	133180.054	104.360	0.810	20	Junction	1	1.009	103.550	225	1 STANDARD

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	1440
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
30	35	0	0
100	0	0	0
100	45	0	0

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Node S42 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	109.735	Product Number	CTL-SHE-0094-5000-1800-5000
Design Depth (m)	1.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node S47 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	113.250	Product Number	CTL-SHE-0045-1000-1200-1000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S49 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	111.300	Product Number	CTL-SHE-0042-1000-1600-1000
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S53 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	107.940	Product Number	CTL-SHE-0044-1000-1250-1000
Design Depth (m)	1.250	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node S51 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	109.825	Product Number	CTL-SHE-0040-8000-1200-8000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.8	Min Node Diameter (mm)	1200

Node S55 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	106.950	Product Number	CTL-SHE-0085-3700-1400-3700
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.7	Min Node Diameter (mm)	1200

Node S47 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	113.320
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	528

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	54.0	0.0	1.200	54.0	0.0	1.201	0.0	0.0

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Node S49 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	111.325
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	120.0	0.0	1.200	120.0	0.0	1.201	0.0	0.0

Node S53 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	115.0	0.0	1.200	115.0	0.0	1.201	0.0	0.0

Node S51 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	109.825
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	315

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	132.0	0.0	1.200	132.0	0.0	1.201	0.0	0.0

Node S41 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	109.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	250

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	67.5	0.0	1.200	67.5	0.0	1.201	0.0	0.0

Node S55 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.975
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	1620

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	155.0	0.0	1.200	155.0	0.0	1.201	0.0	0.0

Node S55 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.975
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	1620

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	60.0	0.0	1.200	60.0	0.0	1.201	0.0	0.0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S35	10	110.747	0.072	13.8	0.0810	0.0000	OK
15 minute summer	S36	10	110.471	0.086	18.4	0.1231	0.0000	OK
15 minute summer	S37	11	110.200	0.085	20.1	0.0958	0.0000	OK
60 minute summer	S38	46	110.110	0.175	13.8	0.1982	0.0000	OK
15 minute summer	S40	10	110.942	0.042	9.1	0.0471	0.0000	OK
60 minute summer	S41	46	110.110	0.160	16.2	10.4638	0.0000	OK
60 minute summer	S42	46	110.110	0.375	15.6	0.4245	0.0000	SURCHARGED
60 minute summer	S43	47	109.535	0.039	4.4	0.0447	0.0000	OK
15 minute summer	S44	10	109.283	0.043	12.1	0.0611	0.0000	OK
15 minute summer	S45	10	108.087	0.047	18.8	0.0678	0.0000	OK
15 minute summer	S46	10	107.269	0.069	21.2	0.1224	0.0000	OK
15 minute summer	S80	10	115.170	0.045	10.6	0.0508	0.0000	OK
120 minute winter	S47	114	113.479	0.229	4.7	8.4527	0.0000	SURCHARGED
15 minute summer	S48	10	112.358	0.048	13.1	0.0692	0.0000	OK
720 minute winter	S49	705	111.582	0.282	2.3	29.6219	0.0000	OK
15 minute summer	S50	11	109.582	0.020	2.7	0.0226	0.0000	OK
1440 minute winter	S53	1020	108.031	0.091	0.7	8.9957	0.0000	OK
15 minute summer	S39	10	111.573	0.033	2.3	0.0479	0.0000	OK
15 minute summer	S60	10	111.460	0.046	10.5	0.0657	0.0000	OK
15 minute summer	S61	10	110.326	0.049	11.2	0.0704	0.0000	OK
480 minute summer	S51	344	109.952	0.127	3.2	16.1028	0.0000	OK
15 minute summer	S52	10	109.684	0.059	11.4	0.0845	0.0000	OK
15 minute summer	S78	10	109.425	0.040	11.3	0.0573	0.0000	OK
15 minute summer	S79	11	107.658	0.043	13.4	0.0757	0.0000	OK
480 minute summer	S55	344	107.230	0.280	11.6	52.6091	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S35	1.000	S36	13.6	0.925	0.127	0.4585	
15 minute summer	S36	1.001	S37	18.2	1.104	0.182	0.5503	
15 minute summer	S37	1.002	S38	20.2	1.284	0.177	0.3497	
60 minute summer	S38	1.003	S42	12.6	0.285	0.087	0.6744	
15 minute summer	S40	2.000	S41	9.0	1.796	0.075	0.0827	
60 minute summer	S41	2.001	S42	15.6	0.376	0.077	0.3583	
60 minute summer	S42	1.004	S43	4.4	0.877	0.029	0.0632	
60 minute summer	S43	1.005	S44	4.4	0.802	0.038	0.0895	
15 minute summer	S44	1.006	S45	12.0	1.615	0.028	0.1911	
15 minute summer	S45	1.007	S46	18.7	1.455	0.017	0.2193	
15 minute summer	S46	1.008	S55	21.3	1.507	0.037	0.4149	
15 minute summer	S80	3.000	S47	10.5	0.883	0.088	0.5987	
120 minute winter	S47	3.001	S49	0.7	0.823	0.006	0.3734	
15 minute summer	S48	4.000	S49	13.0	2.086	0.102	0.0974	
720 minute winter	S49	3.002	S50	0.6	0.873	0.002	0.0187	
15 minute summer	S50	3.003	S53	2.7	1.361	0.009	0.0397	
1440 minute winter	S53	3.004	S79	0.6	0.533	0.003	0.0350	
15 minute summer	S39	5.000	S60	2.3	0.482	0.048	0.0724	
15 minute summer	S60	5.001	S61	10.3	1.783	0.092	0.1321	
15 minute summer	S61	5.002	S51	11.3	2.312	0.050	0.0701	
480 minute summer	S51	5.003	S52	0.5	0.461	0.004	0.0293	
15 minute summer	S52	5.004	S78	11.3	1.483	0.078	0.1107	
15 minute summer	S78	5.005	S79	11.1	2.001	0.038	0.1396	
15 minute summer	S79	3.005	S55	13.4	1.364	0.014	0.3629	
480 minute summer	S55	1.009	S56 - Outfall	3.4	2.182	0.014	0.0252	162.6

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	S56 - Outfall	344	103.569	0.019	3.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S35	10	110.789	0.114	33.8	0.1289	0.0000	OK
15 minute summer	S36	10	110.525	0.140	45.3	0.1998	0.0000	OK
60 minute winter	S37	61	110.494	0.379	24.3	0.4290	0.0000	SURCHARGED
60 minute winter	S38	60	110.494	0.559	23.8	0.6325	0.0000	SURCHARGED
15 minute summer	S40	10	110.965	0.065	22.4	0.0739	0.0000	OK
60 minute winter	S41	61	110.495	0.545	31.5	35.5454	0.0000	SURCHARGED
60 minute winter	S42	60	110.495	0.760	25.8	0.8590	0.0000	SURCHARGED
15 minute summer	S43	67	109.535	0.040	4.4	0.0448	0.0000	OK
15 minute summer	S44	10	109.299	0.059	23.7	0.0841	0.0000	OK
15 minute summer	S45	10	108.108	0.068	40.3	0.0971	0.0000	OK
480 minute winter	S46	472	107.662	0.462	22.1	0.8165	0.0000	OK
15 minute summer	S80	10	115.196	0.070	25.9	0.0797	0.0000	OK
240 minute winter	S47	236	113.835	0.585	6.6	27.1227	0.0000	SURCHARGED
15 minute summer	S48	10	112.386	0.076	32.0	0.1092	0.0000	OK
1440 minute winter	S49	1560	111.944	0.644	2.8	71.2970	0.0000	SURCHARGED
15 minute summer	S50	10	109.591	0.029	6.3	0.0332	0.0000	OK
1440 minute summer	S53	1140	108.056	0.116	1.0	11.8070	0.0000	OK
15 minute summer	S39	10	111.591	0.052	5.7	0.0749	0.0000	OK
15 minute summer	S60	10	111.487	0.073	25.8	0.1041	0.0000	OK
15 minute summer	S61	9	110.349	0.072	27.8	0.1025	0.0000	OK
720 minute winter	S51	675	110.150	0.325	3.4	41.1655	0.0000	SURCHARGED
15 minute summer	S52	10	109.717	0.092	28.0	0.1316	0.0000	OK
15 minute summer	S78	10	109.447	0.062	27.8	0.0890	0.0000	OK
15 minute summer	S79	10	107.681	0.066	33.3	0.1160	0.0000	OK
600 minute winter	S55	585	107.662	0.712	56.0	141.6328	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S35	1.000	S36	33.5	1.185	0.312	0.8790	
15 minute summer	S36	1.001	S37	44.7	1.411	0.448	1.0833	
60 minute winter	S37	1.002	S38	23.8	0.901	0.209	1.2012	
60 minute winter	S38	1.003	S42	22.0	0.345	0.153	0.8395	
15 minute summer	S40	2.000	S41	22.3	2.286	0.185	0.3821	
60 minute winter	S41	2.001	S42	-20.8	0.435	-0.103	0.4641	
60 minute winter	S42	1.004	S43	4.4	0.879	0.029	0.0635	
15 minute summer	S43	1.005	S44	4.4	0.803	0.038	0.0899	
15 minute summer	S44	1.006	S45	23.6	1.925	0.054	0.3144	
15 minute summer	S45	1.007	S46	40.1	1.830	0.037	0.3691	
480 minute winter	S46	1.008	S55	57.6	0.472	0.100	3.7087	
15 minute summer	S80	3.000	S47	25.8	1.227	0.214	0.8886	
240 minute winter	S47	3.001	S49	0.7	0.818	0.006	0.7261	
15 minute summer	S48	4.000	S49	31.9	2.693	0.249	0.2027	
1440 minute winter	S49	3.002	S50	0.7	0.887	0.002	0.0187	
15 minute summer	S50	3.003	S53	6.2	1.758	0.020	0.0708	
1440 minute summer	S53	3.004	S79	0.7	0.535	0.003	0.0483	
15 minute summer	S39	5.000	S60	5.6	0.627	0.120	0.1380	
15 minute summer	S60	5.001	S61	25.6	2.313	0.227	0.2524	
15 minute summer	S61	5.002	S51	27.9	2.603	0.125	0.2090	
720 minute winter	S51	5.003	S52	0.6	0.469	0.004	0.0310	
15 minute summer	S52	5.004	S78	27.8	1.946	0.194	0.2082	
15 minute summer	S78	5.005	S79	27.6	2.621	0.095	0.2645	
15 minute summer	S79	3.005	S55	33.1	1.669	0.034	0.9877	
600 minute winter	S55	1.009	S56 - Outfall	3.5	2.197	0.015	0.0256	330.2

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S56 - Outfall	158	103.569	0.019	3.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S35	10	110.809	0.134	45.6	0.1520	0.0000	OK
120 minute winter	S36	118	110.787	0.402	18.1	0.5756	0.0000	SURCHARGED
120 minute winter	S37	116	110.786	0.671	20.0	0.7590	0.0000	SURCHARGED
120 minute winter	S38	118	110.787	0.852	18.4	0.9633	0.0000	SURCHARGED
15 minute summer	S40	10	110.976	0.076	30.2	0.0863	0.0000	OK
120 minute winter	S41	118	110.787	0.837	25.2	54.6300	0.0000	SURCHARGED
120 minute winter	S42	118	110.787	1.052	21.1	1.1894	0.0000	SURCHARGED
15 minute summer	S43	116	109.535	0.040	4.4	0.0448	0.0000	OK
15 minute summer	S44	10	109.307	0.067	30.5	0.0952	0.0000	OK
15 minute summer	S45	10	108.117	0.077	52.9	0.1106	0.0000	OK
720 minute winter	S46	705	107.986	0.786	11.2	1.3889	0.0000	SURCHARGED
15 minute summer	S80	10	115.208	0.083	35.0	0.0934	0.0000	OK
240 minute winter	S47	236	114.061	0.811	8.9	38.9497	0.0000	SURCHARGED
15 minute summer	S48	10	112.400	0.090	43.2	0.1282	0.0000	OK
1440 minute winter	S49	1440	112.149	0.849	3.5	94.9986	0.0000	SURCHARGED
15 minute summer	S50	10	109.596	0.034	8.3	0.0380	0.0000	OK
1440 minute winter	S53	2190	108.111	0.171	0.9	17.8778	0.0000	OK
15 minute summer	S39	10	111.600	0.061	7.7	0.0872	0.0000	OK
15 minute summer	S60	10	111.499	0.085	34.9	0.1221	0.0000	OK
15 minute summer	S61	10	110.360	0.083	37.6	0.1182	0.0000	OK
720 minute winter	S51	705	110.298	0.473	4.5	60.0316	0.0000	SURCHARGED
15 minute summer	S52	10	109.732	0.107	37.8	0.1532	0.0000	OK
15 minute summer	S78	10	109.457	0.072	37.6	0.1035	0.0000	OK
720 minute winter	S79	705	107.987	0.372	10.5	0.6574	0.0000	OK
720 minute winter	S55	705	107.987	1.037	64.2	208.6031	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S35	1.000	S36	45.3	1.277	0.422	1.1005	
120 minute winter	S36	1.001	S37	18.1	1.039	0.181	2.3540	
120 minute winter	S37	1.002	S38	18.4	0.795	0.161	1.2012	
120 minute winter	S38	1.003	S42	18.0	0.307	0.125	0.8395	
15 minute summer	S40	2.000	S41	30.1	2.455	0.250	0.4209	
120 minute winter	S41	2.001	S42	-16.5	0.298	-0.082	0.4641	
120 minute winter	S42	1.004	S43	4.4	0.879	0.029	0.0635	
15 minute summer	S43	1.005	S44	4.4	0.803	0.038	0.0899	
15 minute summer	S44	1.006	S45	30.4	2.064	0.070	0.3777	
15 minute summer	S45	1.007	S46	52.7	1.980	0.048	0.4478	
720 minute winter	S46	1.008	S55	58.0	0.423	0.101	3.8387	
15 minute summer	S80	3.000	S47	34.8	1.342	0.290	0.9395	
240 minute winter	S47	3.001	S49	0.8	0.822	0.007	0.7274	
15 minute summer	S48	4.000	S49	43.0	2.926	0.336	0.2960	
1440 minute winter	S49	3.002	S50	0.8	0.921	0.002	0.0199	
15 minute summer	S50	3.003	S53	8.2	1.914	0.026	0.0861	
1440 minute winter	S53	3.004	S79	0.7	0.506	0.003	1.2018	
15 minute summer	S39	5.000	S60	7.6	0.683	0.162	0.1714	
15 minute summer	S60	5.001	S61	34.6	2.515	0.307	0.3138	
15 minute summer	S61	5.002	S51	37.5	2.680	0.168	0.2980	
720 minute winter	S51	5.003	S52	0.6	0.469	0.004	0.0350	
15 minute summer	S52	5.004	S78	37.6	2.127	0.262	0.2572	
15 minute summer	S78	5.005	S79	37.3	2.860	0.129	0.3277	
720 minute winter	S79	3.005	S55	9.6	0.188	0.010	3.2051	
720 minute winter	S55	1.009	S56 - Outfall	3.5	2.197	0.015	0.0256	389.9

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	S56 - Outfall	110	103.569	0.019	3.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S35	10	110.807	0.132	43.9	0.1488	0.0000	OK
120 minute winter	S36	118	110.753	0.368	17.6	0.5269	0.0000	SURCHARGED
120 minute winter	S37	118	110.754	0.639	19.5	0.7222	0.0000	SURCHARGED
120 minute winter	S38	118	110.753	0.818	17.6	0.9256	0.0000	SURCHARGED
15 minute summer	S40	10	110.975	0.075	29.0	0.0845	0.0000	OK
120 minute winter	S41	118	110.753	0.803	24.0	52.4254	0.0000	SURCHARGED
120 minute winter	S42	120	110.753	1.018	20.2	1.1511	0.0000	SURCHARGED
15 minute summer	S43	109	109.535	0.040	4.4	0.0448	0.0000	OK
15 minute summer	S44	10	109.306	0.065	29.5	0.0937	0.0000	OK
15 minute summer	S45	10	108.116	0.076	51.0	0.1086	0.0000	OK
720 minute summer	S46	720	107.929	0.729	41.2	1.2886	0.0000	SURCHARGED
15 minute summer	S80	10	115.206	0.081	33.6	0.0914	0.0000	OK
240 minute winter	S47	236	114.034	0.784	8.6	37.5152	0.0000	SURCHARGED
15 minute summer	S48	10	112.398	0.088	41.6	0.1256	0.0000	OK
1440 minute winter	S49	1440	112.091	0.791	3.3	88.2295	0.0000	SURCHARGED
15 minute summer	S50	10	109.595	0.033	8.0	0.0374	0.0000	OK
1440 minute winter	S53	2010	108.095	0.155	0.9	16.1380	0.0000	OK
15 minute summer	S39	10	111.599	0.060	7.4	0.0855	0.0000	OK
15 minute summer	S60	10	111.498	0.083	33.5	0.1195	0.0000	OK
15 minute summer	S61	10	110.358	0.081	36.1	0.1157	0.0000	OK
480 minute winter	S51	472	110.271	0.446	6.1	56.5459	0.0000	SURCHARGED
15 minute summer	S52	10	109.730	0.105	36.4	0.1502	0.0000	OK
15 minute summer	S78	10	109.456	0.071	36.1	0.1015	0.0000	OK
720 minute summer	S79	720	107.928	0.313	5.9	0.5524	0.0000	OK
720 minute summer	S55	720	107.929	0.979	43.3	196.6366	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S35	1.000	S36	43.6	1.265	0.406	1.0691	
120 minute winter	S36	1.001	S37	17.6	1.042	0.176	2.3540	
120 minute winter	S37	1.002	S38	17.6	0.783	0.154	1.2012	
120 minute winter	S38	1.003	S42	17.2	0.336	0.119	0.8395	
15 minute summer	S40	2.000	S41	28.9	2.462	0.240	0.4183	
120 minute winter	S41	2.001	S42	18.0	0.385	0.090	0.4641	
120 minute winter	S42	1.004	S43	4.4	0.879	0.029	0.0635	
15 minute summer	S43	1.005	S44	4.4	0.803	0.038	0.0899	
15 minute summer	S44	1.006	S45	29.4	2.045	0.068	0.3684	
15 minute summer	S45	1.007	S46	50.8	1.960	0.046	0.4364	
720 minute summer	S46	1.008	S55	35.0	0.378	0.061	3.8387	
15 minute summer	S80	3.000	S47	33.4	1.327	0.278	0.9327	
240 minute winter	S47	3.001	S49	0.8	0.822	0.007	0.7272	
15 minute summer	S48	4.000	S49	41.4	2.896	0.324	0.2840	
1440 minute winter	S49	3.002	S50	0.7	0.912	0.002	0.0195	
15 minute summer	S50	3.003	S53	7.9	1.894	0.026	0.0840	
1440 minute winter	S53	3.004	S79	0.7	0.516	0.003	0.8953	
15 minute summer	S39	5.000	S60	7.3	0.676	0.156	0.1666	
15 minute summer	S60	5.001	S61	33.3	2.488	0.295	0.3048	
15 minute summer	S61	5.002	S51	36.0	2.671	0.161	0.2849	
480 minute winter	S51	5.003	S52	0.6	0.469	0.004	0.0399	
15 minute summer	S52	5.004	S78	36.1	2.103	0.252	0.2504	
15 minute summer	S78	5.005	S79	35.8	2.828	0.124	0.3188	
720 minute summer	S79	3.005	S55	6.6	0.213	0.007	2.9549	
720 minute summer	S55	1.009	S56 - Outfall	3.5	2.197	0.015	0.0256	388.4

