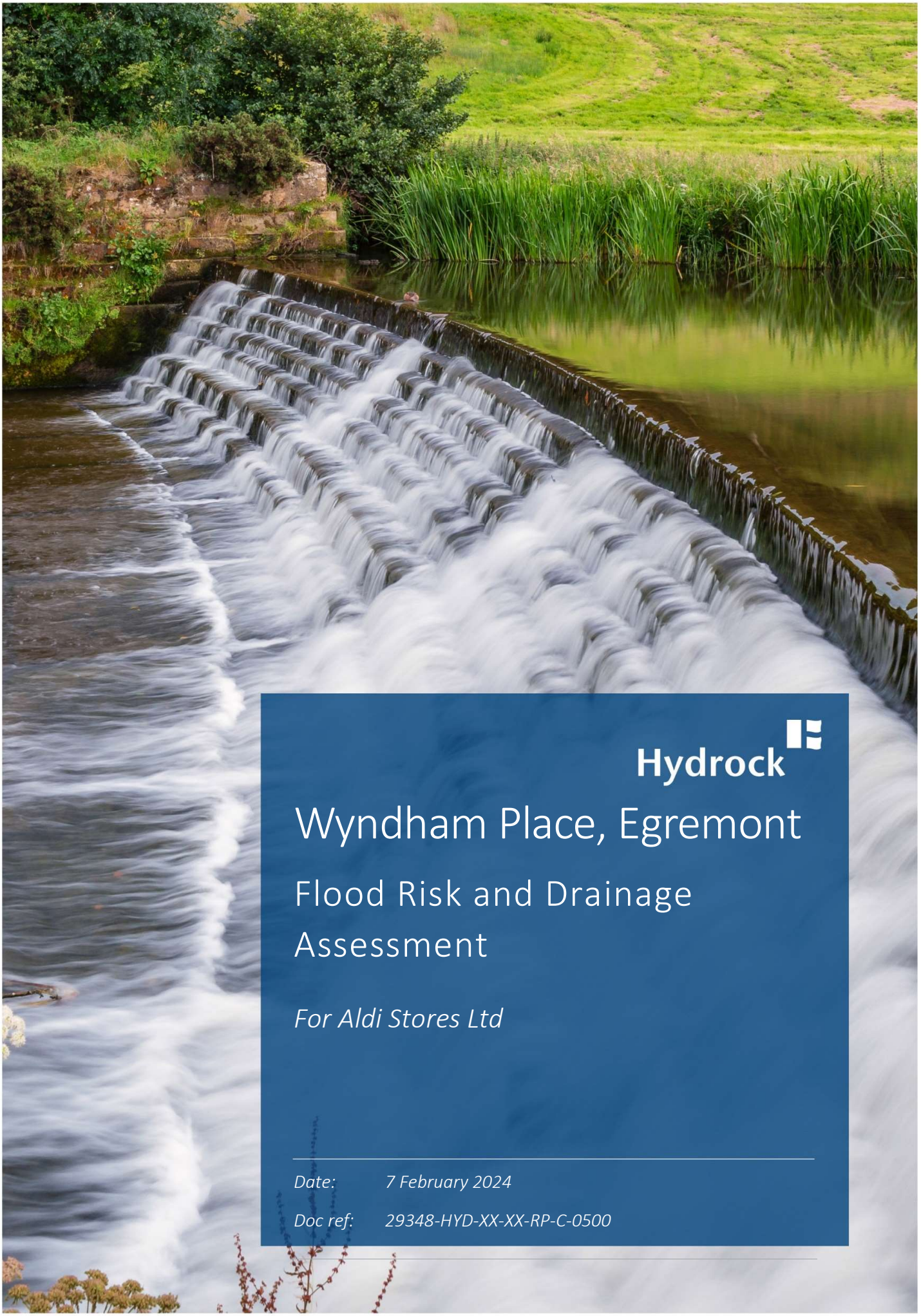

Hydrock

Wyndham Place, Egremont

Flood Risk and Drainage Assessment

For Aldi Stores Ltd

Date: *7 February 2024*

Doc ref: *29348-HYD-XX-XX-RP-C-0500*

DOCUMENT CONTROL SHEET

Issued by	Hydrock Consultants Limited 2 Esh Plaza Sir Bobby Robson Way Great Park Newcastle Upon Tyne NE20 0DS	Tel: 0191 2302993 www.hydrock.com
Client	Aldi Stores Ltd	
Project name	Wyndham Place, Egremont	
Title	Flood Risk and Drainage Assessment	
Doc ref	29348-HYD-XX-XX-RP-C-0500	
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Status	S4 - For Approval	
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Issue Number	P01	Name
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Checked by		Gary Spence
Approved by		Martin Pearse

Document Revision Record			
Issue Number	Status	Date	Revision Details
P01	S4	07/02/24	First Issue - For comment

Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above-named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

CONTENTS

Appendices

1. INTRODUCTION

This report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of our client Aldi Stores Ltd in support of a Planning Application to be submitted for a development at Wyndham Place, Egremont.

Local Planning Authority are advised by the Government's National Planning policy Framework (NPPF) to consult the Environment Agency (EA) and the Lead Local Flood Authority (LLFA) on development proposals in areas at risk of flooding. For a development of this nature the EA and the LLFA normally require a Flood Risk Assessment and drainage strategy to be submitted in support of such an application. The report has been prepared to consider the requirements of NPPF through:

- Assessing whether the proposed development is likely to be affected by flooding;
- Assessing whether the proposed development is appropriate in the suggested location and
- Detailed measures necessary to mitigate any flood risk identified, to ensure that the proposed development and occupants would be safe and that flood risk would not be increased elsewhere.

The report considered the requirements for undertaking a Flood Risk Assessment as stipulated in NPPF Technical Guidance. Only those requirements that are appropriate to a development of this nature have been considered in the compilation of this report.

This report has been prepared in accordance with current EA policy.

The drainage strategy within this report has been produced in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015), Building Regulations Approved Document H: drainage and waste disposal, Sewers for Adoption requirements and the Cumbria County Councils Local Standards for Sustainable Drainage.

This report is based on the following information;

- Topographical Survey and Underground Utility Survey undertaken by Castle Keep Surveys
- Ground Investigation Report dated December 2023 undertaken by Hydrock
- United Utilities Sewer Records

This report presents the factual information available during the time of appraisal, interpretation of the data obtained and recommendations relevant to the scope of works. It has been assumed in the production of this report that the site is to be developed for a Food Retail Unit with associated parking.

This report has been prepared for the sole use of Aldi Stores Ltd and their appointed design team. No other third party may rely upon or reproduce the contents of this report without the written approval of Hydrock Consultants Limited. If any unauthorised third party comes into the possession of this report, they rely on it entirely at their own risk and Hydrock do not owe them any Duty of Care or Skill.

2. SITE INFORMATION

2.1 Location and Setting

The site is located West of Wyndham Place, in Egremont. The site is currently occupied by a former car garage to the north, with a mixture of tarmac and gravel car parking to the South. The A595 Egremont Bypass is situated to the East of the site joining onto the East Road Roundabout.

The site location is shown in Figure 1, with the full address and Ordnance Survey grid reference provided in Table 1.

Table 1 - Site Referencing Information

Site Referencing Information	
Site Address	Wyndham Place, Gill Foot, Egremont, Cumberland, England, CA22 2EB, United Kingdom
Grid Reference	NY 01177 11073 E: 301177 , N: 511073

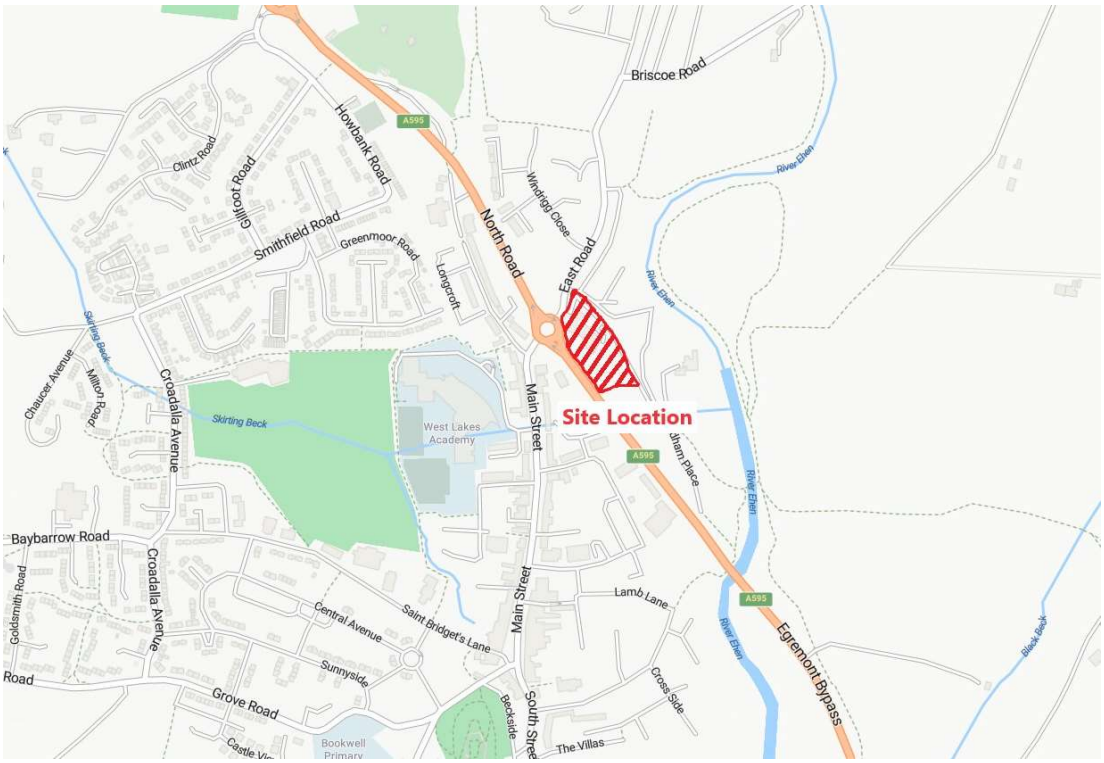

Figure 1 - Site Location

2.2 Topography

A site-specific topographical survey has been undertaken for the site. The site is shown to fall from North to South from a highest level of 54.000mAOD in the North to a lowest level of 45.638mAOD in the South.

A copy of the topographical survey is provided in Appendix A.

2.3 Current Site

The northern area of the site is currently a car garage, with an impermeable tarmac surface surrounding.

The area to the South is predominantly impermeable tarmac surfacing, with some area of gravel forecourt.

2.4 Proposed Development

The proposed development comprises of a new Aldi store with dedicated parking area to the North of the store and a loading bay area to the West of the site.

A copy of the proposed development plan is provided in Appendix B.

3. SOURCES OF FLOOD RISK

3.1 Fluvial Flooding

The River Ehen is located approximately 150m East of the site.

The EA flood maps have been assessed to determine the extent of fluvial flood risk from the River Ehen. As per Figure 2 below, the site is shown to sit wholly within Flood Zone 1.

Therefore, it is considered the site is at low risk of fluvial flooding.

A copy of the EA Flood Map for Planning is contained within Appendix C.

Figure 2 - Extent of flooding from Rivers or the Sea

For Reference the Environment Agency Flood Zones are defined as follows:

- Flood Zone 1 (Low Risk) comprises land assessed as having a <0.1% Annual Exceedance Probability (AEP) of fluvial or tidal flooding in any given year, equivalent to the >1000 year return period flood event.
- Flood Zone 2 (Medium Risk) comprises land assessed as having a 0.1%-1% AEP of fluvial flooding or 0.1-0.5% AEP of tidal flooding in any given year, equivalent to the 1000-100 year or 1,000-200 year return period flood event.
- Flood Zone 3a (High Risk) comprises land assessed as having a > 1% AEP of fluvial or tidal flooding in any given year or a .0.5% AEP of tidal flooding in any given year, equivalent to the <100 year or <200 year return period flood event.
- Flood Zone 3b(Functional Flood Plain) comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional flood plain should take account

of local circumstances and be defined solely on rigid probability parameters. Functional flood plain will normally comprise:

- Land having a 3.3% (1 in 30 year) or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
- Land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

3.2 Tidal Flooding

It should be noted that the EA Flood Zone Mapping does not distinguish between fluvial and tidal flood risk, however , given the inland geographical location and the distance from any tidally influenced waterbodies, the risk of tidal flooding at the site is concluded to be 'low'.

3.3 Surface Water Flooding

Surface water flooding occurs as the result of inability of intense rainfall to infiltrate the ground. This often happens when the maximum soil infiltration rate or storage capacity is reached. Flows generated by such events either enter existing land drainage features or follow the general topography which can concentrate flows and lead to localised ponding/flooding.

The EA Surface Water Flood Risk Maps (Figure 3) shows the majority of the site to be classified as 'Very Low' Risk.

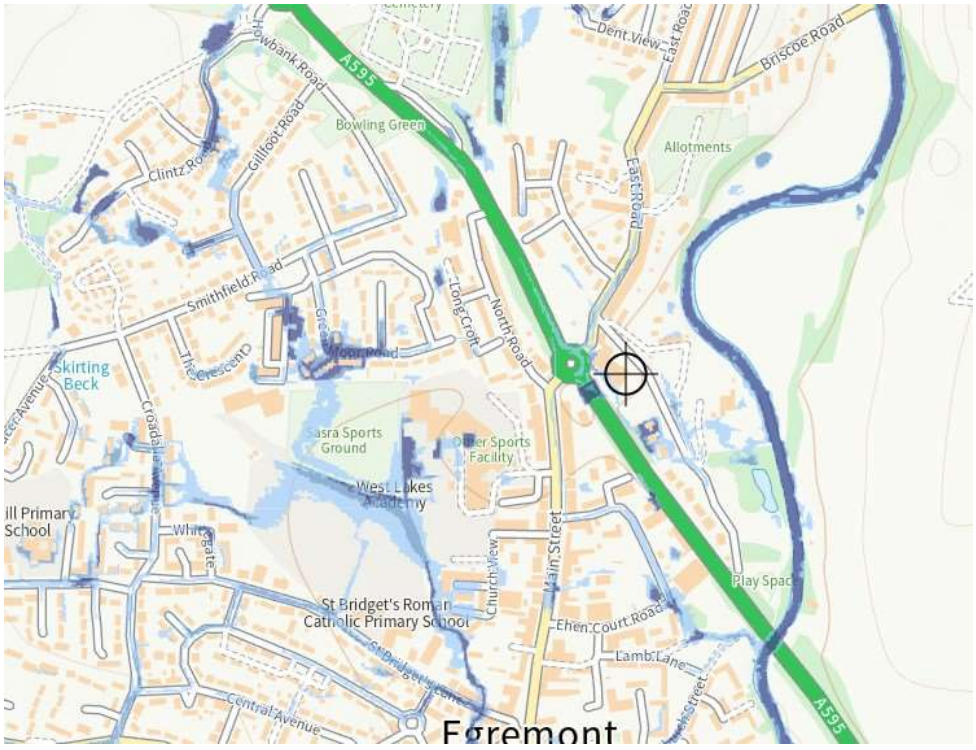

Figure 3 - Extent of flooding from Surface Water

3.4 Ground Water Flooding

A site investigation was undertaken by Hydrock dated December 2023. This shows that groundwater was encountered from depths of between 0.30m 4.50m.

No recorded flood events have been recorded at the site as a result of ground water flooding. It should be noted that whilst groundwater flooding is considered to be low on the site, due to the boreholes identifying groundwater to be near surface there is a potential for there to be interaction with ground water at construction phase but it is not expected to cause a risk of flooding during the operation of the development.

3.5 Sewers and Artificial Infrastructure Flooding

A 300mm water sewer is shown to flow from North to South beyond the site boundary to the East.

