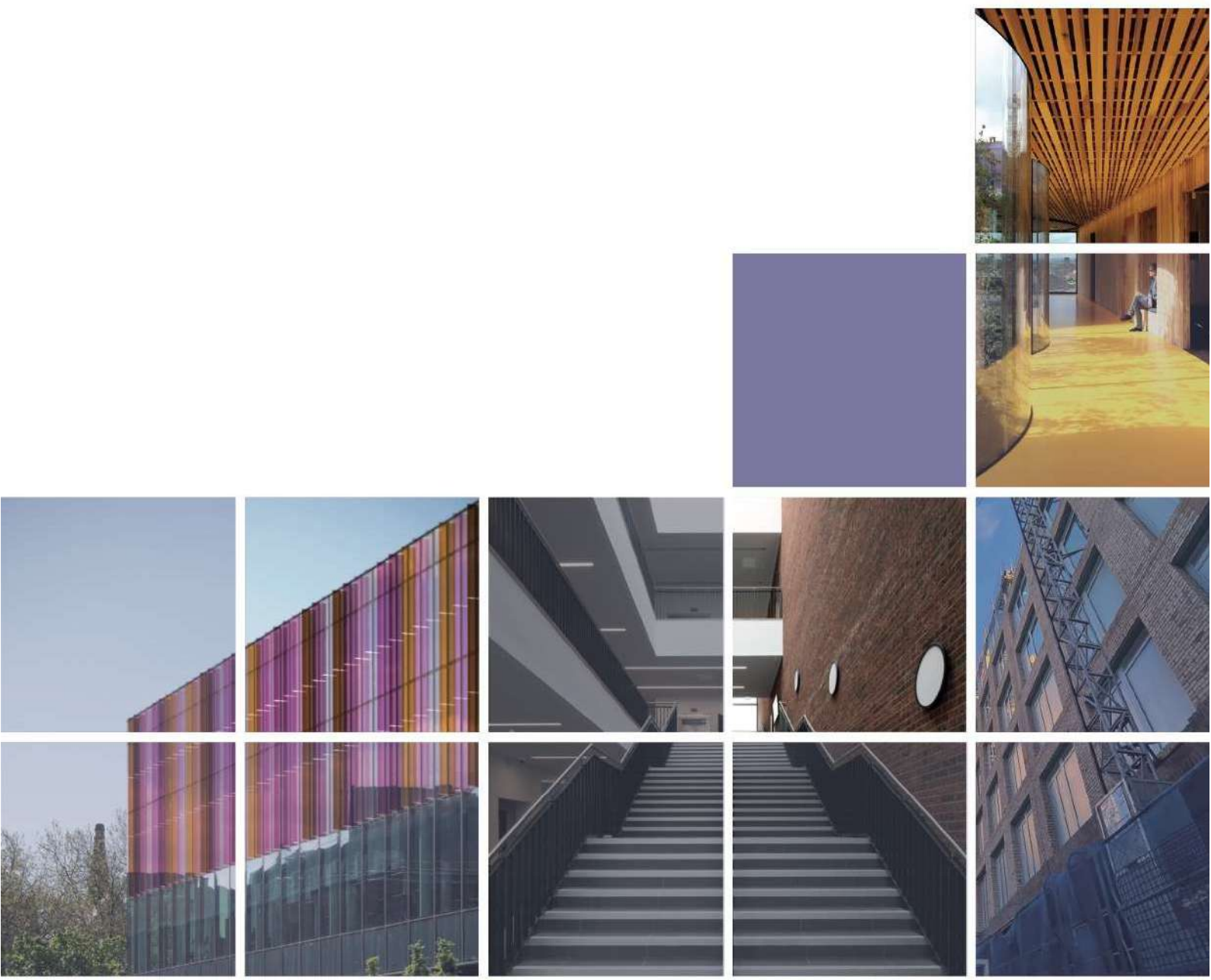
PIXB – West Didsbury

Decision Notice Clause Statement

Doc Ref: 15094-BKP-XX-XX-RP-C-0003 Rev. P05

Date: 24.07.2026



boothking

Any LLFA Comments to LPA
The discharge of Condition 4 was refused under **CDN/25/0660** and **CDN/25/1232**. The Condition was not partially discharged for the clauses which were considered acceptable under those applications. The applicant has only provided information for the matters remaining from the previous refused discharge (CDN/25/1232). Information submitted under previous applications to discharge Condition 4 **will need to be re-submitted**, as the applicant will need to confirm that this information is still relevant to the proposed surface water drainage system.

Condition number	4
Decision Notice	140916/FO/2024

Decision Notice Clause	**Contained in submission**	**Approvable standard**	**Further information required:**
Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.	N	N	This information has not been re-submitted in support of this application.
Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.	N	N	This information has not been re-submitted in support of this application.
Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable.	N	N	This information has not been re-submitted in support of this application.
A finalised drainage layout showing all components, outfalls, levels and connectivity.	Y	Y	<standard comment: The applicant must present a consistent package to discharge this condition (Including all layouts and calculations). The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and hydraulic calculations correspond, and that they can be cross-referenced for checks. This includes layout annotations and schedule printouts. >

An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.	N	N	This information has not been re-submitted in support of this application.
Hydraulic calculations of the proposed drainage system, including all design parameters. Calculations must Include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.	Y	Y	
A plan indicating surface water overland flow routes for extreme events to ensure flows are diverted away from existing and proposed buildings (including basements).	N	N	This information has not been re-submitted in support of this application. This is required given the significant flood volumes predicted in the 1 in 100 + 45% Climate Change.
Construction details of flow control and SuDS elements.	N	N	This information has not been re-submitted in support of this application.
Finished floor levels and proposed ground levels plan.	N	N	This information has not been re-submitted in support of this application.

% Complete submission:	22%
% At approvable standard:	22%
Refusal trigger points: Submission 1 = less than 20% complete. Submission 2 = not 100% approvable standard.	

LLFA Recommendation:	**Further information required (as detailed above).**

Manchester City Council LLFA: CDN consultation

MANCHESTER CITY COUNCIL

Condition number	4
Decision Notice	140916/FO/2024

Decision Notice Clause	**Contained in submission**	**Approvable standard**	**Further information required:**	**Designer's Response**
Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.	Y	N	This information has not been re-submitted in support of this application.	Please refer to 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement Appendix A for the Surface Water Calculations. And Response to Clause 3 for the BRE365 Test results. The NX601 Phase 1 & Preliminary Phase 2 Geoenvironmental Assessment Report for West Didsbury Premier Inn Extension can be provided upon request.
Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.	Y	N	This information has not been re-submitted in support of this application.	Please refer to Appendix B of 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement.
Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable.	Y	N	This information has not been re-submitted in support of this application.	Please refer to the 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement report and drawings attached in Appendix C, D, E and F
A finalised drainage layout showing all components, outfalls, levels and connectivity. 2	Y	Y	<standard comment: The applicant must present a consistent package to discharge this condition (Including all layouts and calculations). The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and hydraulic calculations correspond, and that they can be cross-referenced for checks. This includes layout annotations and schedule printouts. >	Please refer to the 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement report and drawings attached in Appendix A, C, D, E and F

An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.	Y	N	This information has not been re-submitted in support of this application.	Please refer to the 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement report and drawings attached in Appendix C and drawing No: 15094-BKP-XX-XX-DR-C-0501 - Drainage Areas GA
Hydraulic calculations of the proposed drainage system, including all design parameters. Calculations must Include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.	Y	Y	The drainage layout states that the attenuation tank has a capacity of 54m^3. The hydraulic calculations use a modelled volume of 44.16m^3 (60m^2 x 0.8m x 0.92 porosity). Please confirm the proposed storage volume of the tank and ensure that this corresponds between the hydraulic calculations and a clearly labelled volume on the drainage layout.	Surface Water Calculations have been updated to reflect 67.5m^2 x 0.8m deep with 0.95 porosity, modelled volume of 51.3m^3 Drawings have been updated to suit calculation accordingly.
A plan indicating surface water overland flow routes for extreme events to ensure flows are diverted away from existing and proposed buildings (including basements).	Y	N	This information has not been re-submitted in support of this application. This is required given the significant flood volumes predicted in the 1 in 100 + 45% Climate Change.	Please refer to the 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement report and drawings attached in Appendix C and drawing No: 15094-BKP-XX-XX-DR-C-0515 – Exceedance Flood Flow Plan
Construction details of flow control and SuDS elements.	Y	N	This information has not been re-submitted in support of this application.	Please refer to the 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement report and drawings attached in Appendix C, D, E and F
Finished floor levels and proposed ground levels plan. 3	Y	N	This information has not been re-submitted in support of this application.	Please refer to the 15094-BKP-XX-XX-RP-C-0003 - P05 - Decision Notice Clause Statement report and drawings attached in Appendix F. Drawings No: 15094-BKP-XX-XX-DR-C-0510 to 0512 Drainage GAs

% Complete submission:	100%
% At approvable standard:	66%
Refusal trigger points: Submission 1 = less than 20% complete. Submission 2 = not 100% approvable standard.	

LLFA Recommendation:	**Further information required (as detailed above).**

1. Decision Notice Clause

Clause 1

Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.

Further Information required:

The applicant must present a consistent package to discharge this condition (Including all layouts and calculations). The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and hydraulic calculations correspond, and that they can be cross-referenced for checks. This includes layout annotations and schedule printouts.

Response to Clause 1 & Further Information required:

Please refer to Appendix A for the surface water calculations, existing and proposed in conjunction with drawings No: 15094-BKP-XX-XX-DR-C-0510 - Proposed Drainage Key Plan, 15094-BKP-XX-XX-DR-C-0511 - Proposed Drainage GA – Sheet 1 and 15094-BKP-XX-XX-DR-C-0511 - Proposed Drainage GA – Sheet 2 in Appendix F.

Clause 2

Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.

Response to Clause 2

An application for a Section 106 Part 1 Agreement has been submitted to United Utilities (refer to Appendix B). The response can be found in Appendix B.

Clause 3

Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable.

Response to Clause 3

Please refer to Phase 1 & Preliminary Phase 2 Geoenvironmental Assessment for Proposed Premier Inn Annex Extension Premier Inn West Didsbury, Christie Fields Business Park, Derwent Ave, Manchester M21 7QS

(Project No: NX601) prepared by NX Consulting Limited in May 2025 regarding infiltration and ground conditions.

Summary of the Ground conditions (extract from the NX601)

	Made Ground	Glaciofluvial Deposits (Sand)	Glaciofluvial Deposits (Sand and Gravel)	Glaciofluvial Deposits (Clay)	Groundwater Strike(s)
WS1.1	0.00-1.60m	1.60-5.45	-	-	-
WS2.1	0.00-1.60m	1.60-3.50	3.50-4.70	4.70-5.45	3.70
WS3.1	0.00-0.90	0.90-4.65	4.65-4.75	4.75-5.45	4.65
WS4.1	0.00-1.50	1.50-4.70	-	4.70-5.45	3.30

Table 5.1.1. Ground Conditions Summary
M – Denotes metres below ground level

The Glaciofluvial sand would be considered to provide a moderate to good drainage potential where infiltration rates in the order of 10^{-5} m/s to 10^{-6} m/s can be anticipated. Although the Infiltration Rate was found to be 7.03E-05 m/s, Groundwater strikes were recorded within sand and gravel bands in WS2.1 to WS4.1 between depths of 3.30mbgl to 4.65mbgl. Subsequent groundwater level monitoring within WS1.1 recorded groundwater present between 2.59m to 2.77mbgl.

Soil sampling of Made Ground deposits has recorded contaminant concentrations below Tier 1 values for commercial end use (end use determined by sensitivity of proposed end users). Soil concentrations are not considered to pose an unacceptable risk to human health.

Any areas of proposed landscaping and public open space will require imported subsoil/topsoil materials which will require chemical validation to demonstrate that they are suitable for a commercial end use and taken to depths sufficient to provide a sufficient cover system for all proposed materials used which are capable to support root growth.

Based on the above findings, the use of a soakaway is deemed unsuitable and has been ruled out as a viable drainage option.

NX Consulting Limited reports can be provided upon request.

Clause 4

A finalised drainage layout showing all components, outfalls, levels and connectivity.

Further Information required:

Provide calculations to include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change. The proposed drainage plan shows that flows from the proposed SW network discharges into an existing SW network at two separate points, one is restricted to 5 l/s from proposed

manhole SWMH- 5 into an existing SW network at manhole SWMH-7 and the other is unrestricted from proposed SW network at manhole SWMH-3 into existing SW network at manhole EX-SWMH. Calculations to be provided to confirm the discharge rates.

Response to Clause 4

Please refer to Appendix A for the surface water calculations, which present the combined model for both the existing and proposed development. Surface water discharge rates have been restricted to 2.0 l/s, as the QBar (FEH Statistical 2025) for the full site was determined to be 1.6 l/s—a rate that is not technically feasible to achieve with current flow control technologies.

Clause 5

An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.

Response to Clause 5

Please refer to Appendix C for the existing and proposed impermeable areas drawing No: 15094-BKP-XX-XX-DR-C-0501 - Drainage Areas GA and Appendix A for the surface water calculations, both existing and proposed.

Clause 6

Hydraulic calculations of the proposed drainage system, including all design parameters. Calculations must Include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.

Response to Clause 6

Please refer to Appendix A for the surface water calculations, which presents the existing and proposed development.

Clause 7

A plan indicating surface water overland flow routes for extreme events to ensure flows are diverted away from existing and proposed buildings (including basements).

Response to Clause 7

Please refer to Appendix D for the exceedance flood flow routes drawing No: 15094-BKP-XX-XX-DR-C-0515 - P02 - Exceedance flood flow plan.

Clause 8

Construction details of flow control and SuDS elements.

Response to Clause 8

Please refer to Appendix E for drainage detail drawings No: 15094-BKP-XX-XX-DR-C-0590 - C02 - Drainage Details Sheet 1, 15094-BKP-XX-XX-DR-C-0590 - C02 - Drainage Details Sheet 2 and 15094-BKP-XX-XX-DR-C-0590 - C02 - Drainage Details Sheet 3

Clause 9

Finished floor levels and proposed ground levels plan.

Response to Clause 9

The proposed Finished Floor Level (FFL) of the Annex is set at 31.65m AOD or as close to existing Main Hotel Building finished floor level.

APPENDIX A

GREENFIELD RATES & SURFACE WATER CALCULATIONS - EXISTING & PROPOSED

Greenfield runoff rate estimation tool

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

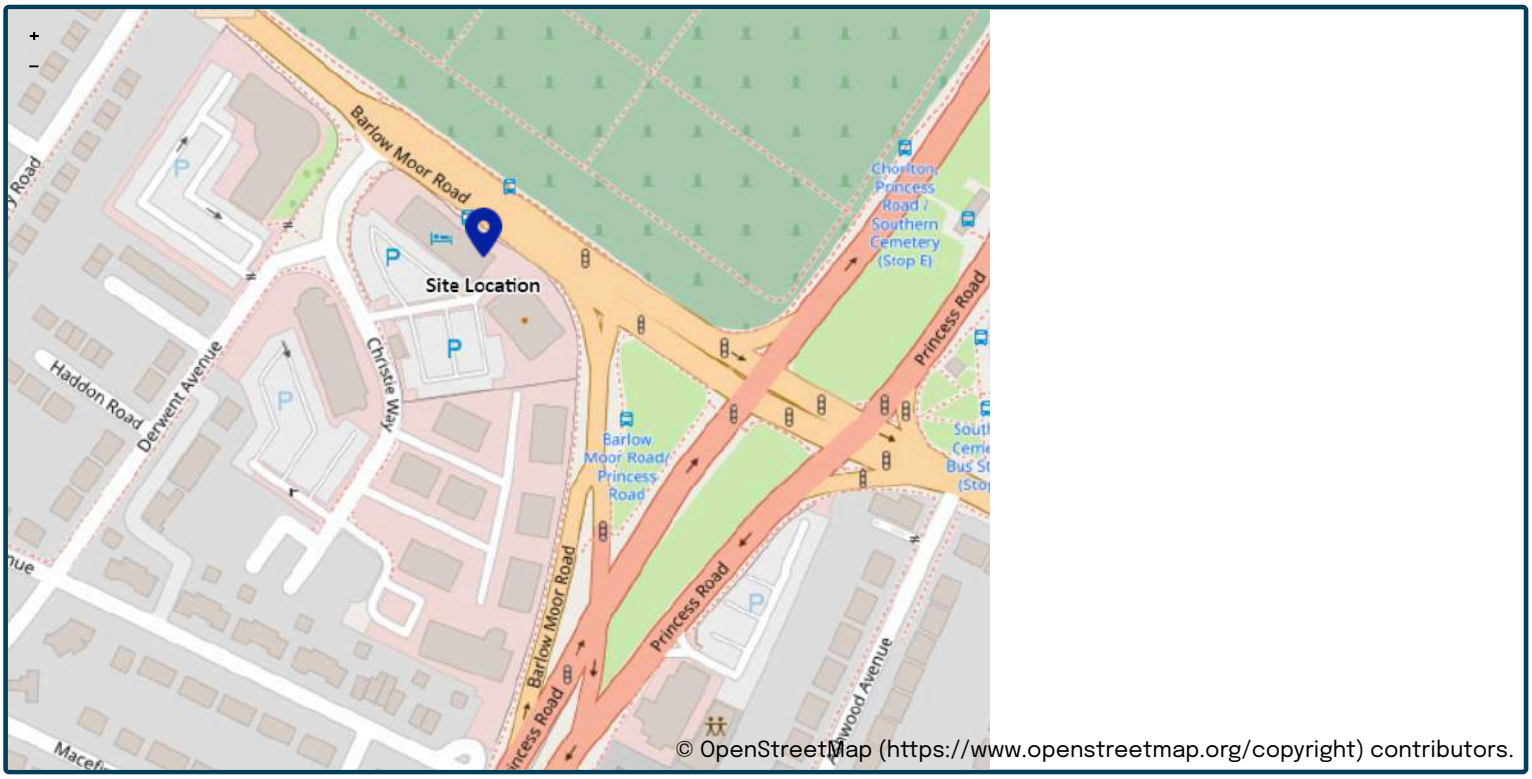
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	11/12/2025
Calculated by	Eleni Zachara
Reference	15094
Model version	2.2.2

Location

Site name	West Didsbury
Site location	Christie Fields Business Pk, Derwent Ave, Manchester M21 7QS



Site easting (British National Grid)	382971
Site northing (British National Grid)	392126

Site details

Total site area (ha)	0.721 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	858 mm		
BFIHOST19scaled	0.682		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	1.5 l/s		
QBar (FEH statistical 2025) (l/s)	1.6 l/s		