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S56 - Outfall	148	103.569	0.019	3.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	S35	118	111.973	1.298	18.9	1.4677	0.0000	SURCHARGED
120 minute winter	S36	118	111.972	1.587	25.5	2.2716	0.0000	FLOOD RISK
120 minute winter	S37	116	111.972	1.857	26.1	2.1000	0.0000	FLOOD RISK
120 minute winter	S38	116	111.973	2.037	25.4	2.3044	0.0000	FLOOD RISK
120 minute winter	S40	116	111.972	1.072	12.5	1.2128	0.0000	SURCHARGED
120 minute winter	S41	116	111.973	2.023	37.1	79.2699	0.0000	FLOOD RISK
120 minute winter	S42	116	111.973	2.238	29.2	2.5312	0.0824	FLOOD
120 minute winter	S43	116	109.539	0.044	5.5	0.0498	0.0000	OK
15 minute summer	S44	10	109.317	0.077	40.6	0.1096	0.0000	OK
1440 minute winter	S45	1140	109.265	1.225	7.2	1.7531	0.0000	SURCHARGED
1440 minute winter	S46	1140	109.265	2.065	8.8	3.6489	0.0000	FLOOD RISK
15 minute summer	S80	10	115.224	0.099	48.7	0.1120	0.0000	OK
360 minute winter	S47	352	114.426	1.175	9.2	58.0652	0.0000	SURCHARGED
1440 minute winter	S48	1470	112.467	0.157	2.5	0.2243	0.0000	OK
1440 minute winter	S49	1470	112.467	1.167	4.5	131.5338	0.0000	SURCHARGED
15 minute summer	S50	10	109.601	0.039	11.3	0.0440	0.0000	OK
1440 minute summer	S53	2880	108.555	0.615	1.8	67.0518	0.0000	SURCHARGED
15 minute summer	S39	10	111.611	0.072	10.7	0.1034	0.0000	OK
15 minute summer	S60	10	111.517	0.102	48.6	0.1466	0.0000	OK
720 minute winter	S61	705	110.506	0.229	3.9	0.3278	0.0000	OK
720 minute winter	S51	705	110.506	0.681	6.9	86.3831	0.0000	SURCHARGED
15 minute summer	S52	10	109.752	0.127	52.5	0.1819	0.0000	OK
15 minute summer	S78	10	109.471	0.085	52.3	0.1223	0.0000	OK
1440 minute winter	S79	1080	109.265	1.650	14.7	2.9158	0.0000	SURCHARGED
1440 minute winter	S55	1080	109.265	2.315	42.9	249.3949	5.4296	FLOOD

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	S35	1.000	S36	18.9	0.994	0.176	2.1857	
120 minute winter	S36	1.001	S37	23.6	1.062	0.236	2.3540	
120 minute winter	S37	1.002	S38	25.4	0.883	0.223	1.2012	
120 minute winter	S38	1.003	S42	24.9	0.353	0.172	0.8395	
120 minute winter	S40	2.000	S41	12.5	1.382	0.104	0.6534	
120 minute winter	S41	2.001	S42	-24.9	-0.353	-0.123	0.4641	
120 minute winter	S42	1.004	S43	5.5	0.941	0.036	0.0742	
120 minute winter	S43	1.005	S44	5.5	0.859	0.047	0.1051	
15 minute summer	S44	1.006	S45	40.5	2.237	0.093	0.4653	
1440 minute winter	S45	1.007	S46	7.2	0.986	0.007	3.6008	
1440 minute winter	S46	1.008	S55	38.4	0.302	0.067	3.8387	
15 minute summer	S80	3.000	S47	48.5	1.476	0.404	1.0036	
360 minute winter	S47	3.001	S49	1.0	0.819	0.008	0.7295	
1440 minute winter	S48	4.000	S49	2.5	0.781	0.020	0.5406	
1440 minute winter	S49	3.002	S50	0.9	0.962	0.003	0.0220	
15 minute summer	S50	3.003	S53	11.2	2.105	0.036	0.1070	
1440 minute summer	S53	3.004	S79	1.8	0.508	0.008	2.5995	
15 minute summer	S39	5.000	S60	10.6	0.746	0.226	0.2182	
15 minute summer	S60	5.001	S61	48.2	2.748	0.428	0.4002	
720 minute winter	S61	5.002	S51	5.5	1.004	0.025	0.7233	
720 minute winter	S51	5.003	S52	0.6	0.480	0.004	0.0397	
15 minute summer	S52	5.004	S78	52.3	2.341	0.364	0.3245	
15 minute summer	S78	5.005	S79	51.9	3.147	0.179	0.4148	
1440 minute winter	S79	3.005	S55	-11.0	0.137	-0.011	3.6473	
1440 minute winter	S55	1.009	S56 - Outfall	4.7	2.394	0.019	0.0312	536.0

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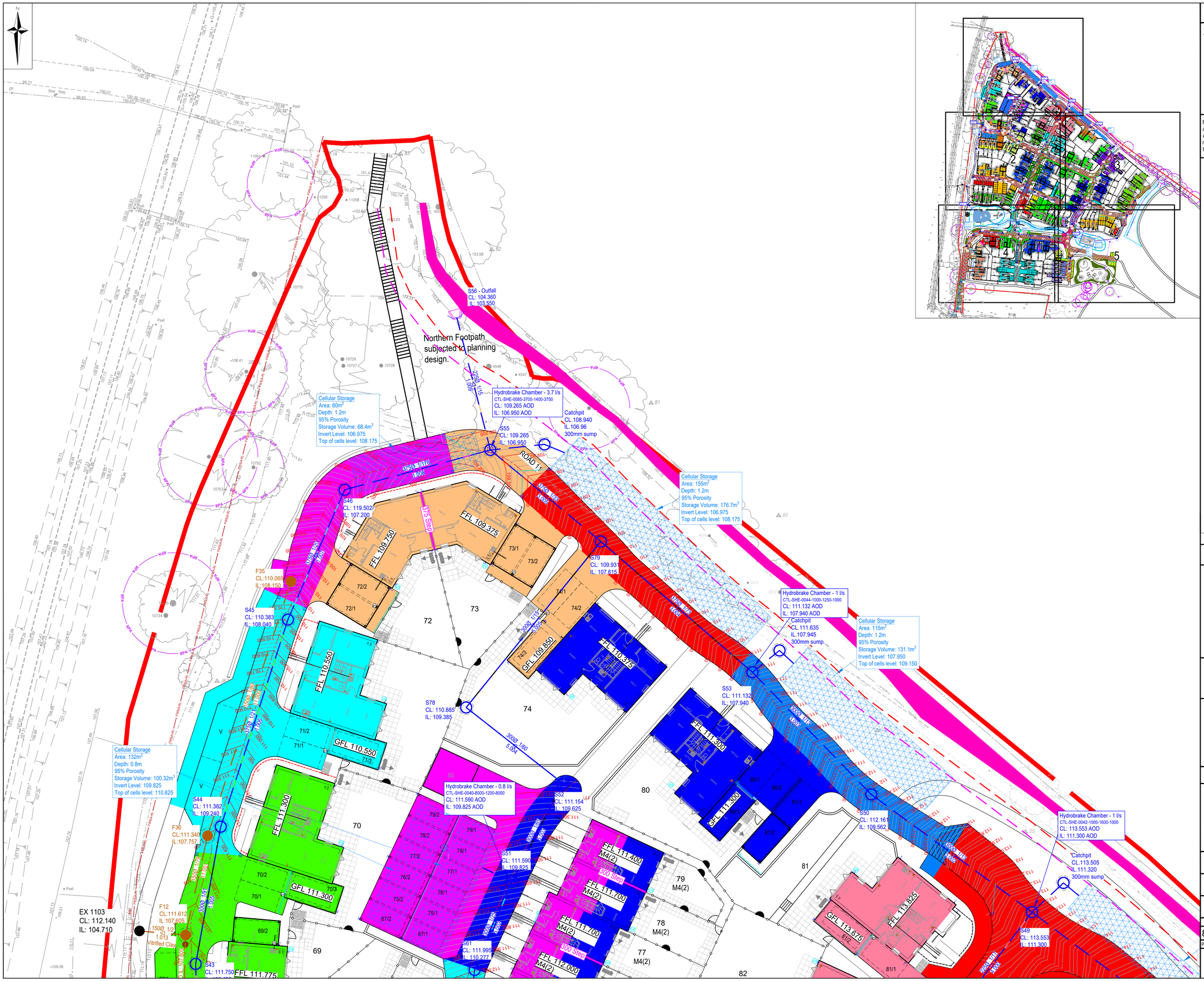
Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	S56 - Outfall	1200	103.572	0.022	4.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)

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APPENDIX E – CATCHMENT AREAS PLAN



CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	31.10.2025	Issued for LLFA Approval.	YP	AM	-

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: CATCHMENT PLAN SHEET 1

Drawn	Date	Checked	Date	Approved	Date
YP	03.09.25	AM	03.09.25	-	-

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3024-3029-Catchment Plan.dwg

Drawing No.: 890844 | RSK (Orig.) | ZZ (Vol./Sys.) | XX (Lev./Loc.) | DR (Type) | C (Role) | 3024 (Draw. No.) | Rev. T01

Scale 1:200
0 2 4 6 8 10m

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	31.10.2025	Issued for LLFA Approval.	YP	AM	-

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: CATCHMENT PLAN SHEET 2

Drawn	Date	Checked	Date	Approved	Date
YP	03.09.25	AM	03.09.25	-	-

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.	Drawing File
00347	890844-RSK-ZZ-XX-DR-C-3024-3029-Catchment Plan.dwg

Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 3025 | Rev. T01

(Project | Orig. | Vol./Sys. | Lev./Loc. | Type | Role | Draw. No.)

Scale 1:200
0 2 4 6 8 10m



CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	31.10.2025	Issued for LLFA Approval.	YP	AM	-

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: CATCHMENT PLAN SHEET 3

Drawn	Date	Checked	Date	Approved	Date
YP	03.09.25	AM	03.09.25	-	-

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347

Drawing File: 890844-RSK-ZZ-XX-DR-C-3024-3029-Catchment Plan.dwg

Drawing No.

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	Rev.
890844	RSK	ZZ	XX	DR	C	3026	T01

Scale 1:200
0 2 4 6 8 10m



CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	31.10.2025	Issued for LLFA Approval.	YP	AM	-

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: CATCHMENT PLAN SHEET 4

Drawn	Date	Checked	Date	Approved	Date
YP	03.09.25	AM	03.09.25	-	-

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347

Drawing File: 890844-RSK-ZZ-XX-DR-C-3024-3029-Catchment Plan.dwg

Drawing No.: 890844 | RSK (Orig.) | ZZ (Vol./Sys.) | XX (Lev./Loc.) | DR (Type) | C (Role) | 3027 (Draw. No.) | Rev. T01

Scale 1:200
0 2 4 6 8 10m



CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
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Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	31.10.2025	Issued for LLFA Approval.	YP	AM	-

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Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: CATCHMENT PLAN SHEET 5

Drawn	Date	Checked	Date	Approved	Date
YP	03.09.25	AM	03.09.25	-	-

Scale	Orig Size	Dimensions
1:200	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3024-3029-Catchment Plan.dwg

Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 3028 | Rev. T01

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.
890844	RSK	ZZ	XX	DR	C	3028

Scale 1:200
0 2 4 6 8 10m



890844 - West Hoathly - SW Network 1 Catchment Areas Schedule							
Manhole Ref	Pipe Code No.	Imp Area (m^2) (Road/Flat Block)	Imp Area (Ha) (Road/Flat Block)	Imp Area (m^2) (Houses)	Imp Area (m^2) (Houses) - 10% Urban Creep	Imp Area (Ha) (Houses) - 10% Urban Creep	Total Area in pipe (Ha)
S13	1.000	354.96	0.035	329.2678	362.19458	0.036	0.072
S13A	1.001	203.925	0.020	0	0	0.000	0.020
S14	1.002	0	0.000	35.11	38.621	0.004	0.004
S18	1.003	214.515	0.021	260.922	287.0142	0.029	0.050
S17	1.004	50.6715	0.005	0	0	0.000	0.005
S19	1.005	0	0.000	0	0	0.000	0.000
S30	1.006	305.1241	0.031	0	0	0.000	0.031
S69	1.007	0	0.000	0	0	0.000	0.000
S70	1.008	0	0.000	0	0	0.000	0.000
S32	1.009	243.736	0.024	209.255	230.1805	0.023	0.047
S33	1.010	0	0.000	0	0	0.000	0.000
S34	1.011	0	0.000	0	0	0.000	0.000
S76	1.012	0	0.000	0	0	0.000	0.000
S14A	2.000	278.8	0.028	0	0	0.000	0.028
S15	2.001	371.215	0.037	300.229	330.2519	0.033	0.070
S16	2.002	288.397	0.029	58.667	64.5337	0.006	0.035
S17A	3.000	148.77	0.015	198.365	218.2015	0.022	0.037
S17	3.001	695.799	0.070	70.236	77.2596	0.008	0.077
S27	4.000	297.5	0.030	0	0	0.000	0.030
S29	4.001	371.449	0.037	254.18	279.598	0.028	0.065
S59	4.002	0	0.000	0	0	0.000	0.000
S28	5.000	669.3178	0.067	437.0172	480.71892	0.048	0.115
S20	6.000	967.875	0.097	566.953	623.6483	0.062	0.159
S23	6.001	492.905	0.049	163.226	179.5486	0.018	0.067
S25	6.002	450.318	0.045	509.249	560.1739	0.056	0.101
S26	6.003	246.472	0.025	0	0	0.000	0.025
S38	6.004	0	0.000	0	0	0.000	0.000
S21	7.000	247.633	0.025	163.213	179.5343	0.018	0.043
S24B	8.000	159.547	0.016	33.098	36.4078	0.004	0.020
S24A	8.001	449.28	0.045	150.585	165.6435	0.017	0.061
S24	8.002	237.879	0.024	0	0	0.000	0.024
S74	9.000	364.6178	0.036	187.9575	206.75325	0.021	0.057
S73	9.001	260.6553	0.026	70.7474	77.82214	0.008	0.034
S72	9.002	0	0.000	0	0	0.000	0.000
S71	9.003	0	0.000	0	0	0.000	0.000
S31	9.004	305.295	0.031	126.1663	138.78293	0.014	0.044
S75	10.000	438.2533	0.044	127.5304	140.28344	0.014	0.058
Total		9114.9098	0.911	4251.9746	4677.17206	0.468	1.379

890844 - West Hoathly - SW Network 2 Catchment Areas Schedule							
Manhole Ref	Pipe Code No.	Imp Area (m^2) (Road/Flat Block)	Imp Area (Ha) (Road/Flat Block)	Imp Area (m^2) (Houses)	Imp Area (m^2) (Houses) - 10% Urban Creep	Imp Area (Ha) (Houses) - 10% Urban Creep	Total Area in pipe (Ha)
S35	1.000	587.805	0.059	169.328	186.2608	0.019	0.077
S36	1.001	272.943	0.027	0	0	0.000	0.027
S37	1.002	0	0.000	98.75	108.625	0.011	0.011
S38	1.003	0	0.000	0	0	0.000	0.000
S42	1.004	181.02	0.018	0	0	0.000	0.018
S43	1.005	0	0.000	0	0	0.000	0.000
S44	1.006	200.469	0.020	221.746	243.9206	0.024	0.044
S45	1.007	272.032	0.027	96.319	105.9509	0.011	0.038
S46	1.008	138.02	0.014	0	0	0.000	0.014
S55	1.009	222.92	0.022	141.46	155.606	0.016	0.038
S56	HEAD WALL	0	0.000	0	0	0.000	0.000
S40	2.000	327.891	0.033	163.14	179.454	0.018	0.051
S41	2.001	0	0.000	0	0	0.000	0.000
S80	3.000	325.214	0.033	238.712	262.5832	0.026	0.059
S47	3.001	213.776	0.021	50.754	55.8294	0.006	0.027
S49	3.002	352.686	0.035	0	0	0.000	0.035
S53	3.003	128.739	0.013	0	0	0.000	0.013
S79	3.004	128.213	0.013	0	0	0.000	0.013
S48	4.000	416.334	0.042	287.958	316.7538	0.032	0.073
S39	5.000	126.883	0.013	0	0	0.000	0.013
S60	5.001	307.285	0.031	136.33	149.963	0.015	0.046
S61	5.002	48.76	0.005	0	0	0.000	0.005
S51	5.003	264.012	0.026	116.866	128.5526	0.013	0.039
S52	5.004	246.512	0.025	350.653	385.7183	0.039	0.063
S78	5.005	0	0.000	0	0	0.000	0.000
Total		4761.514	0.476	2072.016	2279.2176	0.228	0.704

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

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Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	31.10.2025	Issued for LLFA Approval.	YP	AM	-

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Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY, BRICKWORKS

Status: TENDER

Drawing Title: CATCHMENT PLAN

Drawn	Date	Checked	Date	Approved	Date
YP	03.09.25	AM	03.09.25	-	-

Scale	Orig Size	Dimensions
1:500	A0	M

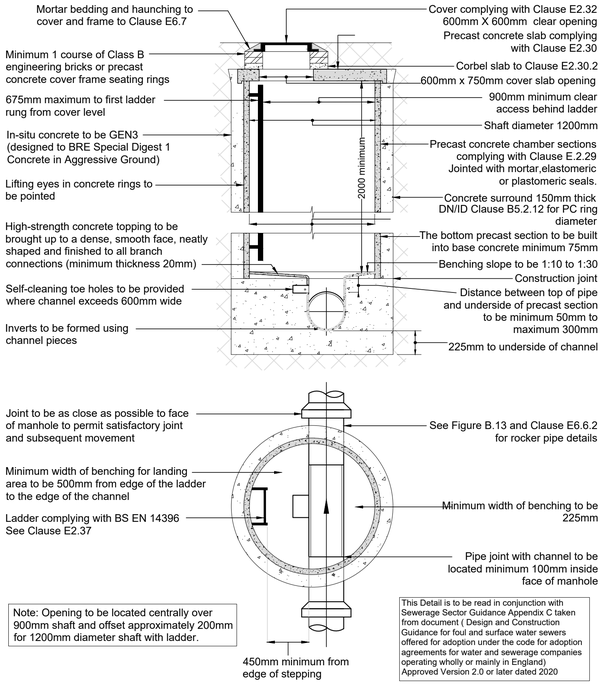
Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-3024-3029-Catchment Plan.dwg

Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 3024 | Rev. T01

Project | Org. | Vol/Sys. | Lev./Loc. | Type | Role | Draw. No. |

Scale 1:500
0 5 10 15 20 25m

APPENDIX F – DRAINAGE DETAILS

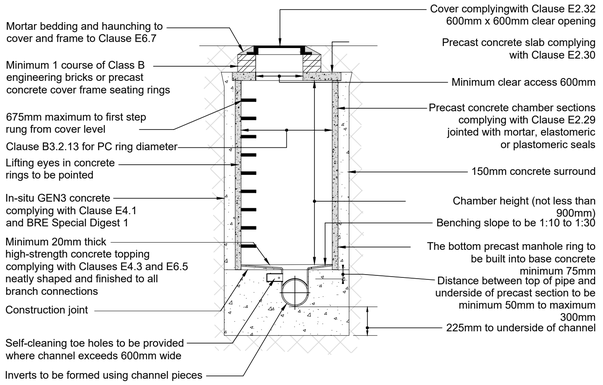


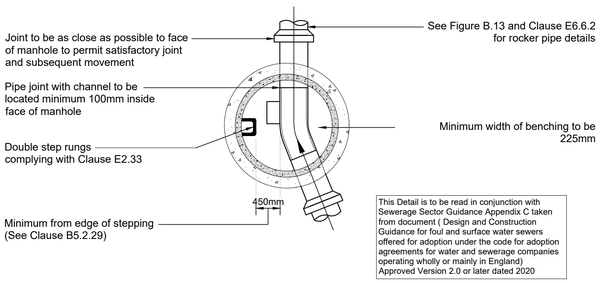
Note: Opening to be located centrally over 900mm shaft and offset approximately 200mm for 1200mm diameter shaft with ladder.