The sewer is shown to be around 1m deep with no flood risk highlighted by United Utilities as part of the pre planning response.

The sewer will be subject to United Utilities maintenance.

If flooding was to occur, flows would exit the public manholes located within Wyndham Place road to the East of the store. The levels of the road fall South, away from the site and building and would not pose a risk to the store.

The online EA Reservoir Failure Extents mapping has been reviewed and shows that the site is not at risk of flooding of this kind.

4. NATIONAL PLANNING POLICY FRAMEWORK

4.1 Sequential Test

The NPPF Sequential Test requires that a sequential approach is followed to steer new development to areas with the lowest probability of flooding (i.e., Flood Zone 1, then zone 2,then zone 3).

This assessment has demonstrated that the site is on land designated as Flood Zone 1.

4.2 Exception Test

The proposed development is for a supermarket which falls under the category of 'less vulnerable' development in accordance with Table 2 of the Flood Risk and Coastal Change National Planning Practice Guidance (NPPG).

Table 2 (taken from Table 2, Paragraph 079 of NPPG) shows that less vulnerable developments in flood zone 1 do not require an Exception test to be undertaken and no mitigation measures will be required.

Table 2 - Flood Risk Vulnerability and Flood Zone 'incompatibility'

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception Test Required	✓	✓
Flood Zone 3a	Exception Test Required	✓	X	Exception Test Required	✓
Flood Zone 3b	Exception Test Required	✓	X	X	X

Where ✓ means development is appropriate and X means development should not be permitted.

5. SURFACE WATER DRAINAGE

5.1 Existing Surface Water Drainage

United Utilities sewer records show a public surface water sewer running from North to South within the road of Wyndham Place, running parallel with the Eastern site boundary. The sewer records also show a public combined sewer to the West of the site flowing from North to South from East Road, across East Road Roundabout, and onto Main Street.

An underground utility survey has been undertaken by Castle Keep Surveys. This survey has identified private surface water sewers on site, previously serving the former car garage building and associated surfacing. The majority of this private network connects into the aforementioned public surface water sewer, with the remainder discharging into the public combined sewer West of the site.

A copy of the United utilities Sewer Records are included in Appendix D.

A copy of the Castle Keep Surveys Underground Utility Survey is included in Appendix E.

5.2 Proposed Surface Water Drainage

In line with the National Planning Policy Framework (NPPF) and Cumbria County Council's current Policy, the aim should be to discharge surface water run-off from the site in line with the order of priority within the surface water drainage hierarchy;

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

It is recommended that further Phase 2 ground investigation works will be required, following demolition of the buildings, to better establish the feasibility of infiltration. However, given the varying ground water levels recorded from the initial Ground Investigation, the use of infiltration should be deemed unsuitable at this stage.

The River Ehen is located approximately 150m East of site. It is believed that the existing public surface water sewer within Wyndham Place, eventually discharges into the River Ehen.

It is therefore proposed that the surface water will be discharged into the existing public surface water sewer.

5.3 Proposed Surface Water Discharge Rates

The proposed development has a total site area of approximately 0.625ha. The Greenfield Runoff rate estimation tool by HR Wallingford has been used to obtain the Qbar greenfield flow rate of 5.8l/s. This calculation has been provided in Appendix F.

A predevelopment enquiry was submit to United Utilities on 24th January 2024, and a response received 30th January 2024, confirming that the discharge rate should not exceed 5.8l/s. This has been provided within Appendix G.

It is therefore proposed to restrict flows to a maximum discharge rate of 5.8l/s, through the use of a Hydrobrake chamber, and pump chamber, as detailed on the Proposed Drainage Layout provided in Appendix H.

5.4 Proposed Surface Water Treatment

Sustainable Drainage Systems (SuDS) should also be used wherever possible to mimic as far as practicable the natural run off regime, improve water quality, reduce run-off volume and attenuate peak flows. These should be designed in accordance with the current guidance, The SuDS Manual (CIRIA C753) and should meet the required treatment indices levels in line with this guidance.

The following SuDS options have been reviewed for the proposed development.

Table 3 - Suitability of SuDS Features

SuDS Feature	Incorporated within design	Reasoning
Green Roofs / Blue Roofs	No	Not suitable for use on this scheme
Pond/Basin	No	No space to facilitate a basin/pond
Rainwater Harvesting	No	Rainwater harvesting has not been considered within the development due to future maintenance and lack of demand
Infiltration Methods	No	Due to the underlying strata and groundwater levels, infiltration methods have not been considered
Raingardens/Bio-retention areas	No	Ground levels and open spaces are not suitable for raingardens
Filter strips and swales	Yes	Filter drains provide to the rear of kerbs wherever possible.
Permeable Paving	No	Permeable paving is considered unsuitable by the client due to the many issues experienced in stores including H&S risks to customer.
Below ground attenuation systems / Oversized Pipework	Yes	Below ground attenuation will be provided to provide attenuation to reduce the peak flows from the development. This will be in the form of cellular storage. A SPEL ESR unit will also be used prior to discharge from the site to meet the SuDS manual treatment indices requirements.

Parking Bays

The parking bays within the car park have been classified as a medium pollution hazard in line with Table 26.2 of the SuDS Manual (C753) 'non residential car parking with frequent change'. This states the pollution hazard indices as follows:

Table 4 - Extract of Table 26.2 C753

Pollution Hazard	Total Suspended Solids(TSS)	Metals	Hydrocarbons
Medium	0.7	0.6	0.7

It is proposed for the parking bays to be treated by Filter Drains followed by a SPEL ESR proprietary unit prior to discharge to the culvert, which provide the following mitigation indices.

Table 5 - Extract of Table 26.3 C753

SuDS Component	Total Suspended Solids(TSS)	Metals	Hydrocarbons
SPEL ESR UNIT	0.8	0.6	0.9
Total	0.8	0.6	0.9

These indices provide greater indices than that required within the SuDS Manual therefore providing sufficient treatment of surface water flows from these areas.

Roof Areas

The roof areas have been classified as a Low pollution hazard in line with Table 26.2 of the SuDS Manual (C753) 'commercial roof'. This states the pollution hazard indices as follows:

Table 6 - Extract of Table 26.2 C753

Pollution Hazard	Total Suspended Solids(TSS)	Metals	Hydrocarbons
Low	0.3	0.2	0..05

It is proposed for the roof are to utilised filter drains for treatment prior to discharge from the site.

Table 7 - Green Roof

SuDS Component	Total Suspended Solids(TSS)	Metals	Hydrocarbons
Filter Drain	0.4	0.4	0.4

These unit indices are greater than that required within the SuDS Manual therefore providing sufficient treatment of surface water flows required from these areas.

5.5 Surface Water Attenuation

All proposed surface water systems should be designed to accommodate the worst case 1 in 100 year storm plus 35% climate change storm event without flooding. Furthermore, the worst case 1 in 100 year plus 50% climate change storm event should also be retained on site in an area that will not cause flooding to any existing or proposed buildings. In accordance with the updated NPPF Technical Guidance a climate change uplift of 50% and an urban creep uplift of 10% should be considered in the design. Due to the nature of the development and the limited space to accommodate an increase due to urban creep the additional 10% increase has not been considered within the design.

Drainage calculations have been undertaken utilising Flow Drainage Design Software based on a proposed impermeable area of 0.625ha (excludes a 10% increase due to potential urban creep). Surface water is proposed to be attenuated utilising cellular storage which is to be located within the car park and will accommodate the worst case 1 in 100-year + 50%cc storm event.

The proposed drainage has been designed to ensure the maximum water level in the drainage system is 48.695mAOD which is greater than 300mm below the proposed finished floor level of the building.

The Proposed Drainage Layout drawing is provided in Appendix H.

Calculations are provided in Appendix I.

5.6 Flood Exceedance Routes

The proposed calculations within Appendix I show that flooding is only predicted to occur in one location for all storm events up to and including the 1in100 year +50% climate change event. This is shown to be within the loading bay area to the south of the building, with a predicted flooded volume of 4.446m^3 shown.

The loading bay area is situated 1.3m below the building floor level and bordered by retaining walls, the flooded volume will therefore be contained to this area and drained into the system once the storm passes.

No flooded volume will affect the proposed building or run on to adjacent sites.

A copy of the proposed flood exceedance routes plan can be found in Appendix J.

5.7 Surface Water Maintenance

Failures or blockages within the drainage network can cause flooding if not adequately maintained. To enable the water treatment process to continue as intended and to reduce the risk of flooding the drainage network will require regular maintenance.

Maintenance and inspection of SuDS features will comply with the requirements of the SuDS Manual (CIRIA C753).

A copy of the proposed surface water drainage management plan is provided in Appendix K detailing the required frequency of works for each particular drainage element and who is responsible to undertake these works

6. FOUL WATER DRAINAGE

6.1 Existing Foul Water Drainage

United Utilities sewer records show a public combined sewer to the West of the site flowing from North to South from East Road, across East Road Roundabout, and onto Main Street.

An underground utility survey has been undertaken by Castle Keep Surveys. This survey has identified private foul and combined sewers on site, previously serving the former car garage building. This private network connects into the aforementioned public combined water sewer.

6.2 Proposed Foul Water Drainage

New foul drainage will be provided within the site which will discharge into the existing private combined manhole on the Eastern boundary of the site, before utilising the existing connection to the public combined sewer.

7. CONCLUSIONS

This Flood Risk and Drainage Assessment Report has been prepared by Hydrock on behalf of Aldi Stores Ltd in support of a planning application for a proposed food retail store on Wyndham Place, Egremont.

A detailed assessment has identified that the site is located in Flood Zone 1 (Low Risk) in accordance with the EA Flood Zone Mapping.

The proposed surface water drainage system will be restricted to a maximum discharge of 5.8l/s into the existing public surface water sewer within Wyndham Place, running parallel to the Eastern boundary of the site.

SuDS options have been considered for the site will be in the form of Filter Drains and an underground proprietary SPEL ESR unit will be utilised in the drainage system to provide treatment of surface water flows prior to discharge to the public sewer.

Foul water flows will discharge into the existing private combined manhole, located to the East of the site boundary, before utilising the existing connection to the public combined sewer.

The proposed drainage system has been designed to accommodate a 1 in 100 year+50% climate change storm event. Attenuation will be provided within the site in the form of underground cellular storage tank.

Hydrock Consultants Limited

Appendix A - Topographical Survey

Reference	Title
CKS – 1240 – OV - B	Castle Keep Surveys - Topographical Survey

Castle Keep Surveys Drawing Legend

Topographical Linetypes:

Road
Drop Kerb
Drop Kerb
Steps
Building Line
Barrier
Channel
Concrete
Chain Fence
Metal Fence
Post & Wire Fence
Wooden Fence
Top of Bank
Bottom of Bank
Tree Canopy Line
Verge Line
Wall
Footpath

Underground Utility Linetypes:

E — Electric
GAS — Gas
W — Water
CATV — Cable TV
CCTV — Closed Circuit TV
BT — British Telecom
EMPTY — Empty Ducting
UNK — Unknown Metallic Utility
GPR — GPR Anomaly Possible Utility
COM — Communications
Foul Water Drainage Route
Surface Water Drainage Route
Combined Service Drainage Route
Unknown Drainage Route
Aco Drain — Aco Drain
E-TFR — Electric - Taken from Records
E AR — Armored Electric
O/H E — Electric Overhead
O/H BT — BT Overhead
MSR — Multi Service Route
Multi Service Trench
W-TFR — Water - Taken from Records
W AR — Armored Water Route
X-W-X — Abandoned Water Route
GAS AR — Armored Gas Route
GAS-TFR — Gas - Taken from Records
Survey Extents

Symbols:

TP Telegraph Pole
LP Lamp Post
EP Electric Post
TL Traffic Light
FL Floodlight
CTV Cable TV IC
SC Stop Cock
GV Gas Valve
BOL Bollard
2.345 Spot Level
Post Post
GUL Gully
ER Earth Rod
GR Gas Riser
RWP Rain Water Pipe
RS Road Sign
SVP Soil Vent Pipe
CK01 E=436676.617 N=546728.511 Level=25.558 — Station Control Pintails
RE Rodding Eye
LOR Line of Reflection
Gate
Manhole
Inspection Chamber
Cable TV Cover
BT Cover
Road Gully
Stop Valve
Water Meter
Air Valve
Wash Out
Fire Hydrant
Gas Valve
Cabinet
Electric Link Pin
Circular Manhole
Triangular Manhole
Tree
End of Transit
MH1 CL 100.000 IL 98.000
SC CL 100.000
CATV CL 100.000
BT CL 100.000
RG CL 100.000
SV CL 100.000
WM CL 100.000
AV CL 100.000
WO CL 100.000
FH CL 100.000
GV CL 100.000
Cabinet 100.000
LB CL 100.000
MH2 CL 100.000 IL 97.500
MH3 CL 100.000 IL 97.500
EOS — End of Survey

