

20.0 APPENDIX G – EA FLOOD MAP FOR PLANNING

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	375144/441622	10 December 2025 15:32

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
Unspecified

Location (easting/northing)
375144/441622

Scale
1:2,500

Created
10 Dec 2025 15:32

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 20 40 60m

21.0 APPENDIX H – UNITED UTILITIES CORRESPONDENCE



United Utilities Water Limited
Planning, Landscape and Ecology
2nd Floor, Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Warrington
WA5 3LP

Planning.liaison@uuplc.co.uk

Ribble Valley Borough Council
Council Officers, Church Walk
Clitheroe
BB7 2RA

Your ref: 3/2020/0601
Our ref: DC/20/2992V2
Date: 15-FEB-21

Dear Sir/Madam,

Location: Land at Highmoor Farm Clitheroe BB7 1PN

Proposal: Outline planning application for the construction of up to 125 dwellings

With regards to the above development proposal, United Utilities Water Limited ('United Utilities') wishes to provide the following comments.

Drainage

In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained on a separate system with foul water draining to the public sewer and surface water draining in the most sustainable way.

Following our review of the submitted Flood Risk Assessment, we can confirm the proposals are acceptable in principle to United Utilities and therefore should planning permission be granted we request the following condition is attached to any subsequent Decision Notice:

Condition 1 – Surface water

The drainage for the development hereby approved, shall be carried out in accordance with principles set out in the submitted Flood Risk Assessment (Ref No.: 18522, Dated: Jan 2021) which was prepared by Topping Engineers. No surface water will be permitted to drain directly or indirectly into the public sewer. Any variation to the discharge of foul shall be agreed in writing by the Local Planning Authority prior to the commencement of the development. The development shall be completed in accordance with the approved details.

Reason: To ensure a satisfactory form of development and to prevent an undue increase in surface water run-off and to reduce the risk of flooding.

Condition 2 – Foul water

Foul and surface water shall be drained on separate systems.

Reason: To secure proper drainage and to manage the risk of flooding and pollution.

The applicant can discuss any of the above with Developer Engineer, **Rob Brenton**, by email at wastewaterdeveloperservices@uuplc.co.uk.

Please note, United Utilities are not responsible for advising on rates of discharge to the local watercourse system. This is a matter for discussion with the Lead Local Flood Authority and / or the Environment Agency (if the watercourse is classified as main river).

If the applicant intends to offer wastewater assets forward for adoption by United Utilities, the proposed detailed design will be subject to a technical appraisal by an Adoptions Engineer as we need to be sure that the proposal meets the requirements of Sewers for Adoption and United Utilities' Asset Standards. The detailed layout should be prepared with consideration of what is necessary to secure a development to an adoptable standard. This is important as drainage design can be a key determining factor of site levels and layout. The proposed design should give consideration to long term operability and give United Utilities a cost effective proposal for the life of the assets. Therefore, should this application be approved and the applicant wishes to progress a Section 104 agreement, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 agreement, has been assessed and accepted in writing by United Utilities. Any works carried out prior to the technical assessment being approved is done entirely at the developers own risk and could be subject to change.

Management and Maintenance of Sustainable Drainage Systems

Without effective management and maintenance, sustainable drainage systems can fail or become ineffective. As a provider of wastewater services, we believe we have a duty to advise the Local Planning Authority of this potential risk to ensure the longevity of the surface water drainage system and the service it provides to people. We also wish to minimise the risk of a sustainable drainage system having a detrimental impact on the public sewer network should the two systems interact. We therefore recommend the Local Planning Authority include a condition in their Decision Notice regarding a management and maintenance regime for any sustainable drainage system that is included as part of the proposed development.

For schemes of 10 or more units and other major development, we recommend the Local

Planning Authority consults with the Lead Local Flood Authority regarding the exact wording of any condition. You may find the below a useful example:

Prior to occupation of the development a sustainable drainage management and maintenance plan for the lifetime of the development shall be submitted to the local planning authority and agreed in writing. The sustainable drainage management and maintenance plan shall include as a minimum:

- a. Arrangements for adoption by an appropriate public body or statutory undertaker, or, management and maintenance by a resident's management company; and*
- b. Arrangements for inspection and ongoing maintenance of all elements of the sustainable drainage system to secure the operation of the surface water drainage scheme throughout its lifetime.*

The development shall subsequently be completed, maintained and managed in accordance with the approved plan.

Reason: To ensure that management arrangements are in place for the sustainable drainage system in order to manage the risk of flooding and pollution during the lifetime of the development.

Please note United Utilities cannot provide comment on the management and maintenance of an asset that is owned by a third party management and maintenance company. We would not be involved in the discharge of the management and maintenance condition in these circumstances.

Water Supply

Our water mains may need extending to serve any development on this site and the applicant may be required to pay a contribution.

If the applicant intends to obtain a water supply from United Utilities for the proposed development, we strongly recommend they engage with us at the earliest opportunity. If reinforcement of the water network is required to meet the demand, this could be a significant project and the design and construction period should be accounted for.

To discuss a potential water supply or any of the water comments detailed above, the applicant can contact the team at [**DeveloperServicesWater@uuplc.co.uk**](mailto:DeveloperServicesWater@uuplc.co.uk).

Please note, all internal pipework must comply with current Water Supply (water fittings) Regulations 1999.

United Utilities' Property, Assets and Infrastructure

Where United Utilities' assets exist, the level of cover to the water mains and public sewers must not be compromised either during or after construction.

For advice regarding protection of United Utilities assets, the applicant should contact the teams as follows:

Water assets – DeveloperServicesWater@uuplc.co.uk

Wastewater assets – WastewaterDeveloperServices@uuplc.co.uk

It is the applicant's responsibility to investigate the possibility of any United Utilities' assets potentially impacted by their proposals and to demonstrate the exact relationship between any United Utilities' assets and the proposed development.

A number of providers offer a paid for mapping service including United Utilities. To find out how to purchase a sewer and water plan from United Utilities, please visit the Property Searches website; <https://www.unitedutilities.com/property-searches/>

You can also view the plans for free. To make an appointment to view our sewer records at your local authority please contact them direct, alternatively if you wish to view the water and the sewer records at our Lingley Mere offices based in Warrington please ring [0370 751 0101](tel:03707510101) to book an appointment.

Due to the public sewer transfer in 2011, not all sewers are currently shown on the statutory sewer records and we do not always show private pipes on our plans. If a sewer is discovered during construction; please contact a Building Control Body to discuss the matter further.

Should this planning application be approved the applicant should contact United Utilities regarding a potential water supply or connection to public sewers. Additional information is available on our website <http://www.unitedutilities.com/builders-developers.aspx>

Yours faithfully



United Utilities
Planning, Landscape and Ecology

22.0 APPENDIX I – PROPOSED DRAINAGE LAYOUT

- NOTES:
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
 - ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
 - ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
 - LOCATION AND LEVELS OF EXISTING PUBLIC SEWERS BASED ON WATER AUTHORITY SEWER RECORDS. SEWERS TO BE FULLY SURVEYED, ALL LOCATIONS TO BE CONFIRMED.
 - SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN.
 - ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION GUIDANCE AND WHERE APPLICABLE UNITED UTILITIES DETAILS.
 - THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADOPTABLE HIGHWAYS SHALL BE 150mm.
 - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE CONTRACTOR SHALL ADHERE TO THE CDM REGULATIONS AT ALL TIMES.
 - EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES.
 - ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS).
 - ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
 - WHERE "ULTRA RIB" UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADOPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH PERFORMANCE PIPE ASSOCIATION.
 - A CLASS 5 BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1m OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL. 4.3.4.
 - DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H. 100mm U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.

HEAD RUN	FOUL	S.W.
1 IN 40	1 IN 60	1 IN 100
ELSEWHERE	1 IN 80	1 IN 100
 - ALL LATERAL CONNECTIONS FROM THE PRIVATE NETWORK TO BE 150mm U.P.V.C. PIPES UNLESS STATED OTHERWISE.
 - ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED UPVC UNLESS NOTED OTHERWISE.
 - MINIMUM COVER TO DRAINAGE SOFFIT LEVEL;

LANDSCAPING	TRAFFICED AREAS	HIGHWAYS
0.600m	0.900m	1.200m
 - CLASS 'S' BEDDING AND SURROUND TO BE USED WHERE MINIMUM COVER IS ACHIEVED.
 - WHERE MINIMUM COVER IS NOT ACHIEVED CLASS 'Z' BEDDING AND SURROUND (CONCRETE ENCASMENT) IS TO BE USED.
 - ANY DAMAGE TO THE EXISTING SEWER NETWORK BECAUSE OF THE DEVELOPMENT SITES ACTIVITIES WILL NEED TO BE RECTIFIED AT THE DEVELOPERS EXPENSE.

- EXISTING SURFACE WATER SEWER
- EXISTING FOUL WATER SEWER
- SURFACE WATER SEWER
- SURFACE WATER FLOW CONTROL
- FOUL WATER FLOW
- SITE BOUNDARY
- PRIVATE DITCHES TO CAPTURE DRIVEWAY SURFACE WATER RUN-OFF
- PERMEABLE PAVING TO CAPTURE DRIVEWAY SURFACE WATER RUN-OFF
- LAND DRAIN / FILTER DRAIN
- CARRIER DRAIN FOR LAND DRAINAGE CONVEYANCE

STRATEGY DRAWING TO SHOW PROPOSED OUTFALL LOCATIONS, DISCHARGE RATES AND GENERAL AREAS OF ATTENUATION FOR PLANNING PURPOSES ONLY; ALL DETAILS SUBJECT TO DETAILED DESIGN/ S104 ADOPTION PROCESSES AND THEREFORE SUBJECT TO CHANGE

P10	16.06.26	KF	SCHEME REVISED TO 20 A/L DISCHARGE
P09	13.05.25	KF	OUTFALL LOCATION AMENDED FOLLOWING TREE SURVEY
P08	07.04.25	KF	OUTFALL LOCATION AMENDED
P07	24.03.25	KF	SYSTEM REVISED TO SUIT NEW OUTFALL LOCATION
P06	18.02.25	KF	SYSTEM REVISED TO SUIT NEW OUTFALL LOCATION
P05	28.01.25	KF	MINOR AMENDMENTS
P04	28.01.25	KF	SYSTEM REVISED TO 23 A/L DISCHARGE
P03	27.01.25	NM	CLIMATE CHANGE TO 40% AS PER DECISION NOTICE
P02	22.01.25	KF	LAND DRAINAGE ADDED
P01	20.01.25	NM	FIRST ISSUE
Rev	Date	By	Description
SHAPE ENGINEERING			
Liverpool Innovation Park Edge Lane Liverpool L17 9PL T: 0151 305 0700 www.shapeengineering.co.uk			
Client: MORRIS HOMES			
Project: HIGHMOOR FARM, CLITHEROE			
Title: Drainage Strategy Layout - Masterplan			
Status	Stability	Description	Structural Stage
KF	PLANNING		20.01.26
Designed By	Drawn By	Scale	Project No.
KF	KF	1:500	2955
Sheet No:	2936-SCE-00-00-DR-C-9001	Revision	
P10			

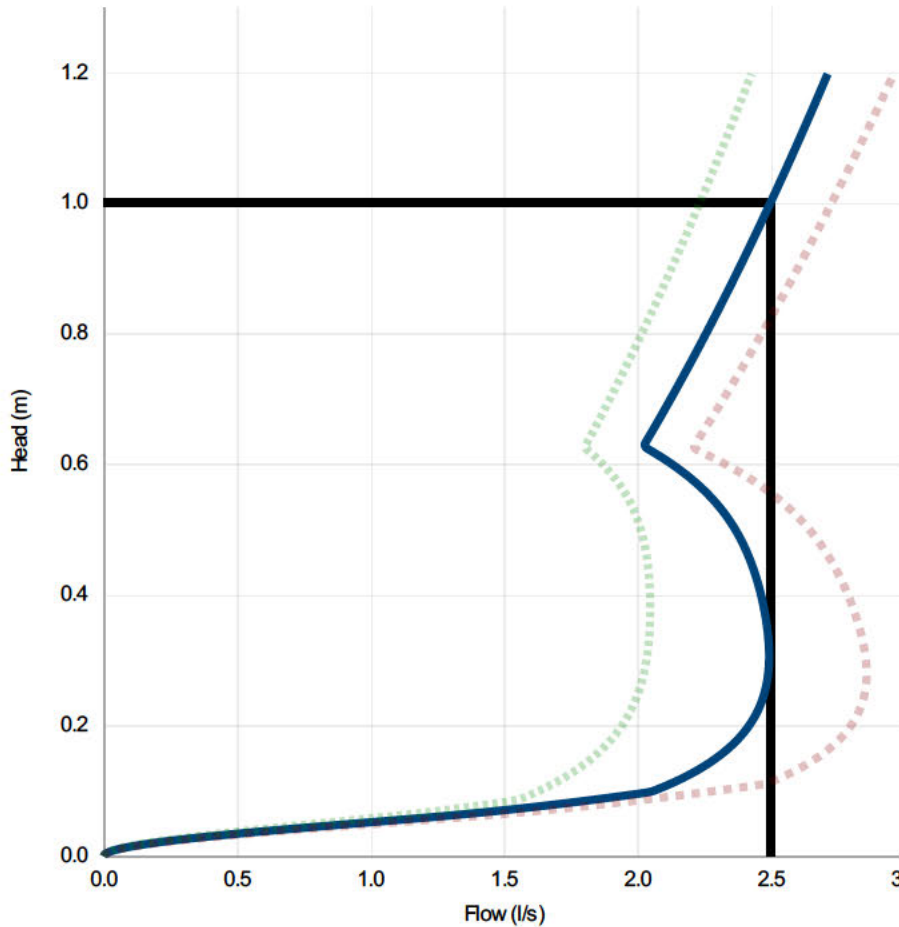
23.0 APPENDIX J – PROPOSED HYDRO-BRAKE® DETAILS

