

Appendix F – United Utilities Correspondence

Pre Development Enquiry Guidance

Version 1 (September 24)

(This document should be read in conjunction with PDE response letter)



Water for the North West

Comment no.	Technical Guidance
General Guidance	
1	Sewer Access If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below: https://www.unitedutilities.com/builders-developers/working-near-our-assets/ Sewer Adoption Under S104 If you intend to offer sewers for adoption, design per current Design and Construction and local practices which have now replaced Sewers for Adoption 6th Edition.. S104 Pre-Design Assessment We recommend submitting a pre-design assessment. This is a free service to discuss the high level design and potential challenges. Please see link to application form in guidance sheet. Adoption of Sewers • Designs must comply with current Design & Construction Guidance. • S104 1b Pre-design assessment, and S104 for adoption of new sewers applications can be found at Sewer adoptions - United Utilities • Submit pre-design assessment to SewerAdoptions@uuplc.co.uk. • No construction should commence until detailed design is approved in writing. Sewer Connections: • Formal S106 application required for sewer connections. Application details available at: www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/ Water Assets • Contact DeveloperServicesWater@uuplc.co.uk regarding clean water assets on site. • Further information: Water pre-development - United Utilities Additional Considerations • Land drainage, overland flows, and track drainage are not accepted into public sewer network. Useful Resources: • Codes for Adoption: www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/ • Design & Construction Guidance: www.water.org.uk/sewerage-sector-guidance-approved-documents/ • United Utilities website: www.unitedutilities.com/builders-developers/ Contact Information: • Main contact number: 0345 6723 723 • Sewer Adoptions and Pre-Development: SewerAdoptions@uuplc.co.uk
2	Flooding Events Please note that United Utilities Water Limited (U UW) can only record and check flooding events which are reported to us, and we must comply with our Regulators instructions on the qualification of flooding events. Our response does not include: • any sewer flooding events caused by blockages or collapses which are the result of third-party actions, natural events, or other actions over which UUW has no control and not a facet of sewer capacity; or • any historical sewer flooding events that have been resolved from investment in our infrastructure.

	Further consideration. - For low-lying sites, care should be taken to ensure that the property is not at increased risk of flooding. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme. - Consult Lead Local Flood Authority (LLFA) for surface water drainage concerns. - Check Environment Agency guidelines if site is in a Groundwater Source Protection Zone.
3	Asset Protection - Due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records. We ask that you proceed with caution and conduct adequate site investigation works. If any uncharted sewers are identified while conducting your investigation, we ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records. - Obtain asset data records before planning development United Utilities - Property Search. - Please be aware that any proposed diversion may require modelling. This process may take up to 6 months to reach an acceptable design. - Maintain minimum easement in line with our easement local practice, unless there is a formal easement in place, in which case the specified easement width would apply. easement-local-practice.pdf (unitedutilities.com) - Contact United Utilities for guidance on work near assets or if diversion is necessary.
4	Surface Water Drainage Hierarchy Follow the hierarchy as per National Planning Practice Guidance: 1. Infiltration 2. Discharge to waterbody 3. Discharge to surface water sewer or highway drain 4. Discharge to combined sewer (last resort) For guidance, The Northwest SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted. The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area). The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining the cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities. SuDS (Sustainable Drainage Systems) - Prioritise multi-functional SuDS in accordance with national planning policy. - Design SuDS components as per CIRIA SuDS Manual (C753). - Consult the North West SuDS Pro-Forma for required evidence at each stage of the drainage hierarchy. Infiltration Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible. A detailed evidence-based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal. Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website: https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below: https://www.gov.uk/government/publications/groundwater-protection-position-statements Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site. Surface Water Discharge Rates Please note the given discharge rate is based on the site area believed to be developed. If there are significant areas of the site that will not be developed, the discharge rate should be reduced accordingly.
5	Please note that this guidance is current as of the date of issue. Always check for the most up-to-date regulations and guidelines when planning your development.

WASTEWATER PRE-DEVELOPMENT ENQUIRY



United Utilities Grasmere House, 2nd Floor
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Response Date: 19/05/2025

Dear Marta

Pre-Development Enquiry for Whitefield Medical Centre, Pinfold Road, Manchester, M45 7NY

UU Reference Number: 07327171

We have assessed your application based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your strategy will need review by other authorities as part of the planning process. We advise conducting necessary site investigations to confirm viability of your proposals.

Modelled Flood Risk

I can confirm that we do not have modelled flood risk within the vicinity of the proposed development.

Please note that our modelling data is indicative, and only representative of the 1:100year storm event.

[Please see comment 2 of the attached guidance sheet](#)

Asset Protection

1. We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of the proposed development.

Foul Water

Foul flow from this site will be allowed to drain into the public combined sewer system.

Our preferred point of discharge would be to the **450mm Combined sewer within Pinfold Lane located North** of your proposed development at an unrestricted rate. You are also able to connect into your existing private drainage onsite if this is more suitable.

Manhole reference SD80053601, **Grid reference** 380357, 405620

[Please see the images on page 3 for clarification](#)

WASTEWATER PRE-DEVELOPMENT ENQUIRY

Surface Water

Follow the National Planning Policy Guidance drainage hierarchy and provide evidence for discounting higher options before considering public sewer discharge. Consult the Lead Local Flood Authority regarding surface water concerns.

[Please see comment 4 within the guidance sheet](#)

Infiltration

[Please see comment 4 within the guidance sheet](#)

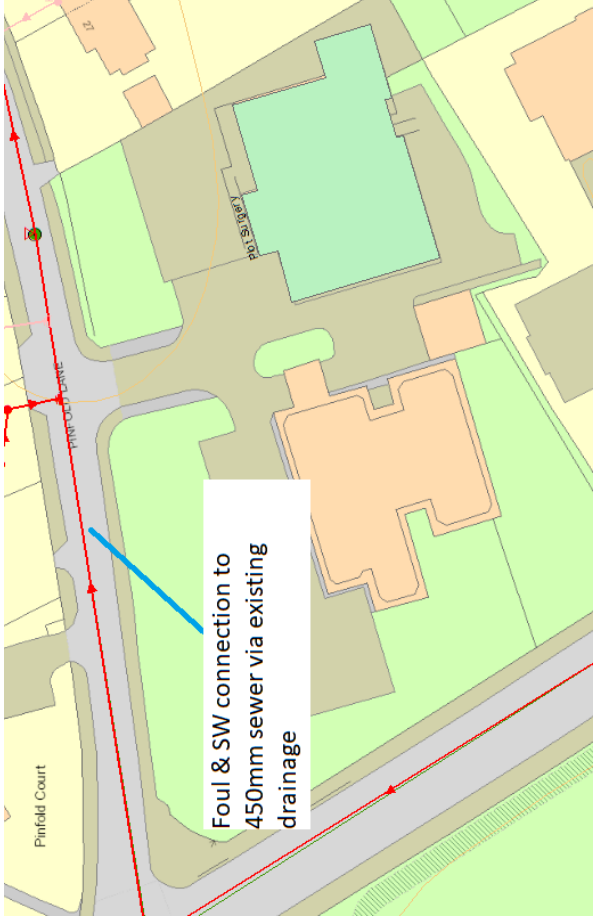
Public Sewer

United Utilities will consider a connection to the **450mm** diameter public **combined sewer** within **Pinfold Lane** located **North** of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities requests that any agreed rate does not exceed **5l/s**.

Manhole reference SD80053601, **Grid reference** 380357, 405620

[Please see images on page 3 for clarification](#)

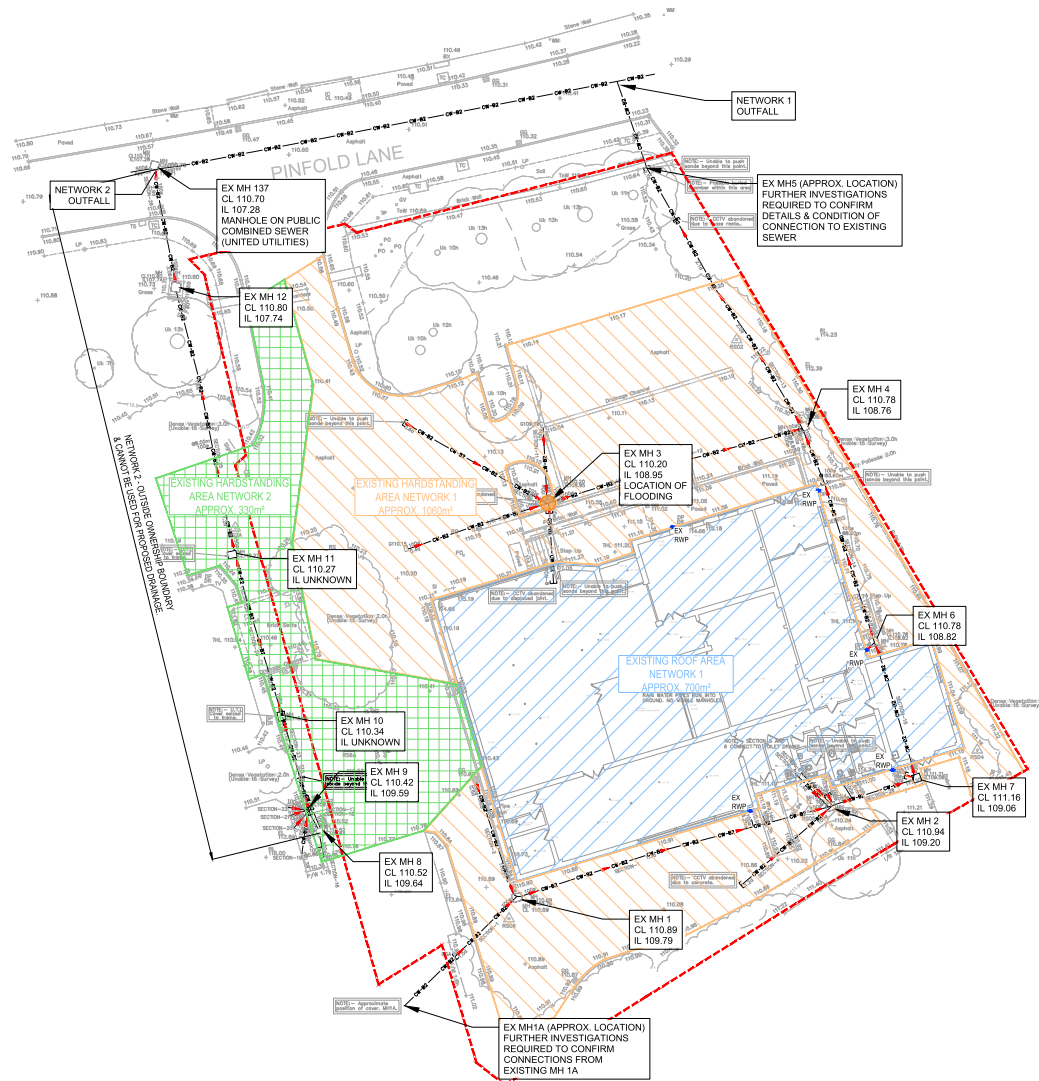
Site Images



Appendix G – Existing & Proposed Catchments

Existing Catchment Plan

Proposed Catchment Plan



- KEY:**
- SITE BOUNDARY
 - EXISTING PRIVATE COMBINED DRAINAGE
 - EXISTING DRAINAGE CATCHMENTS - ROOF DRAINAGE
 - EXISTING DRAINAGE CATCHMENTS - EXTERNAL TO NETWORK 1
 - EXISTING DRAINAGE CATCHMENTS - EXTERNAL TO NETWORK 2
 - EX RWP EXISTING RAINWATER PIPE
 - FLOODING LOCATION

EXISTING DRAINAGE NETWORK 1		
PRE-DEVELOPMENT PEAK FLOW RATES		
STORM EVENT	PEAK FLOW RATE (l/s)	FLOODING VOLUMES (m³)
1-YEAR	15.9	-
30-YEAR	25.1	2.1: MH3
100-YEAR	28.6	5.0: MH3

NETWORK 2 CANNOT BE RE-USED & THEREFORE HAS BEEN EXCLUDED FROM CALCULATIONS - CATCHMENT TO BE SERVED BY PROPOSED SURFACE WATER DRAINAGE

DRAWING BASED ON:

- TOPOGRAPHICAL SURVEY
 - 72968MCLS-01 TOPOGRAPHICAL SURVEY 24.04.25
- CCTV SURVEY
 - S26150-U CCTV SURVEY BY SEP DATED MAY 25
- GPR SURVEY
 - 72968NGUG-01 GPR SURVEY BY SURVEY SOLUTIONS DATED MAY 25

GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.