Approximate National Grid North

CASTLE KEEP SURVEYS

Job Title
ALDI Egremont
Wyndham Place
CA22 2EB

Client Name
ALDI

Drawing Title
Topographical Survey

Scale	Surveyor
1:500 @ A1	HR
Date	Approved
06/09/2022	MD

Castle Keep Surveys Ltd
Unit 7
Fern Court
Peterlee
County Durham
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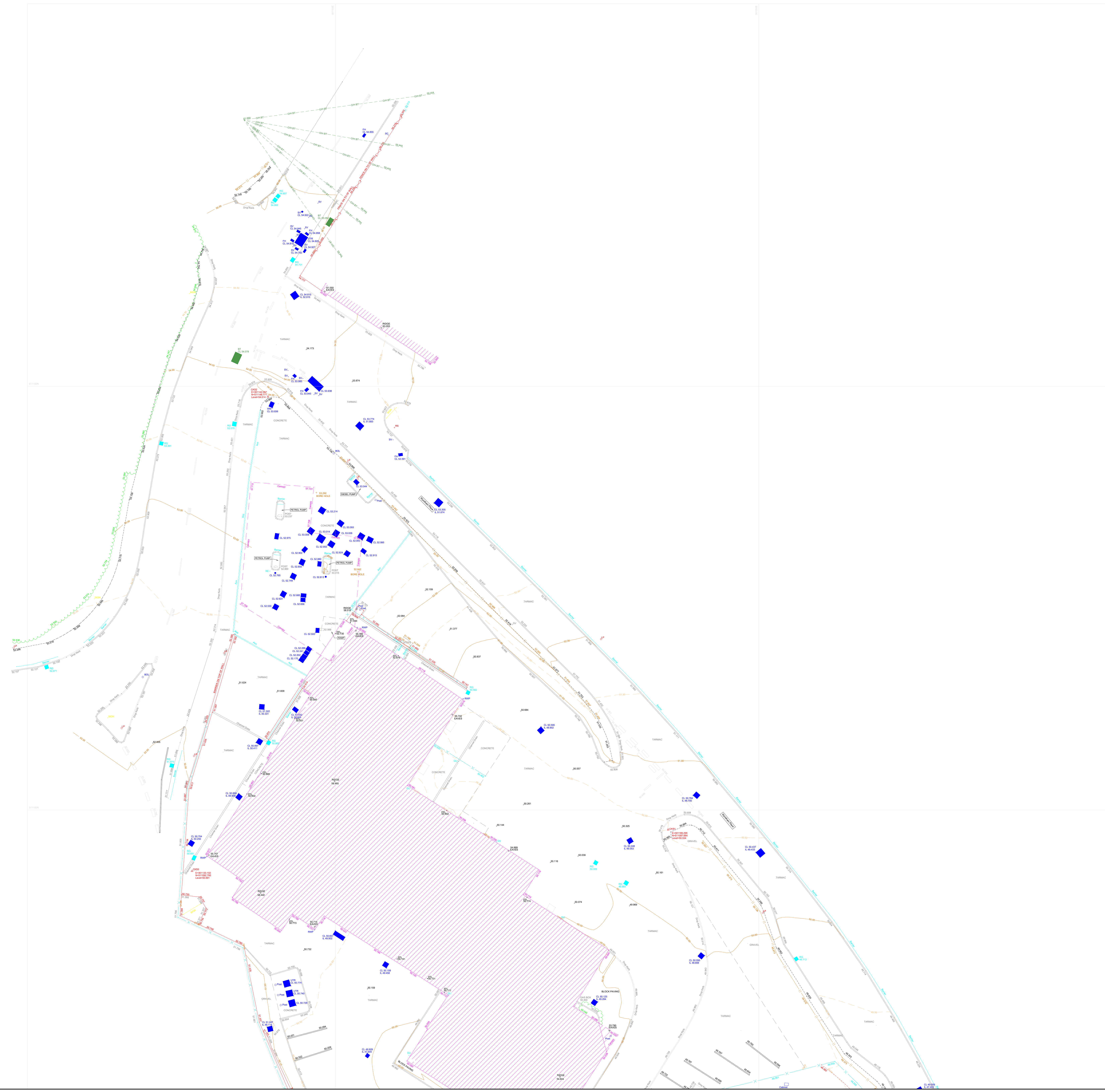
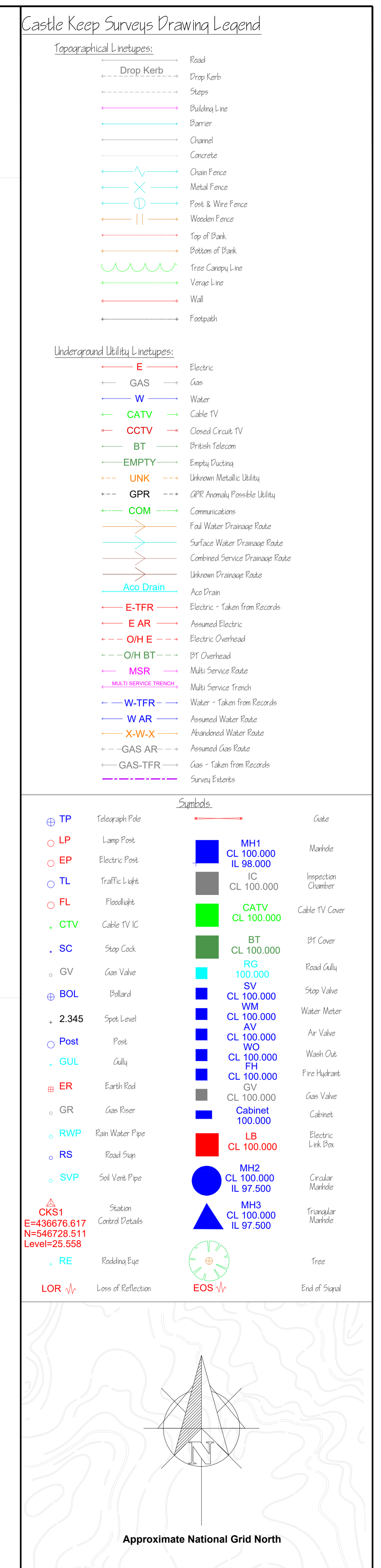
E: info@castlekeepsurveys.co.uk

Revision	Amendments	By	Checked
A	- Additional survey area added.	WH	MD
B	- North West channel and footpath added to survey.	HR	MD

Project Number	Drawing No	Revision
CKS - 1240	OV	B





CASTLE KEEP SURVEYS

Job Title

ALDI Egremont
Wyndham Place
CA22 2EB

Client Name

ALDI

Drawing Title

Topographical Survey

Scale: 1:250 @ A1	Surveyor: HR
Date: 06/09/2022	Approved: MD

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County Durham
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Revision	Amendments	By	Checked
A	- Additional survey area added.	WH	MD
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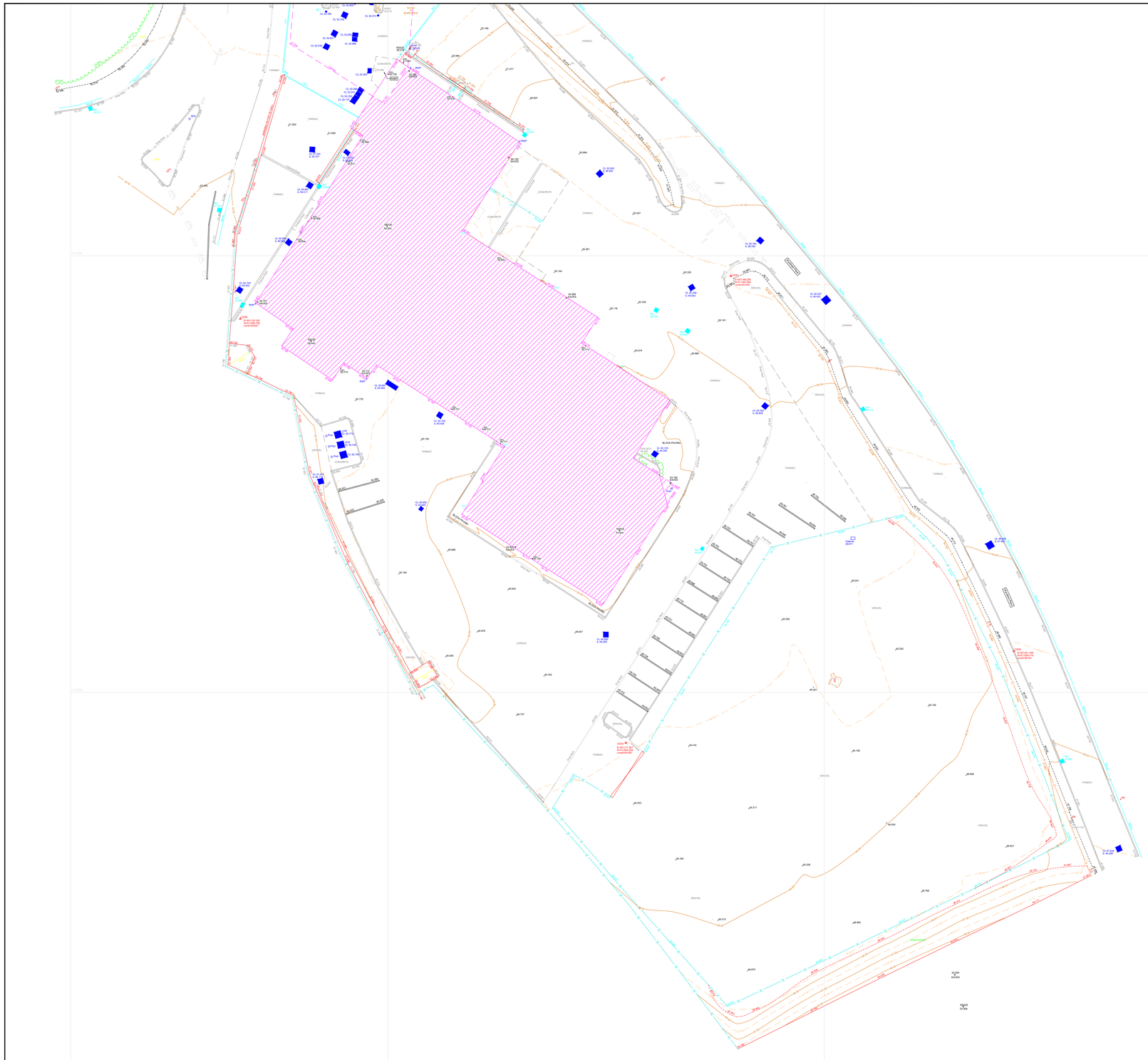
CKS - 1240	001	B



Castle Keep Surveys Drawing Legend

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- Chain Fence
- Metal Fence
- Post & Wire Fence
- Wooden Fence
- Top of Bank
- Bottom of Bank
- Tree Canopy Line
- Verge Line
- Wall
- Footpath

Underground Utility Linetypes:

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- COM — Communications
- Foul Water Drainage Route
- Surface Water Drainage Route
- Combined Service Drainage Route
- Unknown Drainage Route
- Aco Drain — Aco Drain
- E-TFR — Electric - Taken from Records
- E AR — Assumed Electric
- O/H E — Electric Overhead
- O/H BT — BT Overhead
- MSR — Multi Service Route
- MULTISERVICE TRENCH — Multi Service Trench
- W-TFR — Water - Taken from Records
- W AR — Assumed Water Route
- X-W-X — Abandoned Water Route
- GAS-AR — Assumed Gas Route
- GAS-TFR — Gas - Taken from Records
- Survey Extents

Symbols:

- TP — Telegraph Pole
- LP — Lamp Post
- EP — Electric Post
- TL — Traffic Light
- FL — Floodlight
- CTV — Cable TV IC
- SC — Stop Cock
- GV — Gas Valve
- BOL — Bollard
- 2.345 — Spot Level
- Post — Post
- GUL — Gully
- ER — Earth Rod
- GR — Gas Riser
- RWP — Rain Water Pipe
- RS — Road Sign
- SVP — Soil Vent Pipe
- CKS1 E=436076.617 N=546728.511 Level=25.558 — Station Control Details
- RE — Rodding Eye
- LOR — Lane of Reflection
- Gate
- MH1 CL 100.000 IL 98.000 — Manhole
- IC CL 100.000 — Inspection Chamber
- CATV CL 100.000 — Cable TV Cover
- BT CL 100.000 — BT Cover
- RG 100.000 — Road Gully
- SV CL 100.000 — Stop Valve
- WM CL 100.000 — Water Meter
- AV CL 100.000 — Air Valve
- WO CL 100.000 — Wash Out
- FH CL 100.000 — Fire Hydrant
- GV CL 100.000 — Gas Valve
- Cabinet 100.000 — Cabinet
- LB CL 100.000 — Electric Link Box
- MH2 CL 100.000 IL 97.500 — Circular Manhole
- MH3 CL 100.000 IL 97.500 — Triangular Manhole
- Tree
- EOS — End of Survey

Approximate National Grid North

CASTLE KEEP SURVEYS

Job Title: ALDI Egremont, Wyndham Place, CA22 2EB

Client Name: ALDI

Drawing Title: Topographical Survey

Scale	Surveyor
1:250 @ A1	HR
Date	**Approved**
06/09/2022	MD

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Revision	Amendments	By	Checked
A	- Additional survey area added.	WH	MD
B	- North West channel and footpath added to survey.	HR	MD

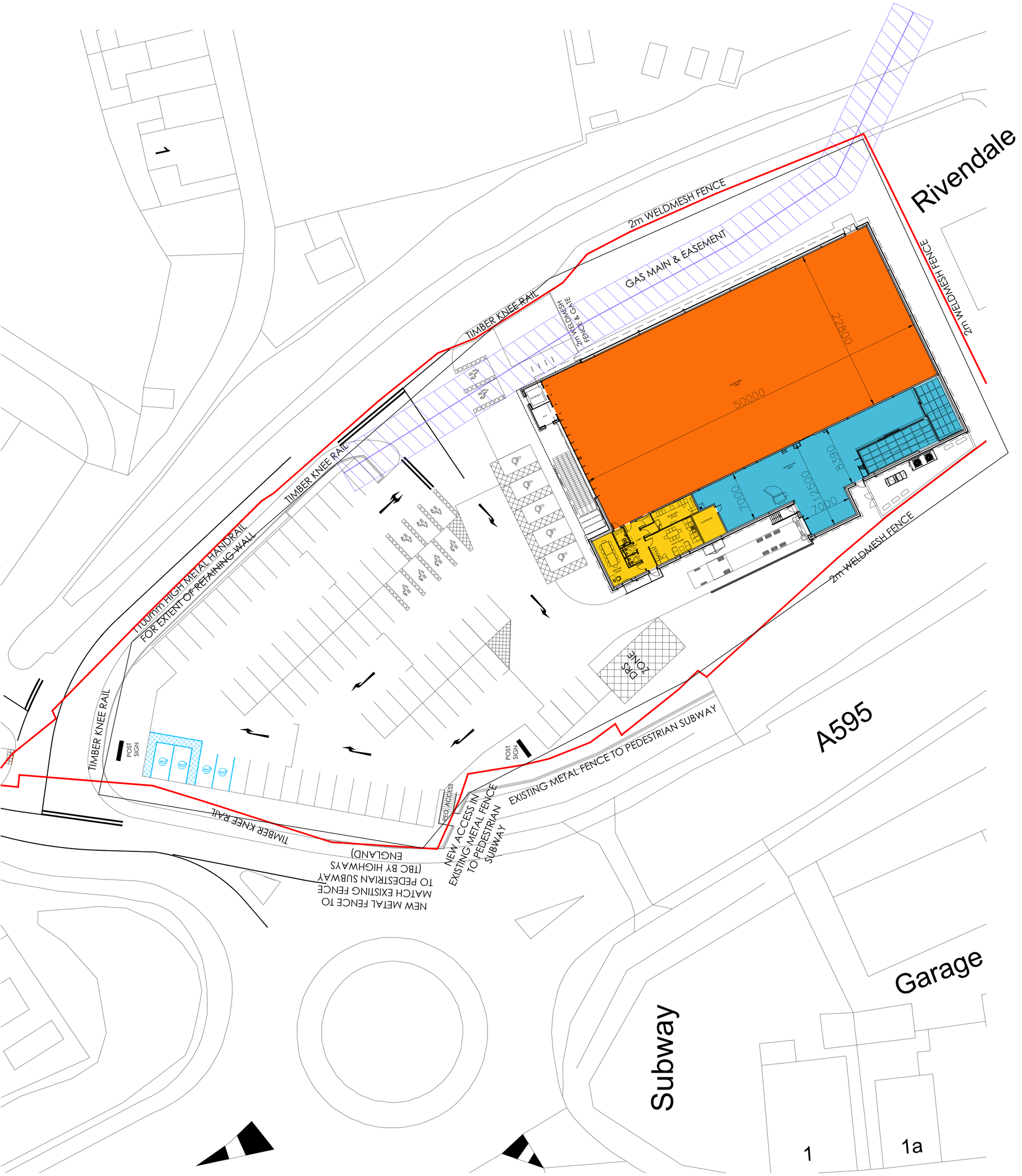
Project Number: CKS - 1240

Drawing No: 002

Revision: B

Appendix B - Proposed Site Plan

Reference	Title
0541 – SK13	Proposed Site Plan


2m WELDMESH FENCE
GAS MAIN & EASEMENT
TIMBER KNEE RAIL
2m WELDMESH FENCE & GATE
22800
50000
7000
7500
8500
7000
Rivendale
2m WELDMESH FENCE
TIMBER KNEE RAIL
1100mm HIGH METAL HANDRAIL FOR EXTENT OF RETAINING WALL
TIMBER KNEE RAIL
POST SIGN
POST SIGN
DRS ZONE
FEED ACCESS
EXISTING METAL FENCE TO PEDESTRIAN SUBWAY
NEW ACCESS IN EXISTING METAL FENCE TO PEDESTRIAN SUBWAY
TIMBER KNEE RAIL
NEW METAL FENCE TO MATCH EXISTING FENCE TO PEDESTRIAN SUBWAY (TBC BY HIGHWAYS ENGLAND)
A595
Subway
Garage
1
1a

Appendix C - Environment Agency Flood Map for Planning

Reference	Title
N/A	Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**301180/511080**	**31 Jan 2024 15:20**

Your selected location is in flood zone 1, an area with a low probability of flooding.