This Detail is to be read in conjunction with Sewerage Sector Guidance Appendix C taken from document (Design and Construction Guidance for foul and surface water sewers offered for adoption under the code for adoption agreements for water and sewerage companies operating wholly or mainly in England) Approved Version 2.0 or later dated 2020

TYPICAL MANHOLE DETAIL - TYPE A2

(Depth from cover level to soffit of pipe 3 m to 6 m with ladder
Alternative rigid material construction with concrete surround)

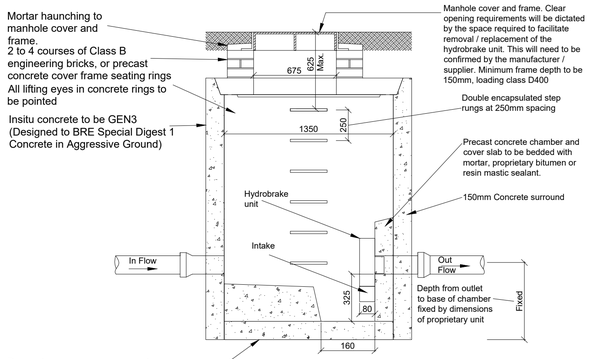


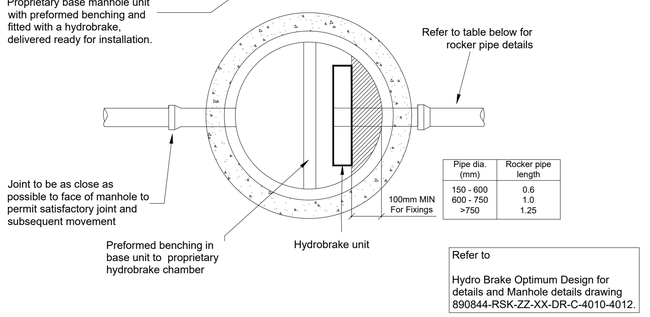


This Detail is to be read in conjunction with Sewerage Sector Guidance Appendix C taken from document (Design and Construction Guidance for foul and surface water sewers offered for adoption under the code for adoption agreements for water and sewerage companies operating wholly or mainly in England) Approved Version 2.0 or later dated 2020

TYPICAL MANHOLE DETAIL - TYPE B

(Depth from cover level to soffit of pipe 1.5 m to 3 m
Alternative rigid material construction with concrete surround)





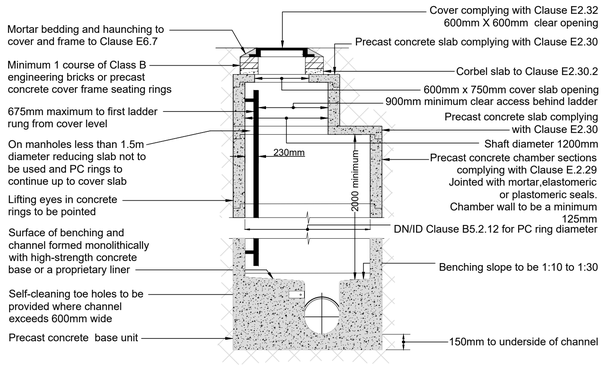
Pipe dia. (mm)	Rocker pipe length
150 - 600	0.6
600 - 750	1.0
>750	1.25

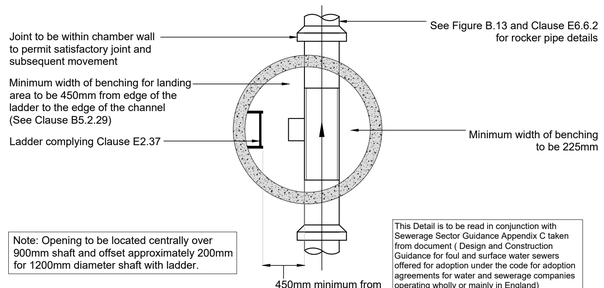
Refer to

Hydro Brake Optimum Design for details and Manhole details drawing 890844-RSK-ZZ-XX-DR-C-4010-4012.

HYDROBRAKE CHAMBER (N.T.S)

(to utilise a proprietary base unit with hydrobrake pre-installed)



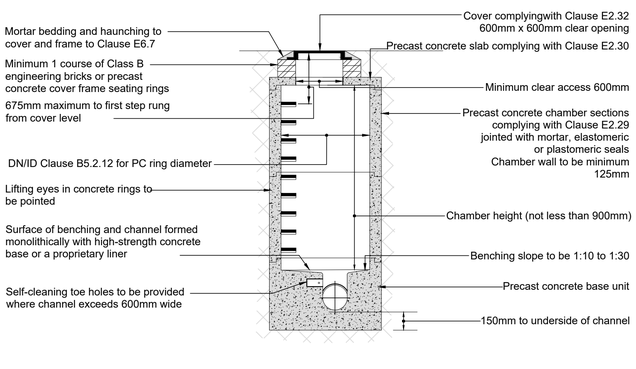


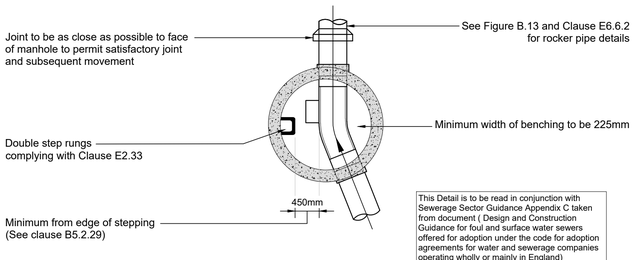
Note: Opening to be located centrally over 900mm shaft and offset approximately 200mm for 1200mm diameter shaft with ladder.

This Detail is to be read in conjunction with Sewerage Sector Guidance Appendix C taken from document (Design and Construction Guidance for foul and surface water sewers offered for adoption under the code for adoption agreements for water and sewerage companies operating wholly or mainly in England) Approved Version 2.0 or later dated 2020

TYPICAL MANHOLE DETAIL - TYPE A1

(Depth from cover to soffit of pipe 3 m to 6 m with ladder and reducing slab
Rigid material construction without concrete surround)

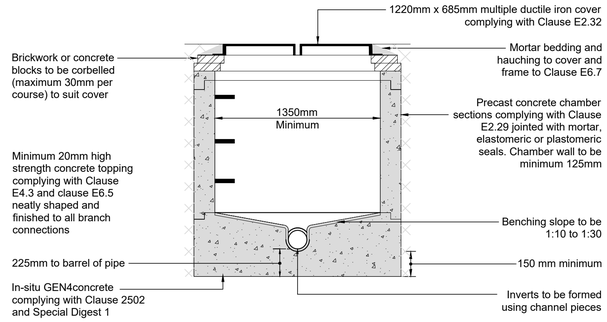




This Detail is to be read in conjunction with Sewerage Sector Guidance Appendix C taken from document (Design and Construction Guidance for foul and surface water sewers offered for adoption under the code for adoption agreements for water and sewerage companies operating wholly or mainly in England) Approved Version 2.1 or later dated 2020

TYPICAL MANHOLE DETAIL - TYPE B

(Depth from cover level to soffit of pipe 1.5 m to 3 m
Rigid material construction with concrete surround)



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Note: The use of precast concrete chamber units to Clause E2.29 with 150mm GEN3 in-situ concrete complying with Clause E4.1 and BRE Special Digest 1 in place of brickwork construction is permitted.

TYPICAL MANHOLE DETAIL - TYPE C

(Depth from cover level to soffit of pipe less than 1.5m
Maximum pipe size 450mm diameter
Ridgid material construction

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

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Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. Do not scale this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers drawings and specifications.
3. For Site Drainage Layout see Drawing No 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage Layout.
4. All adoptable drainage works shall be constructed in accordance with the requirements of the Design and Construction Guidance document.
5. All chamber covers and frames shall be heavy duty ductile iron, kitemarked and compliant with BS EN 124. All covers used in carriageways shall be D400 classification.
6. All precast concrete chamber rings, covers slabs and seating rings to conform with BS EN 1917 and BS 5911-3 and shall be installed in accordance with the manufacturer's recommendations and guidance.
7. The high strength concrete topping as shown on this drawing shall be a granolithic concrete complying with the relevant provisions of BS 8204-2.
8. All institute concrete specified on this drawing shall be compliant with BS EN 206 and BS 8500.
9. All drainage pipes to be compliant with DCG section E2.19 for concrete pipes, E2.18 for vitrified clay pipes and E2.22 for structured wall thermoplastic pipes. Subject to Water Authority approval through S104 Agreement.
10. All pipe bedding and surround material shall comply with Water Industry Standard WIS 4-08-02, where processed granular materials are to be used.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	RD
P01	30.06.2025	Prelminary Tender Pack. Issued for Clients Comments.	LN	AM	

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Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: DRAINAGE CONSTRUCTION DETAILS (SHEET 1 OF 4)

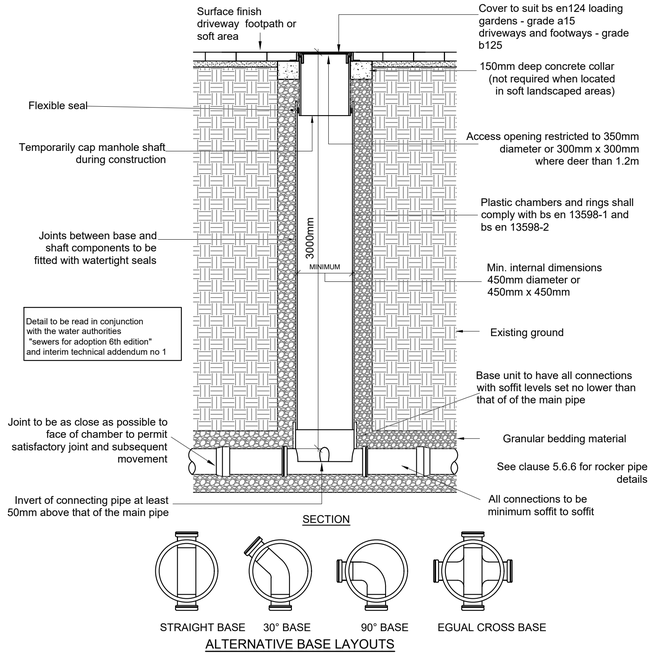
Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
NTS	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-4004-4007-Drainage Construction Details.dwg

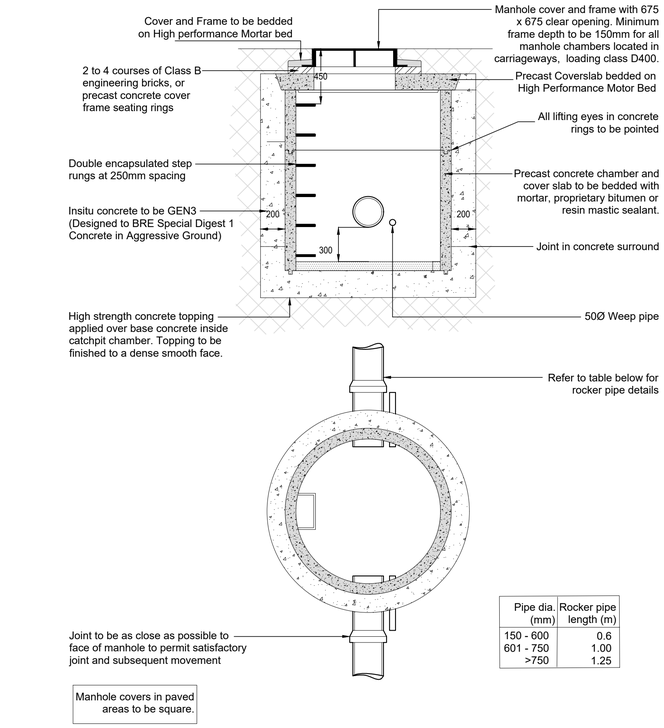
Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 4004 | Rev. T01

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	
890844	RSK	ZZ	XX	DR	C	4004	T01



TYPICAL ACCESS CHAMBER TYPE 3 - (PLASTIC CHAMBER SECTIONS) NON ENTRY

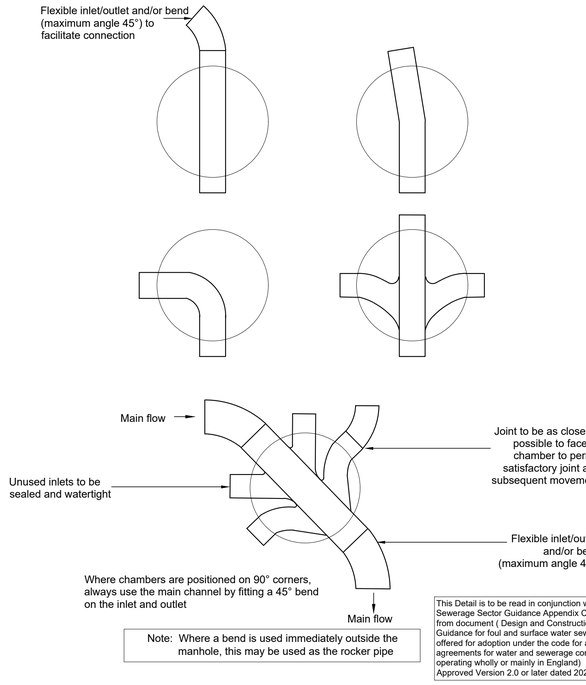
MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3.0 METRES
USED IN DRIVEWAYS, FOOTWAYS AND SOFT LANDSCAPED AREAS



Pipe dia. (mm)	Rocker pipe length (m)
150 - 600	0.6
601 - 750	1.00
>750	1.25

TYPICAL CATCHPIT CHAMBER DETAIL

Maximum depth from cover level to
base of chamber not exceeding 3m

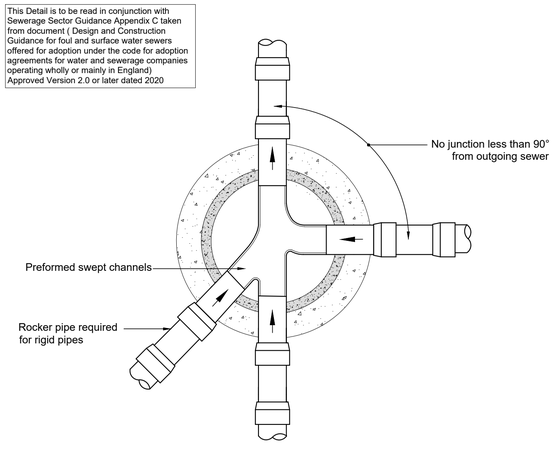


Note: Where a bend is used immediately outside the manhole, this may be used as the rocker pipe

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TYPICAL BASE LAYOUTS FOR TYPE D CHAMBER

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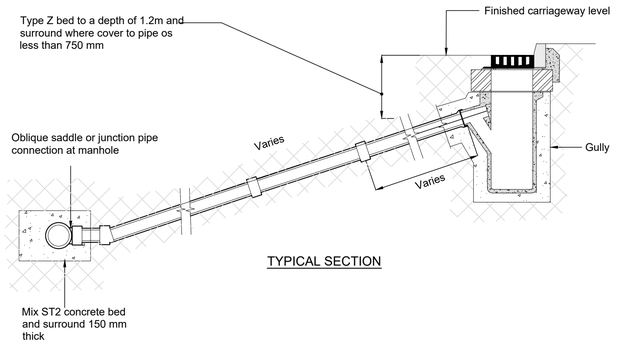
Sectional Plan

Rigid pipes built into manhole should have a flexible joint as close as feasible to the external face of the structure and the length of the next rocker pipe should be as shown.

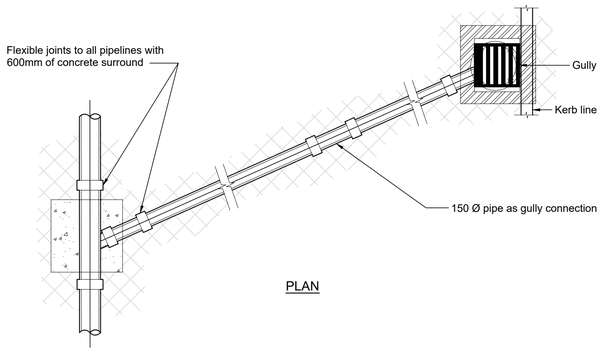
Nominal diameter (mm)	Maximum effective length (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

All pipes entering the bottom of
the manhole to have soffits level.