Rev:	STAGE 3 ISSUE	05.06.25	ATL	MW
Date:	Description:	Date:	By:	Chkd:

Curtins

Merchant Exchange, 17-19 Whitehall Street West, Manchester, M1 5WG
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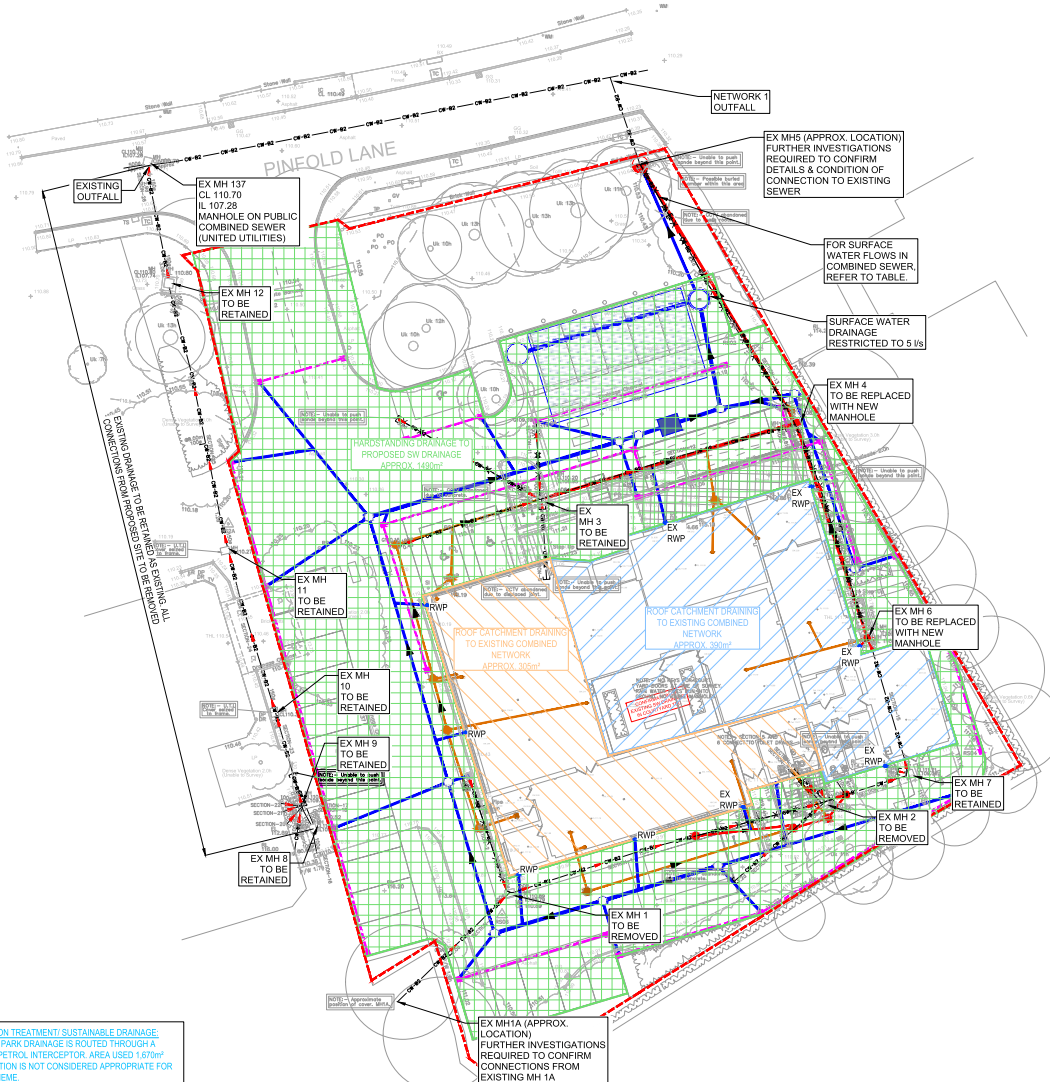
Civil & Structural • Transport Planning • Environmental • Infrastructure • Geotechnical • Construction & Heritage • Principal Designer
Aviation • Urban • Landscape • Coastal • Drainage • Flood • Drainage • Design • Urban • Landscape • Construction • Manchester • Nottingham

Status: **STAGE 3**

Project: **WHITEFIELD MEDICAL CENTRE**

Dwg Title: **EXISTING DRAINAGE CATCHMENTS**

Drawn By	Designed By	Checked By
ATL	ATL	MW
Date	05/06/25	Scale: @ A1
Project No.	Originator	Function
807132	CUR	XX - XX - DR - C - 92520
Revision	Number	Revision
1	1	P01



DESIGN PHILOSOPHY	
SURFACE WATER DESIGN THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 4% CLIMATE CHANGE EVENT SW FLOW RATE: 5 1/8 FLOW CALCULATED BASED ON GREENFIELD RUNOFF RATE. INCREASED TO ACHIEVE MINIMUM CRISE STORAGE TO PREVENT BLOCKAGES) ATTENUATION EXISTING STORAGE REQUIREMENT: 64M³ PROVIDED WITH CELLULAR STORAGE OUTFALL SITE DISCHARGES TO THE EXISTING 5000 COMBINED SEWER IN PINFOLD LAKE VIA AN EXISTING CONNECTION A \$10K AGREEMENT IS REQUIRED WITH UNITED UTILITIES: PART 1 BY CURTINS PART 2 ASSURED NOT REQUIRED AS CONNECTION IS INDIRECT. LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.	POLLUTION TREATMENT/SUSTAINABLE DRAINAGE: THE CAR PARK DRAINAGE IS ROUTED THROUGH A BYPASS PETROL INTERCEPTOR. AREA USED 1.67m² - INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME. EXISTING RAINWATER PIPES WHERE EXISTING RAINWATER PIPES ARE TO BE RETAINED, THESE WILL BE CONNECTED INTO THE AMENDED FULF COMBINED NETWORK ON SITE. THIS IS TO REDUCE THE RISK OF FLOODING TO THE BUILDING. THIS ACCOUNTS FOR APPROXIMATELY 250M³. ALL NEW RAINWATER PIPES, WHICH SERVE APPROXIMATELY 250M² OF THE ROOF AREA, ARE CONNECTED TO THE NEW SURFACE WATER NETWORK.

EXISTING COMBINED DRAINAGE NETWORK PRE & POST-DEVELOPMENT PEAK FLOWS			
STORM EVENT	PRE-DEVELOPMENT PEAK FLOW RATE (l/s)	POST-DEVELOPMENT PEAK FLOW RATE (l/s)	FLOW REDUCTION
1-YEAR	15.9	4.6	71%
30-YEAR	25.1	11.1	56%
100-YEAR + 45% CC	28.6	17.1	40%

DRAWING BASED ON:
TOPOGRAPHICAL SURVEY * 72968MCLS-010 TOPOGRAPHICAL SURVEY 24.04.25
CCTV SURVEY * S26150-U CCTV SURVEY BY SEP DATED MAY 25
GPR SURVEY * 72968NGUG-01 GPR SURVEY BY SURVEY SOLUTIONS DATED MAY 25
ARCHITECT'S PLANS * WFLREF-GDA-V1-S1-DR-A-1002_P06_PROPOSED SITE * WFLREF-GDA-V1-00-DR-A-1001_P04_PROPOSED GENERAL FLOOR GA PLAN * WFLREF-GDA-V1-R1-DR-A-2001_P01_PROPOSED ROOF PLAN
STRUCTURAL PLANS * 087132-CUR-XX-GF-D-S-20001 P01 GENERAL FLOOR GENERAL ARRANGEMENT

- | GENERAL NOTES: | |
|----------------|--|
| 1. | THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS. |
| 2. | DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE. |
| 3. | DESIGN BASED ON TOPOGRAPHICAL SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN. |
| 4. | ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK. |
| 5. | OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY. |
| 6. | ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED. |

	PII	ISSUED FOR COMMENTS		01.05.25	MW	MW
Rev:		Description:		Date:	By:	Chkd:
 Merchant Exchange, 17-19 Whitehall Street West, Manchester, M1 5WG 0161 236 2384 merchex@curtins.com www.curtins.com Curtis Architects • Transport Planning • Environment • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer Integrated Design Collaborator • Growth Catalyst • Client • Strategic • Design Partner • Lead • Concept Developer • Masterplan • Refurbishment						
Stage:						
STAGE 3						
Project:						
WHITEFIELD MEDICAL CENTRE						
Drg Title:						
PROPOSED DRAINAGE PLAN						
Drawn By		Designed By		Checked By		
MW		MW		MW		
Date				Scales @ A1		
29/04/2025				1:100		
Project No - Originator - Function - Spatial - Form - Discipline - Number						Revision
087132 - CUR - XX - XX - DR - C - 92520						P01