Growth curve factors

	My value		Map value
Hydrological region	10		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	FEH statistical (2025)
Flow rate 1 year (l/s)	1.4 l/s
Flow rate 2 year (l/s)	1.5 l/s
Flow rate 10 years (l/s)	2.2 l/s
Flow rate 30 years (l/s)	2.7 l/s
Flow rate 100 years (l/s)	3.3 l/s
Flow rate 200 years (l/s)	3.8 l/s

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

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

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)	T of C (mins)	Rain (mm/hr)
1.000	SWIC-1	SWIC-2	29.314	0.600	30.300	30.090	0.210	139.6	225	5.44	34.8
1.001	SWIC-2	SWIC-2a	10.428	0.600	30.090	30.050	0.040	260.7	225	5.66	34.2
1.002	SWIC-2a	SWMH-1a	3.989	0.600	30.050	30.030	0.020	199.5	225	5.73	34.0
1.003	SWMH-1a	SWMH-1b Hydrobrake	27.396	0.600	30.030	30.000	0.030	913.2	225	6.81	31.3
1.004	SWMH-1b Hydrobrake	SWMH-1	8.896	0.600	30.000	29.940	0.060	148.3	225	6.94	31.0
2.000	SWIC-3	SWMH-2	8.896	0.600	30.300	30.200	0.100	89.0	225	5.11	35.7
2.001	SWMH-2	SWMH-3	23.196	0.600	30.200	29.970	0.230	100.9	225	5.40	34.9
2.002	SWMH-3	SWMH-4	6.517	0.600	29.970	29.900	0.070	93.1	225	5.48	34.7
1.005	SWMH-1	SWMH-4	31.541	0.600	29.940	29.900	0.040	788.5	150	8.44	28.0
1.006	SWMH-4	SW- Petrol Interceptor	3.037	0.600	29.900	29.800	0.100	30.4	225	8.47	27.9
1.007	SW- Petrol Interceptor	SWMH-5 Hydrobrake	3.893	0.600	29.700	29.600	0.100	38.9	225	8.50	27.9
4.000	SWMH-6	SW- Offline Attenuation Tank	9.630	0.600	29.800	29.600	0.200	48.2	150	5.11	35.7
4.001	SW- Offline Attenuation Tank	SWMH-5 Hydrobrake	9.390	0.600	29.600	29.600	0.000	0.0	150	5.27	35.3
4.002	SWMH-5 Hydrobrake	SWMH-7	4.308	0.600	29.600	29.500	0.100	43.1	225	8.53	27.8
5.000	Ex-MH14	Ex-MH12	16.136	0.600	31.280	31.120	0.160	100.9	150	5.27	35.3
5.001	Ex-MH12	Ex-S4	17.174	0.600	31.120	30.740	0.380	45.2	150	5.46	34.7
5.002	Ex-S4	Ex-S3	13.891	0.600	30.740	30.520	0.220	63.1	150	5.64	34.2
5.003	Ex-S3	Ex-SWMH01	52.439	0.600	30.520	29.610	0.910	57.6	150	6.30	32.5
6.000	Ex-SWMH04	Ex-SWMH01	23.865	0.600	30.050	29.610	0.440	54.2	150	5.29	35.2

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

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)	T of C (mins)	Rain (mm/hr)
1.008	Ex-SWMH01	SWMH-7	8.406	0.600	29.610	29.500	0.110	76.4	300	6.38	32.3
1.009	SWMH-7	Ex-SWMH06	14.555	0.600	29.500	29.315	0.185	78.7	300	8.67	27.6
1.010	Ex-SWMH06	Outfall - Ex-SWMH 3	18.459	0.600	29.315	29.130	0.185	99.8	300	8.86	27.2

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

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 %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	30	40	0	0
2	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year 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	SWIC-1	10	30.325	0.025	1.2	0.0040	0.0000	OK
15 minute summer	SWIC-2	11	30.141	0.051	3.4	0.0145	0.0000	OK
15 minute summer	SWIC-2a	11	30.101	0.051	3.4	0.0145	0.0000	OK
15 minute summer	SWMH-1a	13	30.092	0.062	3.4	0.4790	0.0000	OK
30 minute summer	SWMH-1b Hydrobrake	23	30.076	0.076	2.6	0.5929	0.0000	OK
15 minute summer	Ex-SWMH04	11	30.070	0.020	0.9	0.0224	0.0000	OK
15 minute summer	Ex-MH14	10	31.323	0.043	3.0	0.1083	0.0000	OK
15 minute summer	Ex-MH12	10	31.160	0.040	4.1	0.0455	0.0000	OK
15 minute summer	Ex-S4	11	30.783	0.043	4.1	0.0492	0.0000	OK
15 minute summer	Ex-S3	11	30.585	0.065	9.2	0.0738	0.0000	OK
15 minute summer	SWIC-3	10	30.328	0.028	1.7	0.0078	0.0000	OK
15 minute summer	SWMH-2	11	30.228	0.028	1.7	0.0491	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	SWIC-1	1.000	SWIC-2	1.2	0.262	0.026	0.1339	
15 minute summer	SWIC-2	1.001	SWIC-2a	3.4	0.510	0.106	0.0707	
15 minute summer	SWIC-2a	1.002	SWMH-1a	3.4	0.622	0.092	0.0299	
30 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	2.6	0.438	0.157	0.2588	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	1.6				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	0.9	0.138	0.037	0.1638	
15 minute summer	Ex-MH14	5.000	Ex-MH12	2.9	0.747	0.166	0.0637	
15 minute summer	Ex-MH12	5.001	Ex-S4	4.1	1.030	0.154	0.0688	
15 minute summer	Ex-S4	5.002	Ex-S3	4.1	0.714	0.184	0.0804	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	9.2	0.934	0.393	0.5168	
15 minute summer	SWIC-3	2.000	SWMH-2	1.7	0.630	0.031	0.0249	
15 minute summer	SWMH-2	2.001	SWMH-3	1.7	0.432	0.033	0.0923	

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year 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	SWMH-3	10	30.012	0.042	4.0	0.0750	0.0000	OK
15 minute summer	Ex-SWMH01	11	29.709	0.099	24.9	0.1122	0.0000	OK
15 minute summer	SWMH-1	12	30.027	0.087	4.4	0.4643	0.0000	OK
15 minute summer	SWMH-4	11	29.963	0.063	12.2	0.3875	0.0000	OK
15 minute winter	SW- Petrol Interceptor	10	29.856	0.156	11.3	0.1769	0.0000	OK
15 minute summer	SWMH-6	1	29.800	0.000	0.0	0.0000	0.0000	OK
360 minute summer	SW- Offline Attenuation Tank	240	29.791	0.191	3.1	12.2664	0.0000	SURCHARGED
15 minute summer	SWMH-5 Hydrobrake	11	29.868	0.268	13.7	0.4732	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	29.599	0.099	26.2	0.1116	0.0000	OK
15 minute summer	Ex-SWMH06	11	29.444	0.129	38.0	0.1460	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	SWMH-3	2.002	SWMH-4	4.0	0.569	0.073	0.0464	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	24.8	1.226	0.195	0.1701	
15 minute summer	SWMH-1	1.005	SWMH-4	3.7	0.443	0.594	0.2744	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	12.0	1.459	0.127	0.0254	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	13.7	0.721	0.164	0.1345	
15 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	0.0	0.000	0.000	0.0420	
15 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-13.5	-1.139	-0.763	0.0994	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	1.4	0.601	0.018	0.0400	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	26.3	1.073	0.210	0.3576	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	38.1	1.381	0.343	0.5097	22.2

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year 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	Outfall - Ex-SWMH 3	11	29.250	0.120	38.1	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)

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year 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	SWIC-1	10	30.330	0.030	1.7	0.0047	0.0000	OK
15 minute summer	SWIC-2	11	30.153	0.063	5.1	0.0178	0.0000	OK
15 minute summer	SWIC-2a	11	30.114	0.064	5.0	0.0182	0.0000	OK
30 minute summer	SWMH-1a	23	30.110	0.080	4.4	0.6184	0.0000	OK
30 minute summer	SWMH-1b Hydrobrake	22	30.108	0.108	4.0	0.8364	0.0000	OK
15 minute summer	Ex-SWMH04	10	30.074	0.024	1.4	0.0273	0.0000	OK
15 minute summer	Ex-MH14	10	31.333	0.053	4.5	0.1345	0.0000	OK
15 minute summer	Ex-MH12	10	31.170	0.050	6.1	0.0560	0.0000	OK
15 minute summer	Ex-S4	11	30.793	0.053	6.0	0.0603	0.0000	OK
15 minute summer	Ex-S3	11	30.602	0.082	13.8	0.0931	0.0000	OK
15 minute summer	SWIC-3	10	30.334	0.034	2.6	0.0097	0.0000	OK
15 minute summer	SWMH-2	11	30.234	0.034	2.6	0.0597	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	SWIC-1	1.000	SWIC-2	1.7	0.284	0.038	0.1773	
15 minute summer	SWIC-2	1.001	SWIC-2a	5.0	0.555	0.156	0.0959	
15 minute summer	SWIC-2a	1.002	SWMH-1a	4.9	0.665	0.135	0.0421	
15 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	4.2	0.580	0.251	0.3797	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	2.2				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	1.4	0.154	0.056	0.2100	
15 minute summer	Ex-MH14	5.000	Ex-MH12	4.4	0.832	0.249	0.0855	
15 minute summer	Ex-MH12	5.001	Ex-S4	6.0	1.143	0.228	0.0915	
15 minute summer	Ex-S4	5.002	Ex-S3	6.1	0.786	0.272	0.1077	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	13.7	1.053	0.586	0.6737	
15 minute summer	SWIC-3	2.000	SWMH-2	2.6	0.697	0.047	0.0332	
15 minute summer	SWMH-2	2.001	SWMH-3	2.5	0.490	0.049	0.1232	

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year 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	SWMH-3	10	30.022	0.052	5.9	0.0920	0.0000	OK
15 minute summer	Ex-SWMH01	11	29.736	0.126	37.3	0.1425	0.0000	OK
15 minute summer	SWMH-1	12	30.050	0.110	6.5	0.5917	0.0000	OK
15 minute summer	SWMH-4	11	29.985	0.085	18.5	0.5226	0.0000	OK
15 minute summer	SW- Petrol Interceptor	11	29.963	0.263	18.5	0.2976	0.0000	SURCHARGED
360 minute summer	SWMH-6	248	29.860	0.060	0.1	0.0519	0.0000	OK
360 minute summer	SW- Offline Attenuation Tank	248	29.860	0.260	3.7	16.6641	0.0000	SURCHARGED
15 minute summer	SWMH-5 Hydrobrake	11	29.952	0.352	18.7	0.6223	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	29.626	0.126	38.5	0.1421	0.0000	OK
15 minute summer	Ex-SWMH06	11	29.479	0.164	56.1	0.1850	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	SWMH-3	2.002	SWMH-4	5.9	0.603	0.110	0.0668	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	37.0	1.324	0.291	0.2354	
15 minute summer	SWMH-1	1.005	SWMH-4	5.6	0.501	0.902	0.3803	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	18.5	1.550	0.196	0.0677	
15 minute winter	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	19.2	0.800	0.229	0.1543	
180 minute winter	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.1	-0.007	-0.003	0.1023	
15 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-19.7	-1.490	-1.114	0.1386	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	1.5	0.678	0.019	0.0537	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	38.7	1.152	0.309	0.4891	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	56.3	1.516	0.506	0.6855	33.4

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year 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	Outfall - Ex-SWMH 3	11	29.279	0.149	56.3	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)

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWIC-1	10	30.347	0.047	4.3	0.0075	0.0000	OK
30 minute summer	SWIC-2	24	30.276	0.185	11.7	0.0525	0.0000	OK
30 minute summer	SWIC-2a	24	30.275	0.225	11.3	0.0638	0.0000	SURCHARGED
30 minute summer	SWMH-1a	24	30.275	0.245	10.5	1.9053	0.0000	SURCHARGED
30 minute summer	SWMH-1b Hydrobrake	24	30.274	0.274	6.1	2.1309	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	10	30.088	0.038	3.5	0.0433	0.0000	OK
15 minute summer	Ex-MH14	10	31.371	0.091	11.2	0.2309	0.0000	OK
15 minute summer	Ex-MH12	12	31.345	0.225	15.4	0.2544	0.0000	SURCHARGED
15 minute summer	Ex-S4	12	31.263	0.523	14.7	0.5915	0.0000	SURCHARGED
15 minute summer	Ex-S3	12	31.195	0.675	29.8	0.7632	0.0000	FLOOD RISK
15 minute summer	SWIC-3	10	30.355	0.055	6.5	0.0155	0.0000	OK
15 minute summer	SWMH-2	10	30.253	0.053	6.5	0.0935	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	SWIC-1	1.000	SWIC-2	4.2	0.354	0.096	0.5083	
15 minute summer	SWIC-2	1.001	SWIC-2a	12.4	0.669	0.388	0.3708	
15 minute summer	SWIC-2a	1.002	SWMH-1a	12.1	0.792	0.329	0.1564	
15 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	8.9	0.598	0.524	1.0896	
15 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.0				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	3.4	0.271	0.142	0.2522	
15 minute summer	Ex-MH14	5.000	Ex-MH12	11.2	1.050	0.636	0.2263	
15 minute summer	Ex-MH12	5.001	Ex-S4	14.7	1.378	0.554	0.3023	
15 minute summer	Ex-S4	5.002	Ex-S3	16.6	0.945	0.743	0.2445	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	26.6	1.512	1.135	0.9232	
15 minute summer	SWIC-3	2.000	SWMH-2	6.5	0.889	0.117	0.0647	
15 minute summer	SWMH-2	2.001	SWMH-3	6.3	0.530	0.122	0.5433	

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH-3	12	30.217	0.247	14.9	0.4358	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	29.936	0.326	84.8	0.3689	0.0000	SURCHARGED
15 minute summer	SWMH-1	12	30.304	0.364	16.4	1.9551	0.0000	SURCHARGED
15 minute summer	SWMH-4	12	30.210	0.310	38.6	1.9076	0.0000	SURCHARGED
15 minute summer	SW- Petrol Interceptor	12	30.174	0.474	36.0	0.5363	0.0000	SURCHARGED
240 minute summer	SWMH-6	240	30.173	0.373	0.3	0.3227	0.0000	SURCHARGED
240 minute summer	SW- Offline Attenuation Tank	240	30.173	0.573	12.6	36.7236	0.0000	SURCHARGED
240 minute summer	SWMH-5 Hydrobrake	240	30.173	0.573	14.3	1.0119	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	29.852	0.352	84.3	0.3984	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	29.728	0.413	127.7	0.4669	0.0000	SURCHARGED

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	SWMH-3	2.002	SWMH-4	12.7	0.643	0.236	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	83.0	1.481	0.652	0.5919	
30 minute summer	SWMH-1	1.005	SWMH-4	10.1	0.572	1.628	0.5553	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	36.0	1.377	0.380	0.1208	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	36.0	0.915	0.431	0.1548	
15 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.9	-0.079	-0.034	0.1611	
15 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-34.6	-2.068	-1.958	0.1653	
15 minute winter	SWMH-5 Hydrobrake	4.002	SWMH-7	2.9	0.712	0.037	0.1623	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	84.2	1.276	0.671	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	127.6	1.814	1.147	1.2654	81.9

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	11	29.399	0.269	127.6	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)

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	SWIC-1	26	30.456	0.156	5.4	0.0248	0.0000	OK
30 minute summer	SWIC-2	26	30.456	0.366	16.3	0.1037	0.0000	SURCHARGED
30 minute summer	SWIC-2a	26	30.456	0.406	14.6	0.1148	0.0000	SURCHARGED
30 minute summer	SWMH-1a	26	30.455	0.425	13.4	3.3037	0.0000	SURCHARGED
30 minute summer	SWMH-1b Hydrobrake	25	30.455	0.455	8.1	3.5327	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	11	30.338	0.288	5.4	0.3256	0.0000	SURCHARGED
15 minute summer	Ex-MH14	11	31.600	0.320	15.7	0.8144	1.0085	FLOOD
15 minute summer	Ex-MH12	11	31.585	0.465	19.7	0.5258	0.0000	SURCHARGED
15 minute summer	Ex-S4	11	31.503	0.763	15.1	0.8626	0.0000	FLOOD RISK
15 minute summer	Ex-S3	10	31.430	0.910	38.0	1.0292	1.6671	FLOOD
360 minute winter	SWIC-3	344	30.408	0.108	1.2	0.0307	0.0000	OK
15 minute summer	SWMH-2	13	30.411	0.211	9.1	0.3722	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	SWIC-1	1.000	SWIC-2	6.0	0.380	0.137	0.8961	
15 minute summer	SWIC-2	1.001	SWIC-2a	17.4	0.707	0.543	0.4147	
15 minute summer	SWIC-2a	1.002	SWMH-1a	16.6	0.857	0.453	0.1586	
15 minute winter	SWMH-1a	1.003	SWMH-1b Hydrobrake	9.4	0.619	0.554	1.0896	
15 minute winter	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.3				
30 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	7.8	0.504	0.324	0.4201	
15 minute summer	Ex-MH14	5.000	Ex-MH12	13.9	1.013	0.788	0.2841	
30 minute summer	Ex-MH12	5.001	Ex-S4	16.0	1.381	0.603	0.3023	
15 minute summer	Ex-S4	5.002	Ex-S3	18.4	1.047	0.823	0.2445	
30 minute summer	Ex-S3	5.003	Ex-SWMH01	28.4	1.611	1.209	0.9232	
15 minute summer	SWIC-3	2.000	SWMH-2	9.1	0.968	0.164	0.2535	
15 minute summer	SWMH-2	2.001	SWMH-3	8.0	0.509	0.154	0.9098	

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SWMH-3	344	30.408	0.438	2.7	0.7746	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	30.317	0.707	105.1	0.7996	0.0000	SURCHARGED
15 minute summer	SWMH-1	12	30.528	0.588	23.0	3.1550	0.0000	SURCHARGED
360 minute winter	SWMH-4	344	30.408	0.508	9.9	3.1229	0.0000	SURCHARGED
360 minute winter	SW- Petrol Interceptor	344	30.408	0.708	20.3	0.8008	0.0000	SURCHARGED
360 minute winter	SWMH-6	344	30.408	0.608	0.1	0.5262	0.0000	SURCHARGED
360 minute winter	SW- Offline Attenuation Tank	344	30.408	0.808	7.2	51.3321	0.0000	SURCHARGED
360 minute winter	SWMH-5 Hydrobrake	344	30.408	0.808	14.3	1.4277	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	30.182	0.682	106.1	0.7714	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	29.984	0.669	167.7	0.7572	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	SWMH-3	2.002	SWMH-4	14.2	0.654	0.263	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	105.0	1.494	0.825	0.5919	
15 minute summer	SWMH-1	1.005	SWMH-4	10.9	0.618	1.757	0.5553	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	41.4	1.363	0.437	0.1208	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	40.4	1.017	0.484	0.1548	
30 minute winter	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.9	-0.087	-0.036	0.1695	
15 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-38.5	-2.295	-2.178	0.1653	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	5.8	0.712	0.074	0.1713	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	106.4	1.511	0.848	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	168.0	2.385	1.510	1.2867	104.4