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	1.000	2.500	1.000	2.232	1.000	2.726
Flush-Flo™	0.307	2.492	0.380	2.047	0.279	2.857
Kick-Flo®	0.627	2.020	0.625	1.800	0.624	2.205
Mean Flow		2.192		1.873		2.449



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.034	0.504
0.069	1.468
0.103	2.081
0.138	2.250
0.172	2.360
0.207	2.429
0.241	2.469
0.276	2.488
0.310	2.492
0.345	2.487
0.379	2.473
0.414	2.453
0.448	2.426
0.483	2.389
0.517	2.338
0.552	2.269
0.586	2.175
0.621	2.050
0.655	2.061
0.690	2.109
0.724	2.156
0.759	2.202
0.793	2.247
0.828	2.291
0.862	2.334
0.897	2.376
0.931	2.417
0.966	2.457
1.000	2.497

DESIGN ADVICE



The head/flow characteristics of this SHE-0075-2500-1000-2500 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International

A CRH COMPANY

DATE 16/06/2026 13:20

Site Highmoor Farm

DESIGNER Paige Blundell

Ref 2936

SHE-0075-2500-1000-2500

Hydro-Brake® Optimum

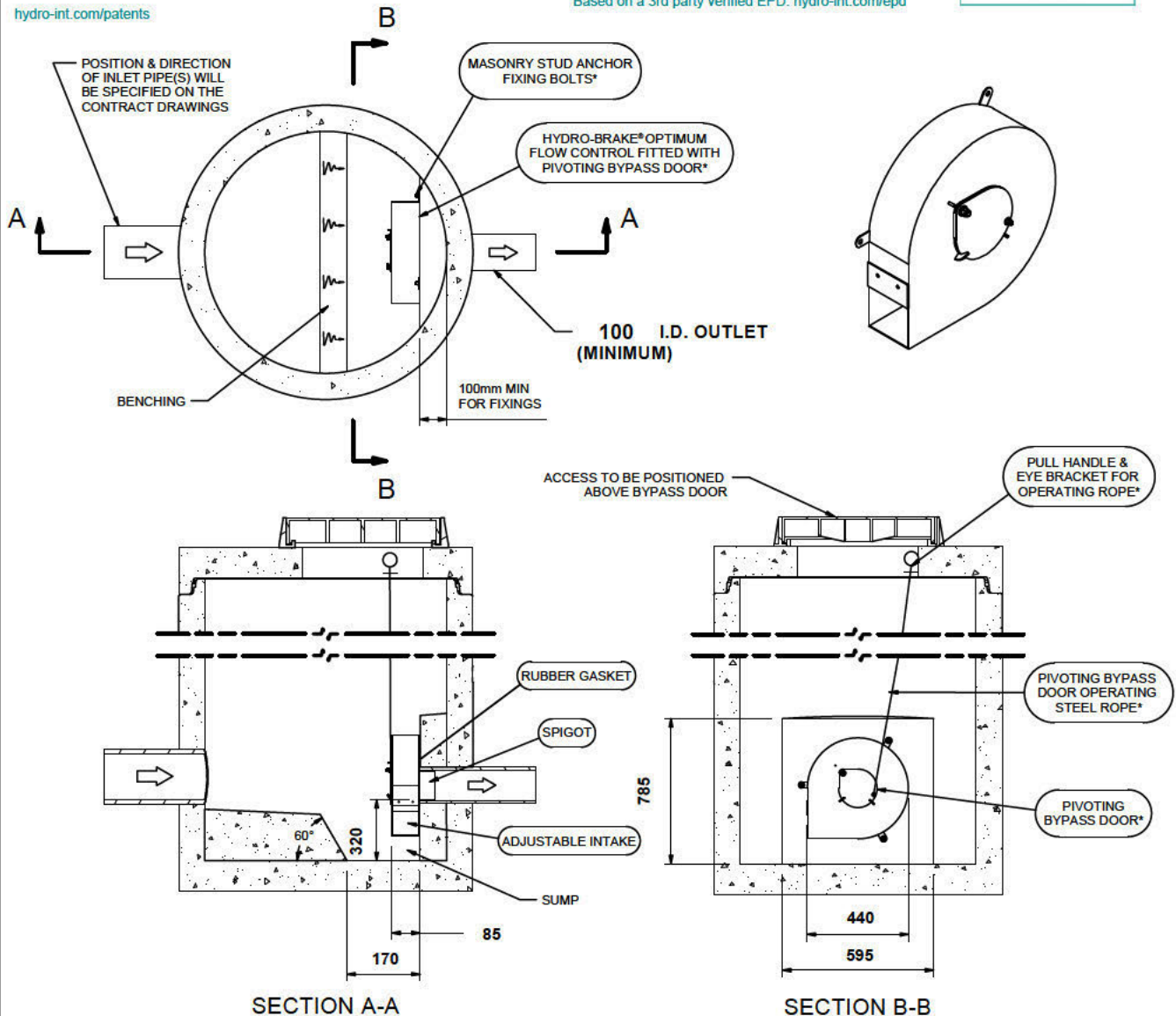
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.000	2.500
Flush-Flo™	0.307	2.492
Kick-Flo®	0.627	2.020
Mean Flow		2.192

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 3 mm Grade 304L stainless steel
 - Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
 - Media blasted for corrosion resistance
 - Variable flow rate post installation via adjustable inlet (if necessary)
 - Indicative Weight: 10 kg
 - Product Carbon Footprint: 44.35 kgCO2e
- Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0075-2500-1000-2500 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	16/06/2026 13:20
SITE	Highmoor Farm
DESIGNER	
REF	2936

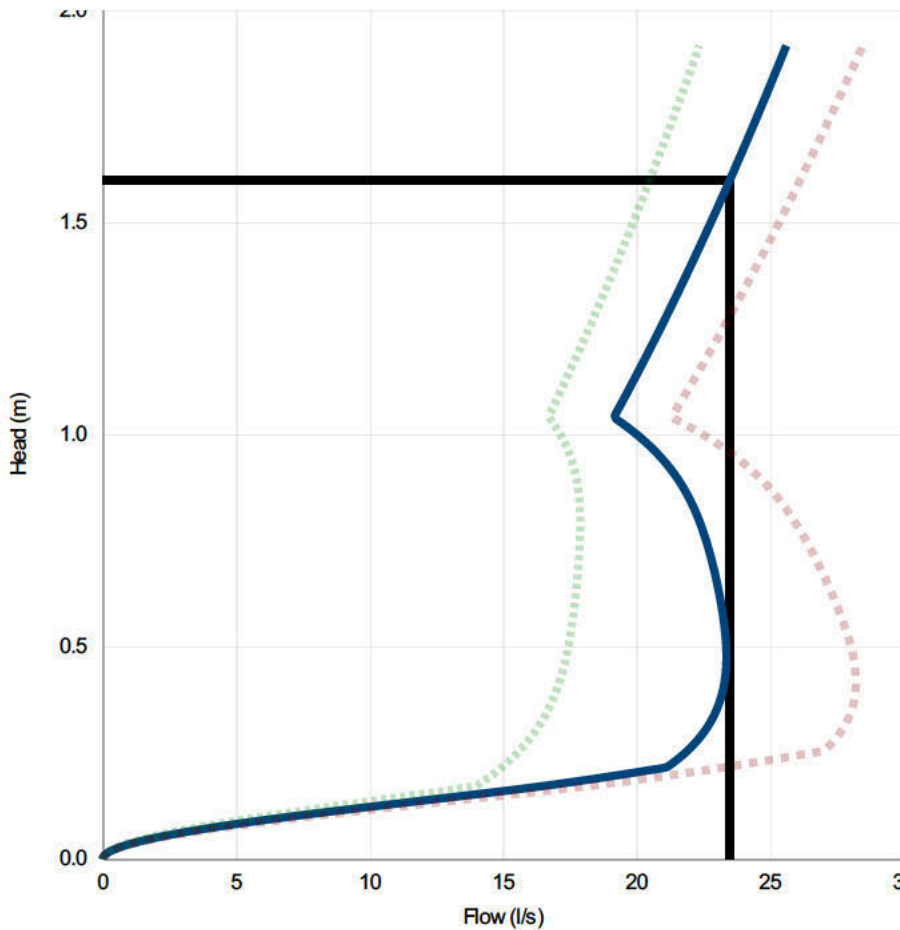
SHE-0075-2500-1000-2500
Hydro-Brake® Optimum

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	1.600	23.500	1.600	20.493	1.600	26.125
Flush-Flo™	0.477	23.362	0.790	17.883	0.417	28.214
Kick-Flo®	1.039	19.129	1.041	16.685	1.039	21.291
Mean Flow		20.224		16.424		23.257



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.055	2.355
0.110	8.318
0.166	15.679
0.221	21.227
0.276	22.220
0.331	22.837
0.386	23.184
0.441	23.338
0.497	23.356
0.552	23.282
0.607	23.147
0.662	22.970
0.717	22.754
0.772	22.487
0.828	22.141
0.883	21.672
0.938	21.027
0.993	20.141
1.048	19.208
1.103	19.682
1.159	20.143
1.214	20.594
1.269	21.034
1.324	21.464
1.379	21.886
1.434	22.298
1.490	22.703
1.545	23.100
1.600	23.490

DESIGN ADVICE



The head/flow characteristics of this SHE-0205-2350-1600-2350 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International
A CRH COMPANY

DATE 16/06/2026 13:42

Site Highmoor Farm

DESIGNER

Ref 2936

SHE-0205-2350-1600-2350

Hydro-Brake® Optimum

Technical Specification

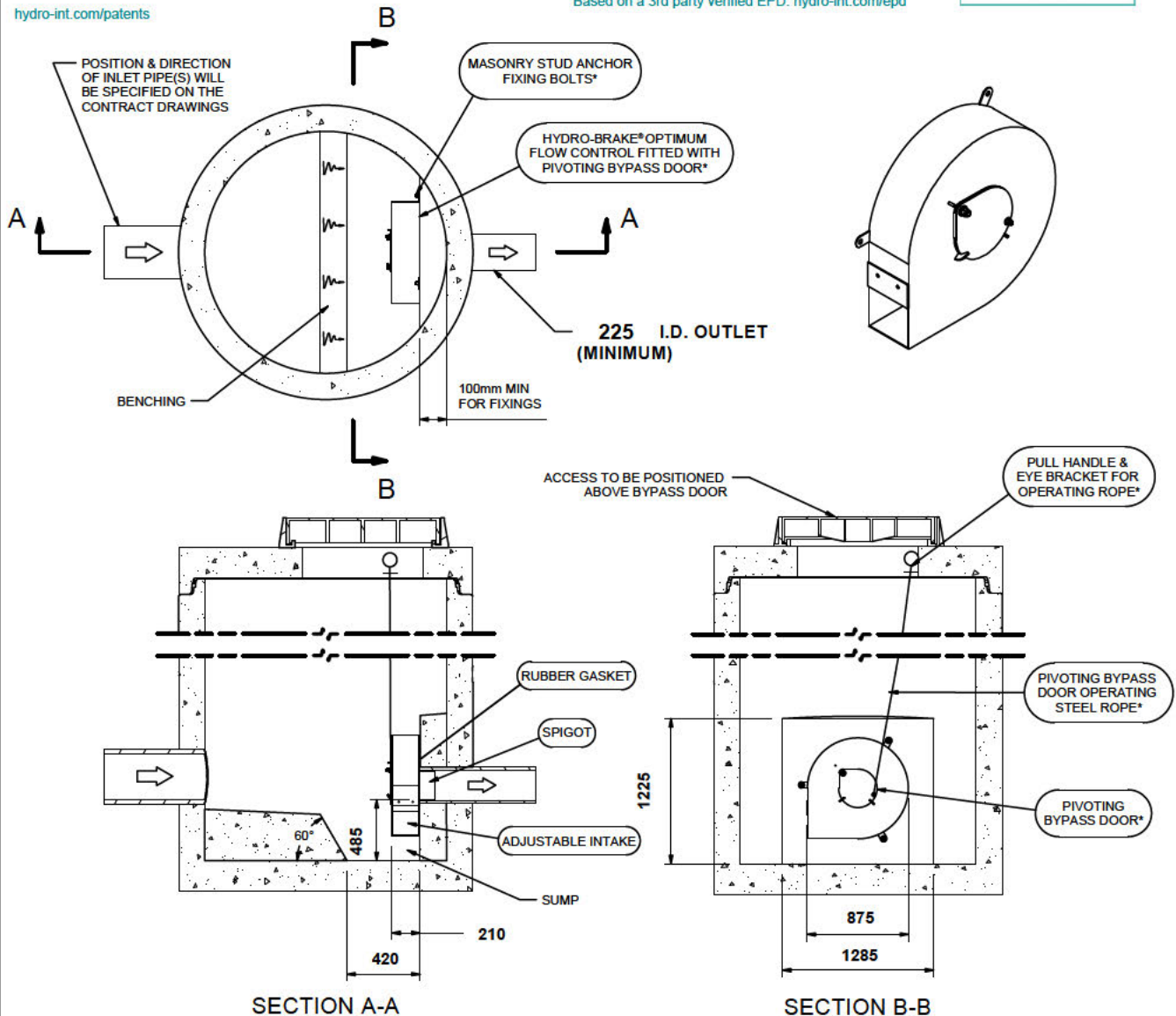
Control Point	Head (m)	Flow (l/s)
Primary Design	1.600	23.500
Flush-Flo™	0.477	23.362
Kick-Flo®	1.039	19.129
Mean Flow		20.224