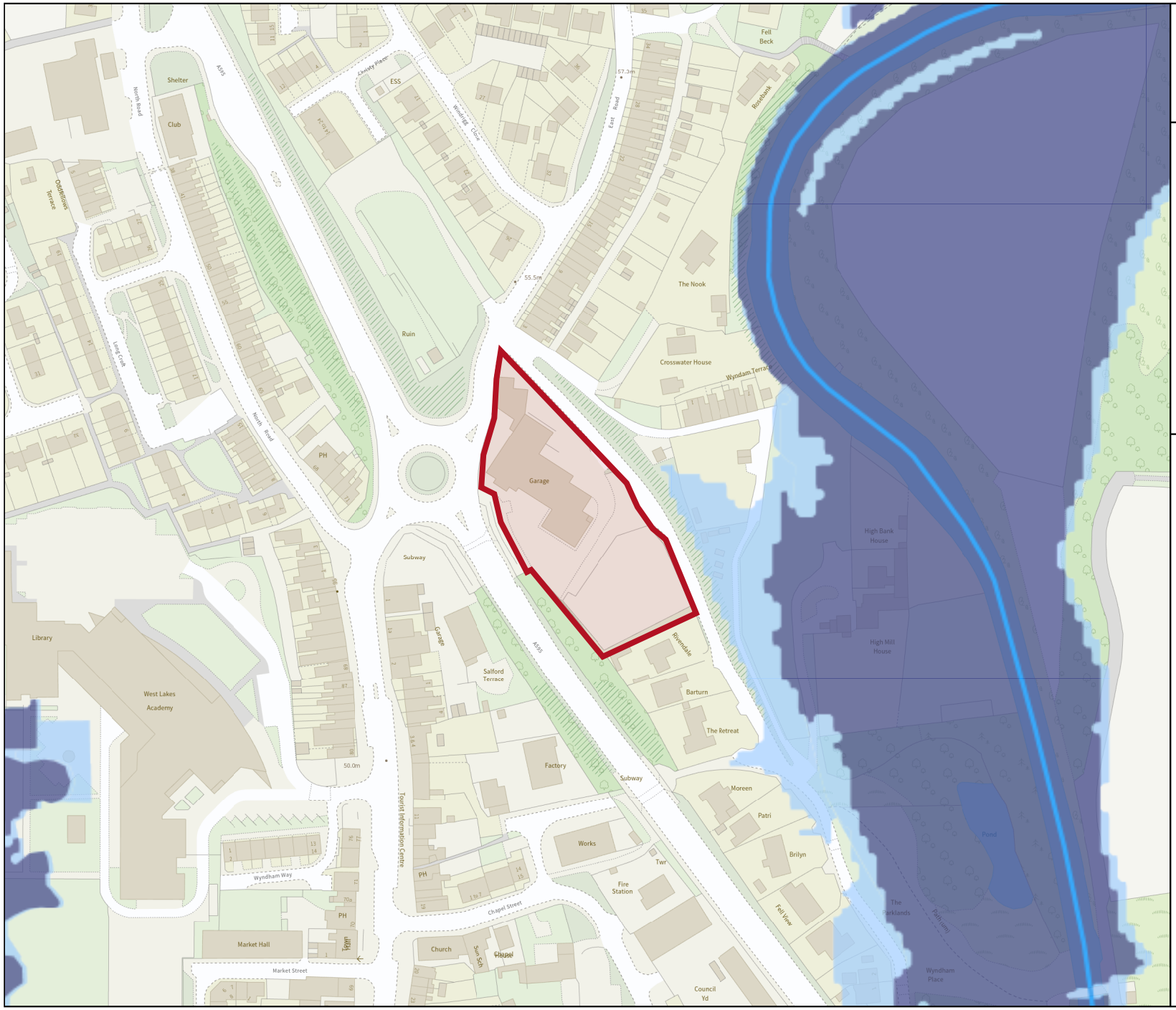
You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

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.



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
301180/511080

Scale
1:2500

Created
31 Jan 2024 15:20

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

0 20 40 60m

Appendix D – United Utilities Records

Reference	Title
N/A	United Utilities Records

United Utilities
Water for the North West

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Nichola Houghton

5200 Cinnabar Court
Daresbury Park, Daresbury
Warrington, Cheshire
WA4 4GE

FAO:

Your Ref: 3856
Our Ref: UUPS-ORD-263162
Date: 30/03/2021

Dear Sirs

Location: Aldi

I acknowledge with thanks your request dated 24/03/2021 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. http://www.unitedutilities.com/work-near-asset.aspx .

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please contact us .

Yours Faithfully,

Karen McCormack
Property Searches Manager

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Water for the North West

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

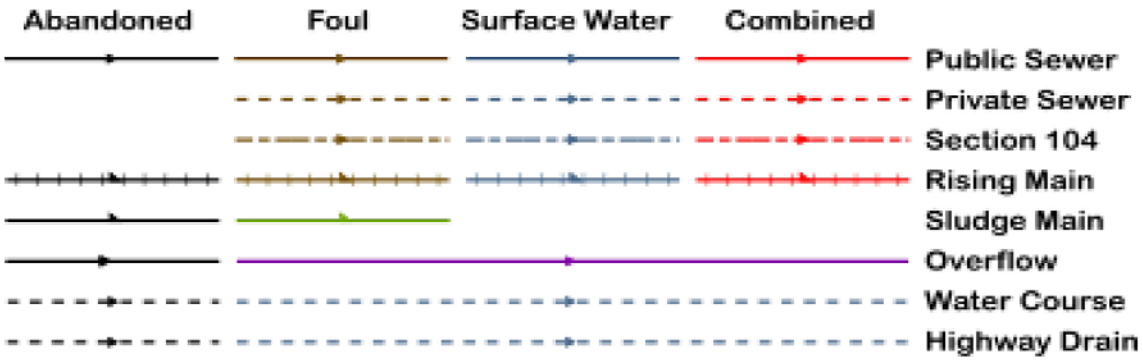
TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

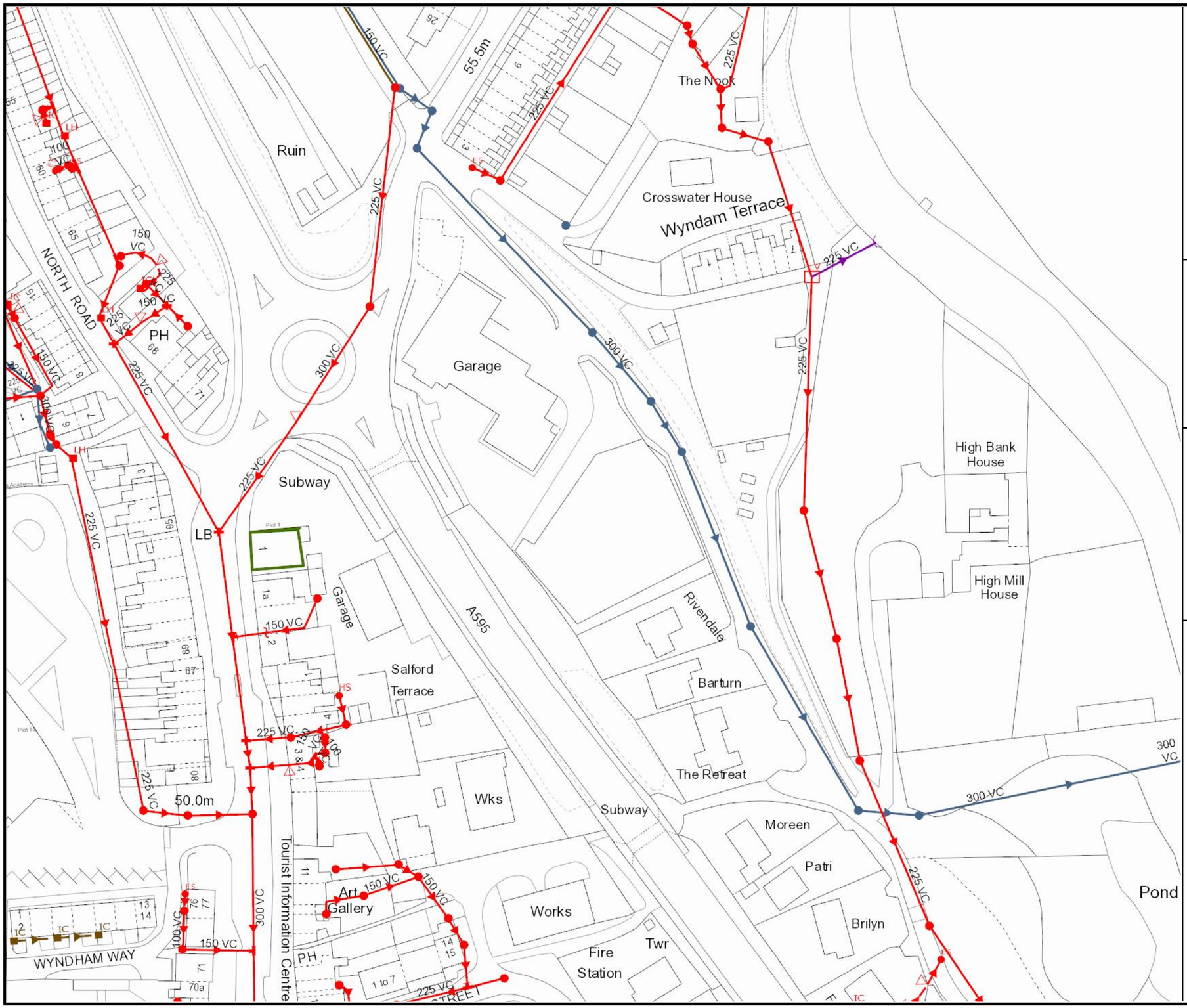
United Utilities
Water for the North West

Wastewater Symbology



All point assets follow the standard colour convention: red – combined, brown - foul, blue – surface water, purple - overflow

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- ST Septic Tank
- CK Control Kiosk
- Change of Characteristic



United Utilities

Water for the North West

SEWER RECORDS

Address or Site Reference

Aldi,

Scale: 1:1250

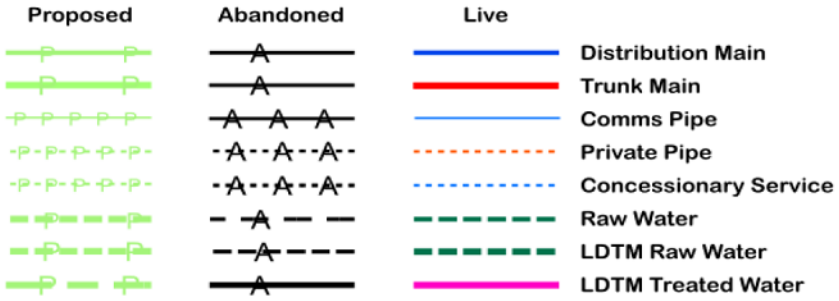
Date: 30/03/2021

Printed by: Property Searches

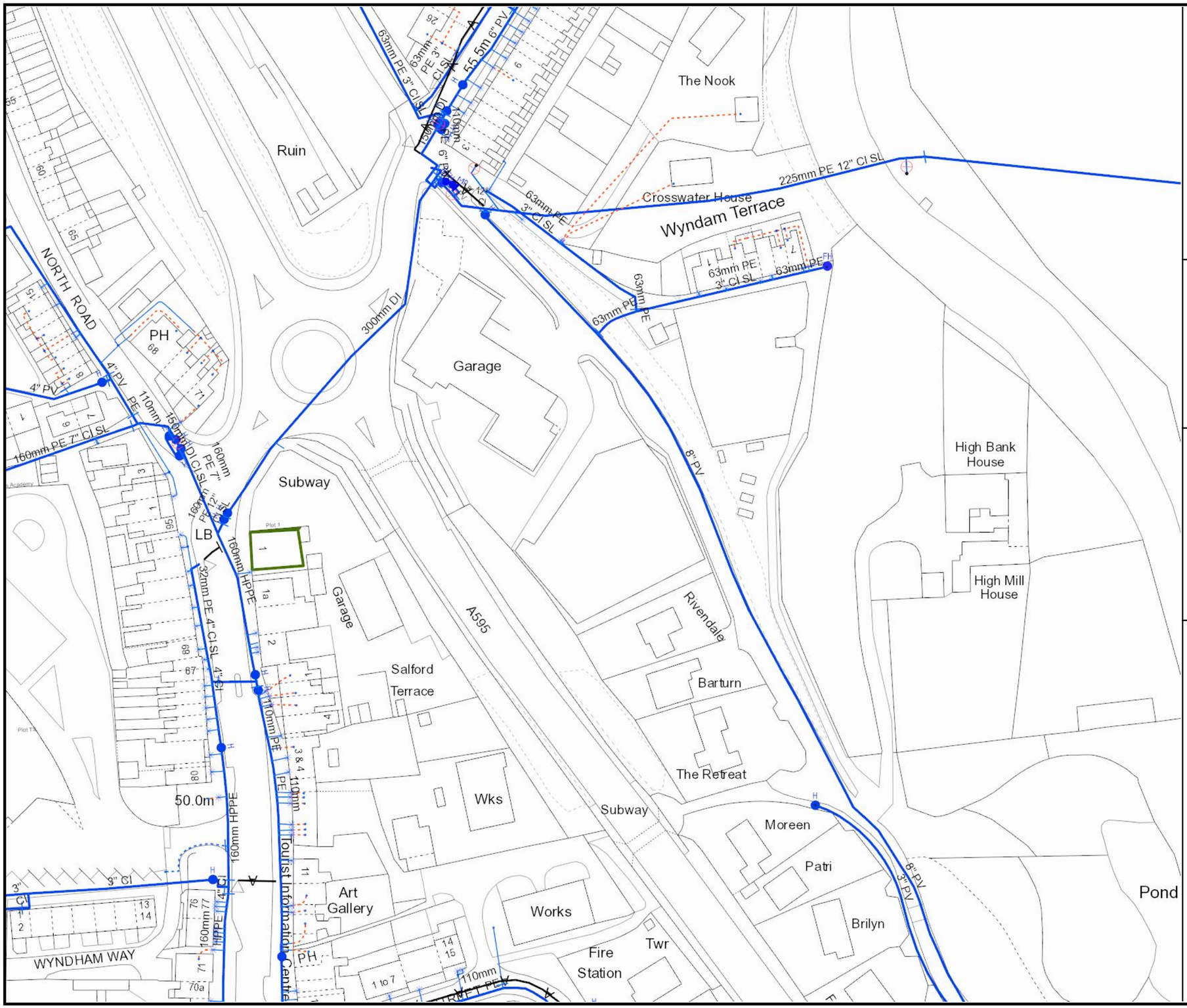
The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

United Utilities
Water for the North West

Clean Water Symbology



Symbology for proposed assets is the same as above, but shown in green
Symbology for abandoned assets is the same as above, but shown in black