Appendix H – Greenfield & Existing Drainage Calculations

Greenfield Runoff Calculations

Existing Drainage (Network 1) Details & Results

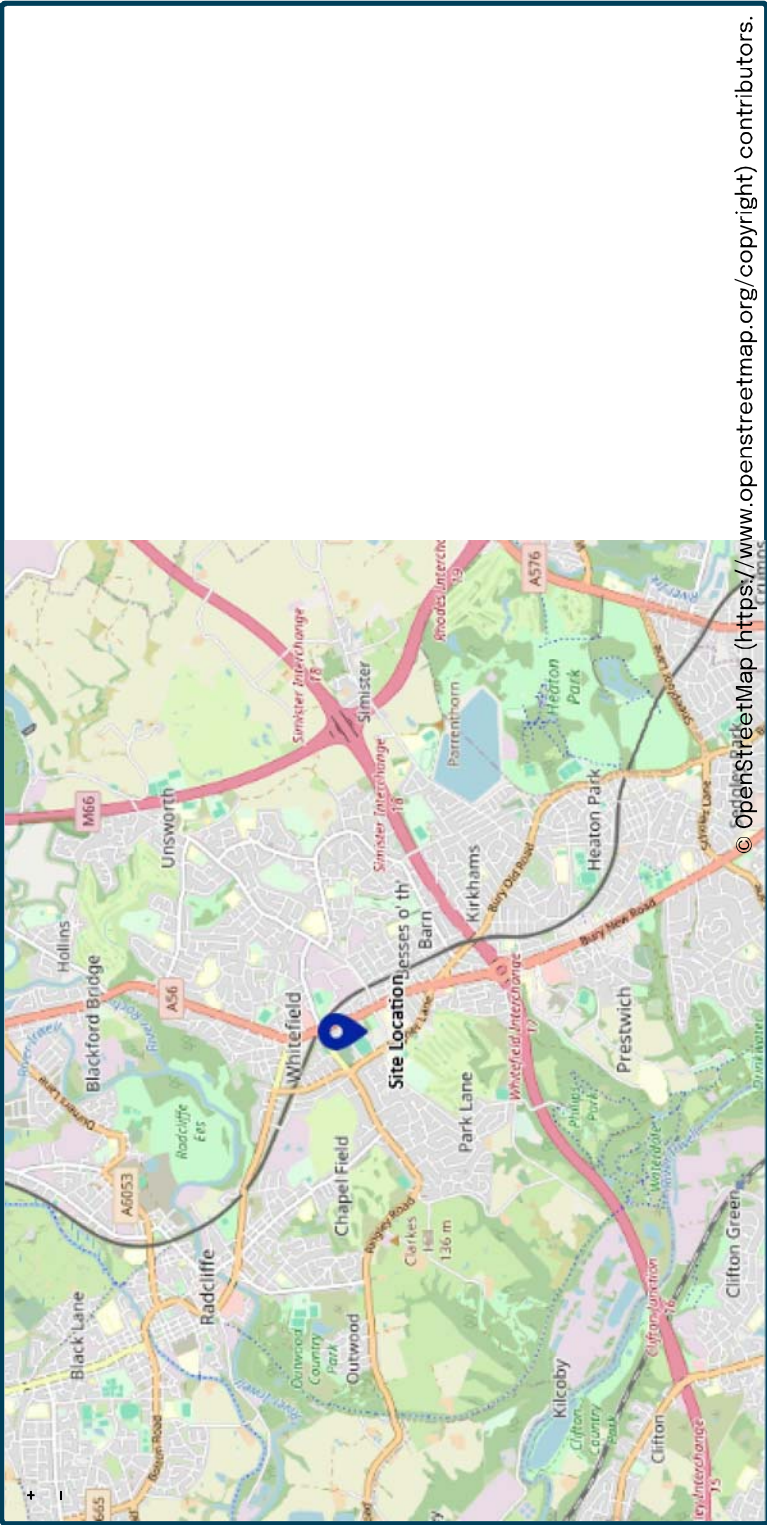
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This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

Project details

Date	07/05/2025
Calculated by	Marta Wolska
Reference	087132
Model version	2.0.0

Location

Site name	Whitefield Medical Centre
Site location	Whitefield Medical Centre



Site easting	380469
Site northing	405600

Site details

Total site area (ha)	0.25	ha
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Greenfield runoff

Method

Method	IH124		
SAAR (mm)	My value 998 mm	Map value 998	
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	1.8	l/s	

Growth curve factors

Hydrological region	My value 10	Map value 10
1 year growth factor	0.87	
2 year growth factor	0.93	
10 year growth factor	1.38	
30 year growth factor	1.7	
100 year growth factor	2.08	
200 year growth factor	2.37	

Results

Method	
Flow rate 1 year (l/s)	IH124
Flow rate 2 year (l/s)	1.6 l/s
Flow rate 10 years (l/s)	1.7 l/s
Flow rate 30 years (l/s)	2.5 l/s
Flow rate 100 years (l/s)	3.1 l/s
Flow rate 200 years (l/s)	3.8 l/s
	4.3 l/s

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.0.0) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/terms-conditions>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Curtins Consulting Ltd		File: 087132-CUR-XX-XX-M-X-9 Network: Combined Network Andy Losty 06/06/2025		Page 1																																																																																																																																																																																																																										
Design Settings Rainfall MethodologyFSR Return Period (years)1 Additional Flow (%)0 FSR RegionEngland and Wales M5-60 (mm)18.000 Ratio-R0.350 CV0.750 Time of Entry (mins)5.00 Maximum Time of Concentration (mins)30.00 Maximum Rainfall (mm/hr)50.0 Minimum Velocity (m/s)1.00 Level Soffits Minimum Backdrop Height (m)0.200 Preferred Cover Depth (m)1.200 Include Intermediate Ground✓ Enforce best practice design rulesx																																																																																																																																																																																																																														
Nodes <table><tr><th>Name</th><th>Area (ha)</th><th>T of E (mins)</th><th>Cover Level (m)</th><th>Diameter (mm)</th><th>Easting (m)</th><th>Northing (m)</th><th>Depth (m)</th></tr><tr><td>1</td><td>0.010</td><td>5.00</td><td>110.890</td><td>1050</td><td>380454.127</td><td>405576.912</td><td>1.100</td></tr><tr><td>2</td><td>0.036</td><td>5.00</td><td>110.940</td><td>1050</td><td>380477.647</td><td>405583.677</td><td>1.740</td></tr><tr><td>7</td><td>0.014</td><td>5.00</td><td>111.210</td><td>900</td><td>380484.158</td><td>405585.869</td><td>2.150</td></tr><tr><td>6</td><td>0.017</td><td>5.00</td><td>110.780</td><td>1050</td><td>380480.961</td><td>405596.082</td><td>1.960</td></tr><tr><td>3</td><td>0.090</td><td>5.00</td><td>110.200</td><td>1050</td><td>380456.506</td><td>405606.439</td><td>1.250</td></tr><tr><td>4</td><td></td><td></td><td>110.780</td><td>1050</td><td>380475.678</td><td>405612.212</td><td>2.020</td></tr><tr><td>5</td><td></td><td></td><td>110.220</td><td>1050</td><td>380463.926</td><td>405631.695</td><td>1.830</td></tr></table> Links <table><tr><th>Name</th><th>US Node</th><th>DS Node</th><th>Length (m)</th><th>ks (mm) / n</th><th>US IL (m)</th><th>DS IL (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>Dia (mm)</th><th>T of C (mins)</th><th>Rain (mm/hr)</th></tr><tr><td>1.000</td><td>1</td><td>2</td><td>24.474</td><td>0.600</td><td>109.790</td><td>109.200</td><td>0.590</td><td>41.5</td><td>100</td><td>5.34</td><td>44.4</td></tr><tr><td>1.001</td><td>2</td><td>7</td><td>6.870</td><td>0.600</td><td>109.200</td><td>109.060</td><td>0.140</td><td>49.1</td><td>100</td><td>5.44</td><td>43.9</td></tr><tr><td>2.004</td><td>7</td><td>6</td><td>10.702</td><td>0.600</td><td>109.060</td><td>108.820</td><td>0.240</td><td>44.6</td><td>100</td><td>5.60</td><td>43.8</td></tr><tr><td>2.005</td><td>6</td><td>4</td><td>16.973</td><td>0.600</td><td>108.820</td><td>108.810</td><td>0.010</td><td>1697.3</td><td>100</td><td>7.18</td><td>39.1</td></tr><tr><td>1.004</td><td>3</td><td>4</td><td>20.022</td><td>0.600</td><td>108.950</td><td>108.810</td><td>0.140</td><td>143.0</td><td>100</td><td>5.52</td><td>42.1</td></tr><tr><td>1.004_1</td><td>4</td><td>5</td><td>22.753</td><td>0.600</td><td>108.760</td><td>108.390</td><td>0.370</td><td>61.5</td><td>150</td><td>7.48</td><td>38.3</td></tr></table> Pro <table><tr><th>Name</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th><th>US Depth (m)</th><th>DS Depth (m)</th><th>Σ Area (ha)</th><th>Σ Inflow (l/s)</th><th>Pro Depth (mm)</th><th>Pro Velocity (m/s)</th></tr><tr><td>1.000</td><td>1.200</td><td>9.4</td><td>1.2</td><td>1.000</td><td>1.640</td><td>0.010</td><td>0.0</td><td>24</td><td>0.816</td></tr><tr><td>1.001</td><td>1.103</td><td>8.7</td><td>5.5</td><td>1.640</td><td>2.050</td><td>0.046</td><td>0.0</td><td>57</td><td>1.164</td></tr><tr><td>2.004</td><td>1.157</td><td>9.1</td><td>7.1</td><td>2.050</td><td>1.860</td><td>0.060</td><td>0.0</td><td>67</td><td>1.280</td></tr><tr><td>2.005</td><td>0.179</td><td>1.4</td><td>8.2</td><td>1.860</td><td>1.870</td><td>0.077</td><td>0.0</td><td>100</td><td>0.184</td></tr><tr><td>1.004</td><td>0.641</td><td>5.0</td><td>10.3</td><td>1.150</td><td>1.870</td><td>0.090</td><td>0.0</td><td>100</td><td>0.658</td></tr><tr><td>1.004_1</td><td>1.285</td><td>22.7</td><td>17.3</td><td>1.870</td><td>1.680</td><td>0.167</td><td>0.0</td><td>98</td><td>1.411</td></tr></table>					Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	1	0.010	5.00	110.890	1050	380454.127	405576.912	1.100	2	0.036	5.00	110.940	1050	380477.647	405583.677	1.740	7	0.014	5.00	111.210	900	380484.158	405585.869	2.150	6	0.017	5.00	110.780	1050	380480.961	405596.082	1.960	3	0.090	5.00	110.200	1050	380456.506	405606.439	1.250	4			110.780	1050	380475.678	405612.212	2.020	5			110.220	1050	380463.926	405631.695	1.830	Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	1.000	1	2	24.474	0.600	109.790	109.200	0.590	41.5	100	5.34	44.4	1.001	2	7	6.870	0.600	109.200	109.060	0.140	49.1	100	5.44	43.9	2.004	7	6	10.702	0.600	109.060	108.820	0.240	44.6	100	5.60	43.8	2.005	6	4	16.973	0.600	108.820	108.810	0.010	1697.3	100	7.18	39.1	1.004	3	4	20.022	0.600	108.950	108.810	0.140	143.0	100	5.52	42.1	1.004_1	4	5	22.753	0.600	108.760	108.390	0.370	61.5	150	7.48	38.3	Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)	1.000	1.200	9.4	1.2	1.000	1.640	0.010	0.0	24	0.816	1.001	1.103	8.7	5.5	1.640	2.050	0.046	0.0	57	1.164	2.004	1.157	9.1	7.1	2.050	1.860	0.060	0.0	67	1.280	2.005	0.179	1.4	8.2	1.860	1.870	0.077	0.0	100	0.184	1.004	0.641	5.0	10.3	1.150	1.870	0.090	0.0	100	0.658	1.004_1	1.285	22.7	17.3	1.870	1.680	0.167	0.0	98	1.411
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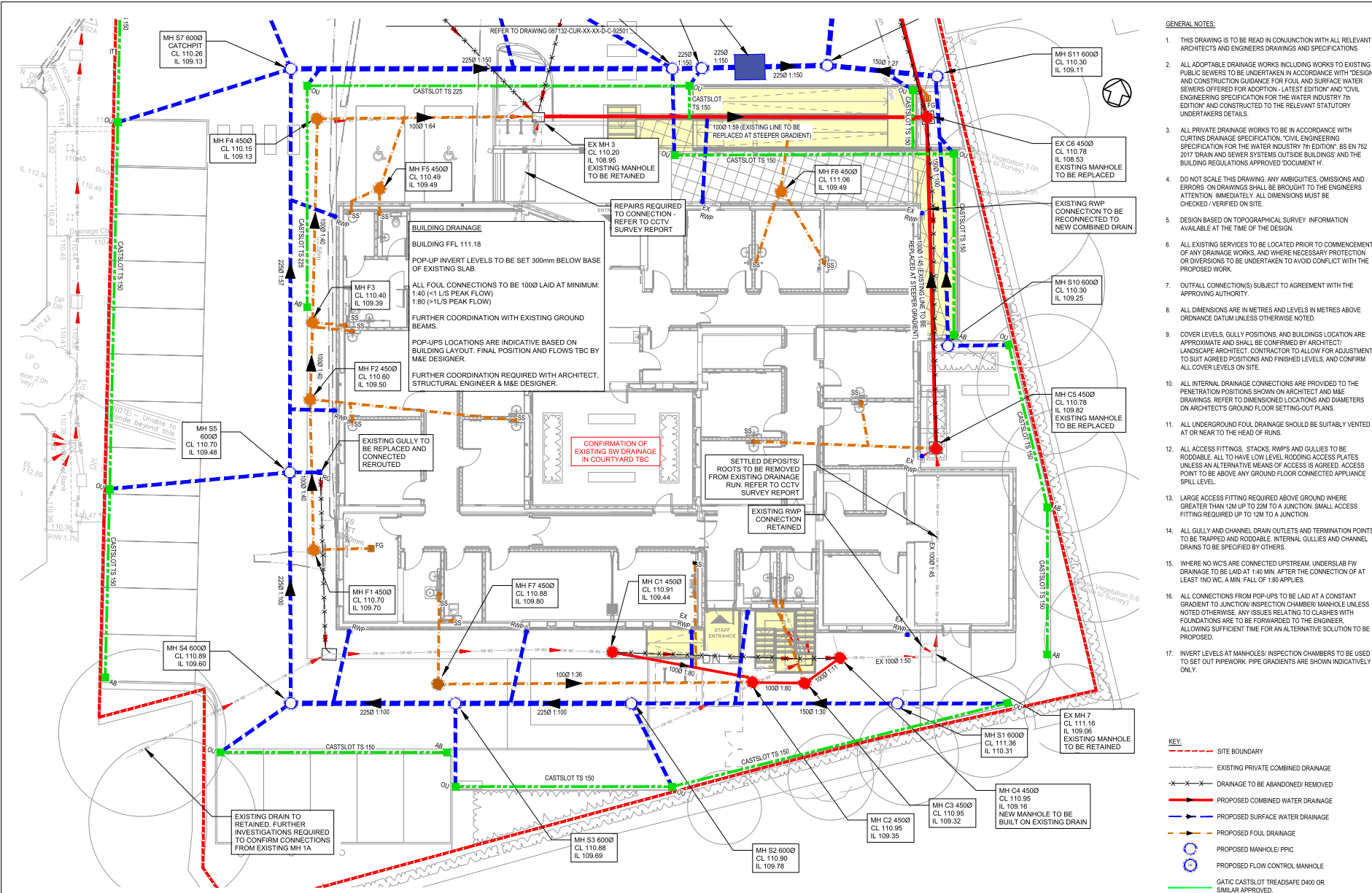
	Curtins Consulting Ltd	File: 087132-CUR-XX-XX-M-X-9 Network: Combined Network Andy Losty 06/06/2025	Page 3								
Simulation Settings											
Rainfall Methodology	FSR	Analysis Speed	Normal								
	Rainfall Events	Skip Steady State	x								
	FSR Region	Drain Down Time (mins)	240								
	M5-60 (mm)	Additional Storage (m³/ha)	20.0								
	Ratio-R	Starting Level (m)									
Summer CV	0.750	Check Discharge Rate(s)	x								
Winter CV	0.840	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								
100	0	0	0								