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 5 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 75 kg
- Product Carbon Footprint: 322.22 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0205-2350-1600-2350 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	16/06/2026 13:42	SHE-0205-2350-1600-2350 Hydro-Brake® Optimum
SITE	Highmoor Farm	
DESIGNER	Paige Blundell	
REF	2936	

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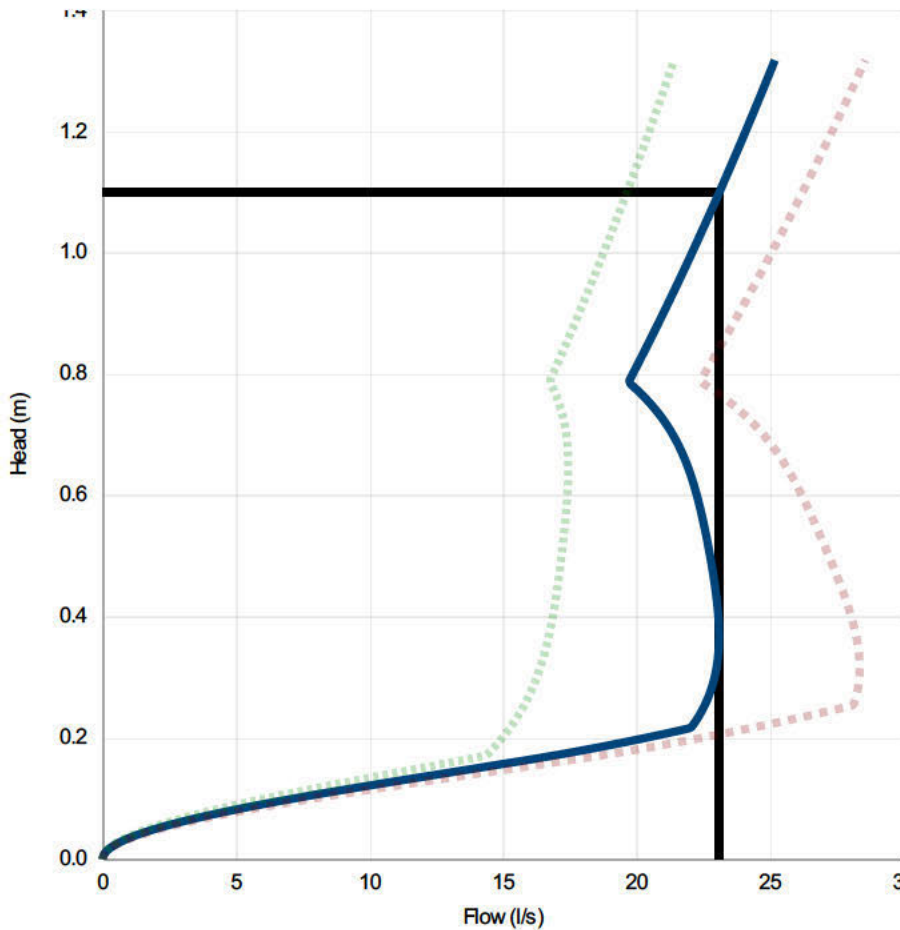
paige.blundell@shape-engineering.co.uk

Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
Primary Design	1.100	23.100	1.100	19.633	1.100	26.211
Flush-Flo™	0.368	23.085	0.646	17.438	0.315	28.354
Kick-Flo®	0.786	19.681	0.786	16.724	0.787	22.361
Mean Flow		19.497		15.440		22.736



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.038	1.168
0.076	4.349
0.114	8.965
0.152	14.259
0.190	19.189
0.228	22.212
0.266	22.669
0.303	22.938
0.341	23.063
0.379	23.082
0.417	23.025
0.455	22.918
0.493	22.778
0.531	22.616
0.569	22.431
0.607	22.211
0.645	21.934
0.683	21.564
0.721	21.057
0.759	20.359
0.797	19.812
0.834	20.254
0.872	20.686
0.910	21.109
0.948	21.523
0.986	21.929
1.024	22.326
1.062	22.716
1.100	23.099

DESIGN ADVICE



The head/flow characteristics of this SHE-0210-2310-1100-2310 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International
A CRH COMPANY

DATE 17/06/2026 09:17

Site Highmoor Farm

DESIGNER [REDACTED]

Ref 2936

SHE-0210-2310-1100-2310

Hydro-Brake® Optimum

Technical Specification

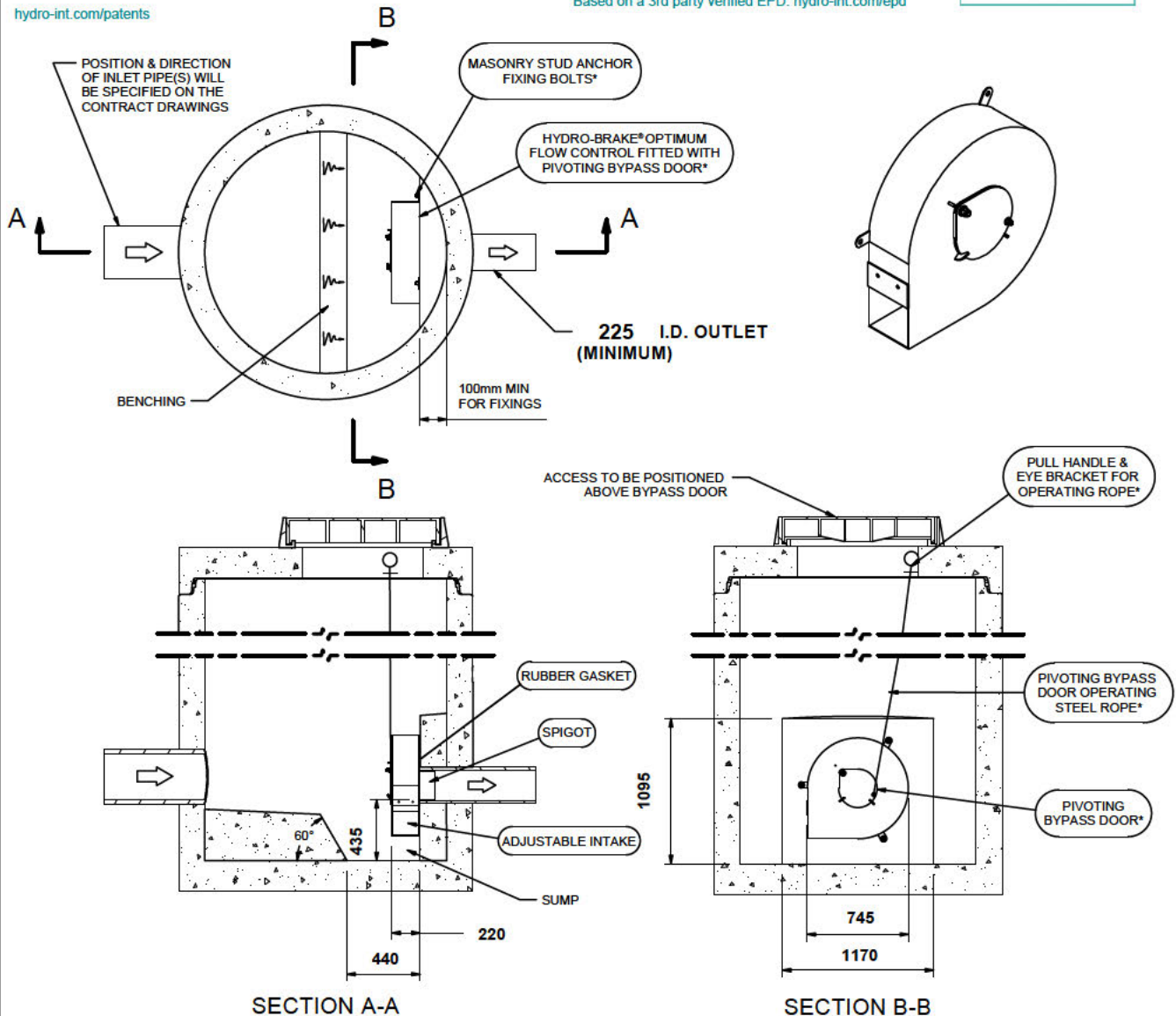
Control Point	Head (m)	Flow (l/s)
Primary Design	1.100	23.100
Flush-Flo™	0.368	23.085
Kick-Flo®	0.786	19.681
Mean Flow		19.497

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 3 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 35 kg
- Product Carbon Footprint: 147.16 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0210-2310-1100-2310 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

**Hydro
International**
A CRH COMPANY

DATE	17/06/2026 09:17	SHE-0210-2310-1100-2310 Hydro-Brake® Optimum
SITE	Highmoor Farm	
DESIGNER	Paige Blundell	
REF	2936	

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paige.blundell@shape-engineering.co.uk

24.0 APPENDIX K – SURFACE WATER CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.650
Ratio-R	0.250	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.175	5.00	98.348	1350	375152.585	441486.944	1.927
2	0.000		98.430	1350	375136.780	441498.650	2.206
3	0.139	5.00	97.904	1350	375104.162	441507.340	2.018
4	0.104	5.00	96.169	1350	375068.503	441517.424	1.417
5	0.079	5.00	95.595	1350	375057.846	441526.304	1.421
6			95.250	1800	375053.313	441541.555	2.344
8	0.015	5.00	95.000	1800	375052.034	441554.621	2.119
9	0.048	5.00	95.534	1800	375061.610	441557.360	2.678
10	0.000	5.00	95.754	1800	375068.966	441564.220	2.923
11	0.000	5.00	95.769	1800	375072.018	441572.775	2.961
12	0.000		95.807	1800	375073.925	441602.403	3.073
13	0.000		95.717	1800	375077.791	441611.401	3.007
14	0.103	5.00	95.747	2100	375083.542	441616.100	3.056
15	0.174	5.00	97.652	1350	375138.538	441578.532	1.500
16	0.129	5.00	96.647	1350	375126.652	441614.270	1.700
17	0.073	5.00	96.241	1800	375119.676	441628.046	3.645
18	0.132	5.00	99.434	1500	375243.470	441619.678	2.100
19	0.109	5.00	98.991	1500	375222.886	441601.681	1.930
20	0.080	5.00	98.791	1500	375212.291	441613.181	1.886
21			98.519	1500	375204.772	441617.142	1.699
22	0.159	5.00	98.151	1500	375190.039	441618.938	2.000
23	0.141	5.00	96.700	1500	375154.321	441658.811	2.690
24	0.077	5.00	96.405	2100	375145.843	441651.283	3.896
25	0.120	5.00	95.449	1800	375103.444	441699.849	3.101
26	0.059	5.00	95.383	1800	375082.262	441724.737	3.117
27	0.069	5.00	95.040	1800	375086.728	441728.889	2.789
28	0.158	5.00	97.516	1350	375209.415	441683.185	1.500
29	0.109	5.00	96.591	1350	375192.602	441699.519	1.500
30	0.102	5.00	95.670	1350	375163.952	441724.684	1.532
31	0.063	5.00	94.800	2700	375127.586	441766.871	2.688
31_OUT			93.250	1350	375107.326	441785.438	1.320
32	0.034	5.00	93.250	1350	375100.737	441807.482	1.363
33			93.600	2100	375097.946	441817.816	1.820
33_OUT			93.000		375099.128	441840.563	2.287
35	0.000		97.300	1350	375188.122	441690.691	1.695
34	0.000	5.00	97.150	1350	375180.394	441683.011	1.500