TYPICAL ARRANGEMENT OF PIPE JUNCTIONS WITHIN MANHOLES

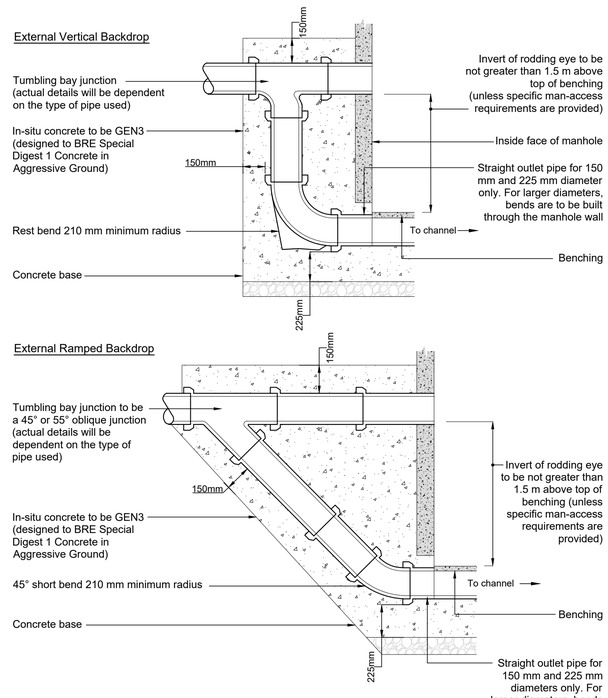


TYPICAL SECTION



PLAN

GULLY CONNECTIONS



TYPICAL VERTICAL AND RAMPED BACKDROP DETAIL

(Note: Steeper gradients are preferred to the use of backdrops.
Type of backdrop to be used to be agreed with Undertaker)

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

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Notes:

1. Do not scale this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers drawings and specifications.
3. For Site Drainage Layout see Drawing No 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage Layout.
4. All adoptable drainage works shall be constructed in accordance with the requirements of the Design and Construction Guidance document.
5. All chamber covers and frames shall be heavy duty ductile iron, kitemarked and compliant with BS EN 124. All covers used in carriageways shall be D400 classification.
6. All precast concrete chamber rings, covers slabs and seating rings to conform with BS EN 1917 and BS 5911-3 and shall be installed in accordance with the manufacturer's recommendations and guidance.
7. The high strength concrete topping as shown on this drawing shall be a granolithic concrete complying with the relevant provisions of BS 8204-2.
8. All institute concrete specified on this drawing shall be compliant with BS EN 206 and BS 8500.
9. All drainage pipes to be compliant with DCG section E2.19 for concrete pipes, E2.18 for vitrified clay pipes and E2.22 for structured wall thermoplastic pipes. Subject to Water Authority approval through S104 Agreement.
10. All pipe bedding and surround material shall comply with Water Industry Standard WIS 4-08-02, where processed granular materials are to be used.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	RD
P01	30.06.2025	Prelminary Tender Pack. Issued for Clients Comments.	LN	AM	

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Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: DRAINAGE CONSTRUCTION DETAILS (SHEET 2 OF 4)

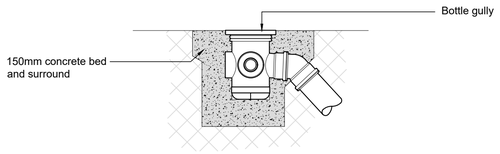
Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
NTS	A1	M

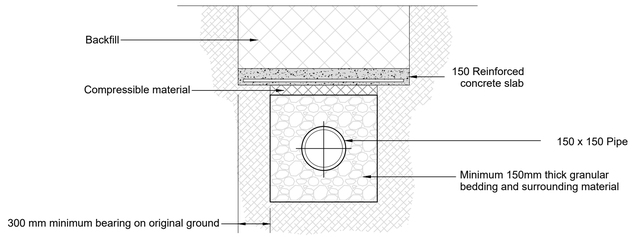
Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-4004-4007-Drainage Construction Details.dwg

Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 4005 | Rev. T01

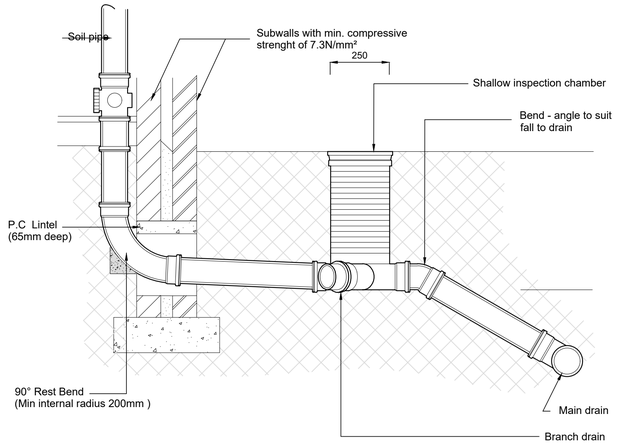
Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	



YARD GULLY DETAIL

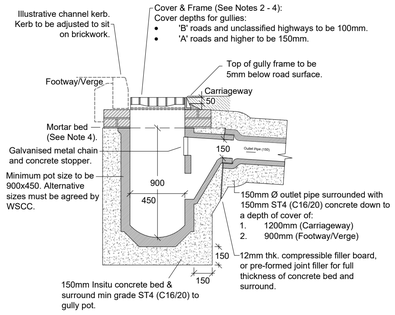


PROTECTION OF PIPES LAID AT SHALLOW DEPTHS



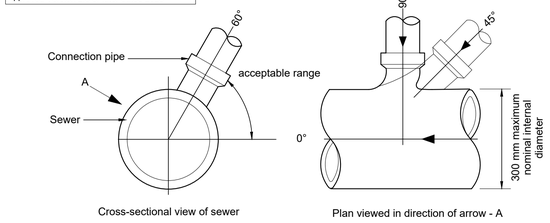
Shallow Inspection Chamber
Circular 250mm.dia. nominal
Depth to invert 600mm.

TYPICAL SECTION
HOUSE DRAINAGE SHALLOW INSPECTION CHAMBER



ROAD GULLY DETAIL

This Detail is to be read in conjunction with Sewerage Sector Guidance Appendix C taken from document (Design and Construction Guidance for foul and surface water sewers offered for adoption under the code for adoption agreements for water and sewerage companies operating wholly or mainly in England) Approved Version 2.0 or later dated 2020



CONNECTIONS TO SEWERS

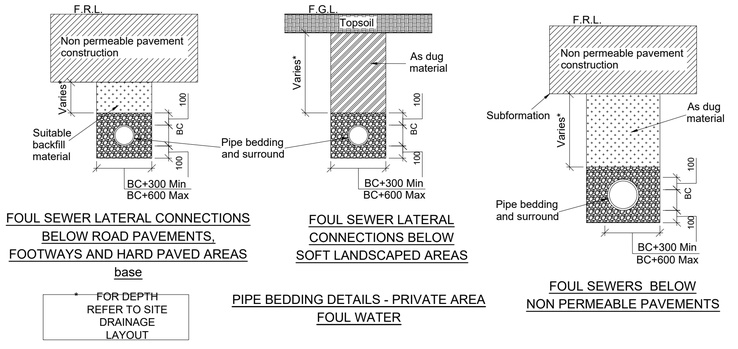
CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. Do not scale this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers drawings and specifications.
3. For Site Drainage Layout see Drawing No 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage Layout.
4. All adoptable drainage works shall be constructed in accordance with the requirements of the Design and Construction Guidance document.
5. All chamber covers and frames shall be heavy duty ductile iron, kitemarked and compliant with BS EN 124. All covers used in carriageways shall be D400 classification.
6. All precast concrete chamber rings, covers slabs and seating rings to conform with BS EN 1917 and BS 5911-3 and shall be installed in accordance with the manufacturer's recommendations and guidance.
7. The high strength concrete topping as shown on this drawing shall be a granolithic concrete complying with the relevant provisions of BS 8204-2.
8. All institute concrete specified on this drawing shall be compliant with BS EN 206 and BS 8500.
9. All drainage pipes to be compliant with DCG section E2.19 for concrete pipes, E2.18 for vitrified clay pipes and E2.22 for structured wall thermoplastic pipes. Subject to Water Authority approval through S104 Agreement.
10. All pipe bedding and surround material shall comply with Water Industry Standard WIS 4-08-02, where processed granular materials are to be used.



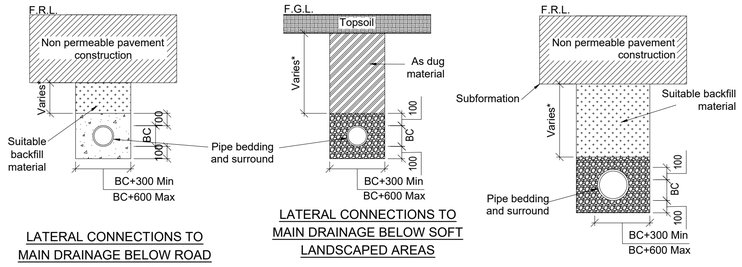
FOUL SEWER LATERAL CONNECTIONS BELOW ROAD PAVEMENTS, FOOTWAYS AND HARD PAVED AREAS

FOUL SEWER LATERAL CONNECTIONS BELOW SOFT LANDSCAPED AREAS

FOUL SEWERS BELOW NON PERMEABLE PAVEMENTS

FOR DEPTH REFER TO SITE DRAINAGE LAYOUT

PIPE BEDDING DETAILS - PRIVATE AREA FOUL WATER



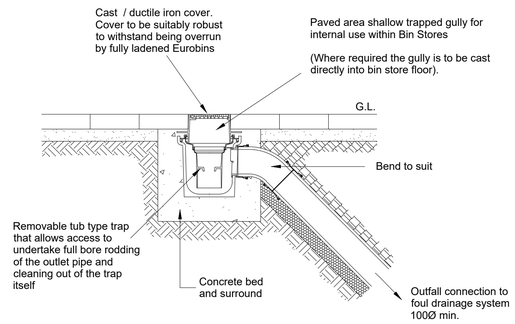
LATERAL CONNECTIONS TO MAIN DRAINAGE BELOW ROAD PAVEMENTS

LATERAL CONNECTIONS TO MAIN DRAINAGE BELOW SOFT LANDSCAPED AREAS

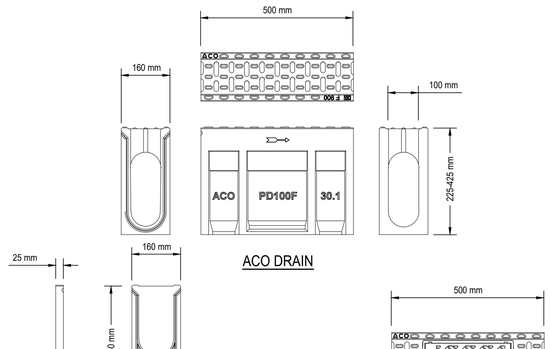
MAIN DRAINAGE BELOW NON PERMEABLE PAVEMENTS

NOTE:
Domestic gardens and pathways without any possibility of vehicular access to have minimum depth of cover to the pipe crown of 350mm

PIPE BEDDING DETAILS - PRIVATE AREA SURFACE WATER



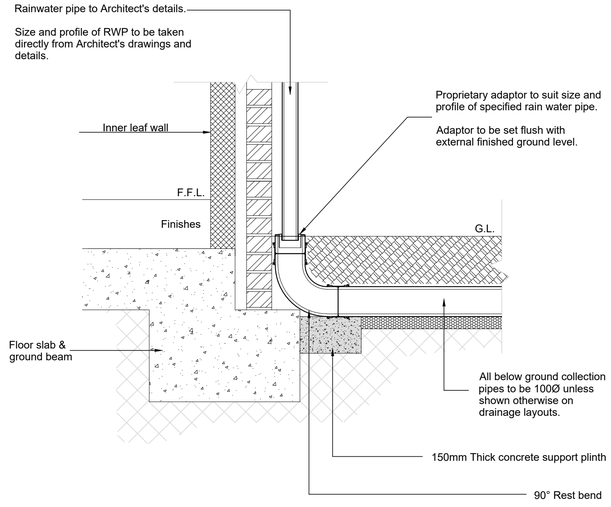
PAVED AREA GULLY TYPICAL DETAIL



ACO DRAIN

ACO DRAIN CLOSING END CAP

ACO DRAIN WITH RODDING ACCESS



EXTERNAL RAINWATER PIPE CONNECTION DETAIL

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	RD
P01	30.06.2025	Prelimnary Tender Pack. Issued for Clients Comments.	LN	AM	

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Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: DRAINAGE CONSTRUCTION DETAILS (SHEET 3 OF 4)

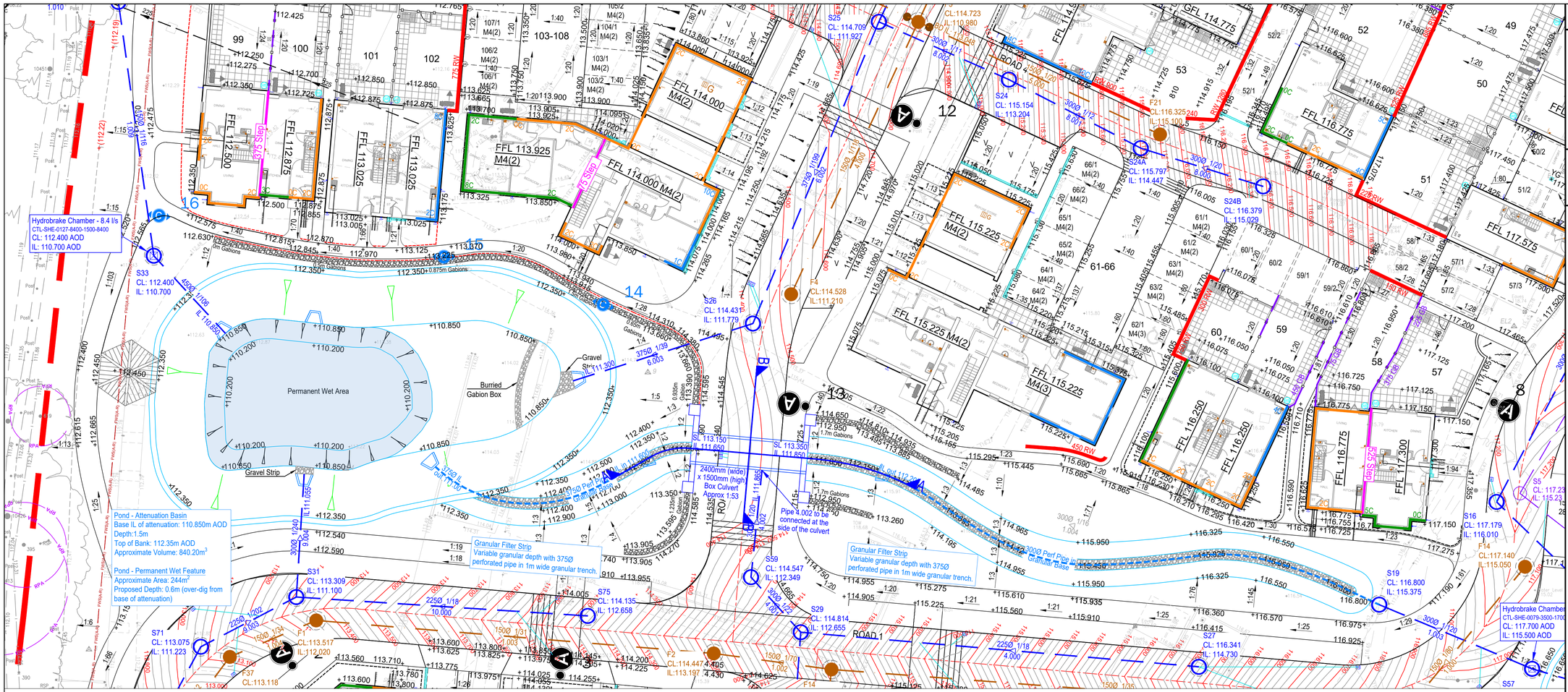
Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

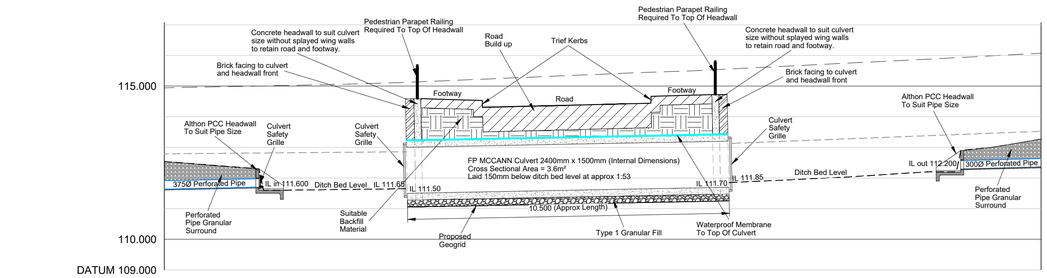
Scale	Orig Size	Dimensions
NTS	A1	M

Project No.: 00347
Drawing File: 890844-RSK-ZZ-XX-DR-C-4004-4007-Drainage Construction Details.dwg

Drawing No.: 890844 RSK ZZ XX DR C 4006 Rev. T01

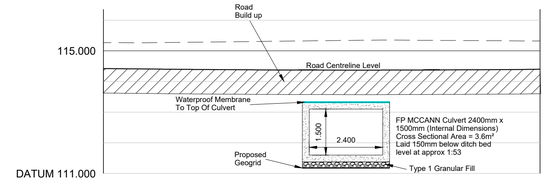
Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	
890844	RSK	ZZ	XX	DR	C	4006	T01





Chainage	0.000						5.000					10.000					15.000					20.000					25.000					28.624
Proposed Levels Profile	112.537	112.497	112.433	112.361	112.300	111.600	111.600	111.625	114.001	114.590	114.545	114.529	114.306	114.325	114.350	114.400	114.419	114.667	114.720	111.900	111.922	111.962	112.025	112.055	112.070	112.155	112.200	112.200	112.900	112.966	113.000	113.048	113.156	113.268
Existing Ground Levels	114.940	114.954	115.023	115.041	115.043	115.066	115.090	115.110	116.120	115.120	115.208	115.418	115.434	115.492	115.556	115.597	115.633	115.853	115.709	115.765	115.820	115.880	115.933	115.968	115.990	116.002	116.036	116.069						

Section A-A



Chainage	0.000			5.000			10.000			14.253
Proposed Levels Profile	114.421			114.380			114.374			114.403
Existing Ground Levels	115.269	115.263		115.306	115.307		115.353	115.347		115.321

Section B-B

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. Do not Scale this drawing.
2. This drawing presents the Ditch Culvert Details for the proposed development at West Hoathly Brickworks.
3. This drawing is to be read in conjunction with all relevant Engineer's and Architect's drawings and specifications.
4. This drawing is to be printed in COLOUR.
5. All levels quoted are in metres A.O.D.
6. Blinding layer and Type 1 Granular Fill to be in accordance with culvert manufacturers specification, may differ from currently shown.
7. For Drainage Layout refer to RSK drawing 890844-RSK-ZZ-XX-DR-C-3000-3005 - Site Drainage Layout.
8. For Drainage Details refer to RSK drawings 890844-RSK-ZZ-XX-DR-C-4004 -4007 - Drainage Details.
9. For SuDS Details refer to RSK drawing 890844-RSK-ZZ-XX-DR-C-4009. For SuDS Attenuation Details refer to RSK drawings 890844-RSK-ZZ-XX-DR-C-3012-3013.
10. All drainage design is subject to technical approval, no connections shall be made to any public sewers without written consent from the drainage authority. All adoptable drainage to be constructed in conjunction with Design and Construction Guidance (Water UK).
11. The drainage design is subject to technical approval by IWNL for the mains drainage, Southern Water for the sewer connections and the LLFA for the Ordinary Watercourse Consent. No connections shall be made to any public sewers without written consent from the drainage authority.
12. All services should be coordinated around the proposed drainage on site.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	

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Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: BRIDGE CULVERT DETAILS