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	10	29.414	0.284	168.0	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)

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	SWIC-1	25	30.403	0.103	5.0	0.0164	0.0000	OK
30 minute summer	SWIC-2	25	30.402	0.312	14.9	0.0882	0.0000	SURCHARGED
30 minute summer	SWIC-2a	25	30.401	0.351	13.7	0.0993	0.0000	SURCHARGED
30 minute summer	SWMH-1a	25	30.401	0.371	12.7	2.8785	0.0000	SURCHARGED
30 minute summer	SWMH-1b Hydrobrake	25	30.399	0.399	7.6	3.1019	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	11	30.218	0.168	4.7	0.1905	0.0000	SURCHARGED
15 minute summer	Ex-MH14	12	31.600	0.320	14.3	0.8144	0.2949	FLOOD
15 minute summer	Ex-MH12	12	31.573	0.453	17.9	0.5121	0.0000	SURCHARGED
15 minute summer	Ex-S4	12	31.495	0.755	16.1	0.8542	0.0000	FLOOD RISK
15 minute summer	Ex-S3	11	31.430	0.910	32.7	1.0292	0.6776	FLOOD
15 minute summer	SWIC-3	10	30.362	0.062	8.2	0.0176	0.0000	OK
15 minute summer	SWMH-2	13	30.338	0.138	8.2	0.2437	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	SWIC-1	1.000	SWIC-2	5.4	0.371	0.123	0.7163	
15 minute summer	SWIC-2	1.001	SWIC-2a	15.8	0.696	0.494	0.4147	
15 minute summer	SWIC-2a	1.002	SWMH-1a	15.3	0.843	0.416	0.1586	
15 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	9.6	0.594	0.570	1.0896	
15 minute winter	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.2				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	7.1	0.422	0.294	0.4201	
15 minute winter	Ex-MH14	5.000	Ex-MH12	13.1	1.065	0.740	0.2841	
15 minute summer	Ex-MH12	5.001	Ex-S4	16.1	1.395	0.607	0.3023	
15 minute winter	Ex-S4	5.002	Ex-S3	18.4	1.048	0.823	0.2445	
30 minute summer	Ex-S3	5.003	Ex-SWMH01	28.5	1.621	1.217	0.9232	
15 minute summer	SWIC-3	2.000	SWMH-2	8.2	0.945	0.150	0.1409	
15 minute summer	SWMH-2	2.001	SWMH-3	8.0	0.558	0.155	0.7570	

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH-3	12	30.335	0.365	19.0	0.6443	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	30.192	0.582	100.3	0.6584	0.0000	SURCHARGED
15 minute summer	SWMH-1	12	30.450	0.510	20.8	2.7361	0.0000	SURCHARGED
15 minute summer	SWMH-4	12	30.327	0.427	45.5	2.6221	0.0000	SURCHARGED
360 minute winter	SW- Petrol Interceptor	344	30.314	0.614	8.8	0.6944	0.0000	SURCHARGED
360 minute winter	SWMH-6	344	30.314	0.514	0.1	0.4451	0.0000	SURCHARGED
360 minute winter	SW- Offline Attenuation Tank	344	30.314	0.714	9.3	45.7806	0.0000	SURCHARGED
360 minute winter	SWMH-5 Hydrobrake	344	30.314	0.714	8.7	1.2615	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	30.071	0.571	100.1	0.6456	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	29.897	0.582	154.7	0.6579	0.0000	SURCHARGED

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	SWMH-3	2.002	SWMH-4	14.5	0.628	0.270	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	99.6	1.522	0.783	0.5919	
15 minute summer	SWMH-1	1.005	SWMH-4	10.3	0.586	1.667	0.5553	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	40.7	1.476	0.430	0.1208	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	40.0	1.007	0.479	0.1548	
30 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	-1.2	-0.104	-0.046	0.1695	
15 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-37.0	-2.246	-2.093	0.1653	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	5.6	0.712	0.070	0.1713	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	99.2	1.409	0.791	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	154.1	2.188	1.385	1.2845	97.4

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	11	29.412	0.282	154.1	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)

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	SWIC-1	495	31.127	0.827	0.7	0.1315	0.0000	SURCHARGED
600 minute winter	SWIC-2	495	31.127	1.037	2.1	0.2934	0.0000	SURCHARGED
600 minute winter	SWIC-2a	495	31.127	1.077	1.8	0.3048	0.0000	SURCHARGED
600 minute winter	SWMH-1a	495	31.127	1.097	1.7	7.9412	0.0000	SURCHARGED
600 minute winter	SWMH-1b Hydrobrake	495	31.127	1.127	1.5	7.9942	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	11	30.781	0.731	11.4	0.8265	0.0000	SURCHARGED
30 minute summer	Ex-MH14	17	31.600	0.320	18.7	0.8144	3.1645	FLOOD
30 minute summer	Ex-MH12	17	31.594	0.474	17.5	0.5361	0.0000	SURCHARGED
15 minute winter	Ex-S4	10	31.506	0.766	15.8	0.8659	0.0000	FLOOD RISK
15 minute summer	Ex-S3	9	31.430	0.910	48.2	1.0292	5.6914	FLOOD
600 minute winter	SWIC-3	495	31.100	0.800	1.0	0.2263	0.0000	SURCHARGED
600 minute winter	SWMH-2	495	31.100	0.900	1.0	1.5895	0.0000	SURCHARGED

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	SWIC-1	1.000	SWIC-2	7.8	0.398	0.178	1.1658	
15 minute summer	SWIC-2	1.001	SWIC-2a	21.4	0.739	0.668	0.4147	
15 minute summer	SWIC-2a	1.002	SWMH-1a	19.8	0.866	0.541	0.1586	
15 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	11.6	0.596	0.688	1.0896	
15 minute winter	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.4				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	11.4	0.647	0.471	0.4201	
15 minute summer	Ex-MH14	5.000	Ex-MH12	13.9	1.079	0.787	0.2841	
15 minute summer	Ex-MH12	5.001	Ex-S4	18.0	1.355	0.678	0.3023	
15 minute winter	Ex-S4	5.002	Ex-S3	18.6	1.054	0.828	0.2445	
30 minute winter	Ex-S3	5.003	Ex-SWMH01	28.5	1.619	1.215	0.9232	
15 minute summer	SWIC-3	2.000	SWMH-2	11.2	0.994	0.203	0.3538	
30 minute summer	SWMH-2	2.001	SWMH-3	9.0	0.558	0.174	0.9225	

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	SWMH-3	495	31.100	1.130	2.4	1.9959	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	30.745	1.135	127.1	1.2839	0.0000	SURCHARGED
600 minute winter	SWMH-1	495	31.100	1.160	3.4	5.6522	0.0000	SURCHARGED
600 minute winter	SWMH-4	495	31.100	1.200	9.5	6.6546	0.0000	SURCHARGED
600 minute winter	SW- Petrol Interceptor	495	31.099	1.399	6.7	1.5828	0.0000	SURCHARGED
600 minute winter	SWMH-6	495	31.099	1.299	0.1	1.1252	0.0000	SURCHARGED
600 minute winter	SW- Offline Attenuation Tank	495	31.099	1.499	7.8	51.3321	0.0000	SURCHARGED
600 minute winter	SWMH-5 Hydrobrake	495	31.099	1.499	8.7	2.6493	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	30.553	1.053	125.6	1.1904	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	30.276	0.961	206.2	1.0871	0.0000	SURCHARGED

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	SWMH-3	2.002	SWMH-4	16.6	0.629	0.309	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	125.6	1.783	0.987	0.5919	
15 minute summer	SWMH-1	1.005	SWMH-4	12.3	0.696	1.979	0.5553	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	49.8	1.479	0.526	0.1208	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	47.6	1.197	0.569	0.1548	
360 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	-3.9	-0.224	-0.153	0.1695	
15 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-43.8	-2.490	-2.477	0.1653	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	-8.6	0.704	-0.109	0.1713	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	125.7	1.785	1.002	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	206.3	2.931	1.855	1.2867	122.8

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	9	29.414	0.284	206.3	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)

Water Quality

Area (ha)	Intended Land Use	Entering via Node or Link	Name	SuDS Component	Pollution hazard indices			Pollution mitigation indices			Cumulative pollution hazard indices		
					TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons
		Node	SWMH-1a	Filter Drain				0.4	0.4	0.4			
		Node	SWMH-1b Hydrobrake	Filter Drain				0.2	0.2	0.2			
		Node	SWMH-1	Filter Drain				0.2	0.2	0.2			
		Node	SWMH-4	Filter Drain				0.2	0.2	0.2			
		Node	Outfall - Ex-SWMH 3										
											Sufficient	Sufficient	Sufficient

Flow+ v17.0 Copyright © 1988-2026 Causeway Technologies Ltd

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	x
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
SWIC-1	0.010	5.00	31.630	450	382992.193	392129.892	1.330	30.300
SWIC-2	0.020	5.00	31.630	600	383012.083	392108.358	1.540	30.090
SWIC-2a	0.000	5.00	31.640	600	383013.900	392098.090	1.590	30.050
SWMH-1a	0.000		31.800	1500	383013.529	392094.118	1.770	30.030
SWMH-1b Hydrobrake	0.000	5.00	32.000	1500	382991.666	392077.609	2.000	30.000
Ex-SWMH04	0.008	5.00	31.540	1200	382982.743	392134.038	1.490	30.050
Ex-MH14	0.026	5.00	31.600	1800	382943.478	392163.826	0.320	31.280
Ex-MH12	0.010	5.00	32.030	1200	382930.356	392173.217	0.910	31.120
Ex-S4	0.000		31.740	1200	382919.123	392160.226	1.000	30.740
Ex-S3	0.046	5.00	31.430	1200	382926.915	392148.726	0.910	30.520
SWIC-3	0.015	5.00	31.630	600	382995.455	392094.684	1.330	30.300
SWMH-2			31.500	1500	382987.623	392090.465	1.300	30.200
SWMH-3	0.020	5.00	31.630	1500	382973.673	392108.998	1.660	29.970
Ex-SWMH01	0.132	5.00	31.400	1200	382967.576	392115.612	1.790	29.610
SWMH-1	0.038	5.00	31.550	1500	382986.407	392084.784	1.610	29.940
SWMH-4	0.043	5.00	31.500	1800	382967.206	392109.807	1.600	29.900
SW- Petrol Interceptor			31.600	1200	382964.215	392109.282	1.900	29.700
SWMH-6		5.00	31.750	1050	382963.670	392089.876	1.950	29.800

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
SW- Offline Attenuation Tank			31.700	10	382962.005	392099.361	2.100	29.600
SWMH-5 Hydrobrake			31.700	1500	382960.381	392108.609	2.100	29.600
SWMH-7			31.600	1200	382959.636	392112.852	2.100	29.500
Ex-SWMH06	0.106	5.00	31.680	1200	382945.712	392108.613	2.365	29.315
Outfall - Ex-SWMH 3			31.700	1500	382928.300	392102.484	2.570	29.130

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	SWIC-1	SWIC-2	29.314	0.600	30.300	30.090	0.210	139.6	225	5.44	34.8
1.001	SWIC-2	SWIC-2a	10.428	0.600	30.090	30.050	0.040	260.7	225	5.66	34.2
1.002	SWIC-2a	SWMH-1a	3.989	0.600	30.050	30.030	0.020	199.5	225	5.73	34.0
1.003	SWMH-1a	SWMH-1b Hydrobrake	27.396	0.600	30.030	30.000	0.030	913.2	225	6.81	31.3
1.004	SWMH-1b Hydrobrake	SWMH-1	8.896	0.600	30.000	29.940	0.060	148.3	225	6.94	31.0
2.000	SWIC-3	SWMH-2	8.896	0.600	30.300	30.200	0.100	89.0	225	5.11	35.7
2.001	SWMH-2	SWMH-3	23.196	0.600	30.200	29.970	0.230	100.9	225	5.40	34.9

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.104	43.9	1.3	1.105	1.315	0.010	0.0	26	0.487
1.001	0.805	32.0	3.7	1.315	1.365	0.030	0.0	51	0.539
1.002	0.922	36.7	3.7	1.365	1.545	0.030	0.0	48	0.593
1.003	0.425	16.9	3.4	1.545	1.775	0.030	0.0	68	0.332
1.004	1.071	42.6	3.4	1.775	1.385	0.030	0.0	43	0.643
2.000	1.387	55.1	1.9	1.105	1.075	0.015	0.0	29	0.652
2.001	1.302	51.8	1.9	1.075	1.435	0.015	0.0	29	0.623

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.002	SWMH-3	SWMH-4	6.517	0.600	29.970	29.900	0.070	93.1	225	5.48	34.7
1.005	SWMH-1	SWMH-4	31.541	0.600	29.940	29.900	0.040	788.5	150	8.44	28.0
1.006	SWMH-4	SW- Petrol Interceptor	3.037	0.600	29.900	29.800	0.100	30.4	225	8.47	27.9
1.007	SW- Petrol Interceptor	SWMH-5 Hydrobrake	3.893	0.600	29.700	29.600	0.100	38.9	225	8.50	27.9
4.000	SWMH-6	SW- Offline Attenuation Tank	9.630	0.600	29.800	29.600	0.200	48.2	150	5.11	35.7
4.001	SW- Offline Attenuation Tank	SWMH-5 Hydrobrake	9.390	0.600	29.600	29.600	0.000	0.0	150	5.27	35.3
4.002	SWMH-5 Hydrobrake	SWMH-7	4.308	0.600	29.600	29.500	0.100	43.1	225	8.53	27.8
5.000	Ex-MH14	Ex-MH12	16.136	0.600	31.280	31.120	0.160	100.9	150	5.27	35.3
5.001	Ex-MH12	Ex-S4	17.174	0.600	31.120	30.740	0.380	45.2	150	5.46	34.7
5.002	Ex-S4	Ex-S3	13.891	0.600	30.740	30.520	0.220	63.1	150	5.64	34.2
5.003	Ex-S3	Ex-SWMH01	52.439	0.600	30.520	29.610	0.910	57.6	150	6.30	32.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.002	1.355	53.9	4.4	1.435	1.375	0.035	0.0	44	0.825
1.005	0.350	6.2	6.9	1.460	1.450	0.068	0.0	150	0.357
1.006	2.382	94.7	14.7	1.375	1.575	0.146	0.0	59	1.737
1.007	2.103	83.6	14.7	1.675	1.875	0.146	0.0	64	1.594
4.000	1.453	25.7	0.0	1.800	1.950	0.000	0.0	0	0.000
4.001	1.000	17.7	0.0	1.950	1.950	0.000	0.0	0	0.000
4.002	1.998	79.5	14.7	1.875	1.875	0.146	0.0	65	1.537
5.000	1.000	17.7	3.3	0.170	0.760	0.026	0.0	44	0.765
5.001	1.500	26.5	4.5	0.760	0.850	0.036	0.0	42	1.124
5.002	1.267	22.4	4.5	0.850	0.760	0.036	0.0	45	0.992
5.003	1.327	23.5	9.6	0.760	1.640	0.082	0.0	67	1.264

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
6.000	Ex-SWMH04	Ex-SWMH01	23.865	0.600	30.050	29.610	0.440	54.2	150	5.29	35.2
1.008	Ex-SWMH01	SWMH-7	8.406	0.600	29.610	29.500	0.110	76.4	300	6.38	32.3
1.009	SWMH-7	Ex-SWMH06	14.555	0.600	29.500	29.315	0.185	78.7	300	8.67	27.6
1.010	Ex-SWMH06	Outfall - Ex-SWMH 3	18.459	0.600	29.315	29.130	0.185	99.8	300	8.86	27.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
6.000	1.369	24.2	1.0	1.340	1.640	0.008	0.0	21	0.673
1.008	1.800	127.2	25.9	1.490	1.800	0.222	0.0	92	1.425
1.009	1.774	125.4	36.7	1.800	2.065	0.368	0.0	111	1.548
1.010	1.574	111.2	46.6	2.065	2.270	0.474	0.0	135	1.505

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	29.314	139.6	225	Circular	31.630	30.300	1.105	31.630	30.090	1.315
1.001	10.428	260.7	225	Circular	31.630	30.090	1.315	31.640	30.050	1.365
1.002	3.989	199.5	225	Circular	31.640	30.050	1.365	31.800	30.030	1.545
1.003	27.396	913.2	225	Circular	31.800	30.030	1.545	32.000	30.000	1.775

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SWIC-1	450	Manhole	Adoptable	SWIC-2	600	Manhole	Adoptable
1.001	SWIC-2	600	Manhole	Adoptable	SWIC-2a	600	Manhole	Adoptable
1.002	SWIC-2a	600	Manhole	Adoptable	SWMH-1a	1500	Manhole	Adoptable
1.003	SWMH-1a	1500	Manhole	Adoptable	SWMH-1b Hydrobrake	1500	Manhole	Adoptable

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

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)
1.004	8.896	148.3	225	Circular	32.000	30.000	1.775	31.550	29.940	1.385
2.000	8.896	89.0	225	Circular	31.630	30.300	1.105	31.500	30.200	1.075
2.001	23.196	100.9	225	Circular	31.500	30.200	1.075	31.630	29.970	1.435
2.002	6.517	93.1	225	Circular	31.630	29.970	1.435	31.500	29.900	1.375
1.005	31.541	788.5	150	Circular	31.550	29.940	1.460	31.500	29.900	1.450
1.006	3.037	30.4	225	Circular	31.500	29.900	1.375	31.600	29.800	1.575
1.007	3.893	38.9	225	Circular	31.600	29.700	1.675	31.700	29.600	1.875
4.000	9.630	48.2	150	Circular	31.750	29.800	1.800	31.700	29.600	1.950
4.001	9.390	0.0	150	Circular	31.700	29.600	1.950	31.700	29.600	1.950
4.002	4.308	43.1	225	Circular	31.700	29.600	1.875	31.600	29.500	1.875
5.000	16.136	100.9	150	Circular	31.600	31.280	0.170	32.030	31.120	0.760