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)	Design Flow (l/s)
1.000	1	2	19.668	0.600	96.421	96.224	0.197	100.0	300	5.21	50.0	20.0
1.001	2	3	33.756	0.600	96.224	95.886	0.338	100.0	300	5.57	50.0	
1.002	3	4	37.057	0.600	95.886	94.827	1.059	35.0	300	5.80	49.6	
1.003	4	5	13.872	0.600	94.752	94.174	0.578	24.0	375	5.86	49.4	
1.004	5	6	15.910	0.600	94.174	93.581	0.593	26.8	375	5.94	49.2	
1.005	6	8	13.128	0.600	92.906	92.881	0.025	525.0	750	6.12	48.6	
1.006	8	9	9.960	0.600	92.881	92.856	0.025	398.4	750	6.24	48.3	
1.007	9	10	10.058	0.600	92.856	92.831	0.025	402.3	750	6.36	47.9	
1.008	10	11	9.083	0.600	92.831	92.808	0.023	400.0	750	6.46	47.6	
1.009	11	12	29.689	0.600	92.808	92.734	0.074	400.0	750	6.82	46.6	
1.010	12	13	9.793	0.600	92.734	92.710	0.024	400.0	750	6.94	46.3	
1.011	13	14	7.427	0.600	92.710	92.691	0.019	400.0	750	7.03	46.0	
1.012	14	17	38.057	0.600	92.691	92.596	0.095	400.0	750	7.48	44.9	
2.000	15	16	37.663	0.600	96.152	94.947	1.205	31.2	300	5.22	50.0	
2.001	16	17	15.442	0.600	94.947	94.638	0.309	50.0	300	5.34	50.0	
1.013	17	24	34.995	0.600	92.596	92.509	0.087	400.0	750	7.90	43.8	20.0
3.000	18	19	27.342	0.600	97.334	97.061	0.273	100.0	300	5.29	50.0	
3.001	19	20	15.637	0.600	97.061	96.905	0.156	100.0	300	5.46	50.0	
3.002	20	21	8.499	0.600	96.905	96.820	0.085	100.0	300	5.55	50.0	
3.003	21	22	14.842	0.600	96.820	96.226	0.594	25.0	300	5.62	50.0	
3.004	22	23	53.532	0.600	96.151	94.010	2.141	25.0	375	5.87	49.4	
3.005	23	24	11.338	0.600	94.010	93.443	0.567	20.0	375	5.92	49.3	
1.014	24	25	64.470	0.600	92.509	92.348	0.161	400.0	750	8.67	0.0	
1.015	25	26	32.682	0.600	92.348	92.266	0.082	400.0	750	9.06	41.3	

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	1.572	111.1	31.6	1.627	1.906	0.175	0.0	109	1.361
1.001	1.572	111.1	31.6	1.906	1.718	0.175	0.0	109	1.361
1.002	2.666	188.5	56.3	1.718	1.042	0.314	0.0	112	2.339
1.003	3.711	409.9	74.7	1.042	1.046	0.418	0.0	107	2.843
1.004	3.509	387.6	88.4	1.046	1.294	0.497	0.0	121	2.866
1.005	1.214	536.4	87.3	1.594	1.369	0.497	0.0	203	0.904
1.006	1.396	616.5	89.3	1.369	1.928	0.512	0.0	191	1.007
1.007	1.389	613.5	97.0	1.928	2.173	0.560	0.0	200	1.027
1.008	1.393	615.3	96.3	2.173	2.211	0.560	0.0	199	1.028
1.009	1.393	615.3	94.3	2.211	2.323	0.560	0.0	197	1.022
1.010	1.393	615.3	93.6	2.323	2.257	0.560	0.0	196	1.020
1.011	1.393	615.3	93.2	2.257	2.306	0.560	0.0	195	1.018
1.012	1.393	615.3	107.5	2.306	2.895	0.663	0.0	211	1.060
2.000	2.822	199.5	31.4	1.200	1.400	0.174	0.0	80	2.077
2.001	2.229	157.6	54.8	1.400	1.303	0.303	0.0	122	2.032
1.013	1.393	615.3	164.7	2.895	3.146	1.039	0.0	263	1.188
3.000	1.572	111.1	23.9	1.800	1.630	0.132	0.0	94	1.260
3.001	1.572	111.1	43.5	1.630	1.586	0.241	0.0	130	1.480
3.002	1.572	111.1	58.0	1.586	1.399	0.321	0.0	154	1.588
3.003	3.157	223.1	58.0	1.399	1.625	0.321	0.0	104	2.668
3.004	3.636	401.6	20.0	1.625	2.315	0.480	0.0	56	1.922
3.005	4.067	449.2	110.5	2.315	2.587	0.621	0.0	126	3.392
1.014	1.393	615.3	0.0	3.146	2.351	1.737	0.0	0	0.000
1.015	1.393	615.3	277.3	2.351	2.367	1.857	0.0	353	1.358

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)	Design Flow (l/s)
1.016	26	27	6.098	0.600	92.266	92.251	0.015	400.0	750	9.14	41.2	40.0
1.017	27	31	55.785	0.600	92.251	92.112	0.139	401.3	750	9.80	0.0	
4.000	28	29	23.441	0.600	96.016	95.091	0.925	25.3	300	5.12	50.0	
4.001	29	30	38.133	0.600	95.091	94.138	0.953	40.0	300	5.48	50.0	
4.002	30	31	55.698	0.600	94.138	92.412	1.726	32.3	300	5.82	49.6	
1.018	31	31_OUT	27.481	0.600	92.112	92.000	0.112	245.4	300	10.26	39.1	
6.000	32	33	10.704	0.600	91.887	91.780	0.107	100.0	300	5.11	50.0	
6.001	33	33_OUT	16.000	0.600	91.780	90.713	1.067	15.0	300	5.18	50.0	
7.000	34	35	10.895	0.600	95.650	95.605	0.045	242.1	300	5.18	50.0	
7.001	35	29	9.900	0.600	95.605	95.091	0.514	19.3	300	5.23	50.0	

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)
1.016	1.393	615.3	285.1	2.367	2.039	1.916	0.0	359	1.368
1.017	1.390	614.3	0.0	2.039	1.938	1.985	0.0	0	0.000
4.000	3.135	221.6	28.6	1.200	1.200	0.158	0.0	72	2.183
4.001	2.493	176.2	48.2	1.200	1.232	0.267	0.0	107	2.136
4.002	2.777	196.3	66.1	1.232	2.088	0.369	0.0	120	2.515
1.018	0.999	70.6	40.0	2.388	0.950	2.417	0.0	162	1.030
6.000	1.572	111.1	6.1	1.063	1.520	0.034	0.0	48	0.857
6.001	4.079	288.3	6.1	1.520	1.987	0.034	0.0	30	1.680
7.000	1.006	71.1	0.0	1.200	1.395	0.000	0.0	0	0.000
7.001	3.598	254.4	0.0	1.395	1.200	0.000	0.0	0	0.000

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	0.0
M5-60 (mm)	19.000	Starting Level (m)	
Ratio-R	0.250	Check Discharge Rate(s)	x
Summer CV	1.000	Check Discharge Volume	✓
Winter CV	1.000	100 year 360 minute (m³)	
Analysis Speed	Detailed		

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 %)
30	40	10	0
100	40	10	0

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	2.452	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	
CWI		Runoff Volume (m³)	

Node 33 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	91.780	Product Number	CTL-SHE-0210-2310-1100-2310
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	23.1	Min Node Diameter (mm)	1800

Node 31 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	92.112	Product Number	CTL-SHE-0205-2350-1600-2350
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	23.5	Min Node Diameter (mm)	1800

Node 32 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	17.210
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	91.887	Main Channel Slope (1:X)	400.0
Safety Factor	2.0	Time to half empty (mins)	0	Main Channel n	0.250

Inlets

31_OUT

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	165.0	163.0	1.400	336.0	547.7

Node 31 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	92.112
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	1300.0	0.0	1.600	1300.0	0.0	1.601	0.0	0.0

Node 25 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	92.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	255

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	150.0	150.0	1.600	150.0	202.1	1.601	0.0	202.1

Node 12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	93.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	135

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	274.0	215.0	0.800	274.0	277.4	0.801	0.0	277.4

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	96.664	0.243	95.5	0.3476	0.0000	OK
15 minute summer	2	10	96.454	0.230	94.9	0.3286	0.0000	OK
15 minute summer	3	11	96.128	0.242	169.4	0.3458	0.0000	OK
15 minute summer	4	10	94.982	0.230	223.0	0.3293	0.0000	OK
15 minute summer	5	10	94.448	0.274	265.4	0.3923	0.0000	OK
15 minute summer	6	11	93.440	0.534	265.1	1.3586	0.0000	OK
15 minute summer	8	11	93.419	0.538	267.2	1.3695	0.0000	OK
1440 minute summer	9	1050	93.416	0.560	32.5	1.4260	0.0000	OK
1440 minute summer	10	1050	93.416	0.585	32.3	1.4896	0.0000	OK
1440 minute summer	11	1050	93.416	0.608	32.3	1.5481	0.0000	OK
1440 minute summer	12	1050	93.416	0.682	32.2	32.1356	0.0000	OK
1440 minute summer	13	1050	93.416	0.706	31.8	1.7975	0.0000	OK
1440 minute summer	14	1050	93.416	0.725	37.4	2.5124	0.0000	OK
15 minute summer	15	10	96.296	0.144	94.9	0.2061	0.0000	OK
15 minute summer	16	11	95.381	0.434	164.9	0.6212	0.0000	SURCHARGED
1440 minute summer	17	1050	93.416	0.820	57.7	2.0876	0.0000	SURCHARGED
15 minute summer	18	11	97.859	0.525	72.0	0.9281	0.0000	SURCHARGED
15 minute summer	19	11	97.723	0.662	126.5	1.1691	0.0000	SURCHARGED
15 minute summer	20	11	97.426	0.521	168.9	0.9213	0.0000	SURCHARGED
15 minute summer	21	11	97.054	0.234	169.3	0.4140	0.0000	OK
15 minute summer	22	11	96.363	0.212	252.4	0.3752	0.0000	OK
15 minute summer	23	11	94.324	0.314	326.2	0.5544	0.0000	OK
1440 minute summer	24	1080	93.416	0.907	95.7	3.1428	0.0000	SURCHARGED
1440 minute summer	25	1050	93.416	1.068	99.5	90.5844	0.0000	SURCHARGED
1440 minute summer	26	1050	93.416	1.150	89.1	2.9268	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	1	1.000	2	94.9	1.594	0.854	1.1700	
15 minute summer	2	1.001	3	93.5	1.582	0.842	2.0010	
15 minute summer	3	1.002	4	168.1	2.904	0.892	2.1416	
15 minute summer	4	1.003	5	222.7	2.833	0.543	1.0907	
15 minute summer	5	1.004	6	265.1	3.413	0.684	1.2324	
15 minute summer	6	1.005	8	259.4	0.928	0.484	4.4203	
15 minute summer	8	1.006	9	260.8	0.934	0.423	3.3819	
1440 minute summer	9	1.007	10	32.3	0.657	0.053	3.6287	
1440 minute summer	10	1.008	11	32.3	0.694	0.052	3.4118	
1440 minute summer	11	1.009	12	32.2	0.659	0.052	11.9220	
1440 minute summer	12	1.010	13	31.8	0.611	0.052	4.1648	
1440 minute summer	13	1.011	14	31.4	0.628	0.051	3.2155	
1440 minute summer	14	1.012	17	36.0	0.620	0.058	16.6695	
15 minute summer	15	2.000	16	94.5	1.696	0.474	1.9554	
15 minute summer	16	2.001	17	160.7	2.282	1.020	1.0770	
1440 minute summer	17	1.013	24	55.4	0.667	0.090	15.4020	
15 minute summer	18	3.000	19	69.7	1.072	0.627	1.9254	
15 minute summer	19	3.001	20	127.2	1.806	1.145	1.1011	
15 minute summer	20	3.002	21	169.3	2.463	1.524	0.5501	
15 minute summer	21	3.003	22	169.5	3.156	0.760	0.7943	
15 minute summer	22	3.004	23	252.8	3.061	0.629	4.3590	
15 minute summer	23	3.005	24	327.1	3.798	0.728	0.9672	
1440 minute summer	24	1.014	25	92.5	0.808	0.150	28.3746	
1440 minute summer	25	1.015	26	85.7	0.708	0.139	14.3840	
1440 minute summer	26	1.016	27	88.1	0.718	0.143	2.6839	

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	27	1050	93.416	1.165	92.1	2.9648	0.0000	SURCHARGED
15 minute summer	28	10	96.145	0.129	86.2	0.1840	0.0000	OK
15 minute summer	29	10	95.307	0.216	145.4	0.3091	0.0000	OK
15 minute summer	30	10	94.403	0.265	199.8	0.3792	0.0000	OK
1440 minute summer	31	1080	93.416	1.304	115.9	1617.7590	0.0000	SURCHARGED
1440 minute winter	31_OUT	810	92.169	0.239	23.4	0.3416	0.0000	OK
1440 minute winter	32	810	92.168	0.281	23.7	0.4025	0.0000	OK
1440 minute winter	33	810	92.161	0.381	23.0	1.3208	0.0000	SURCHARGED
15 minute summer	33_OUT	1	91.713	1.000	22.3	0.0000	0.0000	OK
15 minute summer	35	1	95.605	0.000	0.0	0.0000	0.0000	OK
15 minute summer	34	1	95.650	0.000	0.0	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)
1440 minute summer	27	1.017	31	90.8	0.979	0.148	24.5521	
15 minute summer	28	4.000	29	86.0	2.054	0.388	0.9744	
15 minute summer	29	4.001	30	144.1	2.399	0.818	2.2911	
15 minute summer	30	4.002	31	198.4	3.095	1.011	3.7950	
1440 minute summer	31	Hydro-Brake®	31_OUT	23.4				
1440 minute winter	31_OUT	Flow through Pond	32	22.5	0.022	0.009	47.0945	
1440 minute winter	32	6.000	33	23.0	0.565	0.207	0.7441	
1440 minute winter	33	6.001	33_OUT	23.0	0.479	0.080	0.6377	1788.0
15 minute summer	35	7.001	29	0.0	0.000	0.000	0.2688	
15 minute summer	34	7.000	35	0.0	0.000	0.000	0.0000	