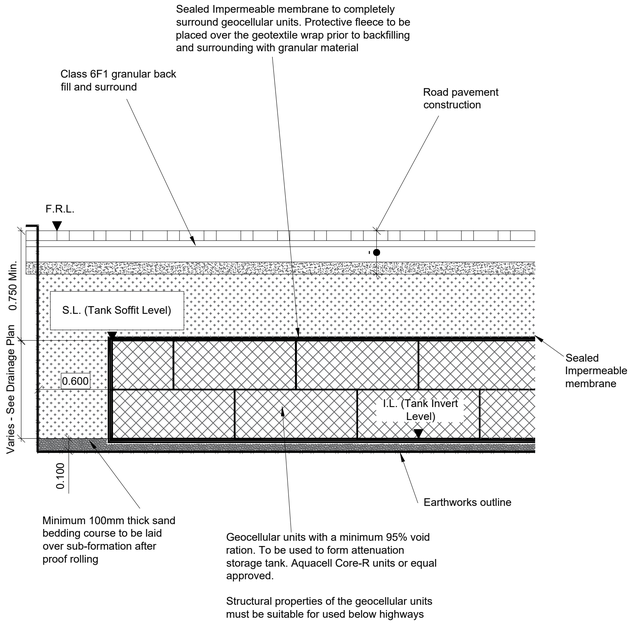
Drawn	Date	Checked	Date	Approved	Date
LN	09.07.2025	AM	10.07.2025		

Scale	Orig Size	Dimensions
NTS	A1	M

Project No.	Drawing File
890844	890844-RSK-ZZ-XX-DR-C-4008-Bridge Culvert Details.dwg

Drawing No. 890844 | RSK | ZZ | XX | DR | C | 4008 | Rev. T01

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	



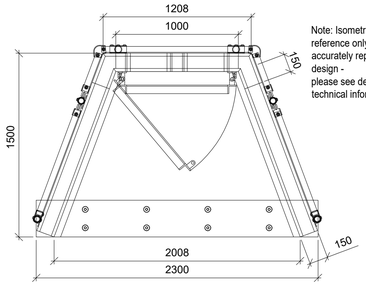
NOTES

1. For details of inlet outlet manifold pipe arrangement refer to manufacturers details.

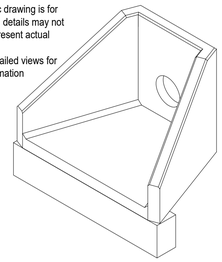
2. All geocellular attenuation tanks to be provided with ventilation as per manufacturers recommendations. Arrangement and exact location of vent outlets to be agreed prior to installation of the geocellular units

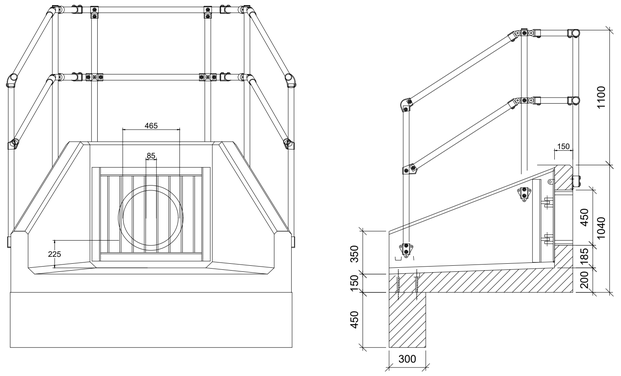
3. All perforations required through geomembrane to accommodate pipework shall be sealed in accordance with the recommendations of the geomembrane system supplier.

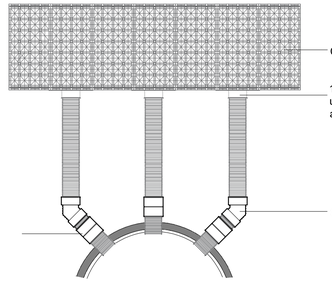
TYPICAL SECTION THROUGH ATTENUATION TANK
BELOW PARKING BAY AND TRAFFICKED AREAS WITH IMPERMEABLE MEMBRANE.



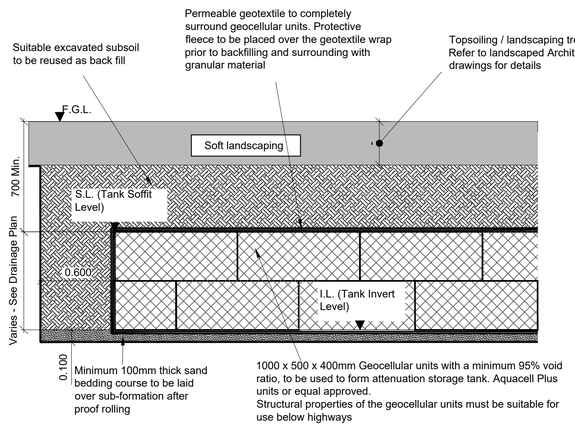
Note: Isometric drawing is for reference only, details may not accurately represent actual design -
please see detailed views for technical information



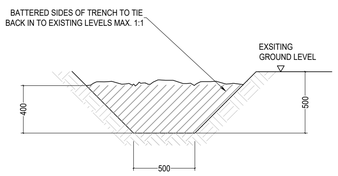




ON-LINE STORAGE INLET AND/OR OUTLET MANIFOLD CONNECTION GENERAL ARRANGEMENT

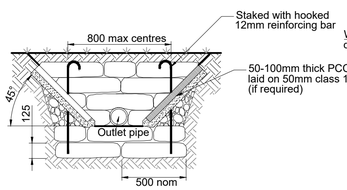


TYPICAL SECTION THROUGH ATTENUATION TANK
BELOW LANDSCAPED AREAS

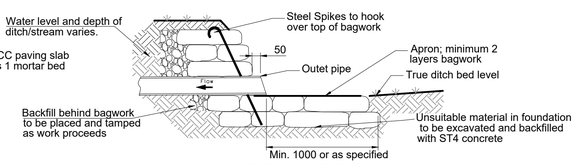


TYPICAL SECTION OF SWALE

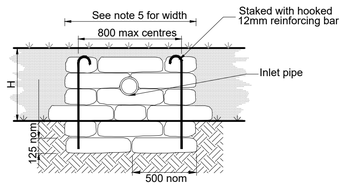
TYPICAL ALTHON SFA 10B HEADWALL DETAIL
(300mm- 400mm Ø PIPE)



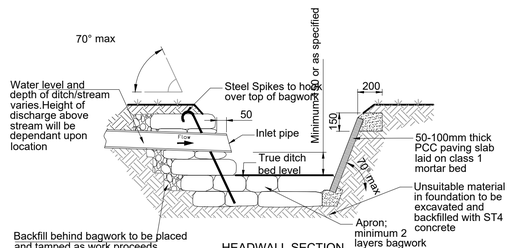
ELEVATION OF HEADWALL
OUTLET FROM END OF DITCH



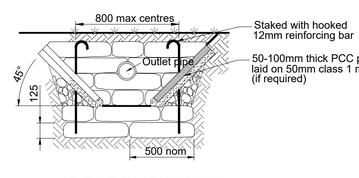
HEADWALL SECTION
OUTLET FROM POND / END OF DITCH



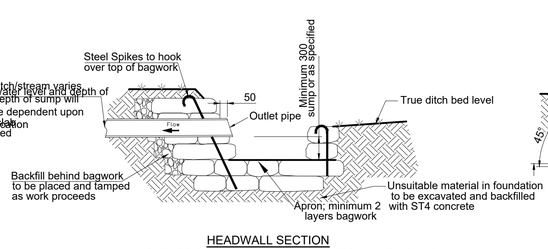
ELEVATION OF HEADWALL
OUTFALL TO SIDE OF DITCH



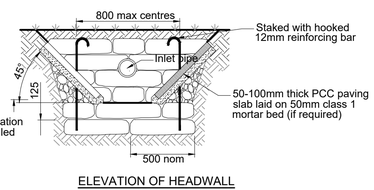
HEADWALL SECTION
OUTFALL TO SIDE OF DITCH



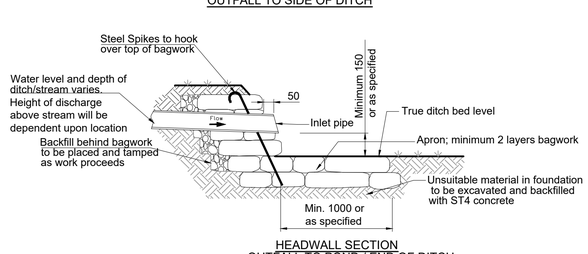
ELEVATION OF HEADWALL
OUTLET FROM END OF DITCH (WITH SUMP)



HEADWALL SECTION
OUTLET FROM POND / END OF DITCH (WITH SUMP)



ELEVATION OF HEADWALL
OUTFALL TO END OF DITCH



HEADWALL SECTION
OUTFALL TO POND / END OF DITCH

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. Do not scale this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers drawings and specifications.
3. Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration.
4. For Site Drainage Layout see Drawing No 890844-RSK-ZZ-XX-DR-C-3005-3005-Site Drainage Layout.
5. All adoptable drainage works shall be constructed in accordance with the requirements of the Design and Construction Guidance document.
6. All chamber covers and frames shall be heavy duty ductile iron, kitemarked and compliant with BS EN 124. All covers used in carriageways shall be D400 classification.
7. All precast concrete chamber rings, covers slabs and seating rings to conform with BS EN 1917 and BS 5911-3 and shall be installed in accordance with the manufacturer's recommendations and guidance.
8. The high strength concrete topping as shown on this drawing shall be a granolithic concrete complying with the relevant provisions of BS 8204-2.
9. All institute concrete specified on this drawing shall be compliant with BS EN 206 and BS 8500.
10. All drainage pipes up to 300Ø size are to be FUNKE HS structural wall thermoplastic to the relevant provisions of BS EN 13476. All pipes above 300Ø size are to be concrete. Subject to Water Authority approval through S104 Agreement.
11. All pipe bedding and surround material shall comply with Water Industry Standard WIS 4-08-02, where processed granular materials are to be used.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T02	06.08.2025	Drawing updated to clients groundworks comments.	YP	AM	RD
T01	11.07.2025	Issued for Tender.	LN	AM	RD
P01	30.06.2025	Preliminary Tender Pack. Issued for Clients Comments.	LN	AM	

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Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: SuDS DETAILS

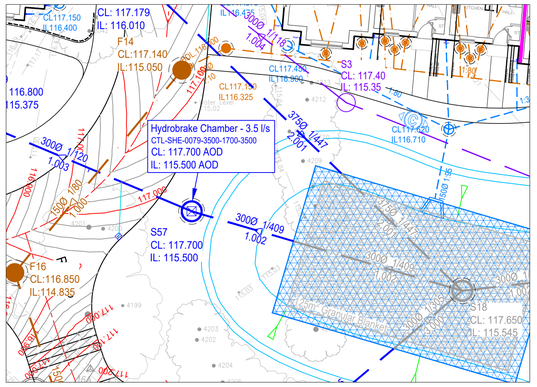
Drawn	Date	Checked	Date	Approved	Date
LN	29.04.2025	AM	04.07.2025	RD	

Scale	Orig Size	Dimensions
NTS	A1	M

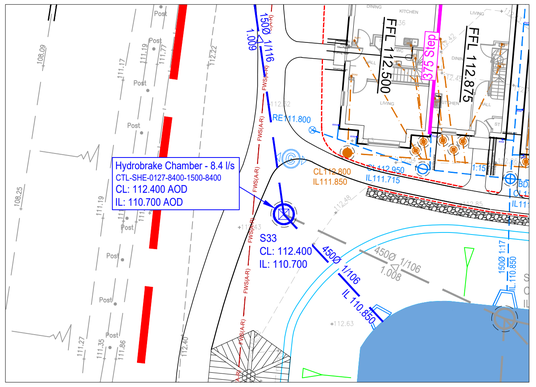
Project No. 00347
Drawing File 890844-RSK-ZZ-XX-DR-C-4009-SuDS Details.dwg

Drawing No. 890844-RSK-ZZ-XX-DR-C-4009 Rev. T02

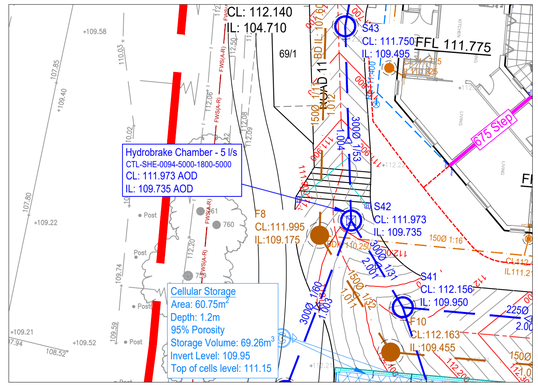
Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.
890844	RSK	ZZ	XX	DR	C	4009



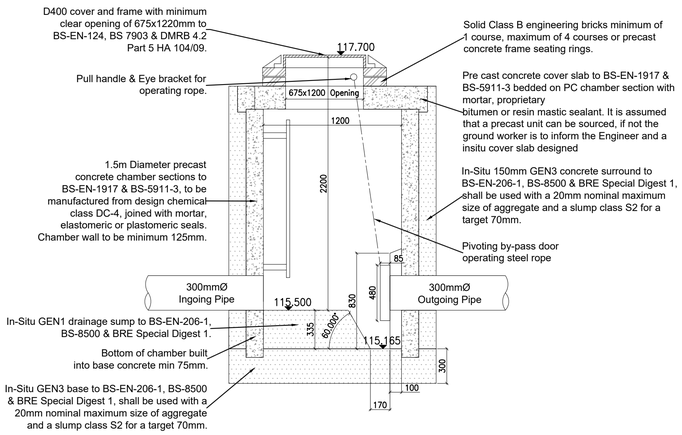
Location of S57 Hydro Brake Manhole

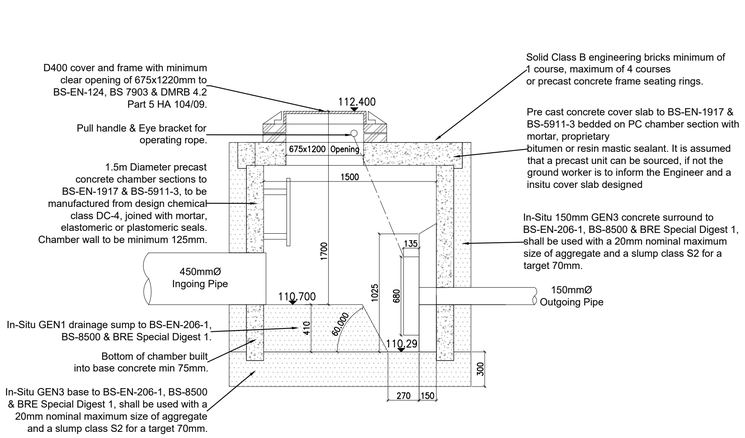


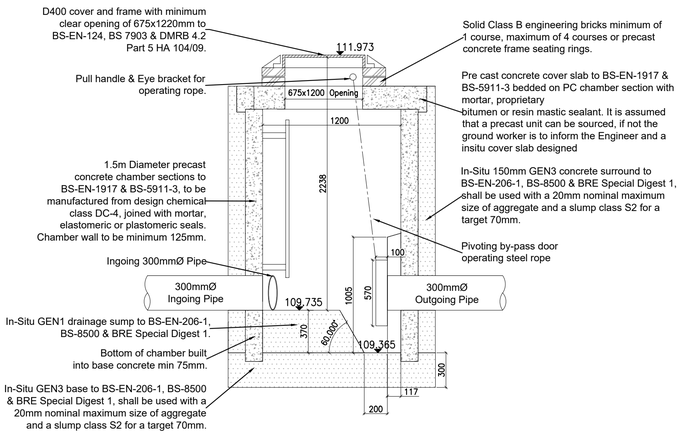
Location of S33 Hydro Brake Manhole

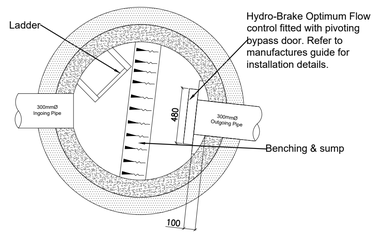


Location of S42 Hydro Brake Manhole



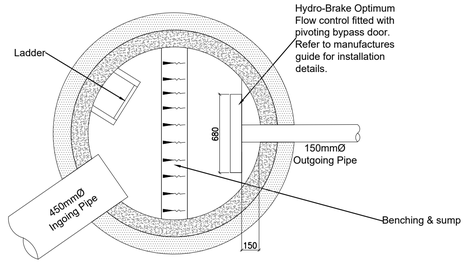






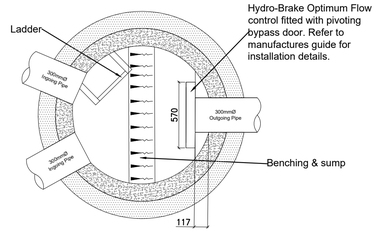
Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S57	1.2m	117.700	115.500/300Ø	115.500/300Ø	1.7m	3.5	Hydro-Brake Optimum

S57 Hydro Brake Manhole Detail



Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S33	1.50m	12.400	110.700/450Ø	110.700/150Ø	1.500m	8.4	Hydro-Brake Optimum

S33 Hydro Brake Manhole Detail



Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S42	1.2m	111.937	109.735/300Ø	109.735/300Ø	1.8m	5.0	Hydro-Brake Optimum

S42 Hydro Brake Manhole Detail

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. This drawing presents the Hydrobrake Manhole Details for the proposed development at West Hoathly, Brickworks.
2. This drawing is to be read in conjunction with all relevant Engineer's and Architect's drawings and specifications.
3. This drawing is to be printed in COLOUR.
4. For drainage layout refer to RSK drawing No 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage Layout

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	RD

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Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: HYDROBRAKE MANHOLE DETAILS (SHEET 1 OF 3)

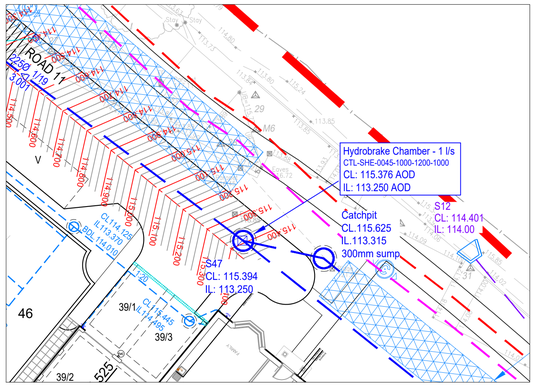
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LN	10.07.2025	AM		RD	

Scale	Orig Size	Dimensions
NTS	A1	M

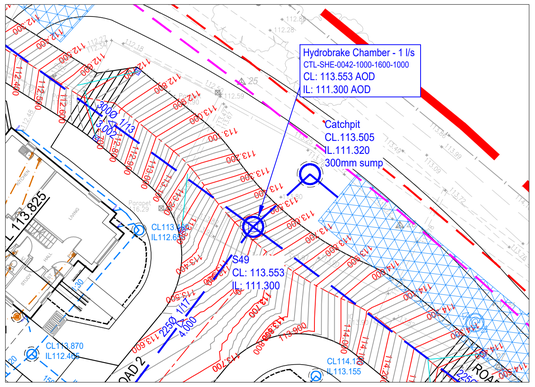
Project No.	Drawing File
00347	890844-RSK-ZZ-XX-DR-C-4011-4012-Hydrobrake Manhole Details.dwg

Drawing No.: 890844 RSK ZZ XX DR C 4011 T01 (Rev.)