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.004	SWMH-1b Hydrobrake	1500	Manhole	Adoptable	SWMH-1	1500	Manhole	Adoptable
2.000	SWIC-3	600	Manhole	Adoptable	SWMH-2	1500	Manhole	Adoptable
2.001	SWMH-2	1500	Manhole	Adoptable	SWMH-3	1500	Manhole	Adoptable
2.002	SWMH-3	1500	Manhole	Adoptable	SWMH-4	1800	Manhole	Adoptable
1.005	SWMH-1	1500	Manhole	Adoptable	SWMH-4	1800	Manhole	Adoptable
1.006	SWMH-4	1800	Manhole	Adoptable	SW- Petrol Interceptor	1200	Manhole	Adoptable
1.007	SW- Petrol Interceptor	1200	Manhole	Adoptable	SWMH-5 Hydrobrake	1500	Manhole	Adoptable
4.000	SWMH-6	1050	Manhole	Adoptable	SW- Offline Attenuation Tank	10	Manhole	Adoptable
4.001	SW- Offline Attenuation Tank	10	Manhole	Adoptable	SWMH-5 Hydrobrake	1500	Manhole	Adoptable
4.002	SWMH-5 Hydrobrake	1500	Manhole	Adoptable	SWMH-7	1200	Manhole	Adoptable
5.000	Ex-MH14	1800	Manhole	Adoptable	Ex-MH12	1200	Manhole	Adoptable

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

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)
5.001	17.174	45.2	150	Circular	32.030	31.120	0.760	31.740	30.740	0.850
5.002	13.891	63.1	150	Circular	31.740	30.740	0.850	31.430	30.520	0.760
5.003	52.439	57.6	150	Circular	31.430	30.520	0.760	31.400	29.610	1.640
6.000	23.865	54.2	150	Circular	31.540	30.050	1.340	31.400	29.610	1.640
1.008	8.406	76.4	300	Circular	31.400	29.610	1.490	31.600	29.500	1.800
1.009	14.555	78.7	300	Circular	31.600	29.500	1.800	31.680	29.315	2.065
1.010	18.459	99.8	300	Circular	31.680	29.315	2.065	31.700	29.130	2.270

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.001	Ex-MH12	1200	Manhole	Adoptable	Ex-S4	1200	Manhole	Adoptable
5.002	Ex-S4	1200	Manhole	Adoptable	Ex-S3	1200	Manhole	Adoptable
5.003	Ex-S3	1200	Manhole	Adoptable	Ex-SWMH01	1200	Manhole	Adoptable
6.000	Ex-SWMH04	1200	Manhole	Adoptable	Ex-SWMH01	1200	Manhole	Adoptable
1.008	Ex-SWMH01	1200	Manhole	Adoptable	SWMH-7	1200	Manhole	Adoptable
1.009	SWMH-7	1200	Manhole	Adoptable	Ex-SWMH06	1200	Manhole	Adoptable
1.010	Ex-SWMH06	1200	Manhole	Adoptable	Outfall - Ex-SWMH 3	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWIC-1	382992.193	392129.892	31.630	1.330	450	0	1.000	30.300	225

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
SWIC-2	383012.083	392108.358	31.630	1.540	600		1	1.000	30.090	225
							0	1.001	30.090	225
SWIC-2a	383013.900	392098.090	31.640	1.590	600		1	1.001	30.050	225
							0	1.002	30.050	225
SWMH-1a	383013.529	392094.118	31.800	1.770	1500		1	1.002	30.030	225
							0	1.003	30.030	225
SWMH-1b Hydrobrake	382991.666	392077.609	32.000	2.000	1500		1	1.003	30.000	225
							0	1.004	30.000	225
Ex-SWMH04	382982.743	392134.038	31.540	1.490	1200		0	6.000	30.050	150
Ex-MH14	382943.478	392163.826	31.600	0.320	1800		0	5.000	31.280	150
Ex-MH12	382930.356	392173.217	32.030	0.910	1200		1	5.000	31.120	150
							0	5.001	31.120	150
Ex-S4	382919.123	392160.226	31.740	1.000	1200		1	5.001	30.740	150
							0	5.002	30.740	150

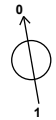
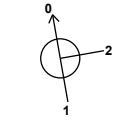
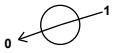
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Ex-S3	382926.915	392148.726	31.430	0.910	1200	1	5.002	30.520	150
						0	5.003	30.520	150
SWIC-3	382995.455	392094.684	31.630	1.330	600	0	2.000	30.300	225
SWMH-2	382987.623	392090.465	31.500	1.300	1500	1	2.000	30.200	225
						0	2.001	30.200	225
SWMH-3	382973.673	392108.998	31.630	1.660	1500	1	2.001	29.970	225
						0	2.002	29.970	225
Ex-SWMH01	382967.576	392115.612	31.400	1.790	1200	1	6.000	29.610	150
						2	5.003	29.610	150
						0	1.008	29.610	300
SWMH-1	382986.407	392084.784	31.550	1.610	1500	1	1.004	29.940	225
						0	1.005	29.940	150
SWMH-4	382967.206	392109.807	31.500	1.600	1800	1	2.002	29.900	225
						2	1.005	29.900	150
						0	1.006	29.900	225
SW- Petrol Interceptor	382964.215	392109.282	31.600	1.900	1200	1	1.006	29.800	225
						0	1.007	29.700	225

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SWMH-6	382963.670	392089.876	31.750	1.950	1050				
						0	4.000	29.800	150
SW- Offline Attenuation Tank	382962.005	392099.361	31.700	2.100	10		1	4.000	29.600	150
							0	4.001	29.600	150
SWMH-5 Hydrobrake	382960.381	392108.609	31.700	2.100	1500		1	4.001	29.600	150
							2	1.007	29.600	225
							0	4.002	29.600	225
SWMH-7	382959.636	392112.852	31.600	2.100	1200		1	4.002	29.500	225
							2	1.008	29.500	300
							0	1.009	29.500	300
Ex-SWMH06	382945.712	392108.613	31.680	2.365	1200		1	1.009	29.315	300
							0	1.010	29.315	300
Outfall - Ex-SWMH 3	382928.300	392102.484	31.700	2.570	1500		1	1.010	29.130	300

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

Storm Durations

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

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	30	40	0	0
2	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0

Node SWMH-5 Hydrobrake Online Hydro-Brake® Control

Flap Valve	✓	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	29.600	Product Number	CTL-SHE-0058-2000-1800-2000
Design Depth (m)	1.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node SWMH-1b Hydrobrake Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	30.000	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 SW- Offline Attenuation Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	29.600
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	67.5	0.0	0.400	67.5	0.0	0.800	67.5	0.0	0.801	0.0	0.0

Node SWMH-1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	29.940
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	225

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	9.0	0.0	1.000	9.0	0.0	1.001	0.0	0.0

Node SWMH-4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	29.900
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	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	9.0	0.0	1.000	9.0	0.0	1.001	0.0	0.0

Node SWMH-1a Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.030
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	210

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	1.000	15.0	0.0	1.001	0.0	0.0

Node SWMH-1b Hydrobrake Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.40	Time to half empty (mins)	225

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	15.0	0.0	1.000	15.0	0.0	1.001	0.0	0.0

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	70.680	20.000	2 year 180 minute summer	23.937	6.160
1 year 15 minute winter	49.600	20.000	2 year 180 minute winter	15.560	6.160
1 year 30 minute summer	45.286	12.815	2 year 240 minute summer	19.298	5.100
1 year 30 minute winter	31.780	12.815	2 year 240 minute winter	12.821	5.100
1 year 60 minute summer	30.299	8.007	2 year 360 minute summer	15.020	3.865
1 year 60 minute winter	20.130	8.007	2 year 360 minute winter	9.763	3.865
1 year 120 minute summer	21.811	5.764	2 year 480 minute summer	11.941	3.156
1 year 120 minute winter	14.490	5.764	2 year 480 minute winter	7.934	3.156
1 year 180 minute summer	17.951	4.619	2 year 600 minute summer	9.835	2.690
1 year 180 minute winter	11.668	4.619	2 year 600 minute winter	6.720	2.690
1 year 240 minute summer	14.758	3.900	2 year 720 minute summer	8.800	2.358
1 year 240 minute winter	9.805	3.900	2 year 720 minute winter	5.914	2.358
1 year 360 minute summer	11.723	3.017	2 year 960 minute summer	7.264	1.913
1 year 360 minute winter	7.620	3.017	2 year 960 minute winter	4.812	1.913
1 year 480 minute summer	9.435	2.493	2 year 1440 minute summer	5.346	1.433
1 year 480 minute winter	6.268	2.493	2 year 1440 minute winter	3.593	1.433
1 year 600 minute summer	7.838	2.144	30 year 15 minute summer	264.760	74.918
1 year 600 minute winter	5.355	2.144	30 year 15 minute winter	185.797	74.918
1 year 720 minute summer	7.059	1.892	30 year 30 minute summer	173.158	48.998
1 year 720 minute winter	4.744	1.892	30 year 30 minute winter	121.515	48.998
1 year 960 minute summer	5.885	1.550	30 year 60 minute summer	116.018	30.660
1 year 960 minute winter	3.898	1.550	30 year 60 minute winter	77.080	30.660
1 year 1440 minute summer	4.372	1.172	30 year 120 minute summer	68.547	18.115
1 year 1440 minute winter	2.938	1.172	30 year 120 minute winter	45.541	18.115
2 year 15 minute summer	105.475	29.846	30 year 180 minute summer	51.851	13.343
2 year 15 minute winter	74.017	29.846	30 year 180 minute winter	33.705	13.343
2 year 30 minute summer	67.657	19.144	30 year 240 minute summer	40.623	10.735
2 year 30 minute winter	47.478	19.144	30 year 240 minute winter	26.989	10.735
2 year 60 minute summer	45.030	11.900	30 year 360 minute summer	30.602	7.875
2 year 60 minute winter	29.917	11.900	30 year 360 minute winter	19.892	7.875
2 year 120 minute summer	30.083	7.950	30 year 480 minute summer	23.889	6.313
2 year 120 minute winter	19.986	7.950	30 year 480 minute winter	15.872	6.313

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 600 minute summer	19.458	5.322
30 year 600 minute winter	13.295	5.322
30 year 720 minute summer	17.288	4.633
30 year 720 minute winter	11.619	4.633
30 year 960 minute summer	14.192	3.737
30 year 960 minute winter	9.401	3.737
30 year 1440 minute summer	10.350	2.774
30 year 1440 minute winter	6.956	2.774
30 year +40% CC 15 minute summer	370.664	104.885
30 year +40% CC 15 minute winter	260.115	104.885
30 year +40% CC 30 minute summer	242.422	68.597
30 year +40% CC 30 minute winter	170.121	68.597
30 year +40% CC 60 minute summer	162.425	42.924
30 year +40% CC 60 minute winter	107.912	42.924
30 year +40% CC 120 minute summer	95.965	25.361
30 year +40% CC 120 minute winter	63.757	25.361
30 year +40% CC 180 minute summer	72.592	18.680
30 year +40% CC 180 minute winter	47.187	18.680
30 year +40% CC 240 minute summer	56.872	15.029
30 year +40% CC 240 minute winter	37.784	15.029
30 year +40% CC 360 minute summer	42.843	11.025
30 year +40% CC 360 minute winter	27.849	11.025
30 year +40% CC 480 minute summer	33.445	8.839
30 year +40% CC 480 minute winter	22.220	8.839
30 year +40% CC 600 minute summer	27.242	7.451
30 year +40% CC 600 minute winter	18.613	7.451
30 year +40% CC 720 minute summer	24.203	6.487
30 year +40% CC 720 minute winter	16.266	6.487
30 year +40% CC 960 minute summer	19.868	5.232
30 year +40% CC 960 minute winter	13.161	5.232
30 year +40% CC 1440 minute summer	14.490	3.884
30 year +40% CC 1440 minute winter	9.738	3.884

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year 15 minute summer	335.636	94.974
100 year 15 minute winter	235.534	94.974
100 year 30 minute summer	221.611	62.708
100 year 30 minute winter	155.517	62.708
100 year 60 minute summer	149.714	39.565
100 year 60 minute winter	99.466	39.565
100 year 120 minute summer	87.241	23.055
100 year 120 minute winter	57.961	23.055
100 year 180 minute summer	65.556	16.870
100 year 180 minute winter	42.613	16.870
100 year 240 minute summer	51.163	13.521
100 year 240 minute winter	33.992	13.521
100 year 360 minute summer	38.396	9.881
100 year 360 minute winter	24.959	9.881
100 year 480 minute summer	30.148	7.967
100 year 480 minute winter	20.030	7.967
100 year 600 minute summer	24.723	6.762
100 year 600 minute winter	16.893	6.762
100 year 720 minute summer	22.103	5.924
100 year 720 minute winter	14.855	5.924
100 year 960 minute summer	18.272	4.811
100 year 960 minute winter	12.104	4.811
100 year 1440 minute summer	13.377	3.585
100 year 1440 minute winter	8.990	3.585
100 year +45% CC 15 minute summer	486.673	137.712
100 year +45% CC 15 minute winter	341.525	137.712
100 year +45% CC 30 minute summer	321.336	90.927
100 year +45% CC 30 minute winter	225.499	90.927
100 year +45% CC 60 minute summer	217.085	57.369
100 year +45% CC 60 minute winter	144.226	57.369
100 year +45% CC 120 minute summer	126.500	33.430
100 year +45% CC 120 minute winter	84.043	33.430

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC 180 minute summer	95.056	24.461	100 year +45% CC 600 minute summer	35.849	9.805
100 year +45% CC 180 minute winter	61.789	24.461	100 year +45% CC 600 minute winter	24.494	9.805
100 year +45% CC 240 minute summer	74.187	19.605	100 year +45% CC 720 minute summer	32.050	8.590
100 year +45% CC 240 minute winter	49.288	19.605	100 year +45% CC 720 minute winter	21.539	8.590
100 year +45% CC 360 minute summer	55.675	14.327	100 year +45% CC 960 minute summer	26.494	6.977
100 year +45% CC 360 minute winter	36.190	14.327	100 year +45% CC 960 minute winter	17.550	6.977
100 year +45% CC 480 minute summer	43.715	11.553	100 year +45% CC 1440 minute summer	19.397	5.198
100 year +45% CC 480 minute winter	29.043	11.553	100 year +45% CC 1440 minute winter	13.036	5.198

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year 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	SWIC-1	10	30.325	0.025	1.2	0.0040	0.0000	OK
15 minute summer	SWIC-2	11	30.141	0.051	3.4	0.0145	0.0000	OK
15 minute summer	SWIC-2a	11	30.101	0.051	3.4	0.0145	0.0000	OK
15 minute summer	SWMH-1a	13	30.092	0.062	3.4	0.4790	0.0000	OK
30 minute summer	SWMH-1b Hydrobrake	23	30.076	0.076	2.6	0.5929	0.0000	OK
15 minute summer	Ex-SWMH04	11	30.070	0.020	0.9	0.0224	0.0000	OK
15 minute summer	Ex-MH14	10	31.323	0.043	3.0	0.1083	0.0000	OK
15 minute summer	Ex-MH12	10	31.160	0.040	4.1	0.0455	0.0000	OK
15 minute summer	Ex-S4	11	30.783	0.043	4.1	0.0492	0.0000	OK
15 minute summer	Ex-S3	11	30.585	0.065	9.2	0.0738	0.0000	OK
15 minute summer	SWIC-3	10	30.328	0.028	1.7	0.0078	0.0000	OK
15 minute summer	SWMH-2	11	30.228	0.028	1.7	0.0491	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	SWIC-1	1.000	SWIC-2	1.2	0.262	0.026	0.1339	
15 minute summer	SWIC-2	1.001	SWIC-2a	3.4	0.510	0.106	0.0707	
15 minute summer	SWIC-2a	1.002	SWMH-1a	3.4	0.622	0.092	0.0299	
15 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	2.6	0.547	0.154	0.2327	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	1.6				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	0.9	0.138	0.037	0.1638	
15 minute summer	Ex-MH14	5.000	Ex-MH12	2.9	0.747	0.166	0.0637	
15 minute summer	Ex-MH12	5.001	Ex-S4	4.1	1.030	0.154	0.0688	
15 minute summer	Ex-S4	5.002	Ex-S3	4.1	0.714	0.184	0.0804	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	9.2	0.934	0.393	0.5168	
15 minute summer	SWIC-3	2.000	SWMH-2	1.7	0.630	0.031	0.0249	
15 minute summer	SWMH-2	2.001	SWMH-3	1.7	0.432	0.033	0.0923	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year 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	SWMH-3	10	30.012	0.042	4.0	0.0750	0.0000	OK
15 minute summer	Ex-SWMH01	11	29.709	0.099	24.9	0.1122	0.0000	OK
15 minute summer	SWMH-1	12	30.027	0.087	4.4	0.4643	0.0000	OK
15 minute summer	SWMH-4	11	29.963	0.063	12.2	0.3875	0.0000	OK
15 minute winter	SW- Petrol Interceptor	10	29.856	0.156	11.3	0.1769	0.0000	OK
15 minute summer	SWMH-6	1	29.800	0.000	0.0	0.0000	0.0000	OK
360 minute summer	SW- Offline Attenuation Tank	240	29.791	0.191	3.1	12.2664	0.0000	SURCHARGED
15 minute summer	SWMH-5 Hydrobrake	11	29.868	0.268	13.7	0.4732	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	29.599	0.099	26.2	0.1116	0.0000	OK
15 minute summer	Ex-SWMH06	11	29.444	0.129	38.0	0.1460	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	SWMH-3	2.002	SWMH-4	4.0	0.569	0.073	0.0464	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	24.8	1.226	0.195	0.1701	
15 minute summer	SWMH-1	1.005	SWMH-4	3.7	0.443	0.594	0.2744	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	12.0	1.459	0.127	0.0254	
15 minute winter	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	9.7	0.757	0.116	0.1341	
15 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	0.0	0.000	0.000	0.0420	
360 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-3.1	-0.225	-0.175	0.1653	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	1.4	0.601	0.018	0.0400	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	26.3	1.073	0.210	0.3576	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	38.1	1.381	0.343	0.5097	22.2

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year 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	Outfall - Ex-SWMH 3	11	29.250	0.120	38.1	0.0000	0.0000	OK