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	97.336	0.915	123.0	1.3089	0.0000	SURCHARGED
15 minute summer	2	11	97.045	0.821	115.6	1.1744	0.0000	SURCHARGED
15 minute summer	3	11	96.604	0.718	207.1	1.0281	0.0000	SURCHARGED
15 minute summer	4	11	95.029	0.277	276.0	0.3960	0.0000	OK
15 minute summer	5	11	94.516	0.342	328.9	0.4899	0.0000	OK
960 minute winter	6	915	93.957	1.051	32.1	2.6742	0.0000	SURCHARGED
960 minute winter	8	915	93.957	1.076	32.7	2.7378	0.0000	SURCHARGED
960 minute winter	9	915	93.957	1.101	35.1	2.8014	0.0000	SURCHARGED
960 minute winter	10	915	93.957	1.126	34.8	2.8650	0.0000	SURCHARGED
960 minute winter	11	915	93.957	1.149	34.3	2.9236	0.0000	SURCHARGED
960 minute winter	12	915	93.957	1.223	33.4	174.1917	0.0000	SURCHARGED
960 minute winter	13	915	93.957	1.247	32.5	3.1729	0.0000	SURCHARGED
960 minute winter	14	915	93.957	1.266	38.2	4.3845	0.0000	SURCHARGED
15 minute summer	15	10	96.351	0.199	122.3	0.2841	0.0000	OK
15 minute summer	16	11	95.689	0.742	210.9	1.0616	0.0000	SURCHARGED
960 minute winter	17	915	93.957	1.361	59.9	3.4630	0.0000	SURCHARGED
15 minute summer	18	11	98.489	1.155	92.7	2.0400	0.0000	SURCHARGED
15 minute summer	19	11	98.275	1.214	162.7	2.1447	0.0000	SURCHARGED
15 minute summer	20	11	97.814	0.909	212.1	1.6063	0.0000	SURCHARGED
15 minute summer	21	11	97.267	0.447	210.5	0.7906	0.0000	SURCHARGED
15 minute summer	22	11	96.408	0.257	315.2	0.4550	0.0000	OK
15 minute summer	23	11	94.614	0.604	409.3	1.0673	0.0000	SURCHARGED
960 minute winter	24	915	93.957	1.448	102.0	5.0147	0.0000	SURCHARGED
960 minute winter	25	915	93.956	1.608	106.7	168.9652	0.0000	SURCHARGED
960 minute winter	26	915	93.956	1.690	97.2	4.3020	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	1	1.000	2	115.6	1.642	1.040	1.3850	
15 minute summer	2	1.001	3	113.9	1.618	1.025	2.3771	
15 minute summer	3	1.002	4	206.1	2.928	1.094	2.6094	
15 minute summer	4	1.003	5	275.8	2.876	0.673	1.3370	
15 minute summer	5	1.004	6	328.3	3.487	0.847	1.4876	
960 minute winter	6	1.005	8	31.7	0.597	0.059	5.7779	
960 minute winter	8	1.006	9	32.1	0.608	0.052	4.3836	
960 minute winter	9	1.007	10	34.8	0.662	0.057	4.4267	
960 minute winter	10	1.008	11	34.3	0.696	0.056	3.9976	
960 minute winter	11	1.009	12	33.4	0.666	0.054	13.0667	
960 minute winter	12	1.010	13	32.5	0.628	0.053	4.3101	
960 minute winter	13	1.011	14	31.9	0.649	0.052	3.2688	
960 minute winter	14	1.012	17	36.8	0.626	0.060	16.7497	
15 minute summer	15	2.000	16	120.3	1.830	0.603	2.2578	
15 minute summer	16	2.001	17	207.6	2.948	1.317	1.0764	
960 minute winter	17	1.013	24	57.5	0.691	0.093	15.4020	
15 minute summer	18	3.000	19	86.9	1.234	0.782	1.9254	
15 minute summer	19	3.001	20	158.3	2.249	1.425	1.1011	
15 minute summer	20	3.002	21	210.5	2.990	1.895	0.5985	
15 minute summer	21	3.003	22	208.5	3.258	0.934	0.9459	
15 minute summer	22	3.004	23	314.7	3.043	0.784	5.1114	
15 minute summer	23	3.005	24	407.1	3.863	0.906	1.1142	
960 minute winter	24	1.014	25	98.9	0.831	0.161	28.3746	
960 minute winter	25	1.015	26	93.4	0.741	0.152	14.3840	
960 minute winter	26	1.016	27	97.0	0.773	0.158	2.6839	

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	27	915	93.956	1.705	101.5	4.3400	0.0000	SURCHARGED
30 minute summer	28	19	96.220	0.204	108.5	0.2925	0.0000	OK
15 minute summer	29	12	96.022	0.931	185.6	1.3321	0.0000	SURCHARGED
30 minute summer	30	19	95.089	0.951	220.3	1.3605	0.0000	SURCHARGED
960 minute winter	31	915	93.956	1.844	129.2	1987.1770	0.0000	SURCHARGED
960 minute winter	31_OUT	990	92.277	0.347	24.2	0.4959	0.0000	OK
960 minute winter	32	990	92.276	0.389	23.9	0.5572	0.0000	SURCHARGED
960 minute winter	33	990	92.269	0.489	23.1	1.6934	0.0000	SURCHARGED
15 minute summer	33_OUT	1	91.713	1.000	22.6	0.0000	0.0000	OK
15 minute summer	35	12	96.037	0.432	32.1	0.6175	0.0000	SURCHARGED
15 minute summer	34	12	96.022	0.372	5.4	0.5323	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)
960 minute winter	27	1.017	31	101.2	1.081	0.165	24.5521	
30 minute summer	28	4.000	29	107.1	2.081	0.483	1.4246	
15 minute summer	29	4.001	30	163.0	2.424	0.925	2.6853	
30 minute summer	30	4.002	31	219.0	3.110	1.116	3.9211	
960 minute winter	31	Hydro-Brake®	31_OUT	24.2				
960 minute winter	31_OUT	Flow through Pond	32	23.5	0.022	0.009	69.0463	
960 minute winter	32	6.000	33	23.1	0.475	0.208	0.7538	
960 minute winter	33	6.001	33_OUT	23.1	0.480	0.080	0.6378	1391.6
15 minute summer	35	7.001	29	43.0	0.688	0.169	0.6972	
15 minute summer	34	7.000	35	15.3	0.433	0.215	0.7672	

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.250	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
3	0.027	5.00	93.850	1500	375045.847	441556.864	2.659
2	0.000		92.750	1500	375016.566	441561.743	1.680
1			92.570	1200	375012.521	441564.720	1.850

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)
100.000	3	2	29.685	0.600	91.191	91.070	0.121	245.0	450	5.38	50.0
100.001	2	1	5.022	0.600	91.070	90.720	0.350	14.3	225	5.41	50.0

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)
100.000	1.294	205.8	3.7	2.209	1.230	0.027	0.0	41	0.501
100.001	3.472	138.0	3.7	1.455	1.625	0.027	0.0	25	1.511

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	0.0
M5-60 (mm)	19.000	Starting Level (m)	
Ratio-R	0.250	Check Discharge Rate(s)	✓
Summer CV	1.000	Check Discharge Volume	✓
Winter CV	1.000	100 year 360 minute (m³)	
Analysis Speed	Detailed		

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 %)
30	40	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m ³)	

Node 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	91.070	Product Number	CTL-SHE-0075-2500-1000-2500
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.5	Min Node Diameter (mm)	1200

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	3	44	91.507	0.316	10.4	0.5587	0.0000	OK
60 minute summer	2	43	91.508	0.438	7.7	0.7748	0.0000	SURCHARGED
15 minute winter	1	15	90.741	0.021	2.5	0.0000	0.0000	OK

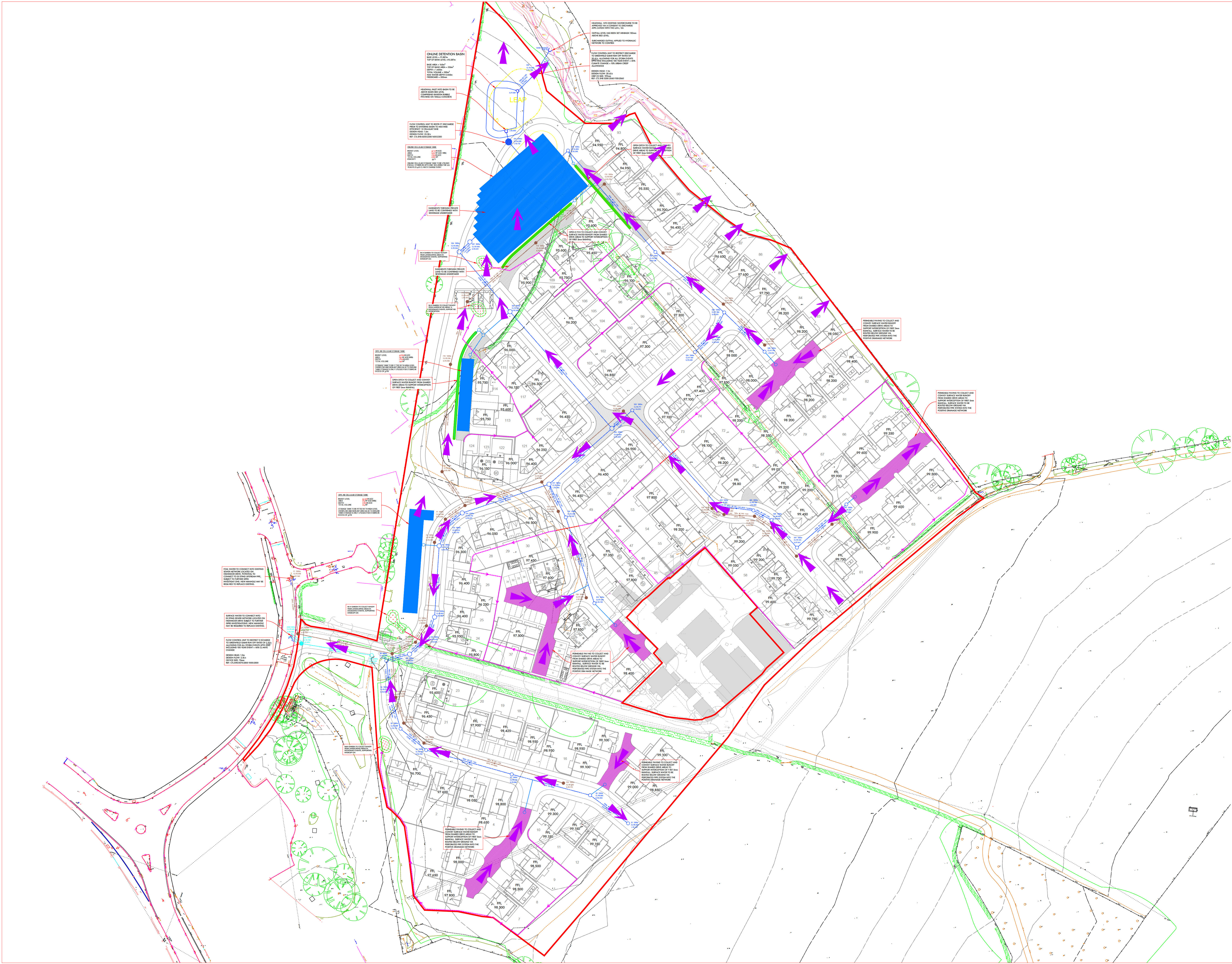
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	3	100.000	2	7.7	0.381	0.038	4.0868	
60 minute summer	2	100.001	1	2.5	1.306	0.018	0.0096	11.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	3	82	92.126	0.935	9.6	1.6525	0.0000	SURCHARGED
120 minute summer	2	82	92.127	1.057	7.1	1.8682	0.0000	SURCHARGED
120 minute summer	1	82	90.741	0.021	2.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	3	100.000	2	7.1	0.373	0.034	4.7034	
120 minute summer	2	100.001	1	2.5	1.312	0.018	0.0097	19.1

25.0 APPENDIX L – FLOOD EXCEEDANCE PLAN



- NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
 2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
 3. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
 4. LOCATION AND LEVELS OF EXISTING PUBLIC SEWERS BASED ON WATER AUTHORITY SEWER RECORDS. SEWERS TO BE FULLY SURVEYED, ALL LOCATIONS TO BE CONFIRMED.
 5. SETTING OUT SHALL BE UNDERTAKEN USING ONLY THE INFORMATION GIVEN.
 6. ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION GUIDANCE AND WHERE APPLICABLE UNITED UTILITIES DETAILS
 7. THE MINIMUM GRAVITY PIPE DIAMETER UNDER ADAPTABLE HIGHWAYS SHALL BE 150mm
 8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION GIVEN WITH REGARDS TO EXISTING SERVICES AND DRAINAGE CONNECTIONS ETC. PRIOR TO COMMENCING THE WORKS. THE CONTRACTOR SHALL ADHERE TO THE CDM REGULATIONS AT ALL TIMES
 9. EXISTING FLOWS IN WATERCOURSES, SEWERS AND LAND DRAINS SHALL BE MAINTAINED AT ALL TIMES
 10. ALL MATERIALS TO BEAR THE RELEVANT B.S. KITEMARK AND COMPLY FULLY WITH THE SPECIFICATIONS. ALL CONCRETE & CONCRETE PRODUCTS MUST USE SULPHATE RESISTANT CEMENT (UNLESS THE SITE INVESTIGATION REPORT PROVES THAT SULPHATE ATTACK FROM SOILS AND GROUNDWATER WILL NOT OCCUR TO WITHSTAND A CLASS
 11. ALL OPENING NOTICES ETC. AS REQUIRED UNDER HIGHWAYS ACTS ETC. ARE TO BE OBTAINED PRIOR TO COMMENCEMENT OF WORKS. ALL WORKS ARE TO BE INSPECTED BY L.A., NHBC OR THE NETWORK OPERATOR AS APPLICABLE.
 12. WHERE "ULTRA RIB" UPVC PIPES (OR SIMILAR APPROVED) ARE USED IN ADAPTABLE DRAINAGE THEY SHALL STILL BE HANDLED AND LAID IN ACCORDANCE WITH THE SPECIFICATION AND GUIDANCE ISSUED BY THE HIGH-PERFORMANCE PIPE ASSOCIATION.
 13. A CLASS S BED AND SURROUND MUST BE USED FOR SUCH PIPES. TRENCH BACKFILL IN HIGHWAYS TO WITHIN 1m OF HIGHWAY SHALL, AS DIRECTED BY THE HIGHWAY AUTHORITY BE A SUITABLE GRANULAR MATERIAL. ALL IN ACCORDANCE WITH SEWERS FOR ADOPTION CL. 4.3.4.
 14. DOMESTIC DRAINAGE SHALL BE TO BUILDING REGULATIONS APPROVED DOCUMENT H. 100mm U.P.V.C. PIPES LAID TO THE FOLLOWING MINIMUM FALLS UNLESS OTHERWISE SHOWN.