WATER MAIN RECORDS

Address or Site Reference

Aldi,

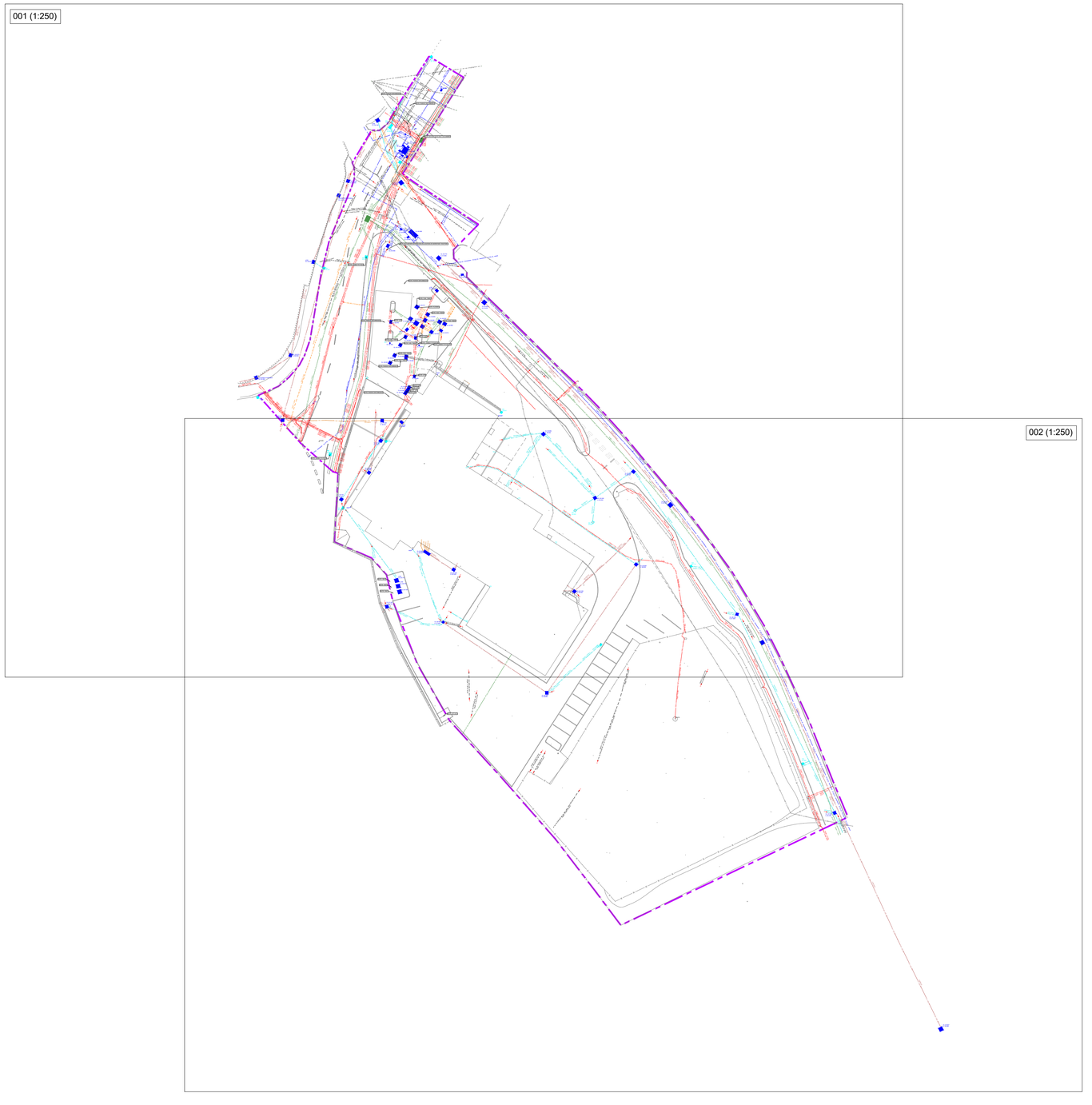
Scale: 1:1250
Date: 30/03/2021

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

Appendix E – Underground Utility Survey

Reference	Title
CKS – 1240 – OV - A	Castle Keep Surveys – Underground Utility Survey



Castle Keep Surveys Drawing Legend

Topographical Linetypes:

Road; Drop Kerb; Steps; Building Line; Barrier; Channel; Concrete; Chain Fence; Metal Fence; Post & Wire Fence; Wooden Fence; Top of Bank; Bottom of Bank; Tree Canopy Line; Verge Line; Wall; Footpath

Underground Utility Linetypes:

E Electric; GAS Gas; W Water; CATV Cable TV; CCTV Closed Circuit TV; BT British Telecom; EDU Empty Ducting; UNK Unknown Metallic Utility; GPR GPR Anomaly Possible Utility; COM Communications; Foul Water Drainage Route; Surface Water Drainage Route; Combined Service Drainage Route; Unknown Drainage Route

Aco Drain; E-TFR Electric - Taken from Records; E AR Assumed Electric; OH E Electric Overhead; OH BT BT Overhead; MSR Multi Service Route; MULTI SERVICE TRENCH Multi Service Trench; W-TFR Water - Taken from Records; W AR Assumed Water Route; X-W-X Abandoned Water Route; GAS AR Assumed Gas Route; GAS-TFR Gas - Taken from Records; Survey Extents

PAS128 Underground Utility Linetypes:

W (QLD) Water QL-D; W (B1) Water B1; W (B2) Water B2; W (B3) Water B3; W (B4) Water B4; G (QL-D) Gas QL-D; G (B1) Gas B1; G (B2) Gas B2; G (B3) Gas B3; G (B4) Gas B4; E (QL-D) Electric QL-D; E (B1) Electric B1; E (B2) Electric B2; E (B3) Electric B3; E (B4) Electric B4; CATV (QL-D) Cable TV QL-D; CATV (B1) Cable TV B1; CATV (B2) Cable TV B2; CATV (B3) Cable TV B3; CATV (B4) Cable TV B4; CS > (QL-D) Combined Service Drainage Route QLD; CS > (B1) Combined Service Drainage Route B1; CS > (B2) Combined Service Drainage Route B2; CS > (B3) Combined Service Drainage Route B3; CS > (B4) Combined Service Drainage Route B4; FS>(QL-D) Foul Water Drainage Route QLD; FS > (B1) Foul Water Drainage Route B1; FS > (B2) Foul Water Drainage Route B2; FS > (B3) Foul Water Drainage Route B3; FS > (B4) Foul Water Drainage Route B4; SWS > (QL-D) Surface Water Drainage Route QLD; SWS > (B1) Surface Water Drainage Route B1; SWS > (B2) Surface Water Drainage Route B2; SWS > (B3) Surface Water Drainage Route B3; SWS > (B4) Surface Water Drainage Route B4; HV (QL-D) High Voltage Electricity Cable QLD; HV (B1) High Voltage Electricity Cable B1; HV (B2) High Voltage Electricity Cable B2; HV (B3) High Voltage Electricity Cable B3; HV (B4) High Voltage Electricity Cable B4

BT (QL-D) British Telecom QL-D; BT (B1) British Telecom B1; BT (B2) British Telecom B2; BT (B3) British Telecom B3; BT (B4) British Telecom B4; GPR (B1) Ground Pen Radar B1; GPR (B2) Ground Pen Radar B2; GPR (B3) Ground Pen Radar B3; UNK (B1) Unknown Radar B1; UNK (B2) Unknown Radar B2; UNK (B3) Unknown Radar B3; UNK (B4) Unknown Radar B4; EDU (QL-D) Empty Ducting QL-D; EDU (B1) Empty Ducting B1; EDU (B2) Empty Ducting B2; EDU (B3) Empty Ducting B3; EDU (B4) Empty Ducting B4

Symbols:

TP Telegraph Pole; LP Lamp Post; EP Electric Post; TL Traffic Light; FL Floodlight; CTV Cable TV IC; SC Stop Cock; GV Gas Valve; BOL Bollard; 2.345 Spot Level; Post Post; GUL Gully; ER Earth Rod; GR Gas Riser; RWP Rain Water Pipe; RS Road Sign; SVP Soil Vent Pipe; CK01 E=436676.617 N=548728.511 Level=25.558 Station Control Details; RE Rodding Eye; LOR Loss of Reflection; Gate; MH1 CL 100.000 IL 98.000 Manhole; IC CL 100.000 Inspection Chamber; CATV CL 100.000 Cable TV Cover; BT CL 100.000 BT Cover; RG 100.000 Road Gully; SV CL 100.000 Stop Valve; WM CL 100.000 Water Meter; AV CL 100.000 Air Valve; WD CL 100.000 Wash Out; FH CL 100.000 Fire Hydrant; GV CL 100.000 Gas Valve; Cabinet 100.000 Cabinet; LB CL 100.000 Electric Link Box; MH2 CL 100.000 IL 97.500 Circular Manhole; MH3 CL 100.000 IL 97.500 Rectangular Manhole; EOS End of Signal; Tree

Approximate National Grid North

CASTLE KEEP SURVEYS

Job Title: Aldi Egremont, Wyndham Place, CA22 2EB

Client Name: ALDI

Drawing Title: Pas128 Underground Utility Survey

Scale	Surveyor
1:500 @ A1	LH
Date	**Approved**
20/09/2022	MD

Castle Keep Surveys Ltd
Unit 7
Fern Court
Peterlee
County Durham
SR8 2RF
T: 0429 856098
E: info@castlekeepsurveys.co.uk

Revision	Amendments	By	Checked
A	- Additional survey area added.	KH/WH	MD

Project Number	Drawing No	Revision
CKS - 1240	OV	A

Castle Keep Surveys Drawing Legend

Topographical Linetypes:

- Road
- Drop Kerb
- Steps
- Building Line
- Barrier
- Channel
- Concrete
- Chain Fence
- Metal Fence
- Post & Wire Fence
- Wooden Fence
- Top of Bank
- Bottom of Bank
- Tree Canopy Line
- Verge Line
- Wall
- Footpath

Underground Utility Linetypes:

- E — Electric
- GAS — Gas
- W — Water
- CATV — Cable TV
- CCTV — Closed Circuit TV
- BT — British Telecom
- EDU — Empty Ducting
- UNK — Unknown Metallic Utility
- GPR — GPR Anomaly Possible Utility
- COM — Communications
- Foul Water Drainage Route
- Surface Water Drainage Route
- Combined Service Drainage Route
- Unknown Drainage Route
- Acc Drain — Acc Drain
- E-TFR — Electric - Taken from Records
- E AR — Assumed Electric
- OH E — Electric Overhead
- OH BT — BT Overhead
- MSR — Multi Service Route
- MULTI SERVICE TRENCH — Multi Service Trench
- W-TFR — Water - Taken from Records
- W AR — Assumed Water Route
- X-W-X — Abandoned Water Route
- GAS AR — Assumed Gas Route
- GAS-TFR — Gas - Taken from Records
- Survey Extents

PAS128 Underground Utility Linetypes:

- W (QLD) — Water QL-D
- W (B1) — Water B1
- W (B2) — Water B2
- W (B3) — Water B3
- W (B4) — Water B4
- G (QL-D) — Gas QL-D
- G (B1) — Gas B1
- G (B2) — Gas B2
- G (B3) — Gas B3
- G (B4) — Gas B4
- E (QL-D) — Electric QL-D
- E (B1) — Electric B1
- E (B2) — Electric B2
- E (B3) — Electric B3
- E (B4) — Electric B4
- CATV (QL-D) — Cable TV QL-D
- CATV (B1) — Cable TV B1
- CATV (B2) — Cable TV B2
- CATV (B3) — Cable TV B3
- CATV (B4) — Cable TV B4
- CS > (QL-D) — Combined Service Drainage Route QLD
- CS > (B1) — Combined Service Drainage Route B1
- CS > (B2) — Combined Service Drainage Route B2
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- CS > (B4) — Combined Service Drainage Route B4
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- FS > (B3) — Foul Water Drainage Route B3
- FS > (B4) — Foul Water Drainage Route B4
- SWS > (QL-D) — Surface Water Drainage Route QLD
- SWS > (B1) — Surface Water Drainage Route B1
- SWS > (B2) — Surface Water Drainage Route B2
- SWS > (B3) — Surface Water Drainage Route B3
- SWS > (B4) — Surface Water Drainage Route B4
- HV (QL-D) — High Voltage Electricity Cable QLD
- HV (B1) — High Voltage Electricity Cable B1
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- HV (B3) — High Voltage Electricity Cable B3
- HV (B4) — High Voltage Electricity Cable B4
- BT (QL-D) — British Telecom QL-D
- BT (B1) — British Telecom B1
- BT (B2) — British Telecom B2
- BT (B3) — British Telecom B3
- BT (B4) — British Telecom B4
- GPR (B1) — Ground Pen Radar B1
- GPR (B2) — Ground Pen Radar B2
- GPR (B3) — Ground Pen Radar B3
- UNK (B1) — Unknown Radar B1
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- UNK (B3) — Unknown Radar B3
- UNK (B4) — Unknown Radar B4
- EDU (QL-D) — Empty Ducting QL-D
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- EDU (B4) — Empty Ducting B4

Symbols:

- TP — Telegraph Pole
- LP — Lamp Post
- EP — Electric Post
- TL — Traffic Light
- FL — Floodlight
- CTV — Cable TV IC
- SC — Stop Cock
- GV — Gas Valve
- BOL — Bollard
- 2.345 — Spot Level
- Post — Post
- GUL — Gully
- ER — Earth Rod
- GR — Gas Riser
- RWP — Rain Water Pipe
- RS — Road Sign
- SVP — Soil Vent Pipe
- CKS1 E=436676.617 N=546728.511 Level=25.558 — Station Control Pinballs
- RE — Radiating Eye
- LOR — Lone of Reflection
- Gate
- Manhole — MH1 CL 100.000 IL 98.000
- Inspection Chamber — IC CL 100.000
- Cable TV Cover — CATV CL 100.000
- BT Cover — BT CL 100.000
- Road Gully — RG 100.000
- Stop Valve — SV CL 100.000
- Water Meter — WM CL 100.000
- Air Valve — AV CL 100.000
- Waste Gat — WG CL 100.000
- Fire Hydrant — FH CL 100.000
- Gas Valve — GV CL 100.000
- Cabinet — Cabinet 100.000
- Electric Link Pits — LB CL 100.000
- Circular Manhole — MH2 CL 100.000 IL 97.500
- Triangular Manhole — MH3 CL 100.000 IL 97.500
- Tree
- EOS — End of Sweat

Approximate National Grid North

CASTLE KEEP SURVEYS

Job Title

Aldi Egremont
Wyndham Place
CA22 2EB

Client Name

ALDI

Drawing Title

Pas128 Underground Utility Survey

Scale: 1:500 @ A1	Surveyor: LH
Date: 20/09/2022	Approved: MD

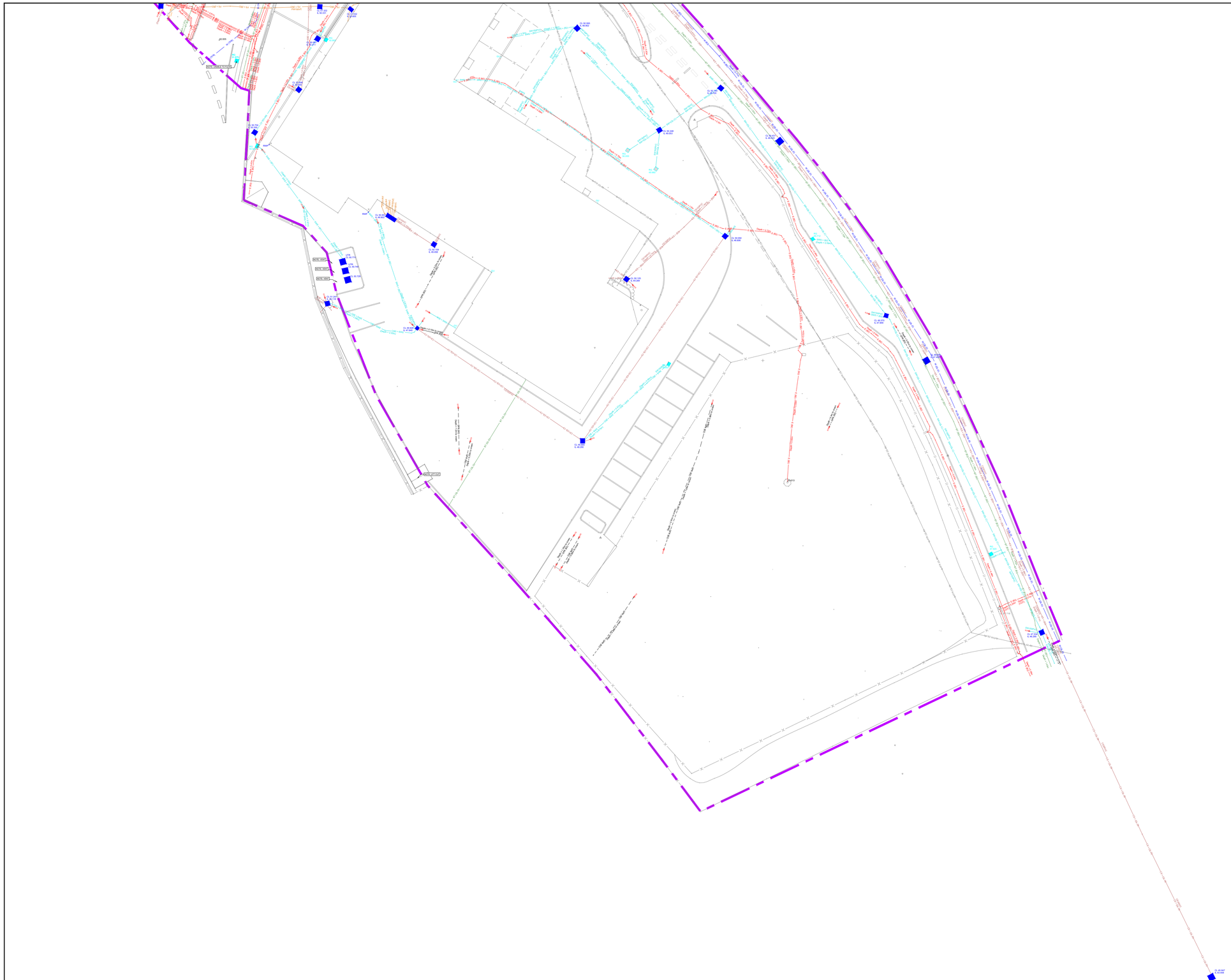
Castle Keep Surveys Ltd
Unit 7
Fern Court
Peterlee
County Durham
SR8 2RR
T: 01429 856038
E: info@castlekeepsurveys.co.uk