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

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year 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	SWIC-1	10	30.330	0.030	1.7	0.0047	0.0000	OK
15 minute summer	SWIC-2	11	30.153	0.063	5.1	0.0178	0.0000	OK
15 minute summer	SWIC-2a	11	30.114	0.064	5.0	0.0182	0.0000	OK
30 minute summer	SWMH-1a	23	30.110	0.080	4.4	0.6184	0.0000	OK
30 minute summer	SWMH-1b Hydrobrake	22	30.108	0.108	4.0	0.8364	0.0000	OK
15 minute summer	Ex-SWMH04	10	30.074	0.024	1.4	0.0273	0.0000	OK
15 minute summer	Ex-MH14	10	31.333	0.053	4.5	0.1345	0.0000	OK
15 minute summer	Ex-MH12	10	31.170	0.050	6.1	0.0560	0.0000	OK
15 minute summer	Ex-S4	11	30.793	0.053	6.0	0.0603	0.0000	OK
15 minute summer	Ex-S3	11	30.602	0.082	13.8	0.0931	0.0000	OK
15 minute summer	SWIC-3	10	30.334	0.034	2.6	0.0097	0.0000	OK
15 minute summer	SWMH-2	11	30.234	0.034	2.6	0.0597	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	SWIC-1	1.000	SWIC-2	1.7	0.284	0.038	0.1773	
15 minute summer	SWIC-2	1.001	SWIC-2a	5.0	0.555	0.156	0.0959	
15 minute summer	SWIC-2a	1.002	SWMH-1a	4.9	0.665	0.135	0.0421	
30 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	4.0	0.419	0.236	0.4254	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	2.2				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	1.4	0.154	0.056	0.2100	
15 minute summer	Ex-MH14	5.000	Ex-MH12	4.4	0.832	0.249	0.0855	
15 minute summer	Ex-MH12	5.001	Ex-S4	6.0	1.143	0.228	0.0915	
15 minute summer	Ex-S4	5.002	Ex-S3	6.1	0.786	0.272	0.1077	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	13.7	1.053	0.586	0.6737	
15 minute summer	SWIC-3	2.000	SWMH-2	2.6	0.697	0.047	0.0332	
15 minute summer	SWMH-2	2.001	SWMH-3	2.5	0.490	0.049	0.1232	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year 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	SWMH-3	10	30.022	0.052	5.9	0.0920	0.0000	OK
15 minute summer	Ex-SWMH01	11	29.736	0.126	37.3	0.1425	0.0000	OK
15 minute summer	SWMH-1	12	30.050	0.110	6.5	0.5917	0.0000	OK
15 minute summer	SWMH-4	11	29.985	0.085	18.5	0.5226	0.0000	OK
15 minute summer	SW- Petrol Interceptor	11	29.963	0.263	18.5	0.2976	0.0000	SURCHARGED
360 minute summer	SWMH-6	248	29.860	0.060	0.1	0.0519	0.0000	OK
360 minute summer	SW- Offline Attenuation Tank	248	29.860	0.260	3.7	16.6641	0.0000	SURCHARGED
15 minute summer	SWMH-5 Hydrobrake	11	29.952	0.352	18.7	0.6223	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	29.626	0.126	38.5	0.1421	0.0000	OK
15 minute summer	Ex-SWMH06	11	29.479	0.164	56.1	0.1850	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	SWMH-3	2.002	SWMH-4	5.9	0.603	0.110	0.0668	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	37.0	1.324	0.291	0.2354	
15 minute summer	SWMH-1	1.005	SWMH-4	5.6	0.501	0.902	0.3803	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	18.5	1.550	0.196	0.0677	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	18.7	0.800	0.223	0.1548	
360 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.1	-0.007	-0.003	0.1164	
360 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-3.7	-0.219	-0.211	0.1653	
15 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	1.5	0.678	0.019	0.0537	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	38.7	1.152	0.309	0.4891	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	56.3	1.516	0.506	0.6855	33.4

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year 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	Outfall - Ex-SWMH 3	11	29.279	0.149	56.3	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)

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWIC-1	10	30.347	0.047	4.3	0.0075	0.0000	OK
30 minute summer	SWIC-2	24	30.276	0.185	11.7	0.0525	0.0000	OK
30 minute summer	SWIC-2a	24	30.275	0.225	11.3	0.0638	0.0000	SURCHARGED
30 minute summer	SWMH-1a	24	30.275	0.245	10.5	1.9053	0.0000	SURCHARGED
30 minute summer	SWMH-1b Hydrobrake	24	30.274	0.274	6.1	2.1309	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	10	30.088	0.038	3.5	0.0433	0.0000	OK
15 minute summer	Ex-MH14	10	31.371	0.091	11.2	0.2309	0.0000	OK
15 minute summer	Ex-MH12	12	31.345	0.225	15.4	0.2544	0.0000	SURCHARGED
15 minute summer	Ex-S4	12	31.263	0.523	14.7	0.5915	0.0000	SURCHARGED
15 minute summer	Ex-S3	12	31.195	0.675	29.8	0.7632	0.0000	FLOOD RISK
15 minute summer	SWIC-3	10	30.355	0.055	6.5	0.0155	0.0000	OK
15 minute summer	SWMH-2	10	30.253	0.053	6.5	0.0935	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	SWIC-1	1.000	SWIC-2	4.2	0.354	0.096	0.5083	
30 minute summer	SWIC-2	1.001	SWIC-2a	11.3	0.625	0.353	0.3898	
30 minute summer	SWIC-2a	1.002	SWMH-1a	10.5	0.695	0.286	0.1586	
30 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	5.9	0.480	0.349	1.0896	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.0				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	3.4	0.271	0.142	0.2522	
15 minute summer	Ex-MH14	5.000	Ex-MH12	11.2	1.050	0.636	0.2263	
15 minute summer	Ex-MH12	5.001	Ex-S4	14.7	1.378	0.554	0.3023	
15 minute summer	Ex-S4	5.002	Ex-S3	16.6	0.945	0.743	0.2445	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	26.6	1.512	1.135	0.9232	
15 minute summer	SWIC-3	2.000	SWMH-2	6.5	0.889	0.117	0.0647	
15 minute summer	SWMH-2	2.001	SWMH-3	6.3	0.530	0.122	0.5433	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH-3	12	30.217	0.247	14.9	0.4358	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	29.936	0.326	84.8	0.3689	0.0000	SURCHARGED
15 minute summer	SWMH-1	12	30.304	0.364	16.4	1.9551	0.0000	SURCHARGED
15 minute summer	SWMH-4	12	30.210	0.310	38.6	1.9076	0.0000	SURCHARGED
15 minute summer	SW- Petrol Interceptor	12	30.174	0.474	36.0	0.5363	0.0000	SURCHARGED
240 minute summer	SWMH-6	240	30.173	0.373	0.3	0.3227	0.0000	SURCHARGED
240 minute summer	SW- Offline Attenuation Tank	240	30.173	0.573	12.6	36.7236	0.0000	SURCHARGED
240 minute summer	SWMH-5 Hydrobrake	240	30.173	0.573	14.3	1.0119	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	29.852	0.352	84.3	0.3984	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	29.728	0.413	127.7	0.4669	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	SWMH-3	2.002	SWMH-4	12.7	0.643	0.236	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	83.0	1.481	0.652	0.5919	
15 minute summer	SWMH-1	1.005	SWMH-4	9.6	0.688	1.555	0.5553	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	36.0	1.377	0.380	0.1208	
15 minute summer	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	36.0	0.915	0.431	0.1548	
240 minute summer	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.3	-0.019	-0.010	0.1695	
240 minute summer	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-12.6	-0.718	-0.716	0.1653	
240 minute summer	SWMH-5 Hydrobrake	4.002	SWMH-7	1.4	0.705	0.018	0.0398	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	84.2	1.276	0.671	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	127.6	1.814	1.147	1.2654	81.9

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	11	29.399	0.269	127.6	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)

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	SWIC-1	26	30.456	0.156	5.4	0.0248	0.0000	OK
30 minute summer	SWIC-2	26	30.456	0.366	16.3	0.1037	0.0000	SURCHARGED
30 minute summer	SWIC-2a	26	30.456	0.406	14.6	0.1148	0.0000	SURCHARGED
30 minute summer	SWMH-1a	26	30.455	0.425	13.4	3.3037	0.0000	SURCHARGED
30 minute summer	SWMH-1b Hydrobrake	25	30.455	0.455	8.1	3.5327	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	11	30.338	0.288	5.4	0.3256	0.0000	SURCHARGED
15 minute summer	Ex-MH14	11	31.600	0.320	15.7	0.8144	1.0085	FLOOD
15 minute summer	Ex-MH12	11	31.585	0.465	19.7	0.5258	0.0000	SURCHARGED
15 minute summer	Ex-S4	11	31.503	0.763	15.1	0.8626	0.0000	FLOOD RISK
15 minute summer	Ex-S3	10	31.430	0.910	38.0	1.0292	1.6671	FLOOD
360 minute winter	SWIC-3	344	30.408	0.108	1.2	0.0307	0.0000	OK
15 minute summer	SWMH-2	13	30.411	0.211	9.1	0.3722	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)
30 minute summer	SWIC-1	1.000	SWIC-2	5.4	0.362	0.123	1.0141	
30 minute summer	SWIC-2	1.001	SWIC-2a	14.6	0.636	0.458	0.4147	
30 minute summer	SWIC-2a	1.002	SWMH-1a	13.4	0.736	0.367	0.1586	
30 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	6.0	0.519	0.357	1.0896	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.2				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	6.8	0.492	0.281	0.4201	
15 minute summer	Ex-MH14	5.000	Ex-MH12	13.9	1.013	0.788	0.2841	
15 minute summer	Ex-MH12	5.001	Ex-S4	15.1	1.422	0.569	0.3023	
15 minute summer	Ex-S4	5.002	Ex-S3	18.4	1.047	0.823	0.2445	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	28.0	1.592	1.195	0.9232	
360 minute winter	SWIC-3	2.000	SWMH-2	1.2	0.550	0.022	0.2551	
15 minute summer	SWMH-2	2.001	SWMH-3	8.0	0.509	0.154	0.9098	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SWMH-3	344	30.408	0.438	2.7	0.7746	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	30.317	0.707	105.1	0.7996	0.0000	SURCHARGED
15 minute summer	SWMH-1	12	30.528	0.588	23.0	3.1550	0.0000	SURCHARGED
360 minute winter	SWMH-4	344	30.408	0.508	9.9	3.1229	0.0000	SURCHARGED
360 minute winter	SW- Petrol Interceptor	344	30.408	0.708	20.3	0.8008	0.0000	SURCHARGED
360 minute winter	SWMH-6	344	30.408	0.608	0.1	0.5262	0.0000	SURCHARGED
360 minute winter	SW- Offline Attenuation Tank	344	30.408	0.808	7.2	51.3321	0.0000	SURCHARGED
360 minute winter	SWMH-5 Hydrobrake	344	30.408	0.808	14.3	1.4277	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	30.182	0.682	106.1	0.7714	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	29.984	0.669	167.7	0.7572	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)
360 minute winter	SWMH-3	2.002	SWMH-4	2.5	0.494	0.046	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	105.0	1.494	0.825	0.5919	
15 minute summer	SWMH-1	1.005	SWMH-4	10.9	0.618	1.757	0.5553	
360 minute winter	SWMH-4	1.006	SW- Petrol Interceptor	20.3	1.301	0.215	0.1208	
360 minute winter	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	14.3	0.430	0.171	0.1548	
360 minute winter	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.1	-0.010	-0.006	0.1695	
360 minute winter	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-7.2	-0.411	-0.409	0.1653	
360 minute winter	SWMH-5 Hydrobrake	4.002	SWMH-7	1.4	0.703	0.018	0.0311	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	106.4	1.511	0.848	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	168.0	2.385	1.510	1.2867	104.4

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	10	29.414	0.284	168.0	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)

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	SWIC-1	25	30.403	0.103	5.0	0.0164	0.0000	OK
30 minute summer	SWIC-2	25	30.402	0.312	14.9	0.0882	0.0000	SURCHARGED
30 minute summer	SWIC-2a	25	30.401	0.351	13.7	0.0993	0.0000	SURCHARGED
30 minute summer	SWMH-1a	25	30.401	0.371	12.7	2.8785	0.0000	SURCHARGED
30 minute summer	SWMH-1b Hydrobrake	25	30.399	0.399	7.6	3.1019	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	11	30.218	0.168	4.7	0.1905	0.0000	SURCHARGED
15 minute summer	Ex-MH14	12	31.600	0.320	14.3	0.8144	0.2949	FLOOD
15 minute summer	Ex-MH12	12	31.573	0.453	17.9	0.5121	0.0000	SURCHARGED
15 minute summer	Ex-S4	12	31.495	0.755	16.1	0.8542	0.0000	FLOOD RISK
15 minute summer	Ex-S3	11	31.430	0.910	32.7	1.0292	0.6776	FLOOD
15 minute summer	SWIC-3	10	30.362	0.062	8.2	0.0176	0.0000	OK
15 minute summer	SWMH-2	13	30.338	0.138	8.2	0.2437	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)
30 minute summer	SWIC-1	1.000	SWIC-2	5.0	0.358	0.114	0.8426	
30 minute summer	SWIC-2	1.001	SWIC-2a	13.7	0.638	0.429	0.4147	
30 minute summer	SWIC-2a	1.002	SWMH-1a	12.7	0.717	0.346	0.1586	
30 minute summer	SWMH-1a	1.003	SWMH-1b Hydrobrake	5.8	0.502	0.341	1.0896	
30 minute summer	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	4.1				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	7.1	0.422	0.294	0.4201	
15 minute summer	Ex-MH14	5.000	Ex-MH12	12.7	1.068	0.719	0.2841	
15 minute summer	Ex-MH12	5.001	Ex-S4	16.1	1.395	0.607	0.3023	
15 minute summer	Ex-S4	5.002	Ex-S3	17.9	1.018	0.800	0.2445	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	28.2	1.602	1.202	0.9232	
15 minute summer	SWIC-3	2.000	SWMH-2	8.2	0.945	0.150	0.1409	
15 minute summer	SWMH-2	2.001	SWMH-3	8.0	0.558	0.155	0.7570	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SWMH-3	12	30.335	0.365	19.0	0.6443	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	30.192	0.582	100.3	0.6584	0.0000	SURCHARGED
15 minute summer	SWMH-1	12	30.450	0.510	20.8	2.7361	0.0000	SURCHARGED
15 minute summer	SWMH-4	12	30.327	0.427	45.5	2.6221	0.0000	SURCHARGED
360 minute winter	SW- Petrol Interceptor	344	30.314	0.614	8.8	0.6944	0.0000	SURCHARGED
360 minute winter	SWMH-6	344	30.314	0.514	0.1	0.4451	0.0000	SURCHARGED
360 minute winter	SW- Offline Attenuation Tank	344	30.314	0.714	9.3	45.7806	0.0000	SURCHARGED
360 minute winter	SWMH-5 Hydrobrake	344	30.314	0.714	8.7	1.2615	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	30.071	0.571	100.1	0.6456	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	29.897	0.582	154.7	0.6579	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	SWMH-3	2.002	SWMH-4	14.5	0.628	0.270	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	99.6	1.522	0.783	0.5919	
15 minute summer	SWMH-1	1.005	SWMH-4	10.3	0.586	1.667	0.5553	
15 minute summer	SWMH-4	1.006	SW- Petrol Interceptor	40.7	1.476	0.430	0.1208	
360 minute winter	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	8.7	0.391	0.104	0.1548	
360 minute winter	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.1	-0.010	-0.005	0.1695	
360 minute winter	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-9.3	-0.529	-0.527	0.1653	
360 minute winter	SWMH-5 Hydrobrake	4.002	SWMH-7	1.4	0.692	0.018	0.0293	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	99.2	1.409	0.791	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	154.1	2.188	1.385	1.2845	97.4

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	11	29.412	0.282	154.1	0.0000	0.0000	OK

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

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	SWIC-1	495	31.127	0.827	0.7	0.1315	0.0000	SURCHARGED
600 minute winter	SWIC-2	495	31.127	1.037	2.1	0.2934	0.0000	SURCHARGED
600 minute winter	SWIC-2a	495	31.127	1.077	1.8	0.3048	0.0000	SURCHARGED
600 minute winter	SWMH-1a	495	31.127	1.097	1.7	7.9412	0.0000	SURCHARGED
600 minute winter	SWMH-1b Hydrobrake	495	31.127	1.127	1.5	7.9942	0.0000	SURCHARGED
15 minute summer	Ex-SWMH04	11	30.781	0.731	11.4	0.8265	0.0000	SURCHARGED
30 minute summer	Ex-MH14	17	31.600	0.320	18.7	0.8144	3.1645	FLOOD
30 minute summer	Ex-MH12	17	31.594	0.474	17.5	0.5361	0.0000	SURCHARGED
15 minute winter	Ex-S4	10	31.506	0.766	15.8	0.8659	0.0000	FLOOD RISK
15 minute summer	Ex-S3	9	31.430	0.910	48.2	1.0292	5.6914	FLOOD
600 minute winter	SWIC-3	495	31.100	0.800	1.0	0.2263	0.0000	SURCHARGED
600 minute winter	SWMH-2	495	31.100	0.900	1.0	1.5895	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	SWIC-1	1.000	SWIC-2	0.7	0.221	0.016	1.1658	
600 minute winter	SWIC-2	1.001	SWIC-2a	1.8	0.403	0.056	0.4147	
600 minute winter	SWIC-2a	1.002	SWMH-1a	1.7	0.317	0.047	0.1586	
600 minute winter	SWMH-1a	1.003	SWMH-1b Hydrobrake	1.5	0.198	0.089	1.0896	
600 minute winter	SWMH-1b Hydrobrake	Hydro-Brake®	SWMH-1	1.4				
15 minute summer	Ex-SWMH04	6.000	Ex-SWMH01	11.4	0.647	0.471	0.4201	
30 minute summer	Ex-MH14	5.000	Ex-MH12	12.3	1.071	0.697	0.2841	
30 minute summer	Ex-MH12	5.001	Ex-S4	16.6	1.369	0.626	0.3023	
15 minute winter	Ex-S4	5.002	Ex-S3	18.6	1.054	0.828	0.2445	
15 minute summer	Ex-S3	5.003	Ex-SWMH01	28.0	1.593	1.195	0.9232	
600 minute winter	SWIC-3	2.000	SWMH-2	1.0	0.521	0.018	0.3538	
600 minute winter	SWMH-2	2.001	SWMH-3	1.0	0.350	0.019	0.9225	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	SWMH-3	495	31.100	1.130	2.4	1.9959	0.0000	SURCHARGED
15 minute summer	Ex-SWMH01	11	30.745	1.135	127.1	1.2839	0.0000	SURCHARGED
600 minute winter	SWMH-1	495	31.100	1.160	3.4	5.6522	0.0000	SURCHARGED
600 minute winter	SWMH-4	495	31.100	1.200	9.5	6.6546	0.0000	SURCHARGED
600 minute winter	SW- Petrol Interceptor	495	31.099	1.399	6.7	1.5828	0.0000	SURCHARGED
600 minute winter	SWMH-6	495	31.099	1.299	0.1	1.1252	0.0000	SURCHARGED
600 minute winter	SW- Offline Attenuation Tank	495	31.099	1.499	7.8	51.3321	0.0000	SURCHARGED
600 minute winter	SWMH-5 Hydrobrake	495	31.099	1.499	8.7	2.6493	0.0000	SURCHARGED
15 minute summer	SWMH-7	11	30.553	1.053	125.6	1.1904	0.0000	SURCHARGED
15 minute summer	Ex-SWMH06	11	30.276	0.961	206.2	1.0871	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	SWMH-3	2.002	SWMH-4	2.1	0.438	0.040	0.2592	
15 minute summer	Ex-SWMH01	1.008	SWMH-7	125.6	1.783	0.987	0.5919	
600 minute winter	SWMH-1	1.005	SWMH-4	3.3	0.461	0.534	0.5553	
600 minute winter	SWMH-4	1.006	SW- Petrol Interceptor	6.7	1.151	0.071	0.1208	
600 minute winter	SW- Petrol Interceptor	1.007	SWMH-5 Hydrobrake	8.7	0.394	0.104	0.1548	
600 minute winter	SWMH-6	4.000	SW- Offline Attenuation Tank	-0.1	-0.007	-0.004	0.1695	
600 minute winter	SW- Offline Attenuation Tank	4.001	SWMH-5 Hydrobrake	-7.8	-0.444	-0.442	0.1653	
600 minute winter	SWMH-5 Hydrobrake	4.002	SWMH-7	1.8	0.752	0.023	0.0287	
15 minute summer	SWMH-7	1.009	Ex-SWMH06	125.7	1.785	1.002	1.0250	
15 minute summer	Ex-SWMH06	1.010	Outfall - Ex-SWMH 3	206.3	2.931	1.855	1.2867	122.8