	FOUL	S.W.
1 IN 40	1 IN 40	1 IN 60
ELSEWHERE	1 IN 80	1 IN 100
 16. ALL LATERAL CONNECTIONS FROM THE PRIVATE NETWORK TO BE 150mm U.P.V.C PIPES UNLESS STATED OTHERWISE
 17. ALL GULLY CONNECTIONS TO BE 150mm VITRIFIED CLAY UNLESS NOTED OTHERWISE
 18. MINIMUM COVER TO DRAINAGE SOFFIT LEVEL:

	LANDSCAPING	TRAFFICKED AREAS	HIGHWAYS
	0.600m	0.900m	1.200m
 19. CLASS 'S' BEDDING AND SURROUND TO BE USED WHERE MINIMUM COVER IS ACHIEVED.
 20. WHERE MINIMUM COVER IS NOT ACHIEVED CLASS 'Z' BEDDING AND SURROUND (CONCRETE ENCASMENT) IS TO BE USED.
 21. ANY DAMAGE TO THE EXISTING SEWER NETWORK BECAUSE OF THE DEVELOPMENT SITES ACTIVITIES WILL NEED TO BE RECTIFIED AT THE DEVELOPERS EXPENSE.

OVERLAND FLOOD EXCEEDANCE ROUTE
ADOPTABLE SURFACE WATER SEWER

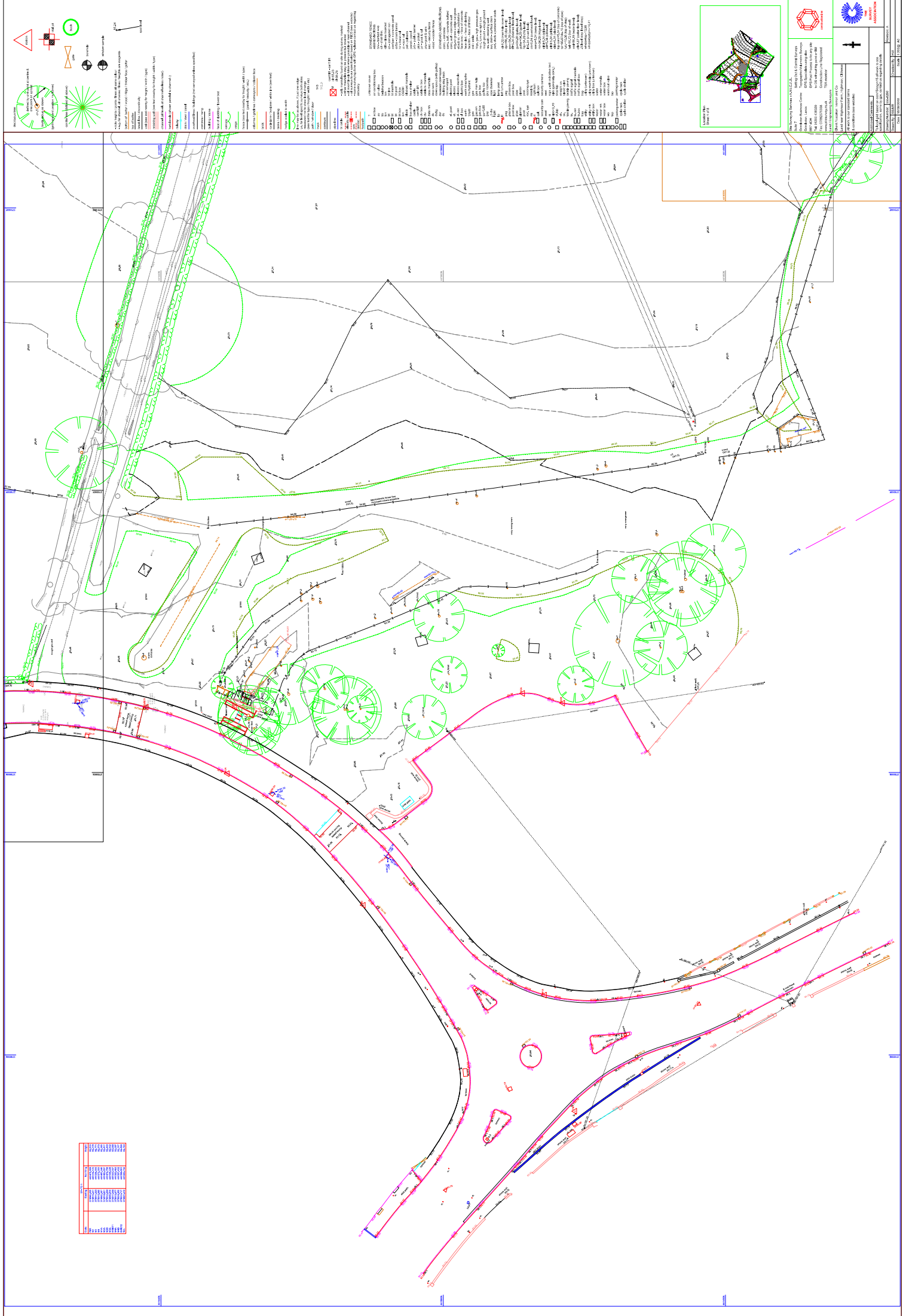
IN THE UNLIKELY EVENT OF BLOCKAGES/FAILURE OVERLAND FLOW ROUTES WILL BE CONTAINED WITHIN KERBS AND RE-ENTER THE SYSTEM VIA GULLIES.

IN PRIVATE AREAS, SUCH AS DRIVEWAYS, RUN-OFF WILL BE CAPTURED BY ACO DRAINS TO ENSURE THERE IS NO RISK TO PROPERTIES.

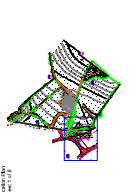
ALL PROPERTIES FFL'S ARE SET 150mm ABOVE ADJACENT GROUND LEVELS AND ABOVE THOSE OF THE CONNECTING ADOPTABLE MANHOLES.

P05	16.06.2026	P8	UPDATED DRAINAGE STRATEGY
P04	31.03.2026	KF	UPDATED DRAINAGE STRATEGY
P03	26.02.2026	KF	UPDATED DRAINAGE STRATEGY
P02	23.01.2026	P8	UPDATED DRAINAGE STRATEGY
P01	16.01.2026	P8	FIRST ISSUE
Rev	Date	By	Description

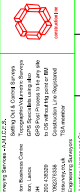
26.0 APPENDIX M – TOPOGRAPHICAL SURVEY



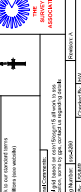
Code	Description	Quantity	Unit
P001	Tree (Oak)	1	pc
P002	Tree (Oak)	1	pc
P003	Tree (Oak)	1	pc
P004	Tree (Oak)	1	pc
P005	Tree (Oak)	1	pc
P006	Tree (Oak)	1	pc
P007	Tree (Oak)	1	pc
P008	Tree (Oak)	1	pc
P009	Tree (Oak)	1	pc
P010	Tree (Oak)	1	pc
P011	Tree (Oak)	1	pc
P012	Tree (Oak)	1	pc
P013	Tree (Oak)	1	pc
P014	Tree (Oak)	1	pc
P015	Tree (Oak)	1	pc
P016	Tree (Oak)	1	pc
P017	Tree (Oak)	1	pc
P018	Tree (Oak)	1	pc
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P023	Tree (Oak)	1	pc
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P025	Tree (Oak)	1	pc
P026	Tree (Oak)	1	pc
P027	Tree (Oak)	1	pc
P028	Tree (Oak)	1	pc
P029	Tree (Oak)	1	pc
P030	Tree (Oak)	1	pc
P031	Tree (Oak)	1	pc
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P100	Tree (Oak)	1	pc



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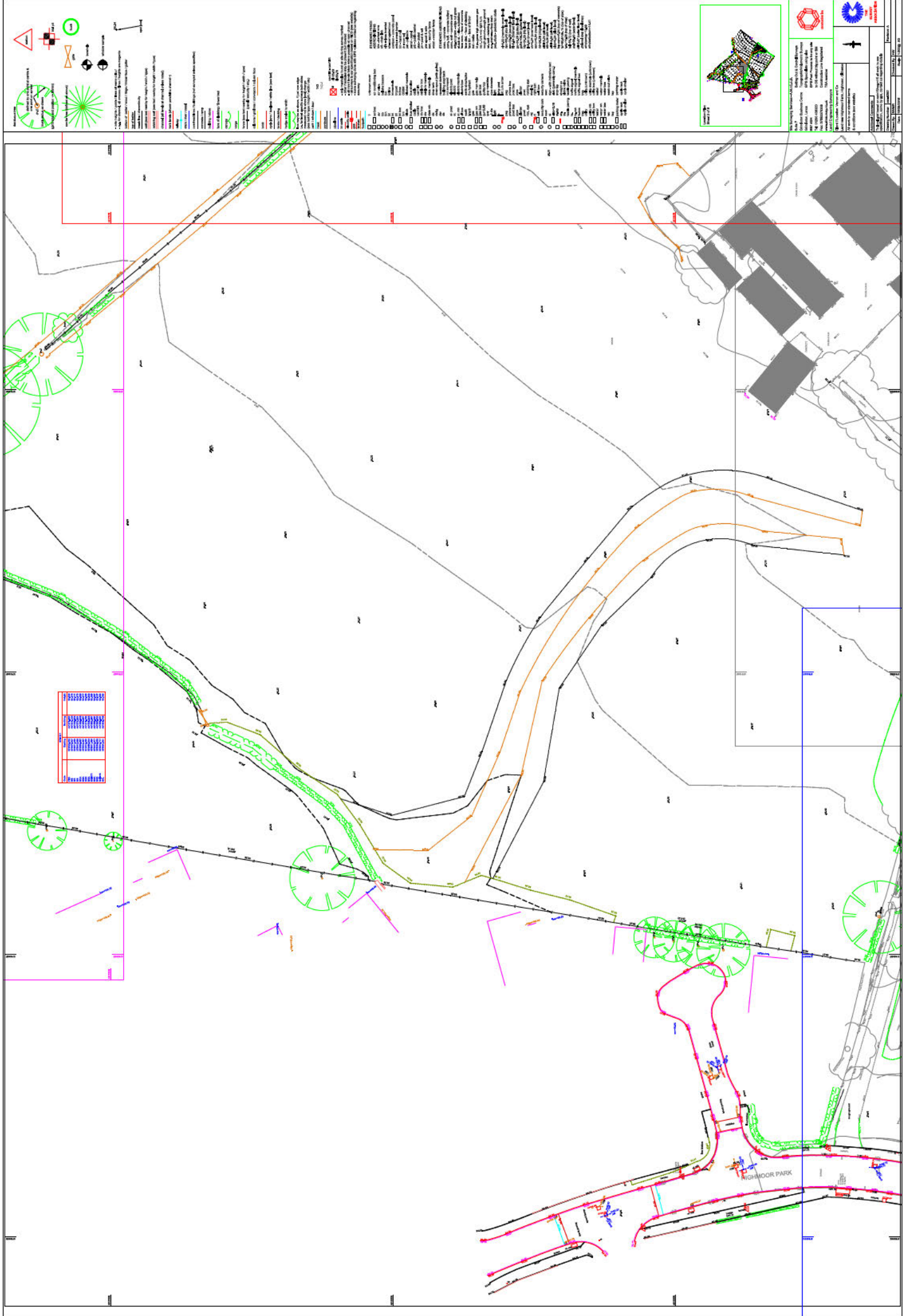
North arrow