Revision	Amendments	By	Checked
A	- Additional survey area added.	KH/WH	MD

Project Number: CKS - 1240

Drawing No: 001

Revision: A



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- Wooden Fence
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- GAS-TFR — Gas - Taken from Records
- Survey Extents

PAS128 Underground Utility Linetypes:

- W (QLD) — Water QL-D
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- W (B3) — Water B3
- W (B4) — Water B4
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- 2.345 — Spot Level
- Post — Post
- GUL — Gully
- ER — Earth Rod
- GR — Gas Riser
- RWP — Rain Water Pipe
- RS — Road Sign
- SVP — Soil Vent Pipe
- CKS1 E=436676.617 N=546728.511 Level=25.558 — Station Control Details
- FE — Existing Eye
- LOR — Loss of Reflection
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- Inspection Chamber — IC CL 100.000
- Cable TV Cover — CATV CL 100.000
- BT Cover — BT CL 100.000
- Road Gully — RG 100.000
- Stop Valve — SV CL 100.000
- Water Meter — WM CL 100.000
- Air Valve — AV CL 100.000
- Waste Out — WO CL 100.000
- First Hydrant — FH CL 100.000
- Gas Valve — GDV CL 100.000
- Cabinet — Cabinet 100.000
- Electric Link Pin — LB CL 100.000
- Circular Manhole — MH2 CL 100.000 IL 97.500
- Triangular Manhole — MH3 CL 100.000 IL 97.500
- Tree
- EOS — End of Tunnel

Approximate National Grid North

CASTLE KEEP SURVEYS

Job Title:

Aldi Egremont
Wyndham Place
CA22 2EB

Client Name:

ALDI

Drawing Title:

Pas128 Underground Utility Survey

Scale	Surveyor
1:500 @ A1	LH
Date	**Approved**
20/09/2022	MD

Castle Keep Surveys Ltd
Unit 7
Fern Court
Peterlee
County Durham
SR8 2RB
T: 01429 896098
E: info@castlekeepsurveys.co.uk

Revision	Amendments	By	Checked
A	- Additional survey area added.	KH/WH	MD

Project Number	Drawing No	Revision
CKS - 1240	002	A

Appendix F – Greenfield Runoff Rate Estimation

Reference	Title
N/A	Greenfield Runoff Rate Estimation

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	James Foster
Site name:	29348
Site location:	Aldi - Egremont

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.

Site Details

Latitude:	54.48521° N
Longitude:	3.52694° W
Reference:	4087431635
Date:	Feb 01 2024 12:08

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): .625

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	1227	1227
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	5.82	5.82
1 in 1 year (l/s):	5.06	5.06
1 in 30 years (l/s):	9.89	9.89
1 in 100 year (l/s):	12.1	12.1
1 in 200 years (l/s):	13.79	13.79

Appendix G – United Utilities Predevelopment Response

Reference	Title
N/A	United Utilities Predevelopment Response

Gary Spence

From: seweradoptions@uuplc.co.uk
Sent: 30 January 2024 11:59
To: Gary Spence
Subject: RE: pre development - Wyndham Place, Egremont - ref 05216482

Good Morning Gary,

Pre Development Enquiry - Wyndham Place, Egremont, Copeland, CA22 2EB – UU ref 05216482

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:
https://www.unitedutilities.com/builders-developers/working-near-our-assets/

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

Our preferred point of discharge would be to the 225mm diameter public combined sewer running north-to-south to the east of the proposed site, at UUMH2902 of UUMH2901.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water
All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.
Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.
A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.
Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:
https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:
https://www.gov.uk/government/publications/groundwater-protection-position-statements

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 300mm diameter public surface water sewer within located just outside the eastern boundary of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5.8 l/s. This is the greenfield QBAR rate, as all sites should aspire to meet greenfield runoff rates.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance

and update our records.

Existing Water Assets Crossing the Site
It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:
https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application
Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:
https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.
If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Tom

Thomas Bethell
Developer Engineer
Developer Services & Metering
Customer Services
M: 07880 339 195
unitedutilities.com

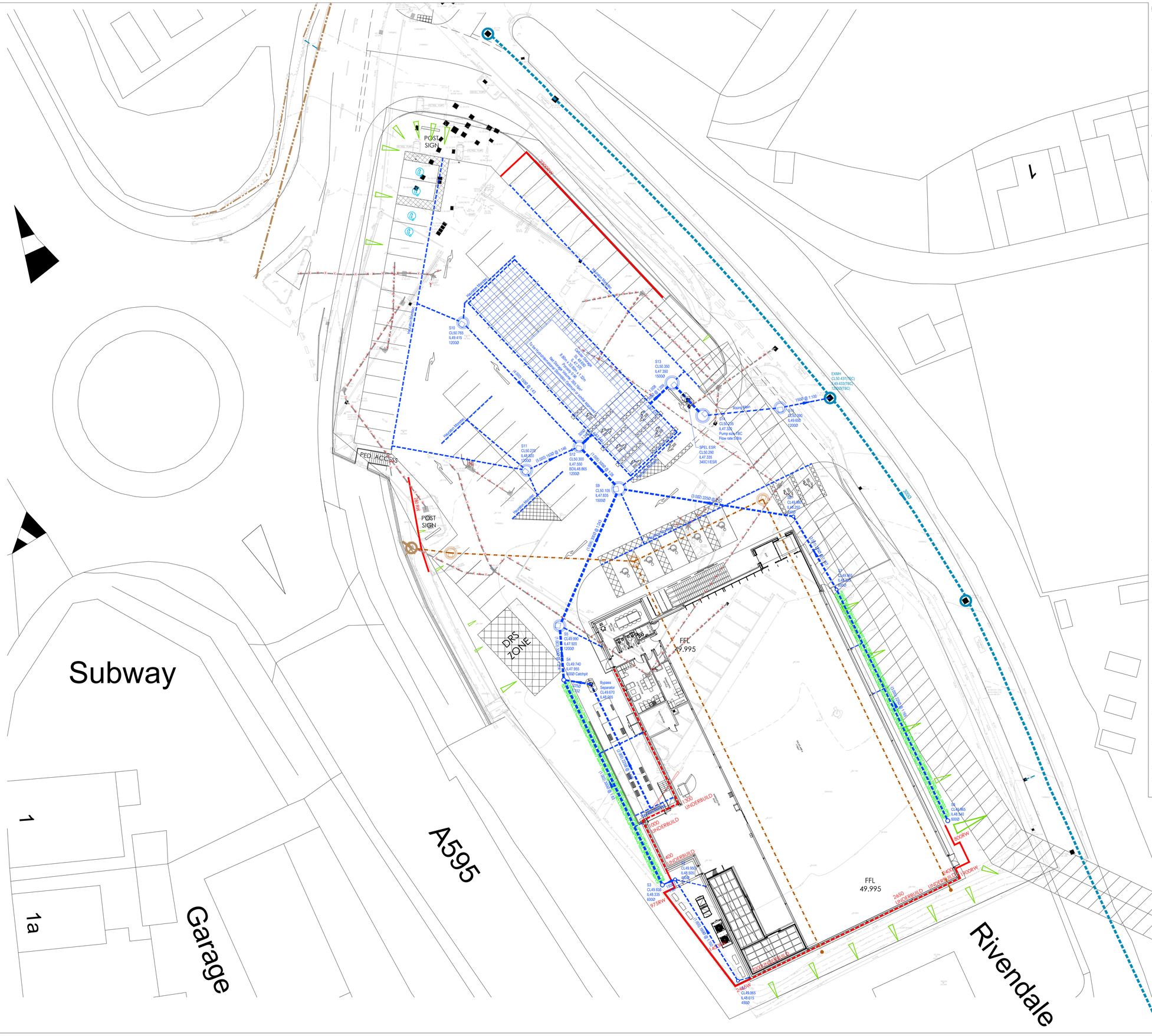
---------- Original Message ----------
From: Gary Spence [garyspence@hydrock.com]
Sent: 24/01/2024 14:03
To: wastewaterdeveloperservices@uuplc.co.uk
Subject: Wyndham Place, Egremont

Good Afternoon,

Please find attached our pre-development enquiry.

Appendix H – Proposed Drainage Layout

Reference	Title
DA-0541-HYD-ZZ-XX-DR-C-Ro-50-20-11-1000	Proposed Drainage Layout



NOTES

1. ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT WATER SERVICES ASSOCIATION "SEWERS FOR ADOPTION" AND ADOPTING WATER AUTHORITY/SEWERAGE AGENCY REQUIREMENTS AND SPECIFICATIONS.
2. ALL PRIVATE DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BUILDING REGULATIONS CURRENT EDITION.
3. CONTRACTOR TO ESTABLISH POSITION SIZE AND DEPTH OF ALL EXISTING SEWERS AND SERVICES PRIOR TO COMMENCEMENT ON SITE.
4. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
5. THE CONTRACTOR SHALL ALLOW FOR ALL TRAFFIC MANAGEMENT IN CONNECTION WITH ROAD AND SEWER WORKS.
6. THE CONTRACTOR SHALL ALLOW FOR KEEPING SEWER TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DEWATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY.
7. PIPES UP TO AND INCLUDING 300mmØ TO BE UNPLASTICISED PVC. PIPES 375mmØ AND GREATER TO BE CONCRETE CLASS H.
8. ALL PIPEWORK TO BE 100mm DIAMETER UNLESS NOTED OTHERWISE.
9. INSITU AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS 4027, UNLESS AGREED OTHERWISE WITH THE ADOPTING AUTHORITY.
10. PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 5911 AND BE KITEMARKED. CONCRETE PIPES TO BE CLASS H UNLESS NOTED OTHERWISE.
11. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN124, HAVE MINIMUM 675 x 675 CLEAR OPENINGS WITH 150 DEEP FRAMES UNLESS OTHERWISE SPECIFIED. MANHOLE COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN WITHOUT CUSHION INSERTS AND BE KITEMARKED. LOAD CLASS D400 IN VEHICULAR TRAFFICKED AREAS AND LOAD CLASS B125 IN FOOTWAYS AND PEDESTRIAN AREAS.
12. GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN124 AND BE OF A NON-ROCKING DESIGN WITH CAPTIVE HINGE ACCESS AND BE KITEMARKED. LOAD CLASS D400 FOR ROADS REGULARLY CARRYING FAST MOVING HEAVY VEHICLES. CLASS C250 TO BE USED IN LESSER TRAFFICKED AREAS eg. ESTATE ROADS, CUL-DE-SACS, RESIDENTIAL CAR PARKING AREAS ETC.
13. CLASS Z BEDDING DETAIL SHALL BE PROVIDED WHERE COVER TO THE PIPE BARREL IS LESS THAN 1.2M IN VEHICULAR TRAFFICKED AREAS AND 0.9M ELSEWHERE, TO ALL ROAD GULLY CONNECTIONS AND WITHIN AREAS OF DEEP ROOTING VEGETATION.
14. WHERE CLASS Z TRENCH BEDDING DETAIL IS USED, THE CONCRETE BED AND SURROUND SHALL BE DISCONTINUED AT EACH PIPE JOINT OVER THE FULL CROSS SECTION BY MEANS OF A SHAPED COMPRESSIBLE FILLER.
15. SELECTED BACKFILL MATERIAL SHALL CONSIST OF UNIFORM MATERIAL FREE FROM STONES LARGER THAN 40mm, CLAY LUMPS LARGER THAN 75mm, TREE ROOTS, ORGANIC MATTER AND FROZEN SOIL. SELECTED BACKFILL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING 225mm, EACH LAYER COMPACTED TO FORM A STABLE TRENCH BACKFILL.
16. GENERAL BACKFILL MATERIAL TO BE FREE FROM STONES LARGER THAN 40mm. GENERAL BACKFILL MATERIAL IS TO BE PLACED IN LAYERS NOT EXCEEDING 150mm THICKNESS AND EACH LAYER COMPACTED BY HAND. NO MECHANICAL COMPACTION OF FILL MATERIAL SHALL BE PERMITTED WITHIN 300mm ABOVE THE CROWN/BARREL OF THE PIPE.
17. BACKFILLING AND REINSTATEMENT TO TRENCHES IN PUBLIC HIGHWAYS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE ADOPTING AUTHORITY, OR, IN THE ABSENCE OF SUCH, IN ACCORDANCE WITH THE REQUIREMENTS OF "THE STREET WORKS REGULATIONS 1992" AND RELEVANT PROVISIONS OF H.A.U.C. "SPECIFICATION FOR THE REINSTATEMENT OF OPENINGS IN HIGHWAYS" JUNE 1992, BOTH UNDER SECTION 71 OF THE NEW ROADS AND STREET WORKS ACT 1991.
18. BACKFILL TO DRAINAGE TRENCHES IN HARD PAVED AREAS SHALL BE G.S.B. TYPE 1.
19. ALL ROAD GULLIES ARE TO BE TRAPPED GULLIES.
20. ALL GULLY LEADS TO BE 150mm DIAMETER.
21. ALL REDUNDANT EXISTING DRAINAGE TO BE GRUBBED UP OR GROUTED, ANY EXISTING LIVE DRAINAGE SHOULD BE REPORTED TO THE ENGINEER AND RECONNECTED.
22. ALL ROAD GULLIES & LEADS TO BE CLEARED OF DEBRIS UPON COMPLETION OF WORKS.
23. ANY EXISTING DRAINAGE WHICH BECOMES UNDER TRAFFICKED AREAS IN THE NEW SCHEME SHOULD BE SUBJECT TO THE FOLLOWING REMEDIALS/REVISIONS. WHERE DEPTH OF COVER IS LESS THAN 1200MM, THE EXISTING PIPEWORK SHALL BE EXPOSED & SURROUNDED WITH 150MM CONCRETE AS CLASS "Z" BEDDING. WHERE THE EXISTING MANHOLE COVER & FRAME IS NOT AS MANHOLE DETAIL A OR B, OR TO BS497 GRADE A, OR EN124 CLASS D, THEN IT SHOULD BE CHANGED FOR SUCH.
24. THE CONTRACTOR MUST ENSURE THAT ANY OF THE EXISTING DRAINAGE WHICH IS LIVE IS KEPT CLEAR OF DEBRIS AND SHOULD ALLOW FOR JETTING THROUGH THE NEW & EXISTING DRAINAGE UPON COMPLETION.
25. CONTRACTOR TO TAKE MEASURES TO PROTECT HIS OPERATIVES WITH RESPECT TO THE PRESENCE OF GAS IN SEWER TRENCHES AND MANHOLES THROUGH THE USE OF GAS MONITORING EQUIPMENT AND BREATHING APPARATUS AS REQUIRED.
26. CONTRACTOR TO APPLY FOR SEWER PERMITS AND ROAD OPENING PERMITS AS NECESSARY FROM THE APPROPRIATE AUTHORITIES, PRIOR TO COMMENCING WORKS.
27. ALL PERFORATED PIPES TO BE TWIN WALL UPVC.
28. ALL MANHOLE COVERS TO BE ALIGNED WITH SURROUNDING FEATURES WHERE POSSIBLE TO SUIT INTERNAL PIPE LAYOUT AND ACCESS REQUIREMENTS.