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Outfall - Ex-SWMH 3	9	29.414	0.284	206.3	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)

Water Quality

Area (ha)	Intended Land Use	Entering via Node or Link	Name	SuDS Component	Pollution hazard indices			Pollution mitigation indices			Cumulative pollution hazard indices		
					TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons	TSS	Metals	Hydrocarbons
		Node	SWMH-1a	Filter Drain				0.4	0.4	0.4			
		Node	SWMH-1b Hydrobrake	Filter Drain				0.2	0.2	0.2			
		Node	SWMH-1	Filter Drain				0.2	0.2	0.2			
		Node	SWMH-4	Filter Drain				0.2	0.2	0.2			
		Node	Outfall - Ex-SWMH 3										
											Sufficient	Sufficient	Sufficient

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

APPENDIX B

SECTION S106 PART 1 UU RESPONSE

S106 Part 1 'Application to connect to a public sewer' Approval Notice

United Utilities Reference Number:	***08094779***
Applicant details	
Applicant name	***Booth King Partnership Ltd***
Applicant address *(including postcode)*	***First Floor, Calico, 55 Mosley Street***
Applicant email	***eleni.z@booth-king.co.uk***
Site details: The site / property which is proposed for connection to the public sewer	
Site address *(including postcode)*	***Christie Fields Business Pk, Derwent Ave, Manchester M21 7QS***

APPROVED

Your application for connection to the public sewer has been approved, to be made via a new connection:

To a private drain	☒	You may appoint your contractor and advise your appointed building control body (who should inspect the work). United Utilities should be advised when this work is complete.
Direct to the public sewer	☐	**Further action required** You may now appoint an appropriately qualified contractor. Your appointed contractor is responsible for obtaining authorisation to work on a public sewer. (The S106 Part 2 application form **'Request for permission to work on a public sewer'** is available on our website; unitedutilities.com).

Mode of connection approved	**Connection into existing manhole**					
Sewer connection type	Foul	☒	Surface water	☒	Combined	☐

This approval is valid for 12 months from the date below.
This approval does not grant access to third party land, permission should be sought if required between applicant and land owner
If the new connection renders access unsafe or is otherwise detrimental to the manhole or sewer, a new/upgraded manhole will be requested.

Comments

Approval granted for a 150mm foul connection via a new connection into the existing private manhole within the site as per drawings submitted.

Approval granted for 300mm surface water connection into existing surface water manhole on site as per drawings submitted.

*Please note, if you are proposing to connect to an existing, unchartered drain or sewer then it is the developers responsibility to confirm that it communicates with the Public Sewer
Connections may be made to private lateral drains or to existing neighbouring drain. A part 1 approval does not give permission to access third party land. The applicant must seek permission from the relevant land owner.

Developer Services Inspector	**Marcus Jones**
Contact number	**07823553970**
Date	**17/09/2025**

APPENDIX C

EXISTING & PROPOSED IMPERMEABLE AREAS

TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available.
This office is to be made aware of any descrepnises found on site.

DRAINAGE AREAS KEY:

REF.	DESCRIPTION
	Indicates soft landscaping area.
	Indicates hard landscaping area.

DRAINAGE AREA CALCULATIONS:

Existing soft landscaping area = 546m²
Existing hard landscaping area = 1239m²

Proposed soft landscaping area = 506m²
Proposed hard landscaping area = 1279m²

Net values:

Decreased soft / increased hard landscaping area = **40m²**



EXISTING DRAINAGE AREAS GA
SCALE 1:200



PROPOSED DRAINAGE AREAS GA
SCALE 1:200

1:200
4m 0 4m 8m 12m 16m 20m

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design,
   4.5 - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction.
    Documents with status code A6 indicate final construction ONLY.
    Any deviations to that which is on site is not the liability of BKPL.

REV.	DATE	REVISION DETAILS	INITIALS
C01	12.06.24	STAGE 3 - PLANNING APPROVAL	CM
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS: A3
PROJECT STAGE: STAGE 3

boothking PARTNERSHIP LIMITED
CONSULTING CIVIL & STRUCTURAL ENGINEERS
www.booth-king.co.uk office@booth-king.co.uk
RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:
Premier Inn Extension
Manchester West Didsbury

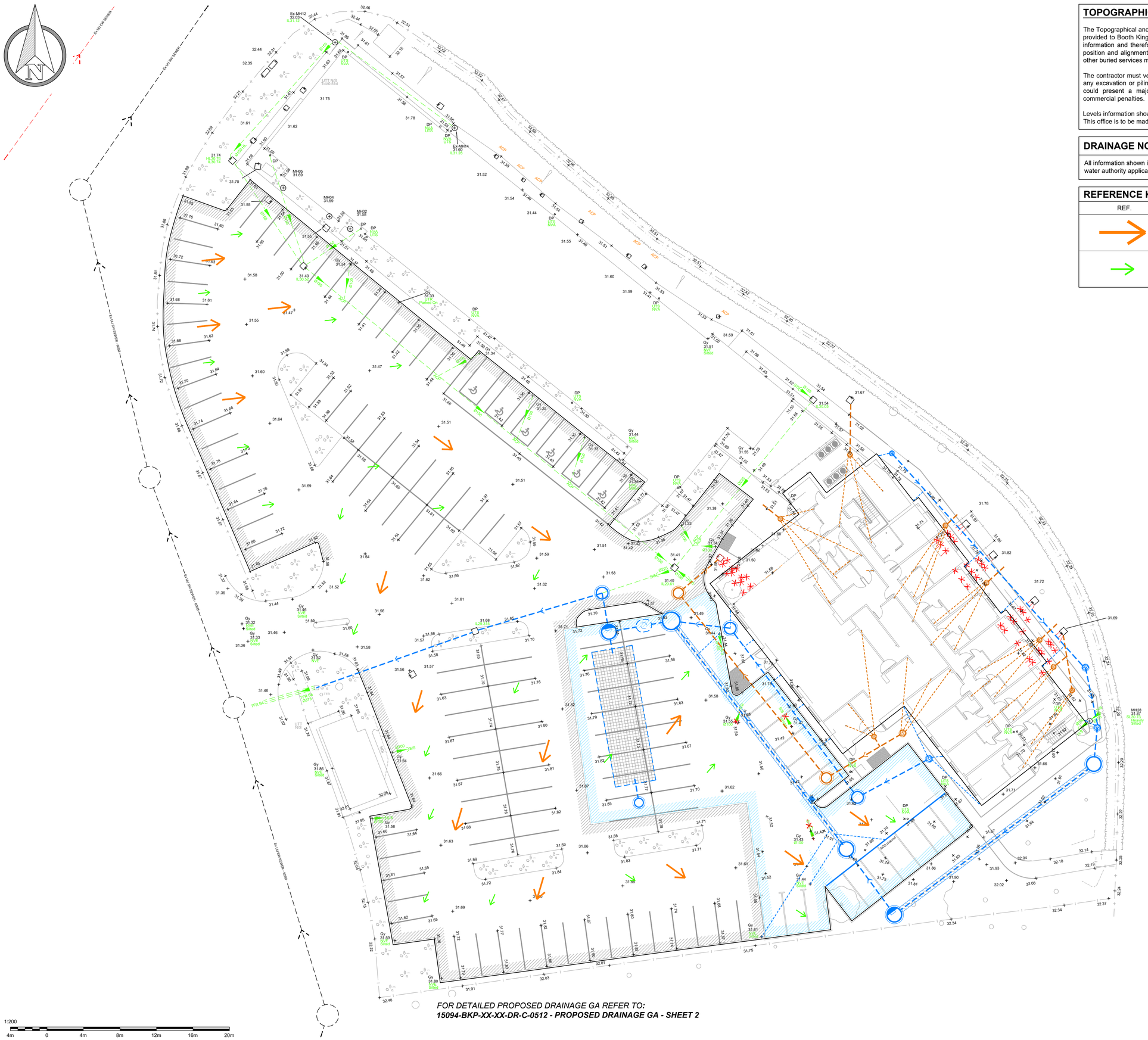
TITLE:
Drainage Areas GA

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
As noted	CM	June 24	C01	15094

DRAWING REF:
15094-BKP-XX-XX-DR-C-0501

APPENDIX D

EXCEEDANCE FLOOD FLOW PLAN



TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available.
This office is to be made aware of any discrepancies found on site.

DRAINAGE NOTE:

All information shown is subject to local building control & local water authority applications, comments & approvals.

REFERENCE KEY:

REF.	SECTION SIZE
	Flow Direction
	Flow Direction

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design,
   4.5 - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction. Documents with status code A6 indicate final construction ONLY. Any deviations to that which is on site is not the liability of BKPL.

REV.	DATE	REVISION DETAILS	INITIALS
P02	11.12.25	ISSUED FOR APPROVAL	CM
P01	04.09.25	ISSUED FOR APPROVAL	CM
		CURRENT DRAWING REVISION CHECKED BY	EZ
		CURRENT DRAWING REVISION APPROVED BY	EZ

DRAWING STATUS:	PROJECT STAGE:
S3	STAGE 4

boothking PARTNERSHIP LIMITED
CONSULTING CIVIL & STRUCTURAL ENGINEERS
www.booth-king.co.uk office@booth-king.co.uk
RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:
Premier Inn Extension
Manchester West Didsbury

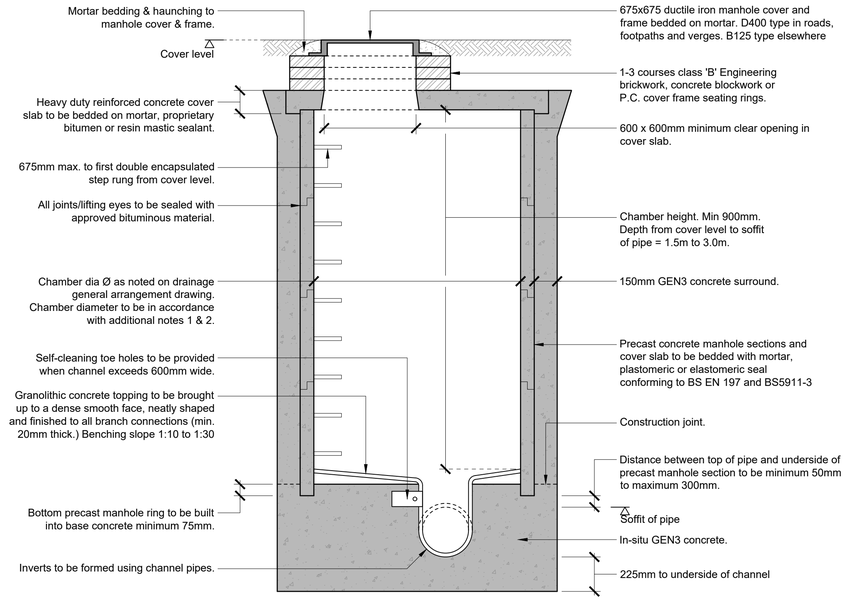
TITLE:
Exceedance flood flow plan

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
1:200	PA	Aug'25	P02	15094

DRAWING REF:
15094-BKP-XX-XX-DR-C-0515

APPENDIX E

DRAINAGE DETAILS



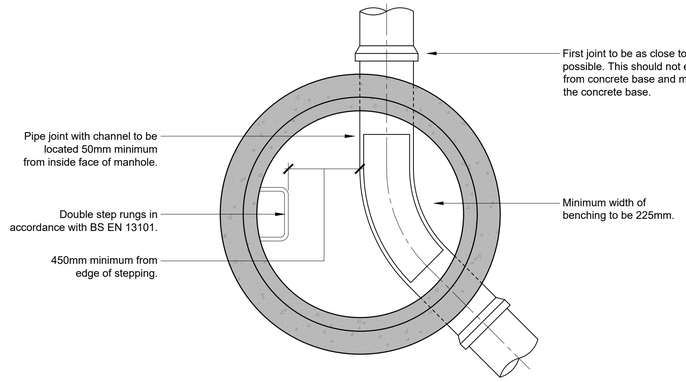
ADDITIONAL NOTES:

1. Manhole diameter to be as follows :

   1200mm Ø (pipe Ø up to 300mm)
   1350mm Ø (pipe Ø > 300mm up to 450mm)
   1500mm Ø (pipe Ø > 450mm up to 525mm)
   1800mm Ø (pipe Ø > 525mm up to 750mm)
   2100mm Ø (pipe Ø > 750mm up to 900mm)

2. 1050mm concrete rings may be used where the manhole is of a 'Straight Through' or 'Terminal' type, where the depth to invert does not exceed 2.5m and the pipe diameter is not greater than 150mm.
3. Where the depth to the top of the benching exceeds 3.0m, a 'Type A' manhole shall be used.
4. Manhole construction to be in accordance with the current editions of 'Sewers for Scotland' (Scotland) OR 'SSG Appendix C' (England & Wales).
5. Top and bottom P.C. rings to be plain ended. Channel to be formed using pre-formed half channel.
6. Where pipes are 600mm diameter or greater, handrail, safety chain and self cleaning toe holes to be provided.
7. Connection to be made soffit/soffit where upstream pipe is smaller than outlet pipe. Invert/ invert when upstream pipe is equal or larger than outlet.
8. A flexible pipe shall be provided as close as feasible to the outside face of the manhole. The next pipe away will be a rocker pipe. See Clause 4.6.6.2.
9. Where there is no change in pipe diameter, the manhole invert shall follow the same gradient as the outgoing sewer.
10. Step irons or otherwise to be fitted as required by the Authority's policy.

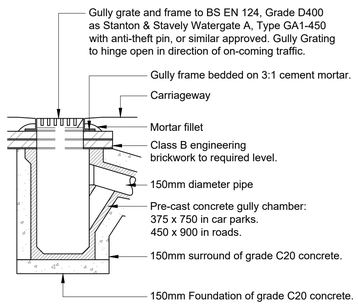
SECTION



PLAN

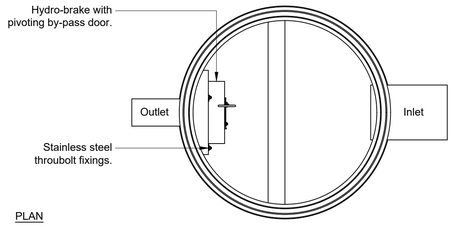
TYPICAL MANHOLE DETAIL - TYPE B - RIGID MATERIAL CONSTRUCTION WITH CONCRETE SURROUND

SCALE 1:20

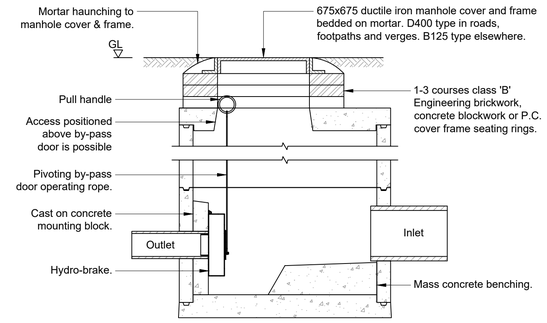


TYPICAL ROAD GULLY INSTALLATION DETAIL

SCALE 1:20



PLAN

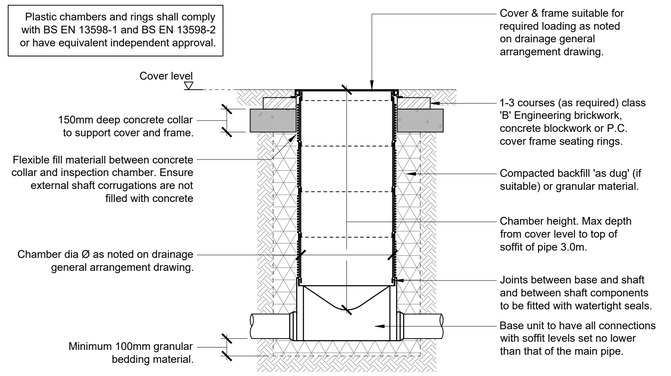


SECTION

TYPICAL HYDROBRAKE CHAMBER DETAIL

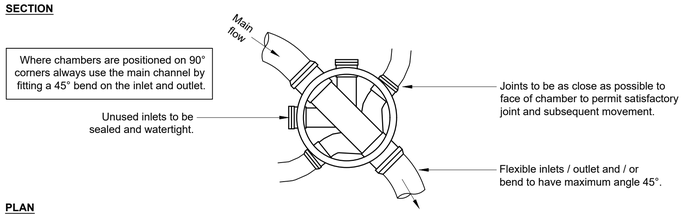
SCALE 1:20

Plastic chambers and rings shall comply with BS EN 13598-1 and BS EN 13598-2 or have equivalent independent approval.



SECTION

Where chambers are positioned on 90° corners always use the main channel by fitting a 45° bend on the inlet and outlet.



PLAN

TYPICAL INSPECTION CHAMBER DETAIL (PPIC)

SCALE 1:20

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design,
   4.5 - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A4 or A5 are suitable for construction. Any deviations to that which is on site is not the liability of BKPL.