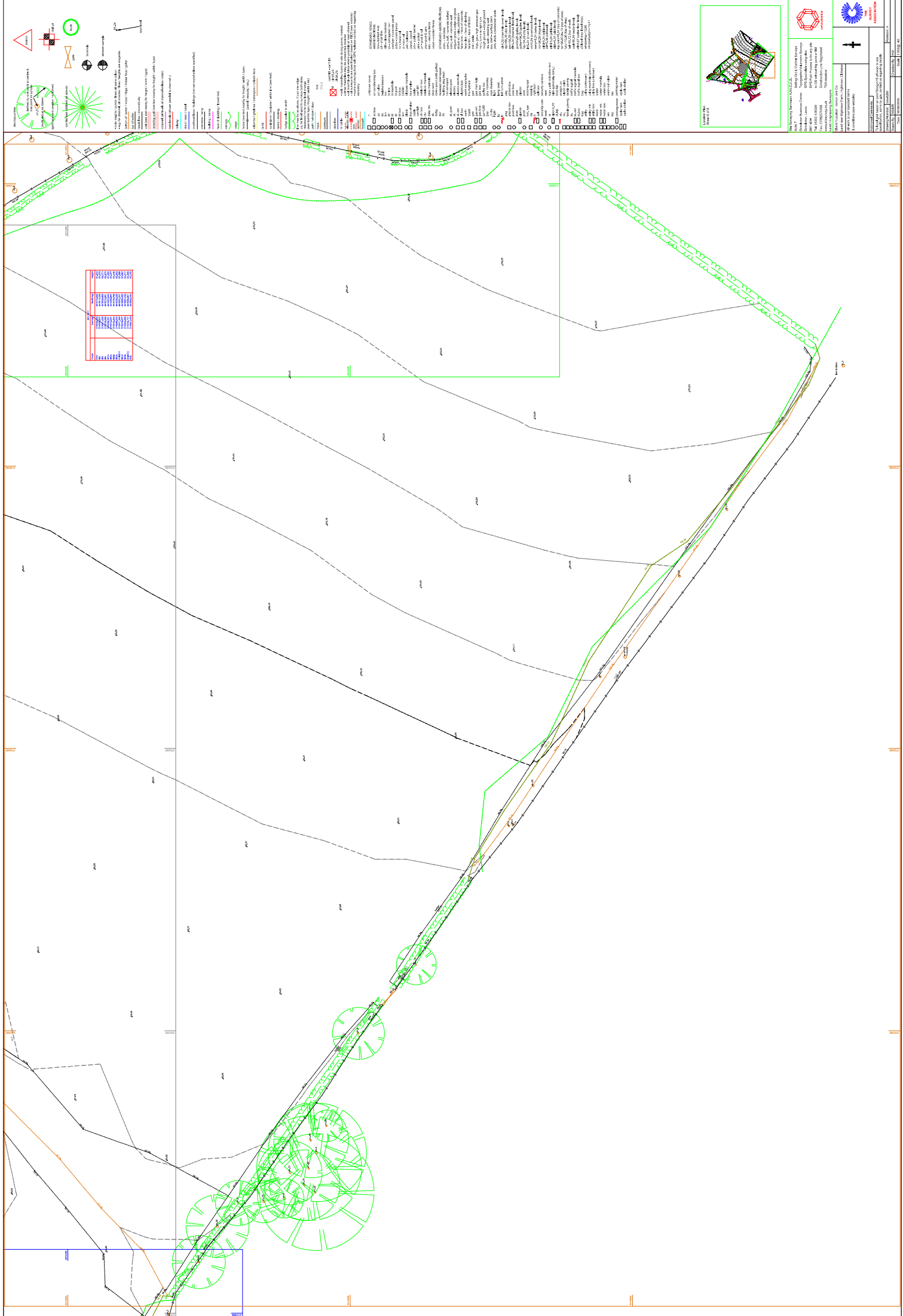


Scale bar: 0, 10, 20 meters

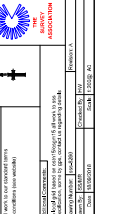
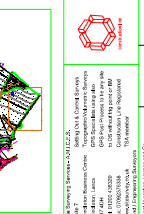
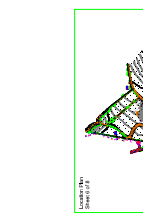
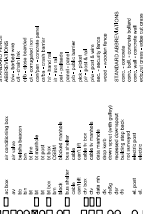
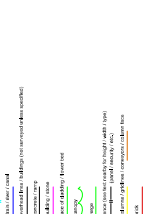
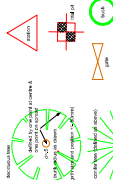


Legend symbols





Lot	Area (sq. ft.)	Area (sq. m.)
p0001	1,234,567	114,000
p0002	987,654	91,300
p0003	543,210	50,400
p0004	321,098	29,800
p0005	210,987	19,500
p0006	109,876	10,100
p0007	98,765	9,100
p0008	87,654	8,100
p0009	76,543	7,100
p0010	65,432	6,100
p0011	54,321	5,100
p0012	43,210	4,000
p0013	32,109	3,000
p0014	21,098	2,000
p0015	10,987	1,000
p0016	9,876	900
p0017	8,765	800
p0018	7,654	700
p0019	6,543	600
p0020	5,432	500



Project Information

Project Name: [Project Name]
Client: [Client Name]
Address: [Address]
City: [City]
State: [State]
Zip: [Zip]

Project Details

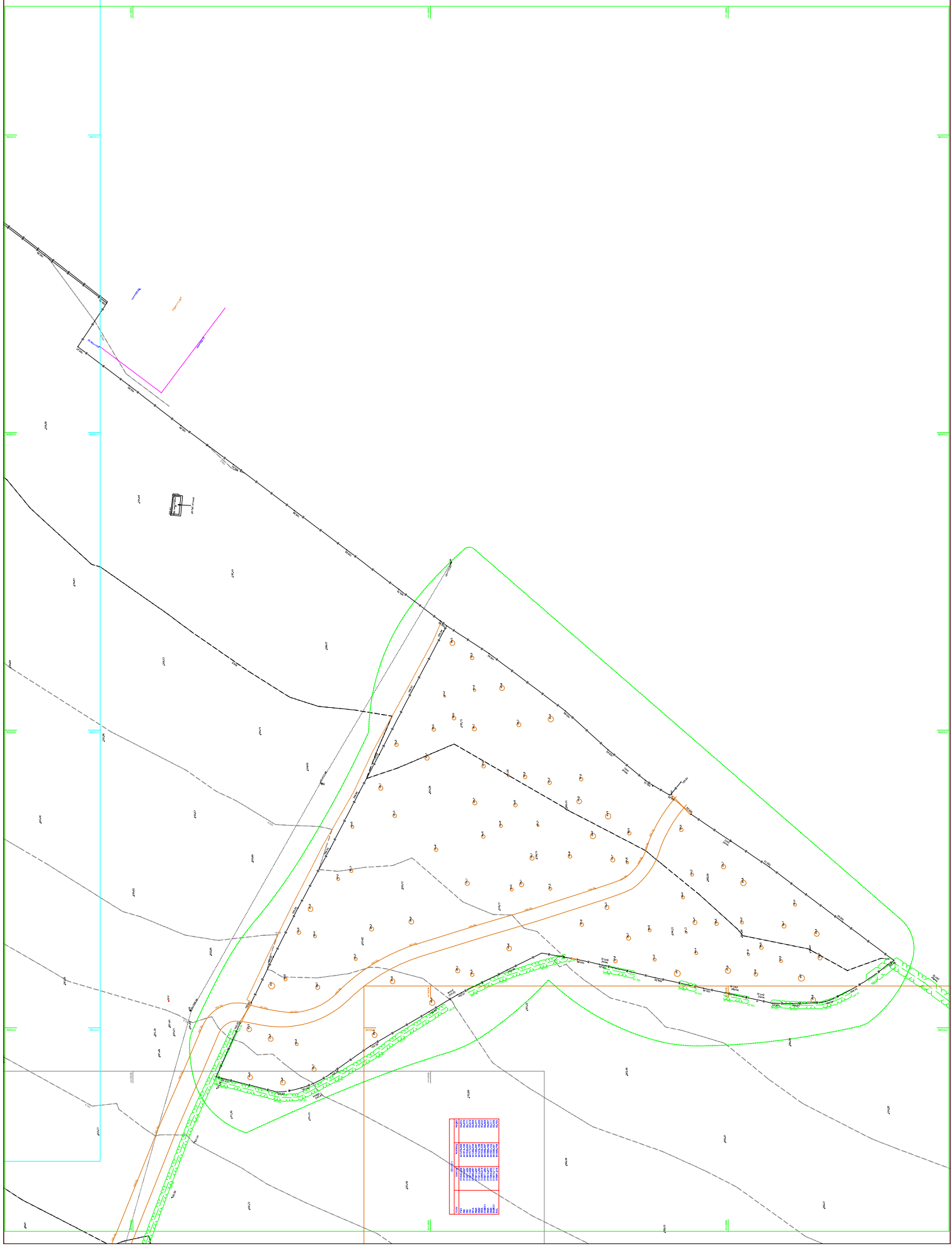
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Drawing No.: [Drawing No.]
Revision: [Revision]

Project Location

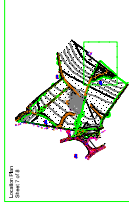
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Project Address: [Project Address]
Project City: [Project City]
Project State: [Project State]
Project Zip: [Project Zip]

Project Contact

Project Contact: [Project Contact]
Project Phone: [Project Phone]
Project Email: [Project Email]