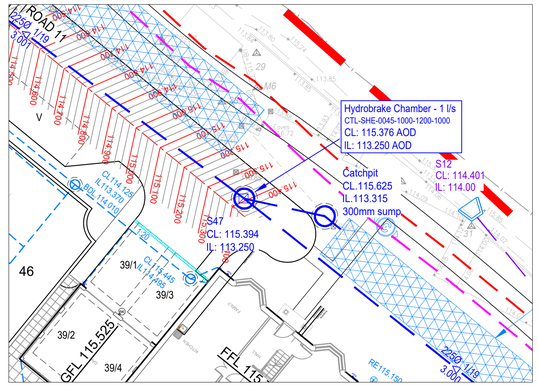
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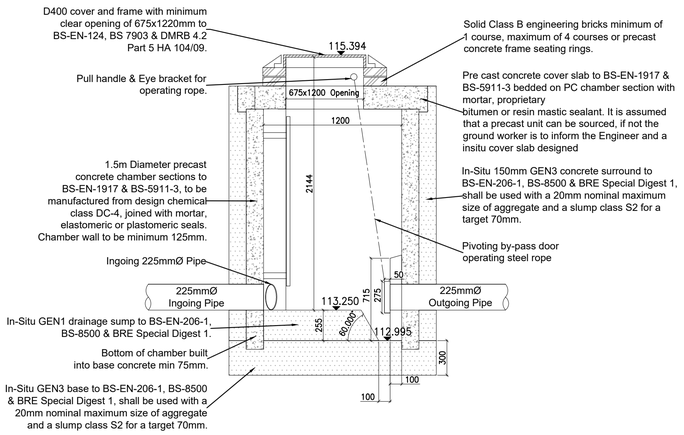
Location of S47 Hydro Brake Manhole

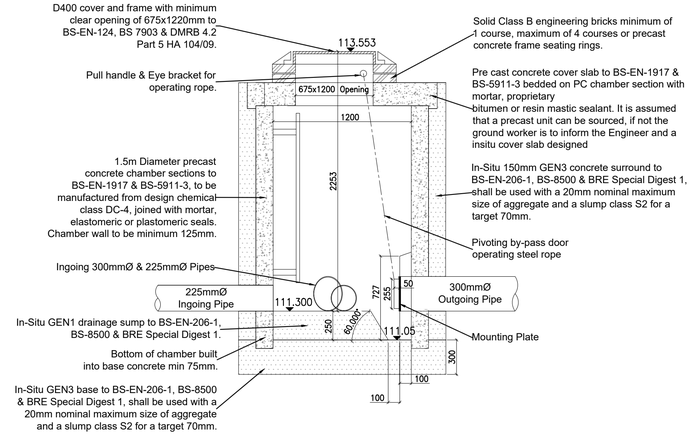


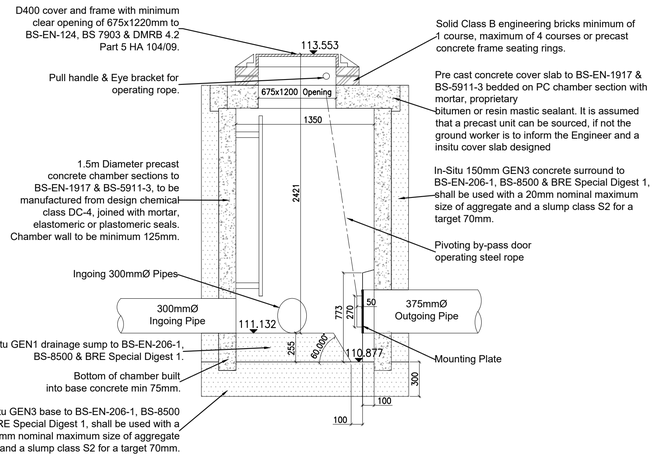
Location of S49 Hydro Brake Manhole

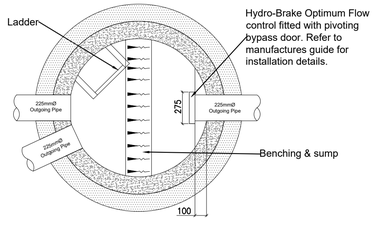


Location of S53 Hydro Brake Manhole



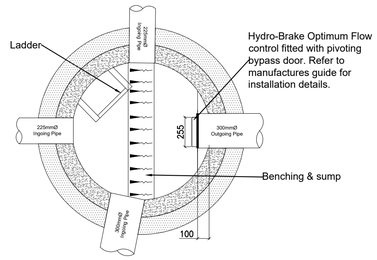






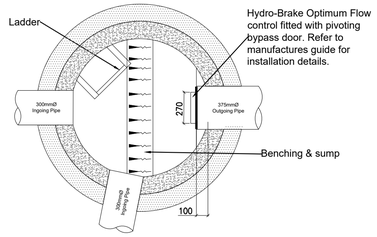
Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S47	1.2m	115.394	113.250/225Ø	113.250/255Ø	1.2m	1.0	Hydro-Brake Optimum

S47 Hydro Brake Manhole Detail



Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S49	1.2m	113.553	111.300/225Ø	111.300/300Ø	1.6m	1.0	Hydro-Brake Optimum

S49 Hydro Brake Manhole Detail



Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S53	1.350m	113.553	111.132/300Ø	107.940/375Ø	1.250m	1.0	Hydro-Brake Optimum

S53 Hydro Brake Manhole Detail

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

1. This drawing presents the Hydrobrake Manhole Details for the proposed development at West Hoathly, Brickworks.
2. This drawing is to be read in conjunction with all relevant Engineer's and Architect's drawings and specifications.
3. This drawing is to be printed in COLOUR.
4. For drainage layout refer to RSK drawing No 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage Layout

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	RD

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Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: HYDROBRAKE MANHOLE DETAILS (SHEET 2 OF 3)

Drawn	Date	Checked	Date	Approved	Date
LN	10.07.2025	AM		RD	

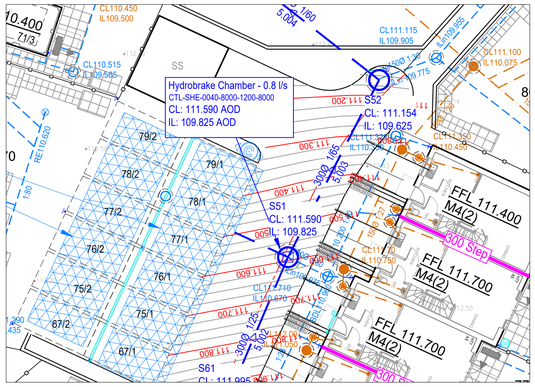
Scale	Orig Size	Dimensions
NTS	A1	M

Project No.: 00347

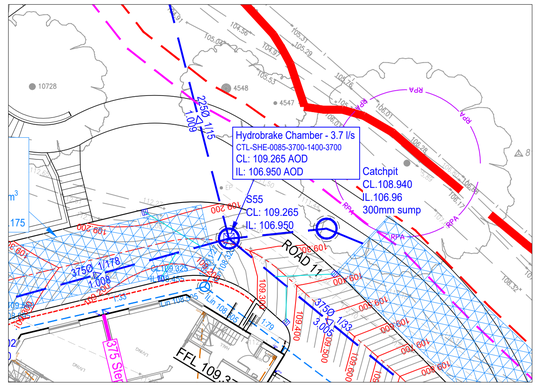
Drawing File: 890844-RSK-ZZ-XX-DR-C-4011-4012-Hydrobrake Manhole Details.dwg

Drawing No.: 890844 | RSK | ZZ | XX | DR | C | 4011 | Rev. T01

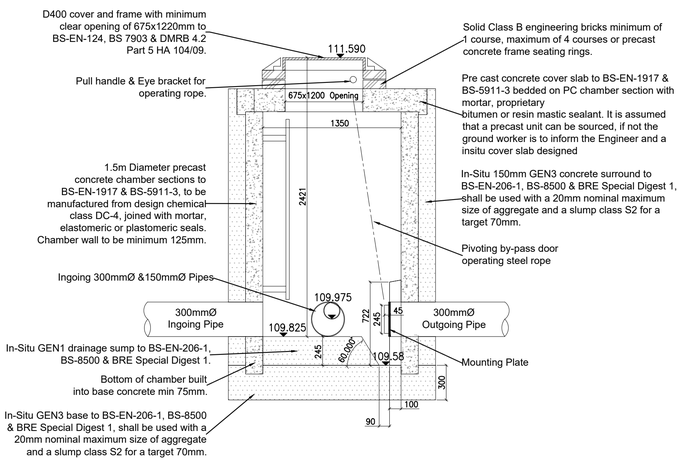
Project | Orig. | Vol./Sys. | Lev./Loc. | Type | Role | Draw. No.

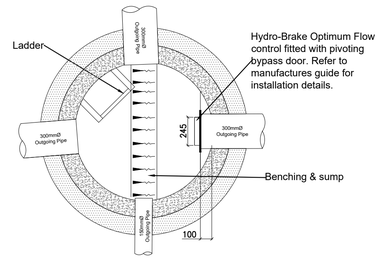


Location of S51 Hydro Brake Manhole



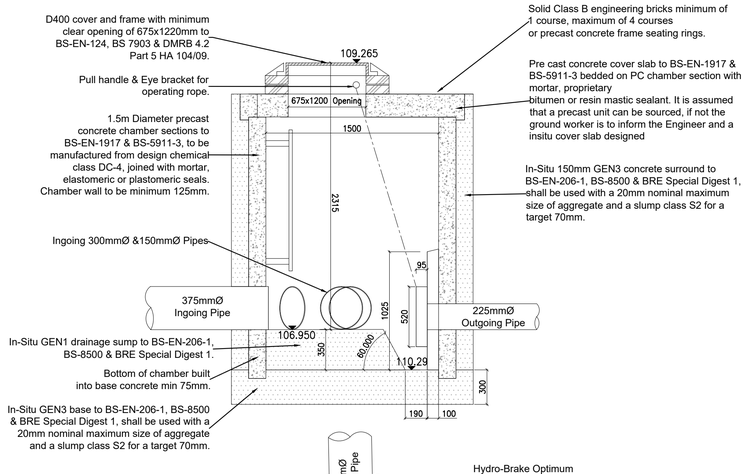
Location of S55 Hydro Brake Manhole

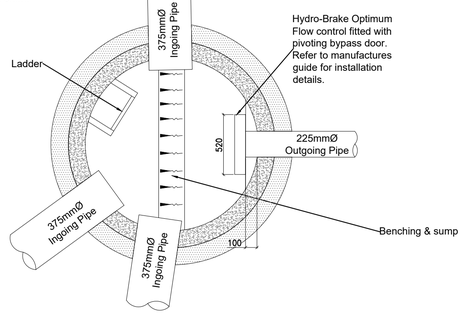




Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S51	1.350m	111.590	109.825/300Ø	109.825/300Ø	1.2m	0.8	Hydro-Brake Optimum

S51 Hydro Brake Manhole Detail





Manhole Reference	Manhole Size	Cover Level	Incoming Pipe IL/Size	Outgoing Pipe IL/Size	Design Head	Flow Rate (l/s)	Flow Control Type
S55	1.50m	109.265	106.950/375Ø	106.950/225Ø	1.400m	3.7	Hydro-Brake Optimum

S55 Hydro Brake Manhole Detail

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

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Notes:

1. This drawing presents the Hydrobrake Manhole Details for the proposed development at West Hoathly, Brickworks.
2. This drawing is to be read in conjunction with all relevant Engineer's and Architect's drawings and specifications.
3. This drawing is to be printed in COLOUR.
4. For drainage layout refer to RSK drawing No 890844-RSK-ZZ-XX-DR-C-3000-3005-Site Drainage Layout

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
T01	11.07.2025	Issued for Tender.	LN	AM	RD

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Web: www.rsk.co.uk

Client: CALA

Project Title: WEST HOATHLY BRICKWORKS

Status: TENDER

Drawing Title: HYDROBRAKE MANHOLE DETAILS (SHEET 3 OF 3)

Drawn	Date	Checked	Date	Approved	Date
LN	10.07.2025	AM		RD	

Scale	Orig Size	Dimensions
NTS	A1	M

Project No. 00347

Drawing File: 890844-RSK-ZZ-XX-DR-C-4011-4012-Hydrobrake Manhole Details.dwg

Drawing No. / Rev.

Project	Orig.	Vol./Sys.	Lev./Loc.	Type	Role	Draw. No.	Rev.
890844	RSK	ZZ	XX	DR	C	4012	T01

APPENDIX G – DECISION NOTICE

MID SUSSEX DISTRICT COUNCIL

Oaklands Road
Haywards Heath
West Sussex
RH16 1SS

Switchboard: 01444 458166

DX 300320 Haywards Heath1
www.midsussex.gov.uk

Ashill Regen Ltd
c/o Bethan O'Sullivan
Montagu Evans
70 St Mary Axe
London
EC3A 8BE

CONTACT: Stuart Malcolm
PHONE: 01444 477293
E-MAIL: stuart.malcolm@midsussex.gov.uk
REF: DM/23/0827
DATE: 18th October 2024

Dear Sir/Madam

West Hoathly Brickworks Hamsey Road Sharpthorne East Grinstead
Full planning application for the demolition of existing structures and redevelopment of the site to provide 108 residential dwellings (Class C3) and associated works, including the provision of an on-site SANG, access, landscaping, parking and associated works. (Amended plans received showing minor changes to scheme, as detailed in applicant's letter dated 13th November)

I advise that your application DM/23/0827 was **Granted Permission** on **18th October 2024.**

I enclose a copy of the Decision Notice in relation to the above application. If you are acting as an Agent please ensure that a copy is given to the applicant. **Please read the notes accompanying this decision notice carefully.**

Please also be advised that this permission does not constitute an approval under Building Regulations. Before you proceed with your proposal you should ensure that a Building Control application is not required, or has been submitted.

Yours faithfully



Ann Biggs
Assistant Director Planning and Sustainable Economy

MID SUSSEX DISTRICT COUNCIL

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RH16 1SS

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TOWN AND COUNTRY PLANNING ACT 1990
TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (ENGLAND) ORDER 2015

PERMISSION

REFERENCE: **DM/23/0827**

DESCRIPTION: **FULL PLANNING APPLICATION FOR THE DEMOLITION OF EXISTING STRUCTURES AND REDEVELOPMENT OF THE SITE TO PROVIDE 108 RESIDENTIAL DWELLINGS (CLASS C3) AND ASSOCIATED WORKS, INCLUDING THE PROVISION OF AN ON-SITE SANG, ACCESS, LANDSCAPING, PARKING AND ASSOCIATED WORKS. (AMENDED PLANS RECEIVED SHOWING MINOR CHANGES TO SCHEME, AS DETAILED IN APPLICANT'S LETTER DATED 13TH NOVEMBER)**

LOCATION: **WEST HOATHLY BRICKWORKS, HAMSEY ROAD, SHARPTHORNE, EAST GRINSTEAD**

DECISION DATE: **18 OCT 2024**

CASE OFFICER: **STUART MALCOLM - STUART.MALCOLM@MIDSUSSEX.GOV.UK**

The Council hereby notify you that they **GRANT** planning permission for the above development to be carried out in accordance with the submitted application and plans and subject to compliance with the following conditions:-

Conditions

1. The development hereby permitted shall be begun before the expiration of 3 years from the date of this permission.

   Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

Pre-development

2. Prior to the commencement of any development above ground/slab level a schedule of materials and finishes to be used for the external walls, roofs and fenestration of the proposed buildings shall have been submitted to and approved by the Local Planning Authority. The materials should be based on the High Weald Colour Study and High Weald Design Guide, should reflect those used in the local area and be locally sourced where possible. The works shall be carried out in accordance with the approved details unless otherwise agreed with the Local Planning Authority in writing.

   Reason: To achieve a development of visual quality in the AONB and to accord with Policies DP16 and DP26 of the Mid Sussex District Plan.

3. No development shall be carried out above slab/ground floor level until the following detailed design issues have been submitted to and approved in writing by the local planning authority:

   - 1:20 sections and front elevations of typical house and the typical features (shown in context) of the other building types including entrance canopies/doors, railing, roof/eaves details, windows, doors, chimneys, rainwater downpipes.

   The development shall not be carried out otherwise than in accordance with the approved details unless otherwise agreed in writing with the local planning authority.

   Reason: To ensure these aspects of the development are compatible with the AONB and to accord with Policies DP16 and DP26 of the Mid Sussex District Plan

4. Prior to the commencement of any development above ground/slab level a soft landscaping scheme for the site shall have been submitted to and approved in writing by the Local Planning Authority. It shall include planting (with planting plans using native species), schedules of trees, hedgerows and plants noting species, plant sizes and proposed numbers/ densities, details of tree pits and soil volumes.

   The approved scheme of soft landscaping works shall be implemented not later than the first planting season following commencement of the development (or within such extended period as may first be agreed in writing with the Local Planning Authority). Any planting removed, dying or becoming seriously damaged or diseased within five years of planting shall be replaced within the first available planting season thereafter with planting of similar size and species unless the Local Planning Authority gives written consent for any variation.

   Reason: To achieve a development of visual quality in the AONB and to accord with Policies DP16, DP26 and DP37 of the Mid Sussex District Plan.

5. Prior to the commencement of any development above ground/slab level a hard landscaping scheme for the site shall have been submitted to and approved in writing by the Local Planning Authority. These details shall provide images and drawings where required and include all hard surfacing materials, means of enclosure and other boundary treatments, car parking layouts, other vehicle and pedestrian access and circulation areas and other elements used throughout the landscape (for example benches, play on the way, mock bridge, lighting solutions, open pavilion themed on Victorian station canopy). The scheme shall also have reference to the High Weald Design Guide and ensure that close board fences are not used as garden boundaries where they would be viewed from public areas.

The scheme shall be implemented prior to the occupation of any part of the development (or within such extended period as may first be agreed in writing with the Local Planning Authority).

Reason: To achieve a development of visual quality in the AONB, to protect neighbouring residential amenity and to accord with Policies DP16 and DP26 of the Mid Sussex District Plan

6. No development, other than demolition, shall take place until details of the existing and proposed site levels have been submitted to and approved in writing by the Local Planning Authority. The development shall only be carried out in accordance with the approved details.

Reason: For the avoidance of doubt and to ensure that the development does not prejudice the amenities of adjacent residents or the appearance of the locality and to accord with Policy DP26 of the Mid Sussex District Plan.

7. The development hereby permitted shall not commence, other than demolition works, unless and until details of the proposed foul and surface water drainage and means of disposal have been submitted to and approved in writing by the Local Planning Authority. No residential unit shall be occupied until all the approved drainage works have been carried out in accordance with the approved details. The details shall include a timetable for its implementation and a management and maintenance plan for the lifetime of the development which shall include arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime. Maintenance and management during the lifetime of the development should be in accordance with the approved details. No drainage systems infiltration of surface water drainage into the ground is permitted other than with the written consent of the Local Planning Authority.