REV.	DATE	REVISION DETAILS	INITIALS
C02	27.06.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C01	17.03.25	STAGE 3 - ISSUED FOR TENDER	PA
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS:	PROJECT STAGE:
A4	STAGE 4

boothking PARTNERSHIP LIMITED

CONSULTING CIVIL & STRUCTURAL ENGINEERS

www.booth-king.co.uk office@booth-king.co.uk

RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:

Premier Inn
West Didsbury

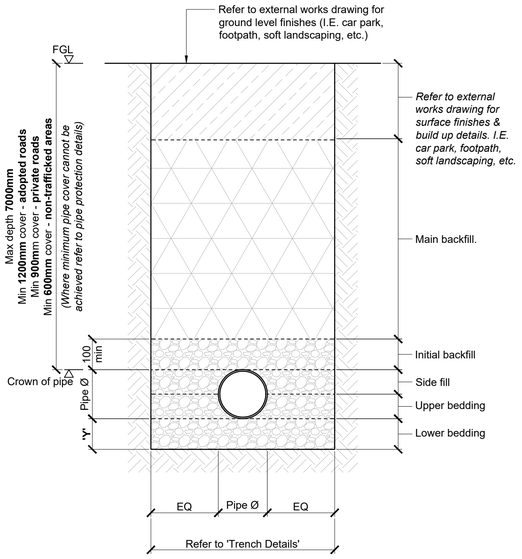
TITLE:

Drainage Details
Sheet 1

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
As Noted	PA	Feb 25	C02	15094

DRAWING REF:

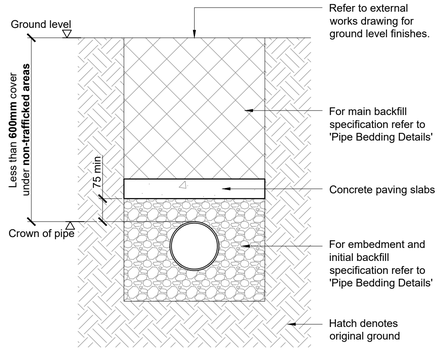
15094-BKP-XX-XX-DR-C-0590



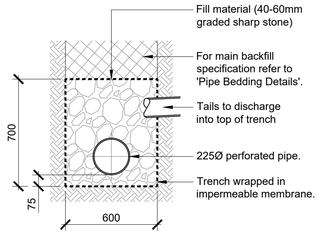
TYPICAL PIPE BEDDING DETAILS
SCALE 1:10

TABLE 3 (refer to figure 2)	
MINIMUM LOWER BEDDING DEPTH	
TRENCH BED CONDITIONS	**MINIMUM DEPTH ('Y')**
Usual soil conditions	100mm
Rock or hard soil conditions	150mm
N.B. Information shown in 'Table 3' has been taken from 'BS EN 1610:2015 Construction and testing of drains and sewers - 7.2 Bedding construction types'	

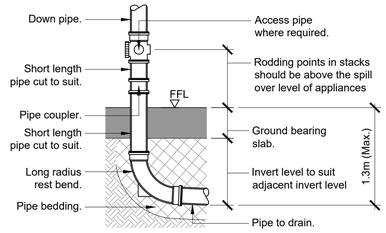
TABLE 4 (refer to figure 2)		
BEDDING & BACKFILL MATERIAL		
LOCATION	**SUITABLE MATERIAL** ('DN' denotes pipe Ø)	ALL MATERIAL TO BE PLACED & COMPACTED AS SPECIFIED IN 'BS 8000-14:1989, SECTION 3'
Main backfill	As dug material (native soil) may be used as long as it complies with *BS EN 1610:2015 Construction and testing of drains and sewers - 5.2.2 Native soil' & 'BS 8000-14:1989 Section 3.3'.* Initial 300mm of main backfill must be free from stones larger than 40mm, lumps of clay over 75mm, timber, frozen material & vegetable matter. N.B. No mechanical compaction to be applied until first 300mm of main backfill in place.	
Initial backfill Side fill	Selected fill or granular fill free from stones larger than 40mm, lumps of clay over 75mm, timber, frozen material & vegetable matter. As dug material (native soil) may be used as long as it complies with *BS EN 1610:2015 Construction and testing of drains and sewers - 5.2.2 Native soil' & 'BS 8000-14:1989 Section 3.2.3'.* N.B. No mechanical compaction to be applied.	
Upper bedding Lower bedding	Single sized or graded granular material (from 5mm) not exceeding: - 22mm for DN ≤ 200mm. - 40mm for DN > 200mm up to DN ≤ 600mm. - 60mm for DN > 600mm. - For DN < 100mm all written instructions of the manufacturer shall be complied with. N.B. No mechanical compaction to be applied.	
N.B. Information shown in 'Table 4' has been taken from 'BS EN 1610:2015 Construction and testing of drains and sewers' & 'BS 8000-14:1989' *N.B. Assumed normal ground conditions. Special bedding construction will be required where the trench formation has little bearing strength, i.e. Soft ground, running sand, etc. Booth King Partnership Limited to be contacted for revised bedding detail in this circumstance.* *N.B. Booth King Partnership Limited advise installer to refer to plastic pipe manufactures specific bedding details to ensure minimum bedding & backfilling requirements are met.*		



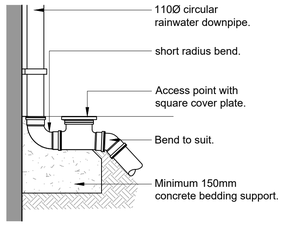
PIPE PROTECTION DETAIL FOR SHALLOW PIPES (Non-trafficked areas)
SCALE 1:10



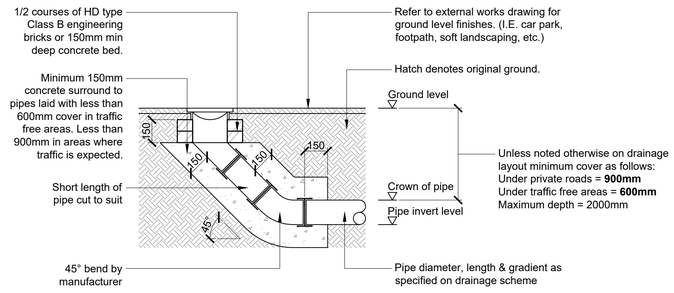
TYPICAL FILTER TRENCH DETAIL
SCALE 1:20



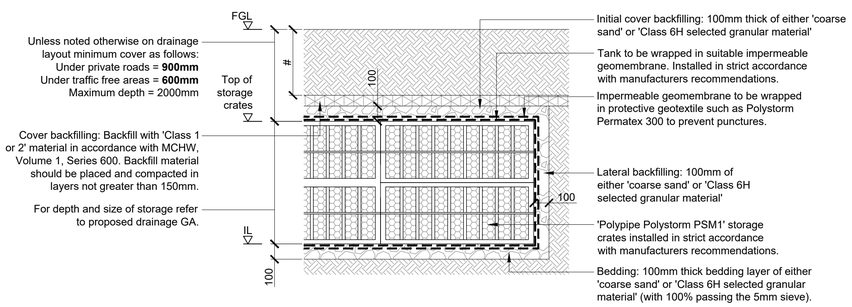
TYPICAL LONG BEND RADIUS DETAIL
SCALE 1:20



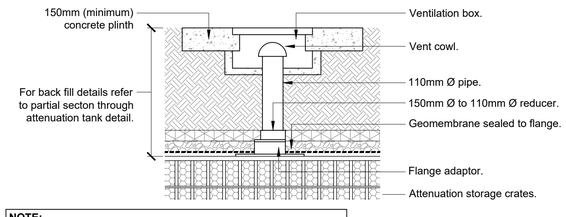
TYPICAL RWP OUTLET DETAIL (soft landscaping)
SCALE 1:20



TYPICAL EXTERNAL RODDING EYE DETAIL
SCALE 1:20



PARTIAL SECTION THROUGH ATTENUTATION TANK
SCALE 1:20



NOTE:

It is recommended that one vent pipe, 110mm in diameter, is provided per 7,500 square meters of impermeable catchment area on a site.

TYPICAL ATTENTUATION TANK VENT DETAIL
SCALE 1:20

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design, **4.5** - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A4 or A5 are suitable for construction. Any deviations to that which is on site is not the liability of BKPL.

REV.	DATE	REVISION DETAILS	INITIALS
C02	27.06.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C01	17.03.25	STAGE 3 - ISSUED FOR TENDER	PA
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS:	PROJECT STAGE:
A4	STAGE 4

boothking PARTNERSHIP LIMITED

CONSULTING CIVIL & STRUCTURAL ENGINEERS

www.booth-king.co.uk office@booth-king.co.uk

RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:

Premier Inn
West Didsbury

TITLE:

Drainage Details
Sheet 2

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
As Noted	PA	Feb 25	C02	15094

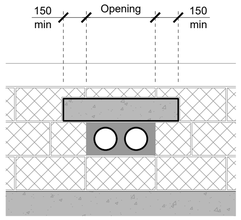
DRAWING REF:

15094-BKP-XX-XX-DR-C-0591

TABLE 1.0 - WALL PENETRATION LINTEL SPECIFICATIONS

WALL THICKNESS (MM)	OPENING WIDTH (MM)	LINTEL SPECIFICATION
100	> 250 < 750	1No. Naylor R9 precast concrete lintel
140	> 250 < 750	1No. Naylor R9 precast concrete lintel
215	> 250 < 750	1No. Naylor R9 precast concrete lintel

> denotes greater than. < denotes lesser than.



ELEVATION

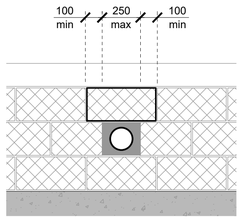
IMPORTANT NOTES:

1. Refer to Table 1.0 for wall penetration lintel specifications.
2. Lintel over to have min 150mm bearing onto blocks under, either side of penetration.
3. Less than 50mm clear space all round the pipe, rocker pipe required! Void filled with lean mix concrete & pipe bedded into wall. Refer to rocker pipe detail

OR

4. 50mm clear space all round the pipe. Important Fill void with compressible sealant to prevent entry of gas. Mask opening both sides with rigid sheet material to prevent entry of fill or vermin.

WALL PENETRATION DETAIL - OPENING MORE THAN 250mm
SCALE 1:20



ELEVATION

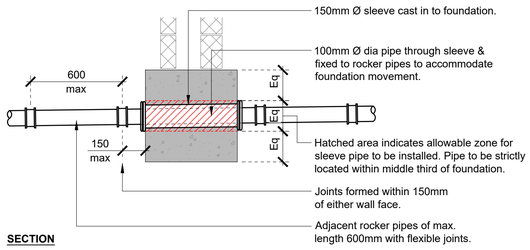
IMPORTANT NOTES:

1. Penetration opening to be max 250mm wide.
2. Block over to have min 100mm bearing onto blocks under, either side of penetration.
2. Less than 50mm clear space all round the pipe, rocker pipe required! Void filled with lean mix concrete & pipe bedded into wall. Refer to rocker pipe detail

OR

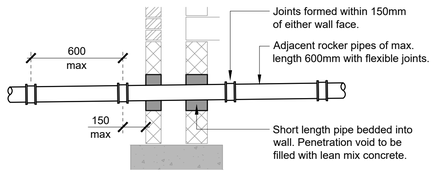
3. 50mm clear space all round the pipe. Important Fill void with compressible sealant to prevent entry of gas. Mask opening both sides with rigid sheet material to prevent entry of fill or vermin.

WALL PENETRATION DETAIL - OPENING LESS THAN 250mm
SCALE 1:20



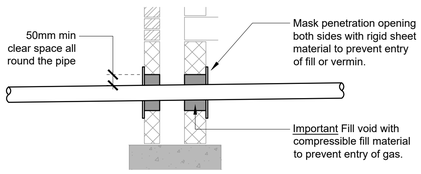
SECTION

FOUNDATION PENETRATION DETAIL - THROUGH FOUNDATION
SCALE 1:20



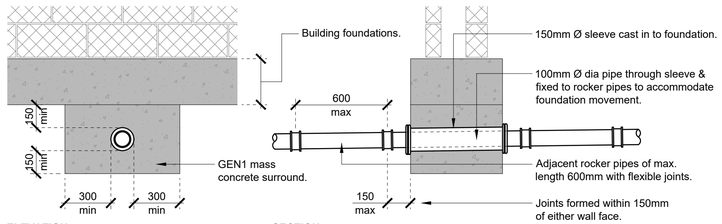
SECTION

WALL PENETRATION DETAIL - ROCKER PIPE DETAIL
SCALE 1:20



SECTION

WALL PENETRATION DETAIL - CLEAR SPACE TO PIPE
SCALE 1:20



ELEVATION **SECTION**

FOUNDATION PENETRATION DETAIL - UNDER FOUNDATION
SCALE 1:20

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design,
   4.5 - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A4 or A5 are suitable for construction. Any deviations to that which is on site is not the liability of BKPL.

REV.	DATE	REVISION DETAILS	INITIALS
C02	27.06.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C01	17.03.25	STAGE 3 - ISSUED FOR TENDER	PA
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS: A4

PROJECT STAGE: STAGE 4

boothking PARTNERSHIP LIMITED

CONSULTING CIVIL & STRUCTURAL ENGINEERS

www.booth-king.co.uk office@booth-king.co.uk

RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:
Premier Inn
West Didsbury

TITLE:
Drainage Details
Sheet 3

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
As Noted	PA	Feb 25	C02	15094

DRAWING REF:
15094-BKP-XX-XX-DR-C-0592

APPENDIX F

PROPOSED DRAINAGE GAs

TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available.
This office is to be made aware of any discrepancies found on site.

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design,
   4.5 - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction.
    Documents with status code A6 indicate final construction ONLY.
    Any deviations to that which is on site is not the liability of BKPL.

FOR DETAILED PROPOSED DRAINAGE GA REFER TO:
15094-BKP-XX-XX-DR-C-0511 - PROPOSED DRAINAGE GA - SHEET 1

FOR DETAILED PROPOSED DRAINAGE GA REFER TO:
15094-BKP-XX-XX-DR-C-0512 - PROPOSED DRAINAGE GA - SHEET 2

Existing FW connection
Existing foul water drainage assumed to connect into Ex UU CW SEWER.

Ex UU CW SEWER

Ex UU SW SEWER

Ex UU SW SEWER - 600Ø

Ex UU FW SEWER - 600Ø

Ex UU FW SEWER - 525Ø

SW - PETROL INTERCEPTOR
Bypass Separator – Kingspan NSBP003 oil separator.
For areas up to 1670m². (Actual area = 1243m²).

Tank to be installed in strict accordance with manufacturers installation guidelines.

CL = 31.60
Inlet IL = 29.80
Outlet IL (inlet -100mm) = 29.70

SW - OFFLINE ATTENUATION TANK
51.3m³ cellular storage crates. 15x4.5m x 0.8m deep.

Polypipe Polystorm-R PSM1® storage crates (95%void ratio) installed in strict accordance with manufacturers recommendations. Tank to be wrapped in impermeable membrane. Impermeable geomembrane to be wrapped in protective geotextile such as Polystorm Permatex 300 to prevent punctures.

CL = 31.70
Top of tank = 30.30
Invert of tank = 29.80

New car park drainage
Hatched area denotes car park area to drain into new SW attenuation system.

Existing car park drainage
Hatched area denotes car park area to drain into existing SW system.

Point of Connection
IL = 30.223

Existing FW drainage
Existing foul water drainage spurs to existing pop ups to be grubbed up.

Existing FW drainage
Existing foul water drainage run to be retained. Drains to be inspected for suitability for re-use.

FFL: 31.65

1:200
4m 0 4m 8m 12m 16m 20m

C09	18.02.26	UPDATED TO AVOID GAS MAIN	EZ
C08	27.01.26	SHEET EXTENTS UPDATED	PA
C07	16.01.26	UPDATED TO LATEST SITE PLAN	CM
C06	11.12.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C05	15.08.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C04	27.06.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C03	17.03.25	STAGE 3 - ISSUED FOR TENDER	PA
C02	03.09.24	STAGE 3 - PLANNING APPROVAL	PA
C01	12.06.24	STAGE 3 - PLANNING APPROVAL	CM
REV.	DATE	REVISION DETAILS	INITIALS
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS: A5
PROJECT STAGE: STAGE 5

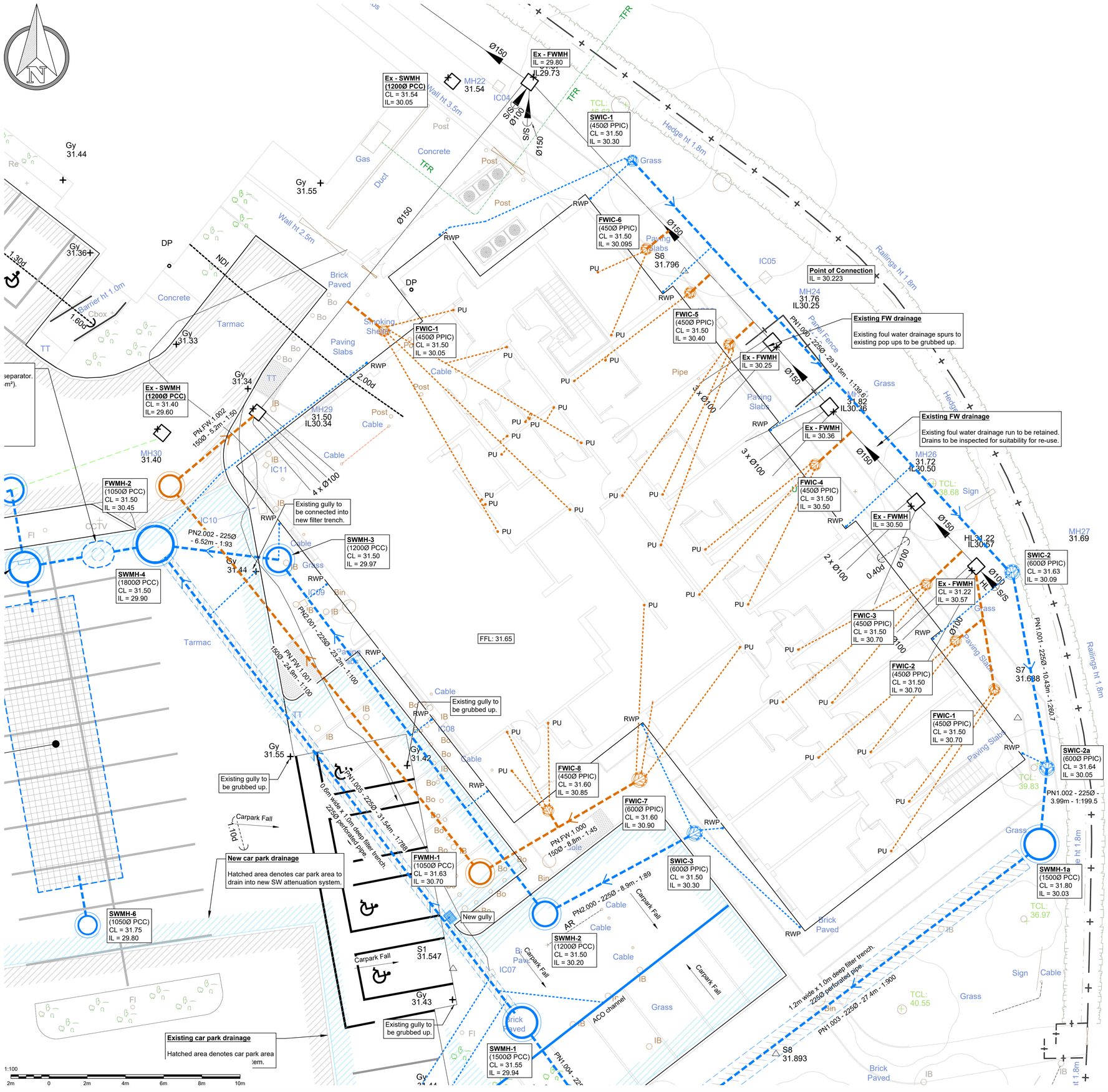
boothking PARTNERSHIP LIMITED
CONSULTING CIVIL & STRUCTURAL ENGINEERS
www.booth-king.co.uk office@booth-king.co.uk
RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:
Premier Inn Extension Manchester West Didsbury

TITLE:
Drainage Key Plan

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
1:200	PA	June 24	C09	15094

DRAWING REF:
15094-BKP-XX-XX-DR-C-0510



TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available.
This office is to be made aware of any discrepancies found on site.