REV	DATE	DESCRIPTION	DRW	CHK
P01	07/02/2024	PRELIMINARY ISSUE	JF	GS

HEALTH & SAFETY

1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

ROADS & DRAINAGE

2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO INSTALLING DRAINAGE
3. THE TIME THAT EXCAVATIONS ARE OPEN ON SITE SHOULD BE KEPT TO A MINIMUM AND ALL TRENCHES SHOULD BE SURROUNDED BY A BARRIER.
4. CONNECTIONS TO EXISTING SEWERS TO BE MADE BY NWL APPROVED CONTRACTOR ONLY
5. CONTRACTOR TO MAKE OPERATIVES AWARE OF ASSOCIATED DANGERS TO HEALTH SUCH AS LEPTOSPIROSIS (WEILS DISEASE) AND RECOMMENDED PRECAUTIONS. ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING TO BE PROVIDED AS REQUIRED.
6. UNFINISHED MANHOLES MUST BE COVERED WITH LOAD BEARING MATERIALS AND SURROUNDED WITH BARRIER.

PIPES & CABLES

7. SERVICE RECORDS TO BE REFERRED TO PRIOR TO WORK COMMENCING. CONTRACTOR TO PROCEED WITH CAUTION AND SERVICES TO BE LOCATED BY HAND DIG AND PROTECTED ACCORDINGLY.

EXCAVATION/FILL

8. CONTRACTOR TO ENSURE RELEVANT MEASURES ARE TAKEN TO KEEP PLANT AND PEOPLE A SAFE DISTANCE FROM STEEP SLOPES DURING THE WORKS.
9. CONTRACTOR TO ENSURE THAT PROCEDURES ARE IN PLACE TO KEEP PEOPLE A SAFE DISTANCE FROM WORKING PLANT WHERE NECESSARY.
10. CONTRACTOR TO REFER TO GROUND INVESTIGATION REPORT FOR CONTAMINATION TESTS AND TO PROVIDE ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING AS REQUIRED.

KEY

- Existing adopted surface water sewer
- Existing adopted combined water sewer
- Existing combined water sewer to be abandoned
- Existing foul water sewer to be abandoned
- Existing surface water sewer to be abandoned
- Proposed surface water sewer
- Proposed foul water sewer
- Proposed cellular storage
- Proposed filter drain with perforated pipe wrapped in impermeable membrane and clean stone aggregate
- Proposed surface water rising main
- Haunton Monotec — Proposed channel drain with D400 rated pedestrian type covers with sump outlet units

Client
Aldi Stores Ltd.

Project Title
Aldi - Egremont (New Build)

Project Address
Wydnham Place
Egremont

Drawing Title
Proposed Drainage Layout

Job No.	Originator	Zone	Level	Type	Role
DA-0541	HYD	ZZ	XX	DR	C

System Classification	Drawing No.	Suitability	Revision
Ro_50_20_11	-1000	S2	P01

Drawn	Checked	Date	Scale	Size
JF	GS	Feb 2024	1:250	A1

Hydrock

2nd Floor, 2 Esh Plaza,
Sir Bobby Robson Way, Great Park
Newcastle
NE13 9BA
t: +44(0)191 230 2993
e: newcastle@3econsult.com

Appendix I – Flow Results Report

Reference	Title
N/A	Flow Results Report

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	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)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	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)
1	0.012	5.00	49.965	450	301187.479	511014.270	1.350
2	0.013	5.00	49.950	450	301178.794	511028.300	1.445
3	0.021	5.00	49.835	600	301177.037	511027.524	1.500
LOADING BAY LDC	0.033	5.00	48.695	300	301175.373	511038.181	0.525
SEPARATOR			49.670	600	301167.139	511055.304	1.615
4			49.740	600	301163.387	511055.912	1.785
5	0.011	5.00	49.990	1200	301162.837	511063.392	2.070
6	0.126	5.00	49.965	600	301216.431	511036.373	1.425
7			49.965	600	301201.048	511068.366	1.640
8			49.980	450	301195.160	511078.535	1.730
9	0.171	5.00	50.105	1500	301171.015	511082.374	2.270
10	0.025	5.00	50.765	1200	301149.449	511105.334	1.350
11	0.053	5.00	50.270	1200	301158.243	511084.920	1.350
12			50.300	1200	301165.538	511088.205	2.750
TANK IN 1			50.020		301167.288	511089.848	2.480
TANK OUT			50.020		301175.334	511094.134	2.650
13	0.018	5.00	50.350	1500	301178.379	511096.993	3.000
14			50.235	1200	301182.634	511092.463	2.915
15			50.215	1200	301193.328	511093.568	
EXISTING MH			50.437	1200	301200.236	511094.923	
ESR			50.290	600	301180.613	511094.614	2.955

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	1	2	16.501	0.600	48.615	48.505	0.110	150.0	150	5.34	46.1
1.001	2	3	1.921	0.600	48.505	48.485	0.020	96.0	150	5.37	46.0
1.002	3	4	31.499	0.600	48.335	47.955	0.380	82.9	300	5.67	45.0
2.000	LOADING BAY LDC	SEPARATOR	19.000	0.600	48.170	48.055	0.115	165.2	225	5.31	46.2
2.001	SEPARATOR	4	3.801	0.600	48.055	48.030	0.025	152.0	225	5.37	46.0

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)
1.000	0.818	14.5	1.5	1.200	1.295	0.012	0.0	33	0.528
1.001	1.025	18.1	3.1	1.295	1.200	0.025	0.0	42	0.767
1.002	1.728	122.1	5.6	1.200	1.485	0.046	0.0	44	0.892
2.000	1.014	40.3	4.1	0.300	1.390	0.033	0.0	49	0.659
2.001	1.058	42.1	4.1	1.390	1.485	0.033	0.0	47	0.673

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)
1.003	4	5	7.500	0.600	47.955	47.920	0.035	214.3	300	5.79	44.6
1.004	5	9	20.669	0.600	47.920	47.835	0.085	243.2	300	6.13	43.5
3.000	6	7	35.499	0.600	48.540	48.325	0.215	165.1	225	5.58	45.3
3.001	7	8	11.751	0.600	48.325	48.250	0.075	156.7	225	5.77	44.7
3.002	8	9	24.448	0.600	48.250	47.910	0.340	71.9	225	6.04	43.8
1.005	9	12	8.000	0.600	47.835	47.550	0.285	28.1	300	6.18	43.4
4.000	10	12	23.500	0.600	49.415	48.865	0.550	42.7	150	5.25	46.4
5.000	11	12	8.001	0.600	48.920	48.865	0.055	145.5	150	5.16	46.7
1.006	12	TANK IN 1	2.400	0.600	47.550	47.540	0.010	240.0	300	6.22	43.3
1.007	TANK IN 1	TANK OUT	1.000	0.600	47.540	47.535	0.005	200.0	300	6.23	43.2
1.008	TANK OUT	13	4.177	0.600	47.370	47.350	0.020	208.8	300	6.29	43.0
1.009	13	ESR	3.263	0.600	47.350	47.335	0.015	217.6	300	6.35	42.9
1.010	ESR	14	2.951	0.600	47.335	47.320	0.015	196.8	300	6.39	42.8

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)
1.003	1.070	75.6	9.6	1.485	1.770	0.079	0.0	72	0.739
1.004	1.004	70.9	10.6	1.770	1.970	0.090	0.0	78	0.727
3.000	1.015	40.3	15.5	1.200	1.415	0.126	0.0	96	0.947
3.001	1.042	41.4	15.3	1.415	1.505	0.126	0.0	94	0.965
3.002	1.544	61.4	15.0	1.505	1.970	0.126	0.0	75	1.277
1.005	2.978	210.5	45.5	1.970	2.450	0.387	0.0	94	2.390
4.000	1.544	27.3	3.1	1.200	1.285	0.025	0.0	34	1.031
5.000	0.831	14.7	6.7	1.200	1.285	0.053	0.0	71	0.813
1.006	1.010	71.4	54.5	2.450	2.180	0.465	0.0	197	1.109
1.007	1.108	78.3	54.5	2.180	2.185	0.465	0.0	185	1.195
1.008	1.084	76.6	54.2	2.350	2.700	0.465	0.0	187	1.172
1.009	1.062	75.0	56.1	2.700	2.655	0.483	0.0	194	1.161
1.010	1.117	79.0	56.0	2.655	2.615	0.483	0.0	187	1.209

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	16.501	150.0	150	Circular	49.965	48.615	1.200	49.950	48.505	1.295
1.001	1.921	96.0	150	Circular	49.950	48.505	1.295	49.835	48.485	1.200
1.002	31.499	82.9	300	Circular	49.835	48.335	1.200	49.740	47.955	1.485
2.000	19.000	165.2	225	Circular	48.695	48.170	0.300	49.670	48.055	1.390
2.001	3.801	152.0	225	Circular	49.670	48.055	1.390	49.740	48.030	1.485
1.003	7.500	214.3	300	Circular	49.740	47.955	1.485	49.990	47.920	1.770
1.004	20.669	243.2	300	Circular	49.990	47.920	1.770	50.105	47.835	1.970

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	450	Manhole	Adoptable	2	450	Manhole	Adoptable
1.001	2	450	Manhole	Adoptable	3	600	Manhole	Adoptable
1.002	3	600	Manhole	Adoptable	4	600	Manhole	Adoptable
2.000	LOADING BAY LDC	300	Manhole	Adoptable	SEPARATOR	600	Manhole	Adoptable
2.001	SEPARATOR	600	Manhole	Adoptable	4	600	Manhole	Adoptable
1.003	4	600	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.004	5	1200	Manhole	Adoptable	9	1500	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	35.499	165.1	225	Circular	49.965	48.540	1.200	49.965	48.325	1.415
3.001	11.751	156.7	225	Circular	49.965	48.325	1.415	49.980	48.250	1.505
3.002	24.448	71.9	225	Circular	49.980	48.250	1.505	50.105	47.910	1.970
1.005	8.000	28.1	300	Circular	50.105	47.835	1.970	50.300	47.550	2.450
4.000	23.500	42.7	150	Circular	50.765	49.415	1.200	50.300	48.865	1.285
5.000	8.001	145.5	150	Circular	50.270	48.920	1.200	50.300	48.865	1.285
1.006	2.400	240.0	300	Circular	50.300	47.550	2.450	50.020	47.540	2.180
1.007	1.000	200.0	300	Circular	50.020	47.540	2.180	50.020	47.535	2.185
1.008	4.177	208.8	300	Circular	50.020	47.370	2.350	50.350	47.350	2.700
1.009	3.263	217.6	300	Circular	50.350	47.350	2.700	50.290	47.335	2.655
1.010	2.951	196.8	300	Circular	50.290	47.335	2.655	50.235	47.320	2.615

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.000	6	600	Manhole	Adoptable	7	600	Manhole	Adoptable
3.001	7	600	Manhole	Adoptable	8	450	Manhole	Adoptable
3.002	8	450	Manhole	Adoptable	9	1500	Manhole	Adoptable
1.005	9	1500	Manhole	Adoptable	12	1200	Manhole	Adoptable
4.000	10	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
5.000	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
1.006	12	1200	Manhole	Adoptable	TANK IN 1		Junction	
1.007	TANK IN 1		Junction		TANK OUT		Junction	
1.008	TANK OUT		Junction		13	1500	Manhole	Adoptable
1.009	13	1500	Manhole	Adoptable	ESR	600	Manhole	Adoptable
1.010	ESR	600	Manhole	Adoptable	14	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	301187.479	511014.270	49.965	1.350	450				
						0	1.000	48.615	150
2	301178.794	511028.300	49.950	1.445	450	1	1.000	48.505	150
									
						0	1.001	48.505	150
3	301177.037	511027.524	49.835	1.500	600	1	1.001	48.485	150
									
						0	1.002	48.335	300
LOADING BAY LDC	301175.373	511038.181	48.695	0.525	300				
						0	2.000	48.170	225
SEPARATOR	301167.139	511055.304	49.670	1.615	600	1	2.000	48.055	225
									
						0	2.001	48.055	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
4	301163.387	511055.912	49.740	1.785	600	1	2.001	48.030	225
						2	1.002	47.955	300
						0	1.003	47.955	300
5	301162.837	511063.392	49.990	2.070	1200	1	1.003	47.920	300
						0	1.004	47.920	300
6	301216.431	511036.373	49.965	1.425	600	0	3.000	48.540	225
7	301201.048	511068.366	49.965	1.640	600	1	3.000	48.325	225
						0	3.001	48.325	225
8	301195.160	511078.535	49.980	1.730	450	1	3.001	48.250	225
						0	3.002	48.250	225
9	301171.015	511082.374	50.105	2.270	1500	1	3.002	47.910	225
						2	1.004	47.835	300
						0	1.005	47.835	300
10	301149.449	511105.334	50.765	1.350	1200	0	4.000	49.415	150
11	301158.243	511084.920	50.270	1.350	1200	0	5.000	48.920	150
12	301165.538	511088.205	50.300	2.750	1200	1	5.000	48.865	150
						2	4.000	48.865	150
						3	1.005	47.550	300
						0	1.006	47.550	300
TANK IN 1	301167.288	511089.848	50.020	2.480		1	1.006	47.540	300
						0	1.007	47.540	300
TANK OUT	301175.334	511094.134	50.020	2.650		1	1.007	47.535	300
						0	1.008	47.370	300
13	301178.379	511096.993	50.350	3.000	1500	1	1.008	47.350	300
						0	1.009	47.350	300
14	301182.634	511092.463	50.235	2.915	1200	1	1.010	47.320	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
15	301193.328	511093.568	50.215		1200				
EXISTING MH	301200.236	511094.923	50.437		1200				
ESR	301180.613	511094.614	50.290	2.955	600	1	1.009	47.335	300
						0	1.010	47.335	300

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.300	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	35	0	0
100	50	0	0

Node 14 Online Pump Control

Flap Valve	x	Design Depth (m)	1.375	Switch off depth (m)	0.050
Replaces Downstream Link	✓	Design Flow (l/s)	5.8		
Invert Level (m)	47.320	Switch on depth (m)	0.100		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.800	0.600	5.800	1.100	5.800	1.600	5.800	2.100	5.800	2.600	5.800
0.200	5.800	0.700	5.800	1.200	5.800	1.700	5.800	2.200	5.800	2.700	5.800
0.300	5.800	0.800	5.800	1.300	5.800	1.800	5.800	2.300	5.800	2.800	5.800
0.400	5.800	0.900	5.800	1.400	5.800	1.900	5.800	2.400	5.800	2.900	5.800
0.500	5.800	1.000	5.800	1.500	5.800	2.000	5.800	2.500	5.800	2.950	5.800

Node TANK OUT Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	47.370
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.96	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	288.6	0.0	1.320	288.6	0.0	1.321	0.0	0.0