Reason: To ensure that the proposal is satisfactorily drained and to accord with the NPPF requirements and Policy DP41 of the Mid Sussex District Plan.

8. No development shall take place, including any works of demolition, until a Construction and Environmental Management Plan has been submitted to and approved in writing by the Local Planning Authority. Thereafter the approved Plan shall be implemented and adhered to throughout the entire construction period. The Plan shall provide details as appropriate but not necessarily be restricted to the following matters;
o the anticipated number, frequency and types of vehicles used during construction;
o the method of access and routing of vehicles during construction;
o the parking of vehicles by site operatives and visitors;
o the loading and unloading of plant, materials and waste;
o the storage of plant and materials used in construction of the development;
o the erection and maintenance of security hoarding;
o the provision of wheel washing facilities and other works required to mitigate the impact of construction upon the public highway (including the provision of temporary Traffic Regulation Orders);
o details of public engagement both prior to and during construction works, including site contact details in case of complaints;
o measures to control noise and vibration affecting nearby residents;
o artificial illumination;
o pollution incident control;
o dust control measures; and

o an arboricultural method statement including indications of all existing trees and hedgerows on the land, and details of those to be retained, together with measures for their protection in the course of development.
Reason: In the interests of highway safety and the amenities of the area, to protect the amenity of local residents from noise and dust emissions during construction and to comply with Policies DP21, DP26, DP29 and DP37 of the Mid Sussex District Plan.

9. Prior to the commencement of any development above ground/slab level, a scheme of mitigation measures to improve air quality relating to the development shall be submitted to, and approved in writing by, the Local Planning Authority. The scheme shall be in accordance with, and to a value derived in accordance with, the "Air Quality and Emissions Mitigation Guidance for Sussex" which is current at the time of the application. All works which form part of the approved scheme shall be completed before any part of the development is occupied and shall thereafter be maintained in accordance with the approved details.

Reason: to preserve the amenity of local residents regarding air quality and emissions and to accord with Policy DP26 of the District Plan and Policy SA38 of the Site Allocations DPD.

10. Prior to the commencement of development approved by this planning permission (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), the following components of a scheme to deal with the risks associated with contamination of the site, including the identification and removal of asbestos containing materials, shall each be submitted to and approved, in writing, by the local planning authority:

a) A further site investigation, based on the recommendations within the phase 1 and phase 2 geo-environmental and geotechnical factual and interpretive report by RSK GeoSciences, dated the 3rd of March 2023, ref: 1922410-R01 (01), to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site;

and, unless otherwise agreed in writing by the LPA,

b) Based on the site investigation results and the detailed risk assessment (a) an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

11. No demolition, development or conversion works shall take place until a Written Scheme of Investigation for a programme of historic building recording work has been submitted to and approved in writing by the local planning authority. This will include a comprehensive photographic survey of the surviving built evidence of the former industrial site.

Reason: In the interests of the significance of a heritage asset and to accord with Policy DP34 of the District Plan and the NPPF.

12. No demolition, development or conversion works shall take place until the satisfactory completion of the historic building recording fieldwork in accordance with the submitted and approved Written Scheme of Investigation.

Reason: In the interests of the significance of a heritage asset and to accord with Policy DP34 of the District Plan and the NPPF.

13. Any works which will impact the breeding / resting place of bats, shall not in in any circumstances commence unless the local planning authority has been provided with either:

a. a licence issued by Natural England pursuant to Regulation 55 of The Conservation of Habitats and Species Regulations 2017 (as amended) authorizing the specified activity/development to go ahead; or

b. evidence of site registration supplied by an individual registered to use a Bat Mitigation Class Licence; or

c. a statement in writing from the Natural England to the effect that it does not consider that the specified activity/development will require a licence."

Reason: To conserve protected species and allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 (as amended) and s17 Crime & Disorder Act 1998 and to accord with Policy DP38 of the District Plan.

14. Any works which will impact the breeding / resting place of Great Crested Newt shall not in in any circumstances commence unless the local planning authority has been provided with either:

a. a licence issued by Natural England pursuant to Regulation 55 of The Conservation of Habitats and Species Regulations 2017 (as amended) authorizing the specified activity/development to go ahead; or

b. a GCN District Level Licence issued by Natural England pursuant to Regulation 55 of The Conservation of Habitats and Species Regulations 2017 (as amended) authorizing the specified activity/development to go ahead; or

c. a statement in writing from the Natural England to the effect that it does not consider that the specified activity/development will require a licence.

Reason: To conserve protected species and allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 (as amended) and s17 Crime & Disorder Act 1998 and to accord with Policy DP38 of the District Plan.

15. Prior to commencement of any development, a construction environmental management plan (CEMP: Biodiversity) shall be submitted to and approved in writing by the local planning authority. The CEMP (Biodiversity) shall include the following.

a) Risk assessment of potentially damaging construction activities.
b) Identification of "biodiversity protection zones".
c) Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements).
d) The location and timing of sensitive works to avoid harm to biodiversity features.
e) The times during construction when specialist ecologists need to be present on site to oversee works.
f) Responsible persons and lines of communication.

g) The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.
h) Use of protective fences, exclusion barriers and warning signs.

The approved CEMP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the local planning authority.

Reason: To conserve protected and Priority species and allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 (as amended) and s40 of the NERC Act 2006 (Priority habitats & species) and to accord with Policy DP38 of the District Plan.

16. Prior to the commencement of any development above ground/slab level, a Biodiversity Enhancement Layout, providing the finalised details and locations of the enhancement measures contained within the Ecological Assessment (Ecology Solutions, March 2023) shall be submitted to and approved in writing by the local planning authority

The enhancement measures shall be implemented in accordance with the approved details prior to occupation and all features shall be retained in that manner thereafter.

Reason: To enhance protected and Priority species & habitats and allow the LPA to discharge its duties under the NPPF 2021 and s40 of the NERC Act 2006 (Priority habitats & species).

17. A Landscape and Ecological Management Plan (LEMP) shall be submitted to, and be approved in writing by, the local planning authority prior to commencement of the development. The content of the LEMP shall include the following:

a) Description and evaluation of features to be managed.
b) Ecological trends and constraints on site that might influence management.
c) Aims and objectives of management.
d) Appropriate management options for achieving aims and objectives.
e) Prescriptions for management actions.
f) Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period).
g) Details of the body or organisation responsible for implementation of the plan.
h) Ongoing monitoring and remedial measures.
The LEMP shall also include details of the legal and funding mechanism(s) by which the long-term implementation of the plan will be secured by the developer with the management body(ies) responsible for its delivery. The plan shall also set out (where the results from monitoring show that conservation aims and objectives of the LEMP are not being met) how contingencies and/or remedial action will be identified, agreed and implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme. The approved plan will be implemented in accordance with the approved details.

Reason: To allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 (as amended) and s40 of the NERC Act 2006 (Priority habitats & species) and to accord with Policy DP38 of the District Plan.

18. Prior to the commencement of any development above ground/slab level, details showing the proposed location of the required fire hydrants or stored water supply (in accordance with the West Sussex Fire and Rescue Guidance Notes) shall be submitted to and

approved in writing by the Local Planning Authority in consultation with West Sussex County Council's Fire and Rescue Service.

Reason: In the interests of amenity and in accordance with The Fire and Rescue Service Act 2004.

19. Two affordable housing dwellings (a 1B/2P flat and a 2B/4P house) shall be provided as wheelchair accessible dwellings which meet the requirements contained in Part M4(3)(1)(a) and (b) and Part M4(3)(2)(b) of Schedule 1 of the Building Regulations 2010 as amended. No above ground works, other than demolition, shall commence on site until the Local Planning Authority has approved final plans/details for the wheelchair accessible dwellings demonstrating that all necessary requirements will be met.
Reason: To ensure that the development provides a range of house types to meet accessibility and adaptability needs to comply with Policy DP28 of the Mid Sussex District Plan.

20. No development shall commence, other than demolition, until details of the play area and fitness trim trail have been submitted to and approved by the Local Planning Authority. The details shall include the layout, drainage, equipment, landscaping and fencing of the areas, a timetable for implementation and arrangements for future management. The development shall be carried out in accordance with the approved details and the approved play area and fitness trim trail shall thereafter be permanently retained as such.

Reason: To ensure satisfactory provision of play equipment and space and to ensure that play areas are provided and retained within the development for use by the general public and to accord with Policy DP20 of the Mid Sussex District Plan.

Construction phase

21. All mitigation and enhancement measures and/or works shall be carried out in accordance with the details contained in the Ecological Assessment (Ecology Solutions, March 2023) and Appendix 5 Defra Metric Assessment (Extracts) (undated), as already submitted with the planning application and agreed in principle with the local planning authority prior to determination. This includes a Non-Licensed Hazel Dormouse Method Statement (Sections 5.3.76 - 5.3.92 Ecological Assessment (Ecology Solutions, March 2023)) which avoids impacts on this European Protected Species and a reptile Method Statement (Sections 5.3.61 - 5.3.69 Ecological Assessment (Ecology Solutions, March 2023)) which avoids impacts on these Priority species.

This will include the appointment of an appropriately competent person e.g. an ecological clerk of works (ECoW) to provide on-site ecological expertise during construction. The appointed person shall undertake all activities, and works shall be carried out, in accordance with the approved details."

Reason: To conserve and enhance protected and Priority species and allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 as amended and s40 of the NERC Act 2006 (Priority habitats & species) and to accord with Policy DP38 of the District Plan.

22. No part of any concrete foundations and no construction activities shall be within 3.5 metres of any drain or watercourse, unless agreed in writing by the Local Planning Authority.

Reason: In the interests of protecting the natural environment and to comply with Policy DP41 of the Mid Sussex District Plan.

23. No work for the implementation of the development hereby permitted shall be undertaken on the site on Sundays or Bank/Public Holidays or at any time other than between the hours 8am and 6pm on Mondays to Fridays and between 9am and 1pm Saturdays.

Reason: To safeguard the amenities of nearby residents and to accord with Policies DP26 and DP29 of the Mid Sussex District Plan.

24. Deliveries or collection of plant, equipment or materials for use during the demolition/construction phase shall be limited to the following times:
- Monday to Friday: 08:00 - 18:00 hrs
- Saturday: 09:00 - 13:00 hrs
- Sundays and Bank/Public Holidays: None permitted

Reason: To protect the amenity of local residents and to accord with Policies DP26 and DP29 of the Mid Sussex District Plan.

25. If during construction, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing by the LPA), shall be carried out until a method statement identifying, assessing the risk and proposing remediation measures, together with a programme, shall be submitted to and approved in writing by the LPA. The remediation measures shall be carried out as approved and in accordance with the approved programme. If no unexpected contamination is encountered during development works, on completion of works and prior to occupation a letter confirming this should be submitted to the LPA. If unexpected contamination is encountered during development works, on completion of works and prior to occupation, the agreed information, results of investigation and details of any remediation undertaken will be produced to the satisfaction of and approved in writing by the LPA.

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

26. Piling or any other foundation designs using penetrative methods shall not be permitted other than with the express written consent of the Local Planning Authority, which may be given for those parts of the site where it has been demonstrated by a piling risk assessment that there is no resultant unacceptable risk to groundwater. The development shall be carried out in accordance with the approved details

Reason: To ensure that the development does not contribute to, or is not put at unacceptable risk from, or adversely affected by, unacceptable levels of water pollution caused by mobilised contaminants in line with paragraph 174 of the National Planning Policy Framework and DP41 of the District Plan.

Pre-occupation conditions

27. A landscape management plan for all the hard and soft landscape areas other than small, privately owned, domestic gardens, shall be submitted to and approved in writing by the local planning authority prior to the occupation of the development. The landscape management plan shall include;
a) Drawings showing:

i. The extent of the Landscape Management Plan.
b) Written Specification detailing:
i. All operation and procedures for soft landscape areas; inspection, watering, pruning, cutting, mowing, clearance and removal of arisings and litter, removal of temporary items (fencing, guards and stakes) and replacement of failed planting.
ii. All operations and procedures for hard landscape areas; inspection, sweeping, clearing of accumulated vegetative material and litter, maintaining edges, and painted or finished surfaces.
iii. Furniture (Bins, Benches and Signage) and Play Equipment
iv. All operations and procedures for surface water drainage system; inspection of linear drains and swales, removal of unwanted vegetative material and litter.
v. Management responsibilities
vi. Long term design objectives
c) Maintenance schedules:
i. task table which explains the maintenance duties across the site in both chronological and systematic order.

The landscape management plan shall be carried out as approved.

Reason: In the interests of the visual amenity of the development in accordance with Policies DP16 and DP26 of the Mid Sussex District Plan.

28. No part of the development shall be first occupied until such time as a lighting design scheme for biodiversity shall be submitted to and approved in writing by the local planning authority. The scheme shall identify those features on site that are particularly sensitive for bats and that are likely to cause disturbance along important routes used for foraging; and show how and where external lighting will be installed (through the provision of appropriate lighting contour plans, Isolux drawings and technical specifications) so that it can be clearly demonstrated that areas to be lit will not disturb or prevent bats using their territory. The lighting shall be designed to Institute of Lighting Professionals light control zone E1 standards (with regard to skyglow/ULR, light temperature, and heights/design of light fixtures) to protect the intrinsically dark night skies of the High Weald AONB.

All external lighting shall be installed in accordance with the specifications and locations set out in the scheme and maintained thereafter in accordance with the scheme. Under no circumstances should any other external lighting be installed without prior consent from the local planning authority.

Reason: To allow the LPA to discharge its duties under the Conservation of Habitats and Species Regulations 2017 (as amended), the Wildlife & Countryside Act 1981 as amended and s40 of the NERC Act 2006 (Priority habitats & species) and to accord with Policy DP38 of the District Plan.

29. No building is to be occupied, or brought into use, until a Verification Report pertaining to the surface water drainage system, carried out by a competent Engineer, has been submitted to the Local Planning Authority. The Verification Report shall demonstrate the suitable operation of the drainage system such that flood risk is appropriately managed, as approved by the Lead Local Flood Authority. The Report shall contain information and evidence (including photographs) of earthworks; details and locations of inlets, outlets, and control structures; extent of planting; details of materials utilised in construction including subsoil, topsoil, aggregate and membrane liners; full as built drawings; and topographical survey of 'as constructed' features. The Verification Report should also include an indication of the adopting or maintaining authority or organisation.

Reason: To ensure that the constructed surface water drainage system complies with the approved drainage design and is maintainable and to comply with Policy DP41 of the Mid Sussex District Plan.

30. Prior to the first occupation of any dwelling/residential unit forming part of the proposed development that they will at their own expense install the required fire hydrants (or in a phased programme if a large development) in the approved location to BS 750 standards or stored water supply and arrange for their connection to a water supply which is appropriate in terms of both pressure and volume for the purposes of firefighting.

The fire hydrant shall thereafter be maintained as part of the development by the water undertaker at the expense of the Fire and Rescue Service if adopted as part of the public mains supply (Fire Services Act 2004) or by the owner / occupier if the installation is retained as a private network.

Reason: In the interests of amenity and in accordance with The Fire & Rescue Service Act 2004.

31. The development shall be constructed in accordance with the applicant's Energy and Sustainability Statement (The PES, July 2023) and the EV, PV and ASHP Plan (2141-C-1012-PL-D 17/11/23). No part of the development shall be first occupied unless or until the details of the PV arrays (siting, design and 1:20 roof section) and air source heat pumps (siting and design) have been submitted to and approved in writing by the local planning authority. The development shall proceed only in accordance with these approved details unless otherwise agreed in writing with the local planning authority

Reason: In the interests of sustainability and to accord with Policy DP39 of the District Plan.

32. No part of the development shall be first occupied until such time as the vehicular access serving the development has been constructed in accordance with the details shown on the drawing titled Proposed Access Arrangement and numbered 2022/6607/009 as included within the approved Transport Assessment.

Reason: In the interests of road safety and to comply with Policy DP21 of the Mid Sussex District Plan.

33. No part of the development shall be first occupied until such time as the highway works at the Top Road/Station Road junction have been constructed in accordance with the details shown on the drawing titled Proposed Junction Improvements (Top Road/Station Road junction) and numbered 2022/6607/011 revision P1 as included within the approved Transport Assessment.

Reason: In the interests of road safety and to comply with Policy DP21 of the Mid Sussex District Plan.

34. No dwelling shall be first occupied until the car parking serving the respective dwelling has been constructed in accordance with the approved site plan. Once provided the spaces shall thereafter be retained at all times for their designated purpose.

Reason: To provide car-parking space for the use and to comply with Policy DP21 of the Mid Sussex District Plan.

35. No dwelling shall be first occupied until covered and secure cycle parking spaces serving the respective dwelling have been provided in accordance with plans and details as shown

on the approved drawing titled Carports and Cycle Store (3211-)B and the Parking Plan (1006-D)

Reason: To provide alternative travel options to the use of the car in accordance with current sustainable transport policies and to comply with Policy DP21 of the Mid Sussex District Plan.

36. No part of the development shall be first occupied until the road(s), footways, and casual parking areas serving the development have been constructed, surfaced, and drained in accordance with plans and details to be submitted to and approved by the Local Planning Authority.

Reason: In the interests of road safety and to comply with Policy DP21 of the Mid Sussex District Plan.

37. Before the development hereby permitted is occupied, refuse and recycling facilities shall be provided as part of the development in accordance with the approved plans.

Reason: To safeguard the appearance of the development and to accord with Policy DP26 of the District Plan

38. The development hereby permitted shall not be occupied until there has been submitted to and approved in writing by the Local Planning Authority a verification plan by a competent person showing that the remediation scheme required and approved has been implemented fully and in accordance with the approved details (unless varied with the written agreement of the LPA in advance of implementation). Any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action shall be identified within the report, and thereafter maintained

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

39. A minimum of 20 percent of the dwellings shall be built to meet national standards for accessibility and adaptability (Category M4(2) of the Building Regulations). These shall be fully implemented prior to completion of the development and thereafter be so maintained and retained. No dwelling shall be occupied until a verification report confirming compliance with category M4(2) has been submitted to and agreed with the Local Planning Authority. Unless an exception is otherwise agreed in writing with the Local Planning Authority.

Reason: To ensure that the development provides a range of house types to meet accessibility and adaptability needs to comply with Policy DP28 of the Mid Sussex District Plan.

40. The development hereby permitted shall not be occupied until the applicant has submitted to the local planning authority an approved report detailing the results of the recording programme in accordance with the approved Written Scheme of Investigation.

Reason: In the interests of the significance of a heritage asset and to accord with Policy DP34 of the District Plan and the NPPF.

Post-occupation monitoring / management conditions

41. The window serving the bathroom at first floor level on the south elevation of both Plots 11 and 12 (as shown on the approved plans) shall at all times be glazed with obscured glass fixed to be top vent opening only.

Reason: To protect the amenities and privacy of the adjoining properties and to accord with Policy DP26 of the Mid Sussex District Plan.