Code	Symbol	Unit	Weight
CM1	20-24.50	kg/m ³	15.71
CM2	25-29.50	kg/m ³	16.75
CM3	30-34.50	kg/m ³	17.75
CM4	35-39.50	kg/m ³	18.75
CM5	40-44.50	kg/m ³	19.75
CM6	45-49.50	kg/m ³	20.75
CM7	50-54.50	kg/m ³	21.75
CM8	55-59.50	kg/m ³	22.75
CM9	60-64.50	kg/m ³	23.75
CM10	65-69.50	kg/m ³	24.75
CM11	70-74.50	kg/m ³	25.75
CM12	75-79.50	kg/m ³	26.75
CM13	80-84.50	kg/m ³	27.75
CM14	85-89.50	kg/m ³	28.75
CM15	90-94.50	kg/m ³	29.75
CM16	95-99.50	kg/m ³	30.75
CM17	100-104.50	kg/m ³	31.75
CM18	105-109.50	kg/m ³	32.75
CM19	110-114.50	kg/m ³	33.75
CM20	115-119.50	kg/m ³	34.75
CM21	120-124.50	kg/m ³	35.75
CM22	125-129.50	kg/m ³	36.75
CM23	130-134.50	kg/m ³	37.75
CM24	135-139.50	kg/m ³	38.75
CM25	140-144.50	kg/m ³	39.75
CM26	145-149.50	kg/m ³	40.75
CM27	150-154.50	kg/m ³	41.75
CM28	155-159.50	kg/m ³	42.75
CM29	160-164.50	kg/m ³	43.75
CM30	165-169.50	kg/m ³	44.75
CM31	170-174.50	kg/m ³	45.75
CM32	175-179.50	kg/m ³	46.75
CM33	180-184.50	kg/m ³	47.75
CM34	185-189.50	kg/m ³	48.75
CM35	190-194.50	kg/m ³	49.75
CM36	195-199.50	kg/m ³	50.75
CM37	200-204.50	kg/m ³	51.75
CM38	205-209.50	kg/m ³	52.75
CM39	210-214.50	kg/m ³	53.75
CM40	215-219.50	kg/m ³	54.75
CM41	220-224.50	kg/m ³	55.75
CM42	225-229.50	kg/m ³	56.75
CM43	230-234.50	kg/m ³	57.75
CM44	235-239.50	kg/m ³	58.75
CM45	240-244.50	kg/m ³	59.75
CM46	245-249.50	kg/m ³	60.75
CM47	250-254.50	kg/m ³	61.75
CM48	255-259.50	kg/m ³	62.75
CM49	260-264.50	kg/m ³	63.75
CM50	265-269.50	kg/m ³	64.75
CM51	270-274.50	kg/m ³	65.75
CM52	275-279.50	kg/m ³	66.75
CM53	280-284.50	kg/m ³	67.75
CM54	285-289.50	kg/m ³	68.75
CM55	290-294.50	kg/m ³	69.75
CM56	295-299.50	kg/m ³	70.75
CM57	300-304.50	kg/m ³	71.75
CM58	305-309.50	kg/m ³	72.75
CM59	310-314.50	kg/m ³	73.75
CM60	315-319.50	kg/m ³	74.75
CM61	320-324.50	kg/m ³	75.75
CM62	325-329.50	kg/m ³	76.75
CM63	330-334.50	kg/m ³	77.75
CM64	335-339.50	kg/m ³	78.75
CM65	340-344.50	kg/m ³	79.75
CM66	345-349.50	kg/m ³	80.75
CM67	350-354.50	kg/m ³	81.75
CM68	355-359.50	kg/m ³	82.75
CM69	360-364.50	kg/m ³	83.75
CM70	365-369.50	kg/m ³	84.75
CM71	370-374.50	kg/m ³	85.75
CM72	375-379.50	kg/m ³	86.75
CM73	380-384.50	kg/m ³	87.75
CM74	385-389.50	kg/m ³	88.75
CM75	390-394.50	kg/m ³	89.75
CM76	395-399.50	kg/m ³	90.75
CM77	400-404.50	kg/m ³	91.75
CM78	405-409.50	kg/m ³	92.75
CM79	410-414.50	kg/m ³	93.75
CM80	415-419.50	kg/m ³	94.75
CM81	420-424.50	kg/m ³	95.75
CM82	425-429.50	kg/m ³	96.75
CM83	430-434.50	kg/m ³	97.75
CM84	435-439.50	kg/m ³	98.75
CM85	440-444.50	kg/m ³	99.75
CM86	445-449.50	kg/m ³	100.75
CM87	450-454.50	kg/m ³	101.75
CM88	455-459.50	kg/m ³	102.75
CM89	460-464.50	kg/m ³	103.75
CM90	465-469.50	kg/m ³	104.75
CM91	470-474.50	kg/m ³	105.75
CM92	475-479.50	kg/m ³	106.75
CM93	480-484.50	kg/m ³	107.75
CM94	485-489.50	kg/m ³	108.75
CM95	490-494.50	kg/m ³	109.75
CM96	495-499.50	kg/m ³	110.75
CM97	500-504.50	kg/m ³	111.75
CM98	505-509.50	kg/m ³	112.75
CM99	510-514.50	kg/m ³	113.75
CM100	515-519.50	kg/m ³	114.75
CM101	520-524.50	kg/m ³	115.75
CM102	525-529.50	kg/m ³	116.75
CM103	530-534.50	kg/m ³	117.75
CM104	535-539.50	kg/m ³	118.75
CM105	540-544.50	kg/m ³	119.75
CM106	545-549.50	kg/m ³	120.75
CM107	550-554.50	kg/m ³	121.75
CM108	555-559.50	kg/m ³	122.75
CM109	560-564.50	kg/m ³	123.75
CM110	565-569.50	kg/m ³	124.75
CM111	570-574.50	kg/m ³	125.75
CM112	575-579.50	kg/m ³	126.75
CM113	580-584.50	kg/m ³	127.75
CM114	585-589.50	kg/m ³	128.75
CM115	590-594.50	kg/m ³	129.75
CM116	595-599.50	kg/m ³	130.75
CM117	600-604.50	kg/m ³	131.75
CM118	605-609.50	kg/m ³	132.75
CM119	610-614.50	kg/m ³	133.75
CM120	615-619.50	kg/m ³	134.75
CM121	620-624.50	kg/m ³	135.75
CM122	625-629.50	kg/m ³	136.75
CM123	630-634.50	kg/m ³	137.75
CM124	635-639.50	kg/m ³	138.75
CM125	640-644.50	kg/m ³	139.75
CM126	645-649.50	kg/m ³	140.75
CM127	650-654.50	kg/m ³	141.75
CM128	655-659.50	kg/m ³	142.75
CM129	660-664.50	kg/m ³	143.75
CM130	665-669.50	kg/m ³	144.75
CM131	670-674.50	kg/m ³	145.75
CM132	675-679.50	kg/m ³	146.75
CM133	680-684.50	kg/m ³	147.75
CM134	685-689.50	kg/m ³	148.75
CM135	690-694.50	kg/m ³	149.75
CM136	695-699.50	kg/m ³	150.75
CM137	700-704.50	kg/m ³	151.75
CM138	705-709.50	kg/m ³	152.75
CM139	710-714.50	kg/m ³	153.75
CM140	715-719.50	kg/m ³	154.75
CM141	720-724.50	kg/m ³	155.75
CM142	725-729.50	kg/m ³	156.75
CM143	730-734.50	kg/m ³	157.75
CM144	735-739.50	kg/m ³	158.75
CM145	740-744.50	kg/m ³	159.75
CM146	745-749.50	kg/m ³	160.75
CM147	750-754.50	kg/m ³	161.75
CM148	755-759.50	kg/m ³	162.75
CM149	760-764.50	kg/m ³	163.75
CM150	765-769.50	kg/m ³	164.75
CM151	770-774.50	kg/m ³	165.75
CM152	775-779.50	kg/m ³	166.75
CM153	780-784.50	kg/m ³	167.75
CM154	785-789.50	kg/m ³	168.75
CM155	790-794.50	kg/m ³	169.75
CM156	795-799.50	kg/m ³	170.75
CM157	800-804.50	kg/m ³	171.75
CM158	805-809.50	kg/m ³	172.75
CM159	810-814.50	kg/m ³	173.75
CM160	815-819.50	kg/m ³	174.75
CM161	820-824.50	kg/m ³	175.75
CM162	825-829.50	kg/m ³	176.75
CM163	830-834.50	kg/m ³	177.75
CM164	835-839.50	kg/m ³	178.75
CM165	840-844.50	kg/m ³	179.75
CM166	845-849.50	kg/m ³	180.75
CM167	850-854.50	kg/m ³	181.75
CM168	855-859.50	kg/m ³	182.75
CM169	860-864.50	kg/m ³	183.75
CM170	865-869.50	kg/m ³	184.75
CM171	870-874.50	kg/m ³	185.75
CM172	875-879.50	kg/m ³	186.75
CM173	880-884.50	kg/m ³	187.75
CM174	885-889.50	kg/m ³	188.75
CM175	890-894.50	kg/m ³	189.75
CM176	895-899.50	kg/m ³	190.75
CM177	900-904.50	kg/m ³	191.75
CM178	905-909.50	kg/m ³	192.75
CM179	910-914.50	kg/m ³	193.75
CM180	915-919.50	kg/m ³	194.75
CM181	920-924.50	kg/m ³	195.75
CM182	925-929.50	kg/m ³	196.75
CM183	930-934.50	kg/m ³	197.75
CM184	935-939.50	kg/m ³	198.75
CM185	940-944.50	kg/m ³	199.75
CM186	945-949.50	kg/m ³	200.75
CM187	950-954.50	kg/m ³	201.75
CM188	955-959.50	kg/m ³	202.75
CM189	960-964.50	kg/m ³	203.75
CM190	965-969.50	kg/m ³	204.75
CM191	970-974.50	kg/m ³	205.75
CM192	975-979.50	kg/m ³	206.75
CM193	980-984.50	kg/m ³	207.75
CM194	985-989.50	kg/m ³	208.75
CM195	990-994.50	kg/m ³	209.75
CM196	995-999.50	kg/m ³	210.75
CM197	1000-1004.50	kg/m ³	211.75
CM198	1005-1009.50	kg/m ³	212.75
CM199	1010-1014.50	kg/m ³	213.75
CM200	1015-1019.50	kg/m ³	214.75
CM201	1020-1024.50	kg/m ³	215.75
CM202	1025-1029.50	kg/m ³	216.75
CM203	1030-1034.50	kg/m ³	217.75
CM204	1035-1039.50	kg/m ³	218.75
CM205	1040-1044.50	kg/m ³	219.75
CM206	1045-1049.50	kg/m ³	220.75
CM207	1050-1054.50	kg/m ³	221.75
CM208	1055-1059.50	kg/m ³	222.75
CM209	1060-1064.50	kg/m ³	223.75
CM210	1065-1069.50	kg/m ³	224.75
CM211	1070-1074.50	kg/m ³	225.75
CM212	1075-1079.50	kg/m ³	226.75
CM213	1080-1084.50	kg/m ³	227.75
CM214	1085-1089.50	kg/m ³	228.75
CM215	1090-1094.50	kg/m ³	229.75
CM216	1095-1099.50	kg/m ³	230.75
CM217	1100-1104.50	kg/m ³	231.75
CM218	1105-1109.50	kg/m ³	232.75
CM219	1110-1114.50	kg/m ³	233.75
CM220	1115-1119.50	kg/m ³	234.75
CM221	1120-1124.50	kg/m ³	235.75
CM222	1125-1129.50	kg/m ³	236.75
CM223	1130-1134.50	kg/m ³	237.75
CM224	1135-1139.50	kg/m ³	238.75
CM225	1140-1144.50	kg/m ³	239.75
CM226	1145-1149.50	kg/m ³	240.75
CM227	1150-1154.50	kg/m ³	241.75
CM228	1155-1159.50	kg/m ³	242.75
CM229	1160-1164.50	kg/m ³	243.75
CM230	1165-1169.50	kg/m ³	244.75
CM231	1170-1174.50	kg/m ³	245.75
CM232	1175-1179.50	kg/m ³	246.75
CM233	1180-1184.50	kg/m ³	247.75
CM234	1185-1189.50	kg/m ³	248.75
CM235	1190-1194.50	kg/m ³	249.75
CM236	1195-1199.50	kg/m ³	250.75
CM237	1200-1204.50	kg/m ³	251.75
CM238	1205-1209.50	kg/m ³	252.75
CM239	1210-1214.50	kg/m ³	253.75
CM240	1215-1219.50	kg/m ³	254.75
CM241			

[illegible]

Legend:

- Tree (Green circle with lines)
- Building (Black outline)
- Infrastructure (Orange lines)
- Other symbols for roads, water, and terrain.

Scale: 1:2500

North arrow

Legend:

- Tree (Green circle with lines)
- Building (Black outline)
- Infrastructure (Orange lines)
- Other symbols for roads, water, and terrain.

Symbol	Description
[Symbol]	Tree
[Symbol]	Building
[Symbol]	Infrastructure
[Symbol]	Road
[Symbol]	Water
[Symbol]	Terrain
[Symbol]	Other



Project Information:

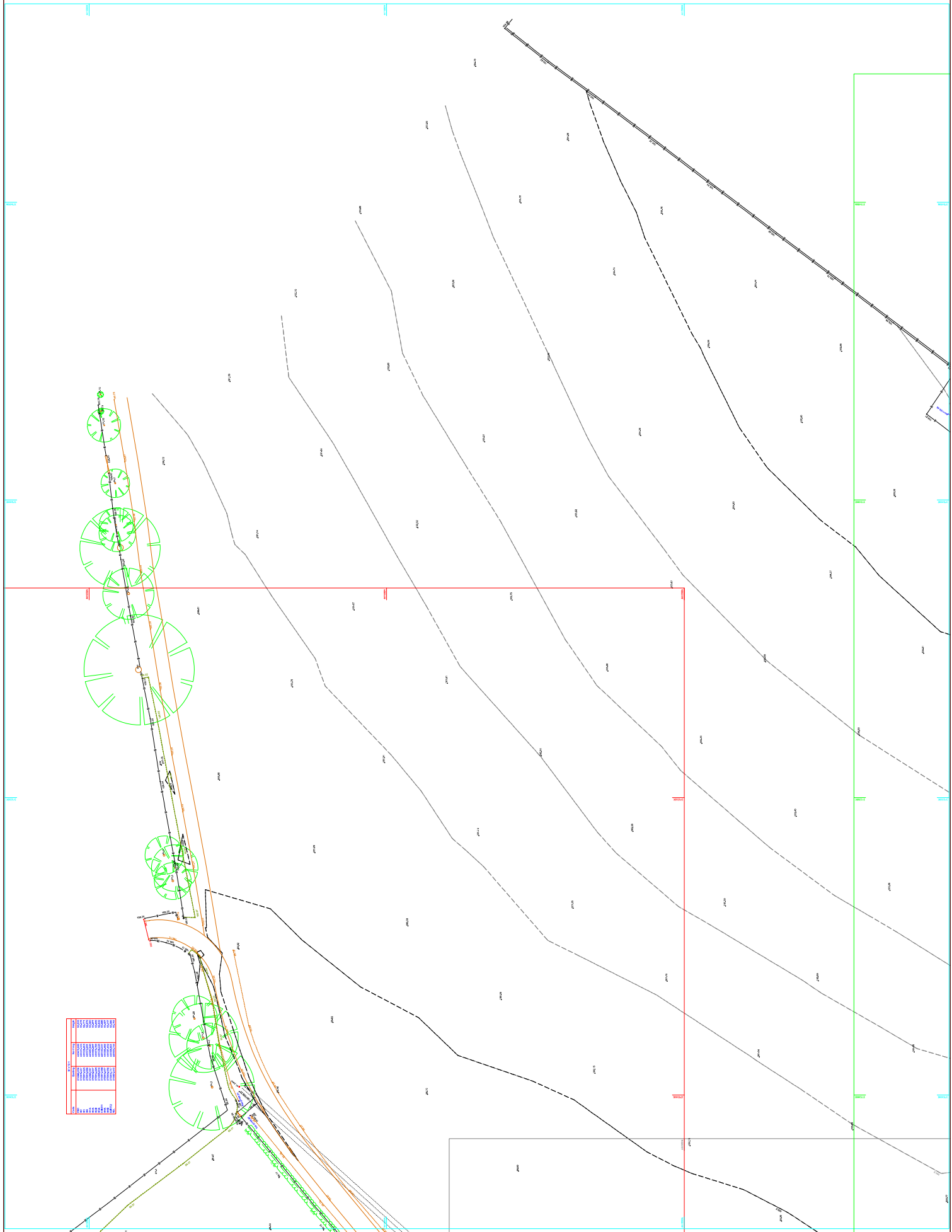
Client: [Name]

Project: [Name]

Location: [Address]

Scale: 1:2500

North arrow



27.0 APPENDIX N – UU SEWER RECORDS



**United Utilities Maps
for SafeDig**

Date :	29/01/2026 10:08:32
Centre X:	375232
Centre Y:	441429
Scale :	4000
UserName:	G4LG72Y

**Extract from maps of United Utilities'
Underground Assets**

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

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