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.90%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	109.815	0.025	1.3	0.0260	0.0000	OK
15 minute winter	2	12	109.312	0.112	5.8	0.1432	0.0000	SURCHARGED
15 minute winter	7	12	109.265	0.205	6.7	0.1572	0.0000	SURCHARGED
15 minute winter	6	12	109.151	0.331	7.7	0.3439	0.0000	SURCHARGED
15 minute winter	3	12	109.341	0.391	11.3	0.9009	0.0000	SURCHARGED
15 minute winter	4	12	108.857	0.097	15.9	0.0840	0.0000	OK
15 minute winter	5	12	108.482	0.092	15.9	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	1.3	0.373	0.134	0.1121	
15 minute summer	2	1.001	7	5.2	0.940	0.598	0.0513	
15 minute winter	7	2.004	6	5.6	0.734	0.620	0.0837	
15 minute winter	6	2.005	4	7.3	0.934	5.187	0.1273	
15 minute winter	3	1.004	4	8.6	1.104	1.715	0.1534	
15 minute winter	4	1.004_1	5	15.9	1.357	0.700	0.2663	9.6
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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.90%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	14	110.208	0.418	3.7	0.4383	0.0000	SURCHARGED
15 minute winter	2	13	110.190	0.990	13.2	1.2669	0.0000	SURCHARGED
15 minute winter	7	13	110.072	1.012	11.3	0.7751	0.0000	SURCHARGED
15 minute winter	6	13	109.785	0.965	13.1	1.0024	0.0000	SURCHARGED
15 minute winter	3	11	110.200	1.250	27.6	2.8825	2.1469	FLOOD
15 minute winter	4	14	109.044	0.284	25.2	0.2462	0.0000	SURCHARGED
15 minute winter	5	14	108.529	0.139	25.1	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	2.9	0.462	0.304	0.1915	
15 minute winter	2	1.001	7	7.0	0.968	0.813	0.0538	
15 minute winter	7	2.004	6	9.0	1.155	0.994	0.0837	
15 minute winter	6	2.005	4	11.7	1.493	8.327	0.1328	
15 minute winter	3	1.004	4	14.1	1.806	2.808	0.1567	
15 minute winter	4	1.004_1	5	25.1	1.427	1.107	0.3941	21.9
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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.90%									
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	
15 minute winter	1	14	110.712	0.922	5.5	0.9665	0.0000	FLOOD RISK	
15 minute winter	2	14	110.685	1.485	15.2	1.9006	0.0000	FLOOD RISK	
15 minute winter	7	14	110.528	1.467	12.9	1.1241	0.0000	SURCHARGED	
15 minute winter	6	14	110.129	1.309	15.5	1.3597	0.0000	SURCHARGED	
15 minute winter	3	10	110.200	1.250	35.6	2.8825	4.9808	FLOOD	
15 minute winter	4	14	109.114	0.354	26.8	0.3069	0.0000	SURCHARGED	
15 minute winter	5	14	108.531	0.141	26.7	0.0000	0.0000	OK	
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)	
15 minute summer	1	1.000	2	3.3	0.525	0.355	0.1915		
15 minute winter	2	1.001	7	8.1	1.035	0.935	0.0538		
15 minute winter	7	2.004	6	10.5	1.347	1.160	0.0837		
15 minute winter	6	2.005	4	13.7	1.745	9.737	0.1328		
15 minute winter	3	1.004	4	14.3	1.827	2.839	0.1567		
15 minute winter	4	1.004_1	5	26.7	1.518	1.177	0.3954	25.9	
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GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ALL ADAPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH 'DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION - LATEST EDITION' AND 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION' AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION', BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
- COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT / LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
- ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
- ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
- ALL ACCESS FITTINGS, STACKS, RWPS AND GULLIES TO BE ROODABLE. ALL TO HAVE LOW LEVEL ROODING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
- LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
- WHERE NO WCS ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 140 MIN. AFTER THE CONNECTION OF AT LEAST 150 WC, A MIN. FALL OF 1/80 APPLIES.
- ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION/ INSPECTION CHAMBER/ MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER. ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.
- INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.

KEY:

- SITE BOUNDARY
- EXISTING PRIVATE COMBINED DRAINAGE
- DRAINAGE TO BE ABANDONED/ REMOVED
- PROPOSED COMBINED WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FLOW DRAINAGE
- PROPOSED MANHOLE/ PPIC
- PROPOSED FLOW CONTROL MANHOLE
- GATIC CASTSLOT TREADSAFE D400 OR SIMILAR APPROVED.
- AB ■ GATIC ACCESS BOX
- OU ■ GATIC OUTLET UNIT
- RG ■ ROAD GULLY
- RWP ■ PROPOSED RAINWATER PIPE
- EX RWP ■ EXISTING RAINWATER PIPE
- SVP ■ SOIL VENT PIPE
- SS ■ STUB STACK
- FG ■ FOUL GULLY
- PROPOSED CELLULAR ATTENUATION TANK
- PROPOSED PETROL INTERCEPTOR
- PROPOSED FOUNDATION EXTENT

GENERAL NOTES:

- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
- ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
 - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
 - 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.
- AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLY(VINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
- SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
- THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE TO SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.
- ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.
- ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 1200mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
- WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE MATERIAL ARE TO BE PROVIDED AT EVERY PIPE JOINT WITH THE CONCRETE.
- WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.
- SULPHATE RESISTANT CEMENT (C25-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED ON A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.
- WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
- ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150MM FROM FACE OF CONCRETE.
- THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND REMS.
- ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.
- UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
 - B125 LOAD CLASS IN PEDESTRIAN AREAS
 - D400 LOAD CLASS IN VEHICULAR AREAS
- WHERE LAND DRAINAGE PERFORATED PIPES ARE SPECIFIED, THE PIPES SHOULD BE FULLY PERFORATED AND IN ACCORDANCE WITH BS EN 295.
- PERFORATED PIPES SHOULD BE WRAPPED IN A GEOTEXTILE MEMBRANE UNLESS NOTED OTHERWISE.
- ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
- THE DESIGN IS BASED ON A GRAVITY RAINWATER SYSTEM.

P02	STAGE 3 ISSUE	05/06/25	ATL	MW
P01	ISSUED FOR COMMENTS	01/06/25	MW	MW
Rev:	Description:	Date:	By:	Chd:



Status:	STAGE 3				
Project:	WHITEFIELD MEDICAL CENTRE				
Dwg Title:	PROPOSED DRAINAGE PLAN SHEET 1				
Drawn By	MW	Designed By	MW	Checked By	MW
		Date	29/04/2025	Scales @ A1	1:100
Project No. - Originator - Function - Spatial - Form - Discipline - Number					Revision
087132 - CUR - XX - XX - DR - C - 92500					P02

(RESIDUAL HAZARD REGISTER RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER XXXXX-CUR-XX-XX-XX-0001.
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING.
MEMBERS ANY ADDITIONAL HAZARDS BE IDENTIFIED. THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.