Approved Plans

42. The development hereby permitted shall be carried out in accordance with the plans listed below under the heading 'Plans Referred to in Consideration of this Applications'.

Reason: For the avoidance of doubt and in the interest of proper planning.

Biodiversity Net Gain

1. This permission is considered to be one which **will not require the approval of a biodiversity gain plan before development is began** because it is considered that one or more of the statutory exemptions or transitional arrangements is considered to apply.

Please see the information contained within the notes to applicants/agents set out below.

Informatives

1. You are advised that this planning permission requires compliance with a planning condition(s) **before development commences**. You are therefore advised to contact the case officer as soon as possible, or you can obtain further information from: https://www.gov.uk/guidance/use-of-planning-conditions#discharging-and-modifying-conditions (Fee of £145 will be payable per request). If you carry out works prior to a pre-development condition being discharged then a lawful start will not have been made and you will be liable to enforcement action.

2. No burning of demolition/construction waste materials shall take place on site.

3. Your attention is drawn to the informatives contained within a number of the consultee comments that the applicant should give consideration to. These being comments from Southern Water, Natural England, Environment Agency, Sussex Police and West Sussex Rights of Way.

4. The applicant's attention is drawn to the comments of West Sussex Highways and the need for the applicant to establish adoption and future maintenance procedures.

5. You are advised to include appropriate safety measures and signage around the water bodies on site.

6. In accordance with Article 35 of the Town and Country Planning (Development Management Procedure) (England) Order 2015, the Local Planning Authority has acted positively and proactively in determining this application by identifying matters of concern within the application (as originally submitted) and negotiating, with the Applicant, acceptable amendments to the proposal to address those concerns. As a result, the Local Planning Authority has been able to grant planning permission for an acceptable proposal,

in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.

Human Rights Implications
The planning application has been considered in light of statute and case law and any interference with an individual's human rights is considered to be proportionate to the aims sought to be realised.

Plans Referred to in Consideration of this Application
The following plans and documents were considered when making the above decision:

Plan Type	Reference	Version	Submitted Date
Other	2022/6607/006	P7	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3020-PL-B_2BH-AFF _ 3BGH-AFF	PLOTS 8 and 9	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3025-PL-B_4BH-AFF_ 2BH-AFF	PLOTS 10-11	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3030-PL-B_4BH-AFF_ 2BH-AFF	PLOTS 12-13	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3035-PL-B_2BH-AFF_3BH-AFF	PLOTS 14-15	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3040-PL-B_3BH3	PLOT 16	26.07.2023
Proposed Elevations	3141-C-3046-PL-B_3BHC_3BH1	PLOTS 17-20	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3050-PL-B_2BH-AFF	PLOTS 21-23	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3055-PL-B_3BH1	PLOT 24	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3060-PL-C_4BH2	PLOT 53	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3070-PL-B_5BH1	PLOTS 25,26 and 40	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3071-PL-A_5BH1	PLOT 39	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3072-PL_5BH1	PLOT 41	26.07.2023
Proposed Elevations	3141-C-3086-PL-C_2BH1 _ 3BHT	PLOTS 33-36	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3090-PL-B_4BH3	PLOT 37	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3100-PL-B_3BH4	PLOT 42	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3101-PL-B_3BH4	PLOT 47	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3102-PL-A-3BH4	PLOT 82	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3103-PL-A_3BH4	PLOT 97	26.07.2023

Proposed Floor and Elevations Plan	3141-C-3105-PL-C_3BHT _ 3BH2	PLOTS 43-45	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3110-PL-B_5BH1	PLOT 46	26.07.2023
Proposed Elevations	3141-C-3116-PL-C_2BH1, 3BH1 _ 3BH2	PLOTS 48-51	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3120-PL-B_3BH4	PLOT 52	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3125-PL-C_3BHT	PLOTS 59,60,101 and 102	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3135-PL-C_3BH2 and 2BH1	PLOTS 57 and 58	17.11.2023
Proposed Elevations	3141-C-3137-PL-B_3BH2, 2BH1, 3BH1 and 4 BH2	PLOTS 28-32	17.11.2023
Proposed Elevations	3141-C-3146-PL-D_Block A	PLOTS 61-66	22.12.2023
Proposed Floor and Elevations Plan	3141-C-3150-PL-B_3BHC _ 2BH2	PLOTS 67-69	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3155-PL-B_4BH3	PLOTS 70,71 and 74	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3160-PL-B_3BHC	PLOTS 72 and 73	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3165-PL-B_2BH-AFF	PLOTS 75-79	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3170-PL-B_4BH3	Plot 80	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3175-PL-C_3BHT_3BH2	PLOTS 83-85	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3180-PL-E_2BH-AFF M4(3)	Plot 86	17.11.2023
Proposed Elevations	3141-C-3186-PL-C_3BH2-AFF, 2BH-AFF, 3BH1_2BH1	PLOTS 87-92	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3190-PL-C_3BHT_3BH2	PLOTS 93-95	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3191-PL-B_3BHT_3BH2	PLOTS 54-56	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3195-PL-C_3BH2_2BH1	PLOTS 99 and 100	17.11.2023
Proposed Elevations	3141-A-3201-PL-D	BLOCK B Plots 103-108	22.12.2023
Proposed Site Plan	3141-C-1002.1-PL-C	footprint	26.07.2023
Proposed Site Plan	3141-C-1003.1-PL-D	Hardstanding	17.11.2023
Existing Site Plan	3141-C-1003-PL-C		26.07.2023
Landscaping	3141-C-1004.1-PL-E		17.11.2023
Proposed Site Plan	3141-C-1004.3-PL-D	volume	17.11.2023
Site Plan	3141-C-1005.1-PL-H	context	17.11.2023
Site Plan	3141-C-1005.1-PL-H	Aerial context	17.11.2023

Site Plan	3141-C-1005-PL-H		17.11.2023
Site Plan	3141-C-1006-PL-D	parking	17.11.2023
Site Plan	3141-C-1007-PL-D	Tenure	17.11.2023
Site Plan	3141-C-1008-PL-D	Dwelling Distribution	17.11.2023
Site Plan	3141-C-1009-PL-D	Storey Heights	17.11.2023
Site Plan	3141-C-1010-PL-E	Material Plan	17.11.2023
Site Plan	3141-C-1011-PL-D	Movement Plan	17.11.2023
Site Plan	3141-C-1012-PL-D	EV,PV and ASHP Plan	17.11.2023
Site Plan	3141-C-1013-PL-B	Refuse	17.11.2023
Site Plan	3141-C-1014-PL-C	Boundary Treatment	17.11.2023
Street Scene	3141-C-1200-PL-D	AA,BB	17.11.2023
Street Scene	3141-C-1201-PL-C	CC,DD	17.11.2023
Site Plan	3141-C-1202-PL-D	EE,FF	17.11.2023
Site Plan	3141-C-1203-PL-C	GG,HH	17.11.2023
Site Plan	3141-C-1204-PL-C	JJ	17.11.2023
Site Plan	3141-A-1021-PL-B	Affordable Homes	17.11.2023
Proposed Floor Plans	3141-A-3085-PL-C	Plots 33-36	17.11.2023
Site Plan	3141-A-1000.1-PR	C	26.07.2023
Site Plan	3141-A-1005-PL	H	17.11.2023
Site Plan	3141-A-1005.1-PL	H	17.11.2023
Proposed Floor Plans	3141-C-3010-PL-B_3BHC and 3BH1	PLOTS 3-6	26.07.2023
Proposed Floor Plans	3141-A-3045-PL-B_3BHC and 3BH1	PLOTS 17-20	26.07.2023
Proposed Floor Plans	3141-B-3085-PL-A 2BH1 & 3BHT	PLOTS 33-36	26.07.2023
Proposed Floor Plans	3141-A-3115-PL-C 2BH1, 3BH1 & 3BH2	PLOTS 48-51	17.11.2023
Proposed Floor Plans	3141-A-3136-PL-B_3BH2, 2BH1, 3BH1 & 4BH2	Plots 28-32	17.11.2023
Proposed Floor Plans	3141-A-3145-PL-G	BLOCK A Plots 61-66	22.12.2023
Proposed Floor Plans	3141-A-3147-PL-D_	BLOCK A PLOT 62	17.11.2023
Proposed Floor Plans	3141-A-3148-PL-D	BLOCK A - Plot 62	17.11.2023
Proposed Floor Plans	3141-A-3181-PL-D_2BH-AFF M4(3)	PLOT 86	17.11.2023
Proposed Floor Plans	3141-A-3182-PL-C_2BH-AFF M4(3)	PLOT 86	17.11.2023
Proposed Floor Plans	3141-A-3185-PL-C 3BH2-AFF, 3BH-AFF & 2BH-AFF	PLOTS 87-92	17.11.2023
Proposed Floor Plans	3141-A-3200-PL-D	BLOCK B Plots 103-108	22.12.2023
Proposed Floor and Elevations Plan	3141-A-3210-PL-B	Garage and	26.07.2023

Proposed Floor and Elevations Plan	3141-A-3211-PL-B	Car Ports Car Port and Cycle Store	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3000-PL-C_4BH2	PLOTS 1,81	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3001-PL-C_4BH2	PLOTS 27,38,96 and 98	17.11.2023
Proposed Floor and Elevations Plan	3141-C-3005-PL-B_4BH3	PLOT 2	26.07.2023
Proposed Elevations	3141-C-3011-PL-B_3BHC_3BH1	PLOTS 3-6	26.07.2023
Proposed Floor and Elevations Plan	3141-C-3015-PL-B_3BH3	PLOT 7	26.07.2023
Other	2022/6607/007 P7	Swept Path Analysis	26.07.2023
Landscaping	1632-002	G	26.07.2023
Landscaping	1632-005	I	17.11.2023
Landscaping	1632-003	E	26.07.2023
Landscaping	1632-001	J	26.07.2023
Landscaping	1632-006	P	17.11.2023
Location Plan	3141-A-1000-PL-A		24.03.2023
Existing Site Plan	3141-A-1001-PL-A		24.03.2023
Existing Elevations	3141-A-3300-PL-A		24.03.2023
Existing Elevations	3141-A-3301-PL-A		24.03.2023
Existing Elevations	3141-A-3302-PL-A		24.03.2023
Existing Elevations	3141-A-3303-PL-A		24.03.2023
Existing Elevations	3141-A-3304-PL-A		24.03.2023
Existing Elevations	3141-A-3305-PL-A		24.03.2023
Existing Elevations	3141-A-3306-PL-A		24.03.2023
Existing Elevations	3141-A-3307-PL-A		24.03.2023
Existing Elevations	3141-A-3308-PL-A		24.03.2023
Existing Site Plan	3141-C-1004.2-PL-A	Volume	24.03.2023
Existing Site Plan	3141-C-1002.1-PL-A		24.03.2023
Existing Site Plan	3141-C-1004.2-PL-A.1		24.03.2023
Drainage Details	134285 RSK ZZ ZZ DR C 3001	P03	04.09.2023



Ann Biggs
Assistant Director Planning and Sustainable Economy

PEFULZ

APPEALS TO THE SECRETARY OF STATE

Notes for Applicants

If you are aggrieved by the decision of your Local Planning Authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under Section 78 of the Town and Country Planning Act 1990.

If you want to appeal against your local planning authority's decision then you must do so within 6 months of the date of this notice;

However, if

(i) this is a decision on a planning application relating to the same or substantially the same land and development as is already the subject of an enforcement notice, and you want to appeal against your local planning authority's decision on your application, then you must do so within 28 days of the date of this notice; or

(ii) an enforcement notice is subsequently served relating to the same or substantially the same land and development as in your application and if you want to appeal against your local planning authority's decision on your application, then you must do so within:

- 28 days of the date of service of the enforcement notice, or
- within 6 months (12 weeks in the case of a householder appeal) of the date of this notice, whichever period expires earlier.

Appeals can be made online at: https://www.gov.uk/planning-inspectorate.
If you are unable to access the online appeal form, please contact the Planning Inspectorate to obtain a paper copy of the appeal form on tel: 0303 444 5000.

The Secretary of State can allow a longer period for giving notice of an appeal but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.

The Secretary of State need not consider an appeal if it seems to the Secretary of State that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

If you intend to submit an appeal that you would like examined by inquiry then you must notify the Local Planning Authority and Planning Inspectorate (inquiryappeals@planninginspectorate.gov.uk) at least 10 days before submitting the appeal. Further details are on GOV.uk.

Biodiversity Net Gain

The effect of paragraph 13 of Schedule 7A to the Town and Country Planning Act 1990 is that planning permission granted for the development of land in England is deemed to have been granted subject to the condition "(the biodiversity gain condition)" that development may not begin unless:

(a) a Biodiversity Gain Plan has been submitted to the planning authority, and
(b) the planning authority has approved the plan.

The planning authority, for the purposes of determining whether to approve a Biodiversity Gain Plan if one is required in respect of this permission would be Mid Sussex District Council.

There are statutory exemptions and transitional arrangements which mean that the biodiversity gain condition does not always apply.

Statutory exemptions and transitional arrangements in respect of the biodiversity gain condition that apply in this instance

The application for planning permission was made before 12th February 2024.

Irreplaceable habitat

If the onsite habitat includes irreplaceable habitat (within the meaning of the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024) there are additional requirements for the content and approval of Biodiversity Gain Plans.

The Biodiversity Gain Plan must include, in addition to information about steps taken or to be taken to minimise any adverse effect of the development on the habitat, information on arrangements for compensation for any impact the development has on the biodiversity of the irreplaceable habitat.

The planning authority can only approve a Biodiversity Gain Plan if satisfied that the adverse effect of the development on the biodiversity of the irreplaceable habitat is minimised and appropriate arrangements have been made for the purpose of compensating for any impact which do not include the use of biodiversity credits.

The effect of section 73D of the Town and Country Planning Act 1990

If planning permission is granted on an application made under section 73 of the Town and Country Planning Act 1990 (application to develop land without compliance with conditions previously attached) and a Biodiversity Gain Plan was approved in relation to the previous planning permission ("the earlier Biodiversity Gain Plan") there are circumstances when the earlier Biodiversity Gain Plan is regarded as approved for the purpose of discharging the biodiversity gain condition subject to which the section 73 planning permission is granted.

Those circumstances are that the conditions subject to which the section 73 permission is granted:

i) do not affect the post-development value of the onsite habitat as specified in the earlier Biodiversity Gain Plan, and

ii) in the case of planning permission for a development where all or any part of the onsite habitat is irreplaceable habitat the conditions do not change the effect of the development on the biodiversity of that onsite habitat (including any arrangements made to compensate for any such effect) as specified in the earlier Biodiversity Gain Plan.

The effect of Paragraph 19 of Schedule 7A to the Town and Country Planning Act 1990

If the permission which has been granted has the effect of requiring or permitting the development to proceed in phases, the modifications in respect of the biodiversity gain condition which are set out in Part 2 of the Biodiversity Gain (Town and Country Planning) (Modifications and Amendments) (England) Regulations 2024 apply.

In summary: Biodiversity gain plans are required to be submitted to, and approved by, the planning authority before development may be begun (the overall plan), and before each phase of development may be begun (phase plans).

Purchase Notices

If either the Local Planning Authority or Secretary of States refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances the owner may serve a purchase notice on the District Council. This notice will require the Council to purchase their interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

APPENDIX H – LLFA CORRESPONDENCE

Ground Floor
Northleigh
County Hall
Chichester
West Sussex
PO19 1RH

Lead Local Flood Authority

Stuart Malcolm
Development Control
Mid Sussex District Council
Oaklands Road
Haywards Heath
West Sussex
RH16 1SS

Date 7th August 2025

Dear Stuart,

RE: **DM/25/1853 - West Hoathly Brickworks, Hamsey Road, Sharpthorne, East Grinstead, West Sussex, RH19 4PB**

Thank you for your consultation on the above site, received on 24th July 2025. We have reviewed the application as submitted and wish to make the following comments.

This application is for Discharge of Conditions 2 (Materials Schedule), 6 (Site Levels) and 7 (Drainage) relating to DM/23/0827.

The LLFA have reviewed the documents submitted in relation to Condition 7, as it relates to drainage. For reference, Condition 7 is worded as follows:

The development hereby permitted shall not commence, other than demolition works, unless and until details of the proposed foul and surface water drainage and means of disposal have been submitted to and approved in writing by the Local Planning Authority. No residential unit shall be occupied until all the approved drainage works have been carried out in accordance with the approved details. The details shall include a timetable for its implementation and a management and maintenance plan for the lifetime of the development which shall include arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime. Maintenance and management during the lifetime of the development should be in accordance with the approved details. No drainage systems infiltration of surface water drainage into the ground is permitted other than with the written consent of the Local Planning Authority.

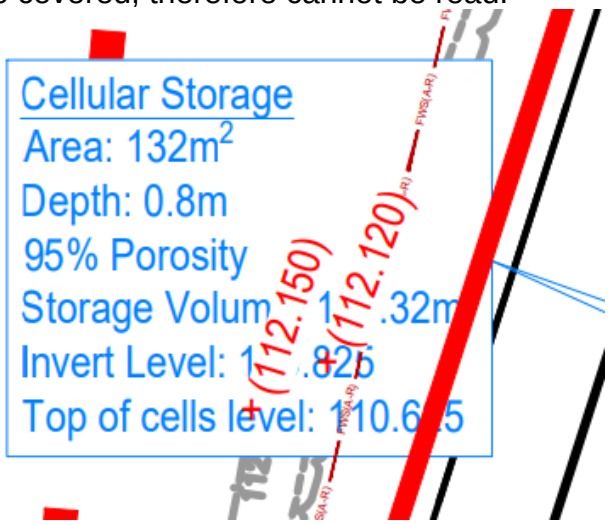
Reason: To ensure that the proposal is satisfactorily drained and to accord with the NPPF requirements and Policy DP41 of the Mid Sussex District Plan.

We have concerns that the submitted information does not meet with NPPF, PPG or the local planning policies and the proposal will either increase the risk of flooding elsewhere

or to the proposed development. We provide the following technical review for your consideration.

The main issues include;

- We have concerns that there have been alterations to the drainage strategy approved at full planning stage, but these changes have not been backed up by relevant calculations and supporting documents. The calculations must follow up to date parameters (FEH2022, Cv value 1, MADD factor/additional storage 0).
- Previously there were rain gardens proposed, however these have been removed from the drainage layout in the DoC.
- Some of the labels are covered, therefore cannot be read:



- The watercourses are not on the drawings.
- In the FRA approved at full planning, we believe it says the
- A catchment plan drawing is required to support the calculations to be submitted.
- We request the Drainage Construction Details 4004-4007.

We'd suggest using the following when addressing comments: detailed-drainage-design-technical-summary-version-2023-03.pdf. Please note we have no comments to make in relation to foul drainage as this does not fall within our remit.

As such, we are **unable to recommend the discharge of Condition 7**.

Receipt of the requested additional information does not mean further information will not be requested as part of this discharge of condition application.

Yours sincerely,

Eleanor Read
Flood Risk Management Team
FRM@westsussex.gov.uk

Annex

The following documents have been reviewed, which have been submitted to support the application;

Site Drainage Sheet 1-6, 30.06.2025, revision T01