DRAINAGE NOTES:

1. All adoptable works to be in accordance with SSG appendix C where applicable.
2. All manhole cover levels to be confirmed by Architect.
3. Clay pipes to be flexibly jointed and comply with the requirements of BS EN 295.
4. Concrete pipes to be flexibly jointed and comply with the requirements of BSEN 1916 and BS 5911.
5. Plastic pipes (PVC-U) to be flexibly jointed and comply with the requirements of BS EN 1401-1 1998.
6. All surface water pipes to be laid at a gradient no flatter than 1:80 (UNO).
7. All foul water pipes to be laid at a gradient no flatter than 1:40 (UNO).
8. For minimum depths requiring pipe protection refer to drainage details drawings.
9. Protection to drains and gully connections may be concrete bed surround between cover depths of 450mm to 200mm.
10. Until final surface is placed, heavy traffic is not to be allowed over pipe trenches without special precautions.
11. Pipes and fittings are to be laid in accordance with the manufacturers recommendations.
12. All Manholes should be concrete manhole rings (UNO).
13. All SVP & RWP positions TBC by Architect.
14. Rodding access is to be provided at all pop-ups.
15. For setting out of all pop-up positions refer to Architect's details.
16. Civil engineering contractor to arrange for:
    a. Own services and temporary supplies.
    b. Pathway & partial closure as deemed required by their method statement. Including costs.
    C. Temporary adequate over pumping as deemed required by civil engineers method of construction.
17. The contractor should confirm the locations for existing services prior construction.

DRAINAGE ANNOTATION KEY:

REF.	DESCRIPTION
SW	Surface water drainage
FWC	Foul water drainage
W	Combined water drainage
MH	Manhole
IC	Inspection chamber
PCC	Precast concrete chamber
PPIC	Polypropylene inspection chamber
GU	Gully
CL	Cover level (m)
IL	Invert level (m)
SVP	Soil vent pipe
PU	Pop up
RWP	Rainwater downpipe

DRAINAGE LINE TYPES KEY:

REF.	DESCRIPTION
	Existing FW network
	Existing SW network
	Existing drainage to be grubbed up
	Proposed FW network
	Proposed SW network

NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design,
   4.5 - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction. Documents with status code A6 indicate final construction ONLY. Any deviations to that which is on site is not the liability of BKPL.

REV.	DATE	REVISION DETAILS	INITIALS
C09	18.02.26	UPDATED TO AVOID GAS MAIN	EZ
C08	27.01.26	COVER LEVELS AMENDED	PA
C07	16.01.26	UPDATED TO LATEST SITE PLAN	CM
C06	11.12.25	STAGE 4 - ISSUED FOR CONSTRUCTION	EZ
C05	14.08.25	STAGE 4 - ISSUED FOR CONSTRUCTION	EZ
C04	27.06.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C03	17.03.25	STAGE 3 - ISSUED FOR TENDER	PA
C02	03.09.24	STAGE 3 - PLANNING APPROVAL	PA
C01	12.06.24	STAGE 3 - PLANNING APPROVAL	CM
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS: A5
PROJECT STAGE: STAGE 5

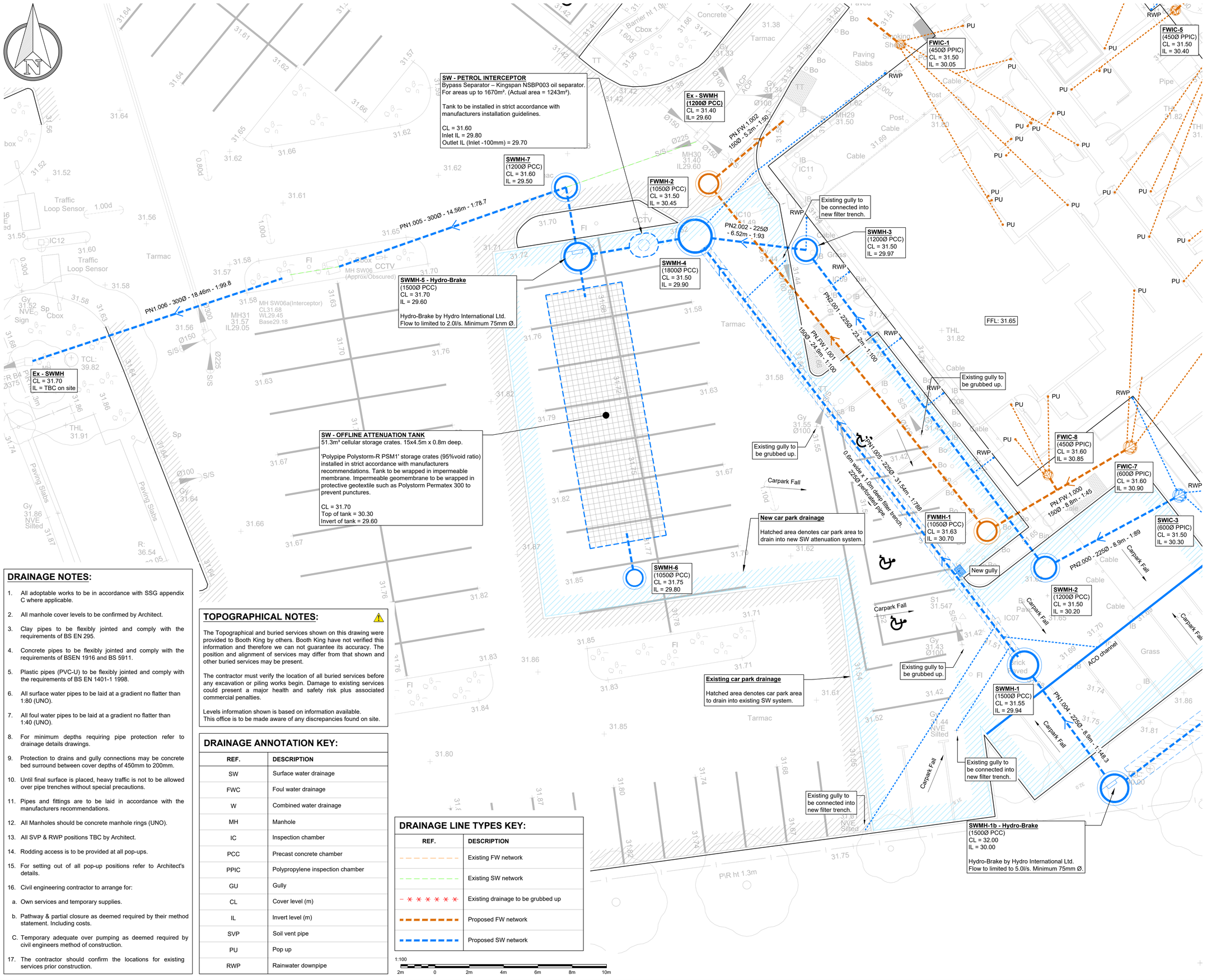
boothking PARTNERSHIP LIMITED
CONSULTING CIVIL & STRUCTURAL ENGINEERS
www.booth-king.co.uk office@booth-king.co.uk
RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:
Premier Inn Extension
Manchester West Didsbury

TITLE:
Proposed Drainage GA
Sheet 1

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
1:100	PA	June 24	C09	15094

DRAWING REF:
15094-BKP-XX-XX-DR-C-0511



NOTES:

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. (BKPL) and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. This document uses revision codes in accordance with ISO EN 19650:
   P. Preliminary (non-contractual) - review, comment or approval.
   C. Contractual - Approved for stage completion.
8. This document uses status codes in accordance with ISO EN 19650:
   Work in progress:
   S0 - WIP
   Shared (non-contractual):
   S1 - Coordination, **S2** - Information, **S3** - Review, **S4** & **S5** - Approval.
   Published (contractual):
   A1, **An**, etc. (where "n" relates to the project stage)
9. This document uses project stages in accordance with the IStructE Structural Plan of Work 2020:
   2 - Concept, **3** - Coordination, **4** - Technical Design, **4.5** - Production Design, **5** - Construction, **6** - Handover.
10. Only documents with a revision code C# (where '#' relates to a revision number) and status code A5 are suitable for construction. Documents with status code A6 indicate final construction ONLY. Any deviations to that which is on site is not the liability of BKPL.

DRAINAGE NOTES:

1. All adoptable works to be in accordance with SSG appendix C where applicable.
2. All manhole cover levels to be confirmed by Architect.
3. Clay pipes to be flexibly jointed and comply with the requirements of BS EN 295.
4. Concrete pipes to be flexibly jointed and comply with the requirements of BSEN 1916 and BS 5911.
5. Plastic pipes (PVC-U) to be flexibly jointed and comply with the requirements of BS EN 1401-1 1998.
6. All surface water pipes to be laid at a gradient no flatter than 1:80 (UNO).
7. All foul water pipes to be laid at a gradient no flatter than 1:40 (UNO).
8. For minimum depths requiring pipe protection refer to drainage details drawings.
9. Protection to drains and gully connections may be concrete bed surround between cover depths of 450mm to 200mm.
10. Until final surface is placed, heavy traffic is not to be allowed over pipe trenches without special precautions.
11. Pipes and fittings are to be laid in accordance with the manufacturers recommendations.
12. All Manholes should be concrete manhole rings (UNO).
13. All SVP & RWP positions TBC by Architect.
14. Rodding access is to be provided at all pop-ups.
15. For setting out of all pop-up positions refer to Architect's details.
16. Civil engineering contractor to arrange for:
    a. Own services and temporary supplies.
    b. Pathway & partial closure as deemed required by their method statement. Including costs.
    C. Temporary adequate over pumping as deemed required by civil engineers method of construction.
17. The contractor should confirm the locations for existing services prior construction.

TOPOGRAPHICAL NOTES:

The Topographical and buried services shown on this drawing were provided to Booth King by others. Booth King have not verified this information and therefore we can not guarantee its accuracy. The position and alignment of services may differ from that shown and other buried services may be present.

The contractor must verify the location of all buried services before any excavation or piling works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

Levels information shown is based on information available.
This office is to be made aware of any discrepancies found on site.

DRAINAGE ANNOTATION KEY:

REF.	DESCRIPTION
SW	Surface water drainage
FWC	Foul water drainage
W	Combined water drainage
MH	Manhole
IC	Inspection chamber
PCC	Precast concrete chamber
PPIC	Polypropylene inspection chamber
GU	Gully
CL	Cover level (m)
IL	Invert level (m)
SVP	Soil vent pipe
PU	Pop up
RWP	Rainwater downpipe

DRAINAGE LINE TYPES KEY:

REF.	DESCRIPTION
	Existing FW network
	Existing SW network
	Existing drainage to be grubbed up
	Proposed FW network
	Proposed SW network

C09	18.02.26	UPDATED TO AVOID GAS MAIN	EZ
C08	27.01.26	UPDATED TO SHOW SWHM-1b	PA
C07	16.01.26	UPDATED TO LATEST SITE PLAN	CM
C06	11.12.25	STAGE 4 - ISSUED FOR CONSTRUCTION	EZ
C05	14.08.25	STAGE 4 - ISSUED FOR CONSTRUCTION	EZ
C04	27.06.25	STAGE 4 - ISSUED FOR CONSTRUCTION	PA
C03	17.03.25	STAGE 3 - ISSUED FOR TENDER	PA
C02	03.09.24	STAGE 3 - PLANNING APPROVAL	PA
C01	12.06.24	STAGE 3 - PLANNING APPROVAL	CM
REV.	DATE	REVISION DETAILS	INITIALS
		CURRENT DRAWING REVISION CHECKED BY	SP
		CURRENT DRAWING REVISION APPROVED BY	AI

DRAWING STATUS: A5
PROJECT STAGE: STAGE 5

boothking PARTNERSHIP LIMITED
CONSULTING CIVIL & STRUCTURAL ENGINEERS
www.booth-king.co.uk office@booth-king.co.uk
RAMSBOTTOM Tel: 01706 822 022 | **MANCHESTER** Tel: 0161 694 7087 | **EDINBURGH** Tel: 0131 229 1547

PROJECT:
Premier Inn Extension Manchester West Didsbury

TITLE:
Proposed Drainage GA Sheet 2

SCALE (A1)	AUTHOR	DATE	REVISION	BKPL No.
1:100	PA	June 24	C09	15094

DRAWING REF:
15094-BKP-XX-XX-DR-C-0512

APPENDIX G

MANCHESTER CITY COUNCIL LLFA TRACKER RESPONSES

Condition number	4
Decision Notice	140916/FO/2024

Decision Notice Clause	Contained in submission	Approvable standard	Further information required:
Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.	Y	Y	
Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.	Y	Y	
Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable.	Y	Y	
A finalised drainage layout showing all components, outfalls, levels and connectivity.	Y	N	Please refer to the below comments on the updated hydraulic calculations, as a consistent package between the drainage layout and calculations is required. <standard comment: The applicant must present a consistent package to discharge this condition (Including all layouts and calculations). The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and hydraulic calculations correspond, and that they can be cross-referenced for checks. This includes layout annotations and schedule printouts. >

An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.	Y	Y	
Hydraulic calculations of the proposed drainage system, including all design parameters. Calculations must Include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.	Y	N	It has been confirmed that the proposed tank volume is 51.3m^3 as per the drainage layout. However, no modelled parameters have been provided for the attenuation tank or flow controls in the hydraulic calculations. The updated hydraulic calculations show an outflow of 5.6l/s from 'SWMH-5 Hydrobrake' to the outfall at ' SWMH-7' in the 1 in 100 year event, despite being downstream of the hydrobrake limiting to 2l/s. - Please ensure that the hydrobrake flow controls (2l/s and 5l/s) have both been modelled. - Please provide all modelled parameters.
A plan indicating surface water overland flow routes for extreme events to ensure flows are diverted away from existing and proposed buildings (including basements).	Y	Y	
Construction details of flow control and SuDS elements.	Y	Y	
Finished floor levels and proposed ground levels plan.	Y	Y	

% Complete submission:	100%
% At approvable standard:	77%
Refusal trigger points: Submission 1 = less than 20% complete. Submission 2 = not 100% approvable standard.	

LLFA Recommendation:	**Refusal.**

Manchester City Council LLFA: CDN consultation

MANCHESTER CITY COUNCIL

Condition number	4
Decision Notice	140916/FO/2024

Decision Notice Clause	**Contained in submission**	**Approvable standard**	**Further information required:**	**Designer's Response**
Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.	Y	Y		No further information required
Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.	Y	Y		No further information required
Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable.	Y	Y		No further information required
A finalised drainage layout showing all components, outfalls, levels and connectivity. 2	Y	N	Please refer to the below comments on the updated hydraulic calculations, as a consistent package between the drainage layout and calculations is required. <standard comment: The applicant must present a consistent package to discharge this condition (Including all layouts and calculations). The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and hydraulic calculations correspond, and that they can be cross-referenced for checks. This includes layout annotations and schedule printouts. >	Please refer to the Appendix B and C below.

An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.	Y	Y		No further information required
Hydraulic calculations of the proposed drainage system, including all design parameters. Calculations must Include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.	Y	N	It has been confirmed that the proposed tank volume is 51.3m^3 as per the drainage layout. However, no modelled parameters have been provided for the attenuation tank or flow controls in the hydraulic calculations. The updated hydraulic calculations show an outflow of 5.6l/s from 'SWMH-5 Hydrobrake' to the outfall at ' SWMH-7' in the 1 in 100 year event, despite being downstream of the hydrobrake limiting to 2l/s. - Please ensure that the hydrobrake flow controls (2l/s and 5l/s) have both been modelled. - Please provide all modelled parameters.	No further information required 600 minute winter SWMH-6 495 31.099 1.299 0.1 1.1252 0.0000 SURCHARGED 4.000 SW- Offline Attenua -0.1 600 minute winter SW- Offline Attenua 495 31.099 1.499 7.8 51.3321 0.0000 SURCHARGED 4.001 SWMH-5 Hydrobral -7.8 600 minute winter SWMH-5 Hydrobral 495 31.099 1.499 8.7 2.6493 0.0000 SURCHARGED 4.002 SWMH-7 1.8 According to the Surface Water Calculation inflow to SWMH-5 Hydrobrake is 8.7l/s with the outflow restricted to 1.8l/s. 600 minute winter SWMH-1a 495 31.127 1.097 1.7 7.9412 0.0000 SURCHARGED 1.003 SWMH-1b Hydrobr 1.5 600 minute winter SWMH-1b Hydrobr 495 31.127 1.127 1.5 7.9942 0.0000 SURCHARGED Hydro-Brake® SWMH-1 1.4 Similarly, inflow to SWMH-1b Hydrobrake is 1.5l/s with the outflow restricted to 1.4l/s. Please refer to Causeway Flow Plus Output page 10 **Node SWMH-5 Hydrobrake Online Hydro-Brake® Control** Flap Valve ✓ Objective (HE) Minimise upstream storage Replaces Downstream Link x Sump Available ✓ Invert Level (m) 29.600 Product Number CTL-SHE-0058-2000-1800-2000 Design Depth (m) 1.800 Min Outlet Diameter (m) 0.075 Design Flow (l/s) 2.0 Min Node Diameter (mm) 1200 **Node SWMH-1b Hydrobrake Online Hydro-Brake® Control** Flap Valve x Objective (HE) Minimise upstream storage Replaces Downstream Link ✓ Sump Available ✓ Invert Level (m) 30.000 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
A plan indicating surface water overland flow routes for extreme events to ensure flows are diverted away from existing and proposed buildings (including basements).	Y	Y		
Construction details of flow control and SuDS elements.	Y	Y		
Finished floor levels and proposed ground levels plan.	Y	Y		

% Complete submission:	100%
% At approvable standard:	77%
Refusal trigger points: Submission 1 = less than 20% complete. Submission 2 = not 100% approvable standard.	

LLFA Recommendation:	**Refusal.**