HAZARD REGISTER			
Hazard Ref.	Item (Feature, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
2.01	Side Walk Issues		
2.01	Surface water flood risk	Potential surface water flooding within car park	Contractor should locate equipment, materials compound located outside low areas
3.01	Existing Buried & Overhead Services		
3.01	Existing foundation, services, drainage	Existing buried services and structures. Risk of plant damaging services during excavation.	Potential for unexpected services structures. Risk of plant damaging services during excavation. All excavation must be controlled carefully. All underground services, foundation must be identified and located by the main contractor prior to commencement of work
5.01	Excavations and Foundations		
5.01	Excavation between existing slab and foundation	Potential of damaging existing structure	Contractor should consider late penetration during drainage installation below existing building

DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR + 40% CLIMATE CHANGE EVENT.
5% FLOW RATE 5% FLOW CALCULATED BASED ON GREENFIELD RUNOFF RATE. INCREASED TO ACHIEVE MINIMUM ORIFICE SIZE TO PREVENT BLOCKAGES).

ATTENUATION
APPROXIMATE STORAGE REQUIREMENT 64m³ PROVIDED WITHIN CELLULAR STORAGE.

OUTFALL
SITE DISCHARGES TO THE EXISTING 5000 COMBINED SEWER IN PINFOLD LANE VIA AN EXISTING COMBINED CONNECTION.
A S108 AGREEMENT IS REQUIRED WITH UNITED UTILITIES.
PART 1 BY CURTINS
PART 2 ASSUMED NOT REQUIRED AS CONNECTION IS INDIRECT.

LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.

POLLUTION TREATMENT/ SUSTAINABLE DRAINAGE:
THE CAR PARK DRAINAGE IS ROUTED THROUGH A BYPASS PETROL INTERCEPTOR. AREA USED 1670m². INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME.

EXISTING RAINWATER PIPES
WHERE EXISTING RAINWATER PIPES ARE TO BE RETAINED, THESE WILL BE CONNECTED INTO THE ADJACENT FOUL COMBINED NETWORK ON SITE. THIS IS TO REDUCE THE RISK OF FLOODING TO THE BUILDING. THIS ACCOUNTS FOR APPROXIMATELY 250m³.

ALL NEW RAINWATER PIPES, WHICH SERVE APPROXIMATELY 200m² OF THE ROOF AREA, ARE CONNECTED TO THE NEW SURFACE WATER DRAINAGE NETWORK.

FOUL WATER DESIGN
FOUL WATER TO DISCHARGE VIA THE EXISTING ADJACENT FOUL COMBINED DRAINAGE NETWORK ON SITE.

THE FOUL/ COMBINED NETWORK REQUIRES SOME

SECTIONS TO BE RELAID IN ORDER TO PROVIDE SUFFICIENT GRADIENTS FOR SELF CLEANSING.

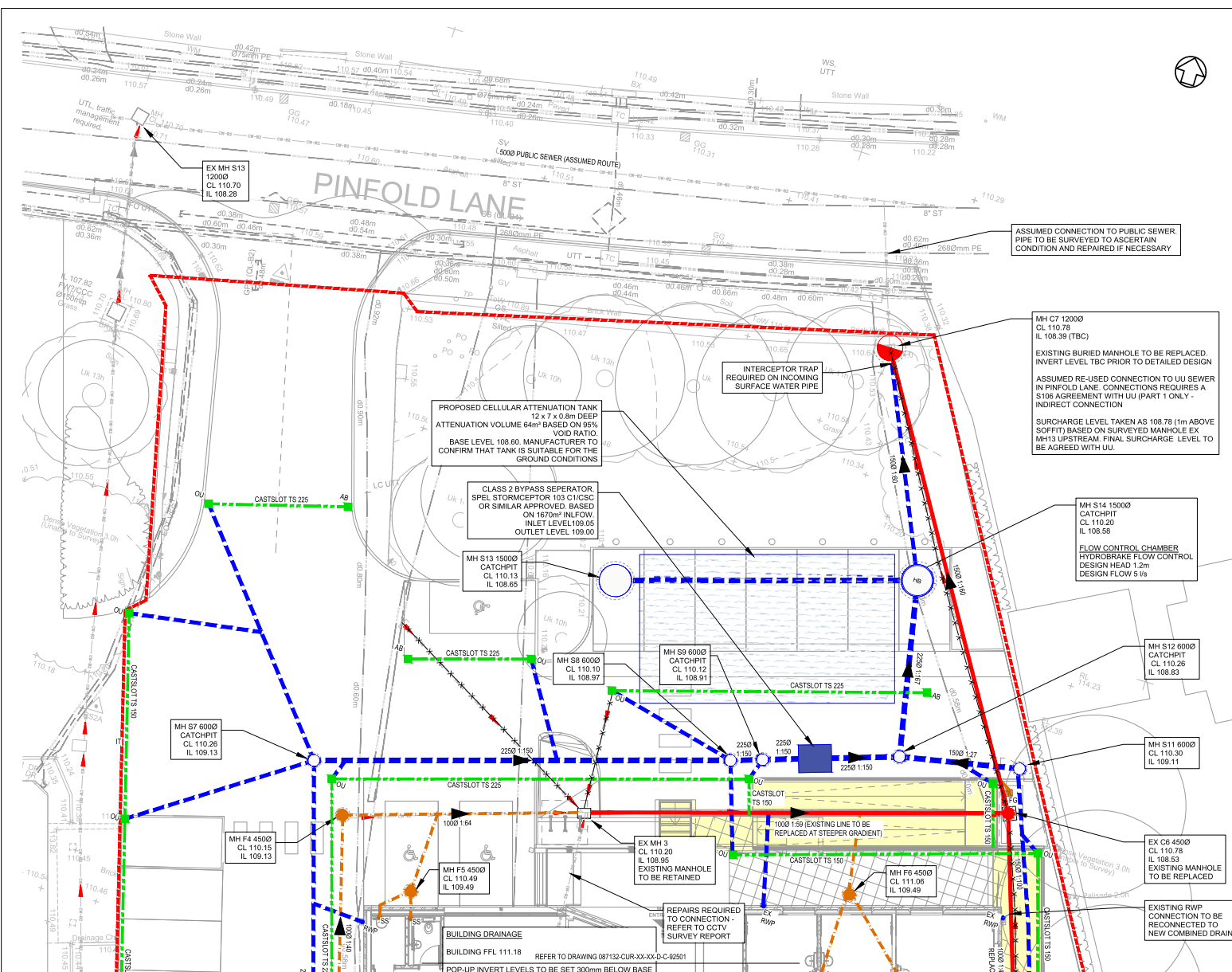
OUTFALL:
SITE DISCHARGES TO THE EXISTING 5000 COMBINED SEWER IN PINFOLD LANE VIA AN EXISTING COMBINED CONNECTION.
A S108 AGREEMENT IS REQUIRED WITH UNITED UTILITIES.
PART 1 BY CURTINS
PART 2 ASSUMED NOT REQUIRED AS CONNECTION IS INDIRECT.

LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.

DRAWING BASED ON:

- TOPOGRAPHICAL SURVEY**
 - 72968MCLSL-01 TOPOGRAPHICAL SURVEY 24.04.25
- CCTV SURVEY**
 - S26150-U CCTV SURVEY BY SEP DATED MAY 25
- GPR SURVEY**
 - 72968NGUG-01 GPR SURVEY BY SURVEY SOLUTIONS DATED MAY 25
- ARCHITECT'S PLANS**
 - WFLREF-GDA-V1-S1-DR-A-1002_P06_PROPOSED SITE
 - WFLREF-GDA-V1-00-DR-A-1001_P04_PROPOSED ROOF GA PLAN
 - WFLREF-GDA-V1-R1-DR-A-2001_P01_PROPOSED ROOF PLAN
- STRUCTURAL PLANS**
 - 087132-CUR-XX-GF-D-S0001 P01 GROUND FLOOR GENERAL ARRANGEMENT

ROOT PROTECTION ZONE AREA TBC ONCE ARBORICULTURALIST REPORT RECEIVED. SOME ADJUSTMENT TO DRAINAGE MAY BE REQUIRED



GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ALL ADAPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH 'DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION - LATEST EDITION' AND 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION' AND THE BUILDING REGULATIONS APPROVED DOCUMENT H.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION', BS EN 752 2017 DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS AND THE BUILDING REGULATIONS APPROVED DOCUMENT H.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
- ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
- OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
- COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT / LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
- ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
- ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
- ALL ACCESS FITTINGS, STACKS, RWPS AND GULLIES TO BE ROODABLE. ALL TO HAVE LOW LEVEL ROODING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
- LARGE ACCESS FITTING REQUIRED ABOVE GROUND. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
- ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND ROODABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
- WHERE NO WCs ARE CONNECTED UPSTREAM, UNDERSLAB F/W DRAINAGE TO BE LAID AT 140 MIN. AFTER THE CONNECTION OF AT LEAST 12M W/C, A MIN. FALL OF 1:80 APPLIES.
- ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION. INSPECTION CHAMBER / MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER. ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.
- INVERT LEVELS AT MANHOLES / INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.

- GENERAL NOTES:
- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
 - ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
 - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
 - 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.
 - AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
 - SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
 - THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SLOUR AND CONNECTED TO A LENGTH OF ROCKER PIPE.
 - ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE SOFFITS LEVEL UNLESS OTHERWISE NOTED.
 - ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICED AREAS AND LESS THAN 1200mm IN TRAFFICED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS 2). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS 3. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
 - WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS 2). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.
 - WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS 3 BEDDING IS ACCEPTABLE.
 - SULPHATE RESISTANT CEMENT (C20-D22) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.
 - WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
 - ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150MM FROM FACE OF CONCRETE.
 - THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
 - ALL MANHOLE COVERS IN BLOCKSLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.
 - UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
 - B125 LOAD CLASS IN PEDESTRIAN AREAS.
 - D400 LOAD CLASS IN VEHICULAR AREAS.
 - WHERE LAND DRAINAGE PERFORATED PIPES ARE SPECIFIED, THE PIPES SHOULD BE FULLY PERFORATED AND IN ACCORDANCE WITH BS EN 295.
 - PERFORATED PIPES SHOULD BE WRAPPED IN A GEOTEXTILE MEMBRANE UNLESS NOTED OTHERWISE.
 - ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
 - THE DESIGN IS BASED ON A GRAVITY RAINWATER SYSTEM.

KEY:

- SITE BOUNDARY
- EXISTING PRIVATE COMBINED DRAINAGE
- DRAINAGE TO BE ABANDONED / REMOVED
- PROPOSED COMBINED WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOU L DRAINAGE
- PROPOSED MANHOLE / PPIC
- PROPOSED FLOW CONTROL MANHOLE
- GATIC CASTSLOT TREADSAFE D400 OR SIMILAR APPROVED
- AB = GATIC ACCESS BOX
- OU = GATIC OUTLET UNIT
- RG = ROAD GULLY
- RWP = PROPOSED RAINWATER PIPE
- EX RWP = EXISTING RAINWATER PIPE
- SVP = SOIL VENT PIPE
- SS = STUB STACK
- FG = FOUL GULLY
- PROPOSED CELLULAR ATTENUATION TANK
- PROPOSED PETROL INTERCEPTOR
- PROPOSED FOUNDATION EXTENT

HAZARD REGISTER			
Hazard Ref.	Item (Features, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
2.01	Side Walk Issues		
2.01	Surface water flood risk	Potential surface water flooding within car park	Contractor should locate equipment, materials compound located outside low areas
3.01	Existing Buried & Overhead Services	Existing buried services and structures. Risk of plant damaging services during excavation.	Potential for unmarked services, structures and structures. All excavation must be carried out with care. If underground services, foundation must be identified and located by the main contractor prior to commencement of work
5.01	Excavations and Foundations		
5.01	Excavation below existing slab and foundation	Potential of damaging existing structure	Contractor should consider late penetration during drainage installation below existing building

DESIGN PHILOSOPHY

SURFACE WATER DESIGN

THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 4% CLIMATE CHANGE EVENT.

SN FLOW RATE 5 l/s (FLOW CALCULATED BASED ON GREENFIELD RUNOFF RATE, INCREASED TO ACHIEVE NOMINAL ORPICE SIZE TO PREVENT BLOCKAGES)

ATTENUATION

APPROXIMATE STORAGE REQUIREMENT 64m³ PROVIDED WITHIN CELLULAR STORAGE.

OUTFALL

SITE DISCHARGES TO THE EXISTING 5000 COMBINED SEWER IN PINFOLD LANE VIA AN EXISTING COMBINED CONNECTION.

A S106 AGREEMENT IS REQUIRED WITH UNITED UTILITIES.

PART 1 BY CURTINS

PART 2 ASSUMED NOT REQUIRED AS CONNECTION IS INDIRECT

LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.

POLLUTION TREATMENT / SUSTAINABLE DRAINAGE

THE CAR PARK DRAINAGE IS ROUTED THROUGH A BYPASS PETROL INTERCEPTOR. AREA USED 1.07m² INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME.

EXISTING RAINWATER PIPES

WHERE EXISTING RAINWATER PIPES ARE TO BE RETAINED, THESE WILL BE CONNECTED INTO THE AMENDED FOUL COMBINED NETWORK ON SITE. THIS IS TO REDUCE THE RISK OF FLOODING TO THE BUILDING. THIS ACCOUNTS FOR APPROXIMATELY 250m³.

ALL NEW RAINWATER PIPES, WHICH SERVE APPROXIMATELY 200m² OF THE ROOF AREA, ARE CONNECTED TO THE NEW SURFACE WATER DRAINAGE NETWORK.

FOUL WATER DESIGN

FOUL WATER TO DISCHARGE VIA THE EXISTING AMENDED FOUL COMBINED DRAINAGE NETWORK ON SITE.

THE FOUL COMBINED NETWORK REQUIRES SOME

SECTIONS TO BE RELAID IN ORDER TO PROVIDE SUFFICIENT GRADIENTS FOR SELF-CLEANING.

OUTFALL:

SITE DISCHARGES TO THE EXISTING 5000 COMBINED SEWER IN PINFOLD LANE VIA AN EXISTING COMBINED CONNECTION.

A S106 AGREEMENT IS REQUIRED WITH UNITED UTILITIES.

PART 1 BY CURTINS

PART 2 ASSUMED NOT REQUIRED AS CONNECTION IS INDIRECT

LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.

DRAWING BASED ON:

TOPOGRAPHICAL SURVEY

- 72068MCLS-01 TOPOGRAPHICAL SURVEY 24.04.25

CCTV SURVEY

- S26150-U CCTV SURVEY BY SEP DATED MAY 25

GPR SURVEY

- 72968NGUG-01 GPR SURVEY BY SURVEY SOLUTIONS DATED MAY 25

ARCHITECT'S PLANS

- WFLREF-GDA-V1-S1-DR-A-1002_P06_PROPOSED SITE
- WFLREF-GDA-V1-00-DR-A-1001_P04_PROPOSED GROUND FLOOR GA PLAN
- WFLREF-GDA-V1-R1-DR-A-2001_P01_PROPOSED ROOF PLAN

STRUCTURAL PLANS

- 087132-CUR-XX-GF-D-2001 P01 GROUND FLOOR GENERAL ARRANGEMENT

ROOT PROTECTION ZONE AREA TBC ONCE ARBORICULTURALIST REPORT RECEIVED. SOME ADJUSTMENT TO DRAINAGE MAY BE REQUIRED

Rev: STAGE 3 ISSUE

Description: Date: By: Chd:

Curtins

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Stages:

STAGE 3

Project: WHITEFIELD MEDICAL CENTRE

Dwg Title: PROPOSED DRAINAGE PLAN SHEET 2

Drawn By: ATL Designed By: ATL Checked By: MW

Date: 06/06/25 Scales @ A1: 1:100

Project No. - Originator - Function - Spatial - Form - Discipline - Number Revision

087132 - CUR - XX - XX - DR - C - 92501 P01

Curtins Consulting Ltd		File: 087132-CUR-XX-XX-M-X-9 Network: Storm Network Andy Losty 06/06/2025		Page 1																																																																																																																																																																																																																																																																																																								
Design Settings Rainfall MethodologyFSR Return Period (years)1 Additional Flow (%)0 FSR RegionEngland and Wales M5-60 (mm)18.600 Ratio-R0.350 CV0.750 Time of Entry (mins)5.00 Maximum Time of Concentration (mins)30.00 Maximum Rainfall (mm/hr)50.0 Minimum Velocity (m/s)1.00 Connection TypeLevel Soffits Minimum Backdrop Height (m)0.200 Preferred Cover Depth (m)0.900 Include Intermediate Ground✓ Enforce best practice design rulesx																																																																																																																																																																																																																																																																																																												
Nodes <table><tr><th>Name</th><th>Area (ha)</th><th>T of E (mins)</th><th>Cover Level (m)</th><th>Diameter (mm)</th><th>Easting (m)</th><th>Northing (m)</th><th>Depth (m)</th></tr><tr><td>1</td><td>0.020</td><td>5.00</td><td>111.360</td><td>600</td><td>380482.863</td><td>405582.937</td><td>1.050</td></tr><tr><td>2</td><td>0.009</td><td>5.00</td><td>110.900</td><td>600</td><td>380469.778</td><td>405578.991</td><td>1.125</td></tr><tr><td>3</td><td>0.004</td><td>5.00</td><td>110.900</td><td>600</td><td>380461.123</td><td>405576.380</td><td>1.215</td></tr><tr><td>4</td><td>0.013</td><td>5.00</td><td>110.900</td><td>600</td><td>380453.021</td><td>405573.941</td><td>1.300</td></tr><tr><td>5</td><td>0.027</td><td>5.00</td><td>110.700</td><td>600</td><td>380449.547</td><td>405585.280</td><td>1.219</td></tr><tr><td>7</td><td>0.060</td><td>5.00</td><td>110.260</td><td>600</td><td>380443.609</td><td>405605.151</td><td>1.135</td></tr><tr><td>8</td><td>0.030</td><td>5.00</td><td>110.120</td><td>600</td><td>380462.381</td><td>405610.820</td><td>1.191</td></tr><tr><td>9</td><td>0.004</td><td>5.00</td><td>110.120</td><td>600</td><td>380463.819</td><td>405611.288</td><td>1.206</td></tr><tr><td>10</td><td>0.008</td><td>5.00</td><td>110.300</td><td>600</td><td>380480.051</td><td>405601.279</td><td>1.050</td></tr><tr><td>11</td><td>0.004</td><td>5.00</td><td>110.300</td><td>600</td><td>380475.517</td><td>405614.371</td><td>1.189</td></tr><tr><td>12</td><td></td><td></td><td>110.260</td><td>600</td><td>380469.948</td><td>405613.281</td><td>1.475</td></tr><tr><td>13</td><td></td><td>5.00</td><td>110.130</td><td>1500</td><td>380454.746</td><td>405617.350</td><td>1.480</td></tr><tr><td>14</td><td></td><td></td><td>110.200</td><td>1500</td><td>380468.358</td><td>405621.461</td><td>1.635</td></tr><tr><td>C7</td><td></td><td></td><td>110.640</td><td>1200</td><td>380463.860</td><td>405631.624</td><td>2.250</td></tr></table> Links <table><tr><th>Name</th><th>US Node</th><th>DS Node</th><th>Length (m)</th><th>ks (mm) / n</th><th>US IL (m)</th><th>DS IL (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>Dia (mm)</th><th>T of C (mins)</th><th>Rain (mm/hr)</th></tr><tr><td>1.000</td><td>1</td><td>2</td><td>13.667</td><td>0.600</td><td>110.310</td><td>109.850</td><td>0.460</td><td>29.7</td><td>150</td><td>5.12</td><td>47.2</td></tr><tr><td>1.001</td><td>2</td><td>3</td><td>9.040</td><td>0.600</td><td>109.775</td><td>109.685</td><td>0.090</td><td>100.0</td><td>225</td><td>5.24</td><td>46.7</td></tr><tr><td>1.002</td><td>3</td><td>4</td><td>8.461</td><td>0.600</td><td>109.685</td><td>109.600</td><td>0.085</td><td>100.0</td><td>225</td><td>5.35</td><td>46.3</td></tr><tr><td>1.003</td><td>4</td><td>5</td><td>11.859</td><td>0.600</td><td>109.600</td><td>109.481</td><td>0.119</td><td>100.0</td><td>225</td><td>5.50</td><td>45.8</td></tr><tr><td>1.004</td><td>5</td><td>7</td><td>20.739</td><td>0.600</td><td>109.481</td><td>109.125</td><td>0.356</td><td>58.3</td><td>225</td><td>5.70</td><td>45.1</td></tr><tr><td>1.005</td><td>7</td><td>8</td><td>19.609</td><td>0.600</td><td>109.125</td><td>108.929</td><td>0.196</td><td>100.0</td><td>225</td><td>5.95</td><td>44.2</td></tr><tr><td>1.006</td><td>8</td><td>9</td><td>1.512</td><td>0.600</td><td>108.929</td><td>108.914</td><td>0.015</td><td>100.0</td><td>225</td><td>5.97</td><td>44.1</td></tr></table> Pro <table><tr><th>Name</th><th>Vel (m/s)</th><th>Cap (l/s)</th><th>Flow (l/s)</th><th>US Depth (m)</th><th>DS Depth (m)</th><th>Σ Area (ha)</th><th>Σ Inflow (l/s)</th><th>Pro Depth (mm)</th><th>Pro Velocity (m/s)</th></tr><tr><td>1.000</td><td>1.854</td><td>32.8</td><td>2.6</td><td>0.900</td><td>0.900</td><td>0.020</td><td>0.0</td><td>28</td><td>1.108</td></tr><tr><td>1.001</td><td>1.307</td><td>52.0</td><td>3.7</td><td>0.900</td><td>0.990</td><td>0.029</td><td>0.0</td><td>40</td><td>0.756</td></tr><tr><td>1.002</td><td>1.307</td><td>52.0</td><td>4.1</td><td>0.990</td><td>1.075</td><td>0.033</td><td>0.0</td><td>43</td><td>0.786</td></tr><tr><td>1.003</td><td>1.307</td><td>52.0</td><td>5.7</td><td>1.075</td><td>0.994</td><td>0.046</td><td>0.0</td><td>51</td><td>0.869</td></tr><tr><td>1.004</td><td>1.717</td><td>68.3</td><td>8.9</td><td>0.994</td><td>0.910</td><td>0.073</td><td>0.0</td><td>55</td><td>1.198</td></tr><tr><td>1.005</td><td>1.307</td><td>52.0</td><td>15.9</td><td>0.910</td><td>0.966</td><td>0.133</td><td>0.0</td><td>86</td><td>1.155</td></tr><tr><td>1.006</td><td>1.307</td><td>52.0</td><td>19.5</td><td>0.966</td><td>0.981</td><td>0.163</td><td>0.0</td><td>95</td><td>1.216</td></tr></table>					Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	1	0.020	5.00	111.360	600	380482.863	405582.937	1.050	2	0.009	5.00	110.900	600	380469.778	405578.991	1.125	3	0.004	5.00	110.900	600	380461.123	405576.380	1.215	4	0.013	5.00	110.900	600	380453.021	405573.941	1.300	5	0.027	5.00	110.700	600	380449.547	405585.280	1.219	7	0.060	5.00	110.260	600	380443.609	405605.151	1.135	8	0.030	5.00	110.120	600	380462.381	405610.820	1.191	9	0.004	5.00	110.120	600	380463.819	405611.288	1.206	10	0.008	5.00	110.300	600	380480.051	405601.279	1.050	11	0.004	5.00	110.300	600	380475.517	405614.371	1.189	12			110.260	600	380469.948	405613.281	1.475	13		5.00	110.130	1500	380454.746	405617.350	1.480	14			110.200	1500	380468.358	405621.461	1.635	C7			110.640	1200	380463.860	405631.624	2.250	Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	1.000	1	2	13.667	0.600	110.310	109.850	0.460	29.7	150	5.12	47.2	1.001	2	3	9.040	0.600	109.775	109.685	0.090	100.0	225	5.24	46.7	1.002	3	4	8.461	0.600	109.685	109.600	0.085	100.0	225	5.35	46.3	1.003	4	5	11.859	0.600	109.600	109.481	0.119	100.0	225	5.50	45.8	1.004	5	7	20.739	0.600	109.481	109.125	0.356	58.3	225	5.70	45.1	1.005	7	8	19.609	0.600	109.125	108.929	0.196	100.0	225	5.95	44.2	1.006	8	9	1.512	0.600	108.929	108.914	0.015	100.0	225	5.97	44.1	Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)	1.000	1.854	32.8	2.6	0.900	0.900	0.020	0.0	28	1.108	1.001	1.307	52.0	3.7	0.900	0.990	0.029	0.0	40	0.756	1.002	1.307	52.0	4.1	0.990	1.075	0.033	0.0	43	0.786	1.003	1.307	52.0	5.7	1.075	0.994	0.046	0.0	51	0.869	1.004	1.717	68.3	8.9	0.994	0.910	0.073	0.0	55	1.198	1.005	1.307	52.0	15.9	0.910	0.966	0.133	0.0	86	1.155	1.006	1.307	52.0	19.5	0.966	0.981	0.163	0.0	95	1.216
Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)																																																																																																																																																																																																																																																																																																					
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1.001	2	3	9.040	0.600	109.775	109.685	0.090	100.0	225	5.24	46.7																																																																																																																																																																																																																																																																																																	
1.002	3	4	8.461	0.600	109.685	109.600	0.085	100.0	225	5.35	46.3																																																																																																																																																																																																																																																																																																	
1.003	4	5	11.859	0.600	109.600	109.481	0.119	100.0	225	5.50	45.8																																																																																																																																																																																																																																																																																																	
1.004	5	7	20.739	0.600	109.481	109.125	0.356	58.3	225	5.70	45.1																																																																																																																																																																																																																																																																																																	
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1.001	1.307	52.0	3.7	0.900	0.990	0.029	0.0	40	0.756																																																																																																																																																																																																																																																																																																			
1.002	1.307	52.0	4.1	0.990	1.075	0.033	0.0	43	0.786																																																																																																																																																																																																																																																																																																			
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1.004	1.717	68.3	8.9	0.994	0.910	0.073	0.0	55	1.198																																																																																																																																																																																																																																																																																																			
1.005	1.307	52.0	15.9	0.910	0.966	0.133	0.0	86	1.155																																																																																																																																																																																																																																																																																																			
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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
C7	380463.860	405631.624	110.640	2.250	1200	1	1.009	108.390	150



Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	18.600	Additional Storage (m ³ /ha)	20.0
Ratio-R	0.350	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	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
100	45	0	0

Node C7 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m ²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		
Applies to 100yr+45% CC 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 minute storms					

[illegible]

Node 14 Online Hydro-Brake® Control

Replaces Downstream Link	Flap Valve	✓	Objective Sump Available Product Number Min Outlet Diameter (m) Min Node Diameter (mm)	(HE) Minimise upstream storage ✓ CTL-SHE-0103-5000-1200-5000 0.150 1200
	Invert Level (m)	108.578		
	Design Depth (m)	1.200		
	Design Flow (l/s)	5.0		

Node 14 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.565
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	132

Curtins Consulting Ltd			File: 087132-CUR-XX-XX-M-X-9 Network: Storm Network Andy Losty 06/06/2025			Page 5
Depth (m)		Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000		84.0	84.0	0.800	84.0	110.0
Rainfall						
Event		Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event		
1 year 15 minute summer		97.174	27.497	30 year 360 minute summer		
1 year 15 minute winter		68.192	27.497	30 year 360 minute winter		
1 year 30 minute summer		64.431	18.232	30 year 480 minute summer		
1 year 30 minute winter		45.215	18.232	30 year 480 minute winter		
1 year 60 minute summer		44.651	11.800	30 year 600 minute summer		
1 year 60 minute winter		29.665	11.800	30 year 600 minute winter		
1 year 120 minute summer		28.402	7.506	30 year 720 minute summer		
1 year 120 minute winter		18.869	7.506	30 year 720 minute winter		
1 year 180 minute summer		22.296	5.737	30 year 960 minute summer		
1 year 180 minute winter		14.493	5.737	30 year 960 minute winter		
1 year 240 minute summer		17.929	4.738	30 year 1440 minute summer		
1 year 240 minute winter		11.912	4.738	30 year 1440 minute winter		
1 year 360 minute summer		13.990	3.600	100 year +45% CC 15 minute summer		
1 year 360 minute winter		9.094	3.600	100 year +45% CC 15 minute winter		
1 year 480 minute summer		11.165	2.951	100 year +45% CC 30 minute summer		
1 year 480 minute winter		7.418	2.951	100 year +45% CC 30 minute winter		
1 year 600 minute summer		9.245	2.529	100 year +45% CC 60 minute summer		
1 year 600 minute winter		6.316	2.529	100 year +45% CC 60 minute winter		
1 year 720 minute summer		8.318	2.229	100 year +45% CC 120 minute summer		
1 year 720 minute winter		5.590	2.229	100 year +45% CC 120 minute winter		
1 year 960 minute summer		6.941	1.828	100 year +45% CC 180 minute summer		
1 year 960 minute winter		4.598	1.828	100 year +45% CC 180 minute winter		
1 year 1440 minute summer		5.158	1.382	100 year +45% CC 240 minute summer		
1 year 1440 minute winter		3.466	1.382	100 year +45% CC 240 minute winter		
30 year 15 minute summer		237.842	67.301	100 year +45% CC 360 minute summer		
30 year 15 minute winter		166.907	67.301	100 year +45% CC 360 minute winter		
30 year 30 minute summer		158.373	44.814	100 year +45% CC 480 minute summer		
30 year 30 minute winter		111.139	44.814	100 year +45% CC 480 minute winter		
30 year 60 minute summer		108.241	28.605	100 year +45% CC 600 minute summer		
30 year 60 minute winter		71.913	28.605	100 year +45% CC 600 minute winter		
30 year 120 minute summer		67.120	17.738	100 year +45% CC 720 minute summer		
30 year 120 minute winter		44.593	17.738	100 year +45% CC 720 minute winter		
30 year 180 minute summer		51.553	13.266	100 year +45% CC 960 minute summer		
30 year 180 minute winter		33.511	13.266	100 year +45% CC 960 minute winter		
30 year 240 minute summer		40.654	10.744	100 year +45% CC 1440 minute summer		
30 year 240 minute winter		27.010	10.744	100 year +45% CC 1440 minute winter		
				Peak Intensity (mm/hr)		
				Average Intensity (mm/hr)		
				Peak Intensity (mm/hr)		
				Average Intensity (mm/hr)		
				Peak Intensity (mm/hr)		
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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.41%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	110.355	0.045	6.1	0.0300	0.0000	OK
15 minute winter	2	10	109.842	0.067	8.8	0.0296	0.0000	OK
15 minute winter	3	10	109.757	0.072	10.0	0.0252	0.0000	OK
15 minute winter	4	10	109.684	0.084	13.9	0.0406	0.0000	OK
15 minute winter	5	10	109.568	0.087	22.0	0.0630	0.0000	OK
15 minute winter	7	10	109.285	0.160	40.2	0.2138	0.0000	OK
15 minute winter	8	11	109.142	0.213	48.5	0.1679	0.0000	OK
15 minute winter	9	11	109.080	0.166	49.7	0.0581	0.0000	OK
15 minute winter	10	10	109.289	0.039	2.4	0.0169	0.0000	OK
15 minute winter	11	10	109.142	0.031	3.6	0.0109	0.0000	OK
120 minute winter	12	92	108.957	0.172	18.4	0.0488	0.0000	OK
120 minute winter	13	92	108.957	0.307	0.5	0.5421	0.0000	SURCHARGED
120 minute winter	14	92	108.957	0.392	18.4	31.9497	0.0000	SURCHARGED
120 minute winter	C7	92	108.437	0.047	5.0	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	6.0	1.386	0.184	0.0596	
15 minute winter	2	1.001	3	8.8	0.843	0.169	0.0941	
15 minute winter	3	1.002	4	9.9	0.813	0.190	0.1035	
15 minute winter	4	1.003	5	13.7	0.998	0.264	0.1638	
15 minute winter	5	1.004	7	21.8	0.980	0.319	0.4585	
15 minute winter	7	1.005	8	39.5	1.134	0.761	0.6753	
15 minute winter	8	1.006	9	48.5	1.360	0.933	0.0533	
15 minute winter	9	1.007	12	49.8	1.638	0.676	0.1959	
15 minute winter	10	2.000	11	2.4	0.762	0.134	0.0433	
15 minute winter	11	2.001	12	3.6	1.068	0.095	0.0349	
15 minute winter	12	1.008	14	53.5	1.991	0.651	0.2507	
15 minute winter	13	3.000	14	-3.3	-0.190	-0.081	0.5158	
120 minute winter	14	1.009	C7	5.0	1.020	0.216	0.0544	49.9
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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.41%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	110.374	0.064	11.5	0.0427	0.0000	OK
240 minute winter	2	184	110.107	0.332	3.5	0.1473	0.0000	SURCHARGED
240 minute winter	3	184	110.107	0.422	4.0	0.1474	0.0000	SURCHARGED
240 minute winter	4	184	110.107	0.507	5.6	0.2450	0.0000	SURCHARGED
240 minute winter	5	184	110.107	0.626	8.8	0.4547	0.0000	SURCHARGED
240 minute winter	7	184	110.107	0.982	16.0	1.3154	0.0000	FLOOD RISK
240 minute winter	8	184	110.107	1.178	19.6	0.9267	0.0000	FLOOD RISK
240 minute winter	9	184	110.104	1.190	19.4	0.4152	0.0000	FLOOD RISK
240 minute winter	10	184	110.105	0.854	1.0	0.3717	0.0000	FLOOD RISK
240 minute winter	11	184	110.104	0.993	1.5	0.3476	0.0000	FLOOD RISK
240 minute winter	12	184	110.105	1.320	20.6	0.3735	0.0000	FLOOD RISK
240 minute winter	13	184	110.103	1.453	1.5	2.5679	0.0000	FLOOD RISK
240 minute winter	14	184	110.103	1.538	20.3	66.5974	0.0000	FLOOD RISK
15 minute summer	C7	1	108.780	0.390	4.8	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	11.4	1.635	0.348	0.1594	
15 minute winter	2	1.001	3	16.6	0.928	0.320	0.3595	
15 minute summer	3	1.002	4	19.6	0.877	0.378	0.3365	
15 minute winter	4	1.003	5	26.1	1.047	0.502	0.4716	
15 minute summer	5	1.004	7	36.2	0.984	0.531	0.8248	
15 minute winter	7	1.005	8	61.0	1.534	1.174	0.7799	
15 minute winter	8	1.006	9	75.7	1.903	1.456	0.0601	
15 minute winter	9	1.007	12	77.2	1.940	1.047	0.2563	
15 minute winter	10	2.000	11	4.5	0.911	0.255	0.0989	
15 minute winter	11	2.001	12	6.8	1.016	0.181	0.0797	
15 minute winter	12	1.008	14	82.5	2.076	1.004	0.3314	
15 minute summer	13	3.000	14	-4.8	-0.201	-0.119	0.5655	
240 minute winter	14	1.009	C7	5.2	0.296	0.225	0.1957	100.6
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Design Settings Rainfall MethodologyFSR Return Period (years)1 Additional Flow (%)0 FSR RegionEngland and Wales M5-60 (mm)18.000 Ratio-R0.350 CV0.750 Time of Entry (mins)5.00 Maximum Time of Concentration (mins)30.00 Maximum Rainfall (mm/hr)50.0 Minimum Velocity (m/s)1.00 Level Soffits Minimum Backdrop Height (m)0.200 Preferred Cover Depth (m)1.200 Include Intermediate Ground✓ Enforce best practice design rulesx																																																																																																																												
Nodes <table><tr><th>Name</th><th>Area (ha)</th><th>T of E (mins)</th><th>Cover Level (m)</th><th>Diameter (mm)</th><th>Easting (m)</th><th>Northing (m)</th><th>Depth (m)</th></tr><tr><td>F1</td><td></td><td>5.00</td><td>110.700</td><td>450</td><td>380452.058</td><td>405581.255</td><td>1.000</td></tr><tr><td>F2</td><td></td><td></td><td>110.600</td><td>450</td><td>380449.528</td><td>405588.952</td><td>1.103</td></tr><tr><td>F3</td><td></td><td></td><td>110.400</td><td>450</td><td>380448.337</td><td>405592.971</td><td>1.008</td></tr><tr><td>F4</td><td></td><td></td><td>110.150</td><td>405</td><td>380445.422</td><td>405603.038</td><td>1.020</td></tr><tr><td>EX MH3</td><td>0.014</td><td>5.00</td><td>110.200</td><td>1050</td><td>380456.506</td><td>405606.439</td><td>1.250</td></tr><tr><td>F7</td><td></td><td>5.00</td><td>110.880</td><td>450</td><td>380459.994</td><td>405577.071</td><td>1.080</td></tr><tr><td>C1</td><td>0.009</td><td>5.00</td><td>110.910</td><td>450</td><td>380468.114</td><td>405581.232</td><td>1.470</td></tr><tr><td>C2</td><td></td><td></td><td>110.950</td><td>450</td><td>380475.446</td><td>405581.833</td><td>1.602</td></tr><tr><td>C3</td><td></td><td></td><td>110.950</td><td>450</td><td>380477.987</td><td>405582.600</td><td>1.635</td></tr><tr><td>C4</td><td></td><td></td><td>110.950</td><td>450</td><td>380479.384</td><td>405584.329</td><td>1.790</td></tr><tr><td>EX MH7</td><td>0.004</td><td>5.00</td><td>111.160</td><td>900</td><td>380484.158</td><td>405585.869</td><td>2.100</td></tr><tr><td>C5</td><td>0.011</td><td>5.00</td><td>111.780</td><td>450</td><td>380480.961</td><td>405596.082</td><td>2.960</td></tr><tr><td>C6</td><td></td><td></td><td>110.780</td><td>450</td><td>380475.678</td><td>405612.212</td><td>2.247</td></tr><tr><td>C7</td><td></td><td></td><td>110.220</td><td>1200</td><td>380463.926</td><td>405631.695</td><td>1.830</td></tr></table> Links					Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	F1		5.00	110.700	450	380452.058	405581.255	1.000	F2			110.600	450	380449.528	405588.952	1.103	F3			110.400	450	380448.337	405592.971	1.008	F4			110.150	405	380445.422	405603.038	1.020	EX MH3	0.014	5.00	110.200	1050	380456.506	405606.439	1.250	F7		5.00	110.880	450	380459.994	405577.071	1.080	C1	0.009	5.00	110.910	450	380468.114	405581.232	1.470	C2			110.950	450	380475.446	405581.833	1.602	C3			110.950	450	380477.987	405582.600	1.635	C4			110.950	450	380479.384	405584.329	1.790	EX MH7	0.004	5.00	111.160	900	380484.158	405585.869	2.100	C5	0.011	5.00	111.780	450	380480.961	405596.082	2.960	C6			110.780	450	380475.678	405612.212	2.247	C7			110.220	1200	380463.926	405631.695	1.830
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<table><tr><th>Name</th><th>US Node</th><th>DS Node</th><th>Length (m)</th><th>ks (mm) / n</th><th>US IL (m)</th><th>DS IL (m)</th><th>Fall (m)</th><th>Slope (1:X)</th><th>Dia (mm)</th><th>T of C (mins)</th><th>Rain (mm/hr)</th></tr><tr><td>1.000</td><td>F1</td><td>F2</td><td>8.102</td><td>0.600</td><td>109.700</td><td>109.497</td><td>0.203</td><td>40.0</td><td>100</td><td>5.11</td><td>45.7</td></tr><tr><td>1.001</td><td>F2</td><td>F3</td><td>4.192</td><td>0.600</td><td>109.497</td><td>109.392</td><td>0.105</td><td>40.0</td><td>100</td><td>5.17</td><td>45.5</td></tr><tr><td>1.002</td><td>F3</td><td>F4</td><td>10.481</td><td>0.600</td><td>109.392</td><td>109.130</td><td>0.262</td><td>40.0</td><td>100</td><td>5.31</td><td>45.0</td></tr><tr><td>1.003</td><td>F4</td><td>EX MH3</td><td>11.594</td><td>0.600</td><td>109.130</td><td>108.950</td><td>0.180</td><td>64.4</td><td>100</td><td>5.51</td><td>44.3</td></tr><tr><td>1.004</td><td>EX MH3</td><td>C6</td><td>20.022</td><td>0.600</td><td>108.950</td><td>108.608</td><td>0.342</td><td>58.5</td><td>100</td><td>5.84</td><td>42.1</td></tr><tr><td>2.000</td><td>F7</td><td>C2</td><td>16.169</td><td>0.600</td><td>109.800</td><td>109.348</td><td>0.452</td><td>35.8</td><td>100</td><td>5.21</td><td>45.4</td></tr><tr><td>3.000</td><td>C1</td><td>C2</td><td>7.357</td><td>0.600</td><td>109.440</td><td>109.348</td><td>0.092</td><td>80.0</td><td>100</td><td>5.14</td><td>45.6</td></tr><tr><td>2.001</td><td>C2</td><td>C3</td><td>2.654</td><td>0.600</td><td>109.348</td><td>109.315</td><td>0.033</td><td>80.0</td><td>100</td><td>5.26</td><td>45.2</td></tr><tr><td>2.002</td><td>C3</td><td>C4</td><td>2.223</td><td>0.600</td><td>109.315</td><td>109.160</td><td>0.155</td><td>14.3</td><td>100</td><td>5.28</td><td>45.1</td></tr></table> Pro					Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)	1.000	F1	F2	8.102	0.600	109.700	109.497	0.203	40.0	100	5.11	45.7	1.001	F2	F3	4.192	0.600	109.497	109.392	0.105	40.0	100	5.17	45.5	1.002	F3	F4	10.481	0.600	109.392	109.130	0.262	40.0	100	5.31	45.0	1.003	F4	EX MH3	11.594	0.600	109.130	108.950	0.180	64.4	100	5.51	44.3	1.004	EX MH3	C6	20.022	0.600	108.950	108.608	0.342	58.5	100	5.84	42.1	2.000	F7	C2	16.169	0.600	109.800	109.348	0.452	35.8	100	5.21	45.4	3.000	C1	C2	7.357	0.600	109.440	109.348	0.092	80.0	100	5.14	45.6	2.001	C2	C3	2.654	0.600	109.348	109.315	0.033	80.0	100	5.26	45.2	2.002	C3	C4	2.223	0.600	109.315	109.160	0.155	14.3	100	5.28	45.1
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)																																																																																																																	
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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%								
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	F1	1	109.700	0.000	0.0	0.0000	0.0000	OK
15 minute summer	F2	1	109.497	0.000	0.0	0.0000	0.0000	OK
15 minute summer	F3	1	109.392	0.000	0.0	0.0000	0.0000	OK
15 minute summer	F4	1	109.130	0.000	0.0	0.0000	0.0000	OK
15 minute winter	EX MH3	10	109.035	0.085	8.0	0.0921	0.0000	OK
15 minute summer	F7	1	109.800	0.000	0.0	0.0000	0.0000	OK
15 minute winter	C1	10	109.511	0.071	5.2	0.0199	0.0000	OK
15 minute winter	C2	11	109.418	0.070	5.1	0.0112	0.0000	OK
15 minute winter	C3	13	109.385	0.070	5.0	0.0112	0.0000	OK
15 minute winter	C4	13	109.377	0.217	5.0	0.0345	0.0000	SURCHARGED
15 minute winter	EX MH7	12	109.348	0.288	6.3	0.1942	0.0000	SURCHARGED
15 minute winter	C5	12	109.257	0.437	11.0	0.1019	0.0000	SURCHARGED
15 minute winter	C6	12	108.735	0.202	17.2	0.0321	0.0000	SURCHARGED
15 minute winter	C7	12	108.511	0.121	17.0	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	F1	1.000	F2	0.0	0.000	0.000	0.0000	
15 minute summer	F2	1.001	F3	0.0	0.000	0.000	0.0000	
15 minute summer	F3	1.002	F4	0.0	0.000	0.000	0.0000	
15 minute summer	F4	1.003	EX MH3	0.0	0.000	0.000	0.0393	
15 minute winter	EX MH3	1.004	C6	7.9	1.107	0.995	0.1490	
15 minute summer	F7	2.000	C2	0.0	0.000	0.000	0.0457	
15 minute winter	C1	3.000	C2	5.1	0.870	0.758	0.0433	
15 minute winter	C2	2.001	C3	5.0	1.112	0.745	0.0147	
15 minute winter	C3	2.002	C4	5.0	1.220	0.309	0.0152	
15 minute winter	C4	2.003	EX MH7	4.4	0.842	0.519	0.0392	
15 minute winter	EX MH7	2.004	C5	6.1	0.784	0.675	0.0837	
15 minute winter	C5	2.005	C6	10.0	1.280	1.481	0.1328	
15 minute winter	C6	1.005	C7	17.0	0.985	1.215	0.3729	10.1
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