Node 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	47.955	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	1.200	Inf Depth (m)	
Porosity	0.30	Length (m)	30.500		

Node 6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	48.540	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	5	Depth (m)	
Safety Factor	2.0	Width (m)	1.200	Inf Depth (m)	
Porosity	0.30	Length (m)	34.500		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	48.652	0.037	2.0	0.0059	0.0000	OK
15 minute summer	2	10	48.559	0.054	4.1	0.0086	0.0000	OK
15 minute summer	3	11	48.384	0.049	7.4	0.0140	0.0000	OK
15 minute summer	LOADING BAY LDC	10	48.226	0.056	5.4	0.0040	0.0000	OK
15 minute summer	SEPARATOR	11	48.113	0.058	5.3	0.0165	0.0000	OK
15 minute summer	4	12	48.043	0.088	12.6	0.6576	0.0000	OK
15 minute summer	5	12	48.007	0.087	13.2	0.0985	0.0000	OK
15 minute summer	6	11	48.653	0.113	20.5	1.0166	0.0000	OK
15 minute summer	7	11	48.439	0.114	19.6	0.0322	0.0000	OK
15 minute summer	8	12	48.340	0.090	19.4	0.0143	0.0000	OK
15 minute summer	9	11	47.961	0.126	58.2	0.2227	0.0000	OK
15 minute summer	10	10	49.455	0.040	4.1	0.0449	0.0000	OK
15 minute summer	11	10	49.008	0.088	8.6	0.0999	0.0000	OK
15 minute summer	12	11	47.781	0.231	70.1	0.2610	0.0000	OK
15 minute summer	TANK IN 1	11	47.747	0.207	70.0	0.0000	0.0000	OK
240 minute summer	TANK OUT	168	47.583	0.213	25.9	59.0327	0.0000	OK
240 minute summer	13	168	47.583	0.233	6.3	0.4116	0.0000	OK
240 minute summer	14	168	47.582	0.262	5.9	0.2968	0.0000	OK
	15							
	EXISTING MH							
240 minute summer	ESR	168	47.583	0.248	6.1	0.0701	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	1	1.000	2	2.0	0.431	0.136	0.0756	
15 minute summer	2	1.001	3	4.0	0.755	0.220	0.0101	
15 minute summer	3	1.002	4	7.3	0.693	0.060	0.3850	
15 minute summer	LOADING BAY LDC	2.000	SEPARATOR	5.3	0.671	0.132	0.1509	
15 minute summer	SEPARATOR	2.001	4	5.3	0.687	0.125	0.0292	
15 minute summer	4	1.003	5	11.8	0.694	0.156	0.1279	
15 minute summer	5	1.004	9	13.3	0.650	0.187	0.4601	
15 minute summer	6	3.000	7	19.6	0.976	0.486	0.7131	
15 minute summer	7	3.001	8	19.4	1.116	0.467	0.2041	
15 minute summer	8	3.002	9	19.4	1.347	0.316	0.3517	
15 minute summer	9	1.005	12	57.9	1.325	0.275	0.3450	
15 minute summer	10	4.000	12	4.0	1.095	0.147	0.0863	
15 minute summer	11	5.000	12	8.5	0.827	0.579	0.0822	
15 minute summer	12	1.006	TANK IN 1	70.0	1.270	0.980	0.1320	
15 minute summer	TANK IN 1	1.007	TANK OUT	69.9	1.351	0.892	0.0517	
240 minute summer	TANK OUT	1.008	13	5.7	0.484	0.075	0.2344	
240 minute summer	13	1.009	ESR	6.1	0.442	0.081	0.1972	
240 minute summer	14	Pump		5.8				94.9
240 minute summer	ESR	1.010	14	5.9	0.398	0.075	0.1882	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	48.674	0.059	4.8	0.0094	0.0000	OK
15 minute summer	2	10	48.598	0.093	9.9	0.0147	0.0000	OK
15 minute summer	3	10	48.412	0.077	18.2	0.0218	0.0000	OK
15 minute summer	LOADING BAY LDC	10	48.262	0.092	13.1	0.0065	0.0000	OK
15 minute summer	SEPARATOR	12	48.176	0.121	13.0	0.0341	0.0000	OK
15 minute summer	4	12	48.170	0.215	30.8	2.0937	0.0000	OK
15 minute summer	5	12	48.161	0.241	35.5	0.2725	0.0000	OK
15 minute summer	6	11	48.784	0.244	50.2	2.6710	0.0000	SURCHARGED
15 minute summer	7	11	48.522	0.197	44.1	0.0556	0.0000	OK
30 minute summer	8	20	48.396	0.146	43.0	0.0232	0.0000	OK
15 minute summer	9	12	48.141	0.306	130.4	0.5406	0.0000	SURCHARGED
15 minute summer	10	10	49.479	0.064	10.0	0.0728	0.0000	OK
15 minute summer	11	10	49.143	0.223	21.1	0.2526	0.0000	SURCHARGED
240 minute winter	12	232	47.953	0.403	39.0	0.4562	0.0000	SURCHARGED
240 minute winter	TANK IN 1	232	47.953	0.413	39.0	0.0000	0.0000	SURCHARGED
240 minute winter	TANK OUT	232	47.953	0.583	39.0	161.5777	0.0000	SURCHARGED
240 minute winter	13	232	47.953	0.603	6.4	1.0655	0.0000	SURCHARGED
240 minute winter	14	232	47.952	0.632	6.0	0.7153	0.0000	OK
240 minute winter	15 EXISTING MH ESR	232	47.953	0.618	6.1	0.1748	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	4.7	0.533	0.328	0.1470	
15 minute summer	2	1.001	3	9.8	0.947	0.541	0.0199	
15 minute summer	3	1.002	4	18.0	0.831	0.147	1.0563	
15 minute summer	LOADING BAY LDC	2.000	SEPARATOR	13.0	0.834	0.322	0.3229	
15 minute summer	SEPARATOR	2.001	4	12.8	0.868	0.304	0.0906	
15 minute summer	4	1.003	5	33.4	0.766	0.442	0.4304	
15 minute summer	5	1.004	9	40.4	0.816	0.570	1.3545	
15 minute summer	6	3.000	7	44.1	1.127	1.094	1.3594	
15 minute summer	7	3.001	8	44.0	1.373	1.063	0.3727	
30 minute summer	8	3.002	9	43.0	1.546	0.700	0.8027	
15 minute summer	9	1.005	12	129.0	1.833	0.613	0.5634	
15 minute summer	10	4.000	12	9.9	1.395	0.361	0.1660	
15 minute summer	11	5.000	12	20.8	1.182	1.413	0.1358	
240 minute winter	12	1.006	TANK IN 1	39.0	1.069	0.546	0.1690	
240 minute winter	TANK IN 1	1.007	TANK OUT	39.0	1.130	0.498	0.0704	
240 minute winter	TANK OUT	1.008	13	5.7	0.479	0.075	0.2941	
240 minute winter	13	1.009	ESR	6.1	0.422	0.082	0.2298	
240 minute winter	14	Pump		5.8				150.1
240 minute winter	ESR	1.010	14	6.0	0.345	0.075	0.2078	

Results for 100 year +35% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	48.696	0.081	8.3	0.0128	0.0000	OK
15 minute summer	2	12	48.674	0.169	17.2	0.0269	0.0000	SURCHARGED
15 minute summer	3	12	48.649	0.314	31.5	0.0889	0.0000	SURCHARGED
15 minute summer	LOADING BAY LDC	12	48.664	0.494	22.9	0.0351	0.0000	FLOOD RISK
15 minute summer	SEPARATOR	12	48.638	0.583	24.4	0.1649	0.0000	SURCHARGED
15 minute summer	4	12	48.628	0.673	52.8	7.2528	0.0000	SURCHARGED
15 minute summer	5	12	48.609	0.689	64.5	0.7789	0.0000	SURCHARGED
30 minute summer	6	20	49.405	0.865	82.9	10.5621	0.0000	SURCHARGED
30 minute summer	7	20	48.990	0.665	53.6	0.1881	0.0000	SURCHARGED
15 minute summer	8	12	48.831	0.581	55.1	0.0923	0.0000	SURCHARGED
15 minute summer	9	12	48.556	0.721	187.2	1.2744	0.0000	SURCHARGED
15 minute summer	10	10	49.505	0.090	17.4	0.1023	0.0000	OK
15 minute summer	11	10	49.454	0.534	36.8	0.6043	0.0000	SURCHARGED
480 minute winter	12	456	48.527	0.977	40.5	1.1054	0.0000	SURCHARGED
480 minute winter	TANK IN 1	464	48.527	0.987	40.3	0.0000	0.0000	SURCHARGED
480 minute winter	TANK OUT	464	48.527	1.157	40.1	320.6323	0.0000	SURCHARGED
480 minute winter	13	464	48.527	1.177	6.3	2.0799	0.0000	SURCHARGED
480 minute winter	14	464	48.527	1.207	5.9	1.3646	0.0000	OK
480 minute winter	15 EXISTING MH ESR	464	48.527	1.192	6.1	0.3373	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	8.2	0.596	0.570	0.2226	
15 minute summer	2	1.001	3	16.9	1.050	0.932	0.0338	
15 minute summer	3	1.002	4	29.6	0.898	0.243	2.2181	
15 minute summer	LOADING BAY LDC	2.000	SEPARATOR	24.4	0.900	0.606	0.7557	
15 minute summer	SEPARATOR	2.001	4	20.6	0.891	0.491	0.1512	
15 minute summer	4	1.003	5	62.2	0.883	0.822	0.5281	
15 minute summer	5	1.004	9	67.0	0.951	0.944	1.4555	
30 minute summer	6	3.000	7	53.6	1.347	1.328	1.4118	
30 minute summer	7	3.001	8	55.2	1.387	1.331	0.4673	
15 minute summer	8	3.002	9	58.3	1.657	0.951	0.9723	
15 minute summer	9	1.005	12	187.8	2.667	0.892	0.5634	
15 minute summer	10	4.000	12	17.2	1.592	0.630	0.2536	
15 minute summer	11	5.000	12	35.9	2.040	2.446	0.1394	
480 minute winter	12	1.006	TANK IN 1	40.3	0.982	0.564	0.1690	
480 minute winter	TANK IN 1	1.007	TANK OUT	40.1	1.038	0.513	0.0704	
480 minute winter	TANK OUT	1.008	13	5.7	0.479	0.075	0.2941	
480 minute winter	13	1.009	ESR	6.1	0.435	0.081	0.2298	
480 minute winter	14	Pump		5.8				231.3
480 minute winter	ESR	1.010	14	5.9	0.358	0.075	0.2078	

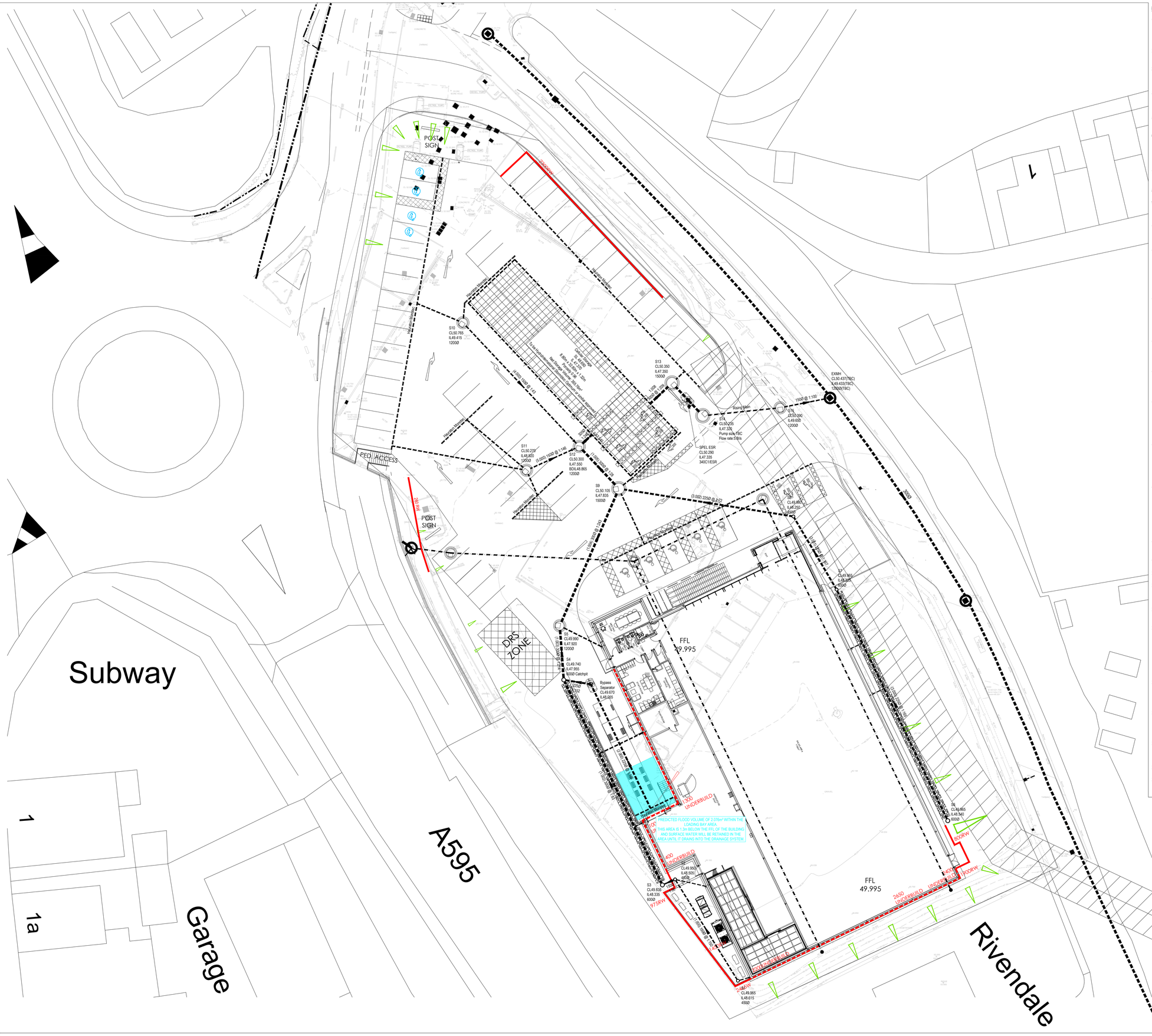
Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	12	48.821	0.206	9.3	0.0327	0.0000	SURCHARGED
15 minute summer	2	12	48.780	0.275	18.8	0.0437	0.0000	SURCHARGED
15 minute summer	3	12	48.739	0.404	34.9	0.1143	0.0000	SURCHARGED
15 minute summer	LOADING BAY LDC	11	48.695	0.525	26.2	0.0373	2.0755	FLOOD
15 minute summer	SEPARATOR	12	48.705	0.650	21.8	0.1841	0.0000	SURCHARGED
15 minute summer	4	12	48.708	0.753	55.5	8.1467	0.0000	SURCHARGED
480 minute winter	5	456	48.696	0.776	8.7	0.8774	0.0000	SURCHARGED
30 minute summer	6	21	49.614	1.074	92.1	13.2212	0.0000	SURCHARGED
30 minute summer	7	20	49.137	0.812	57.2	0.2299	0.0000	SURCHARGED
15 minute summer	8	12	48.957	0.707	58.9	0.1124	0.0000	SURCHARGED
480 minute winter	9	456	48.695	0.860	37.3	1.5204	0.0000	SURCHARGED
15 minute summer	10	10	49.512	0.097	19.3	0.1099	0.0000	OK
15 minute summer	11	10	49.555	0.635	40.9	0.7179	0.0000	SURCHARGED
480 minute winter	12	456	48.695	1.145	43.3	1.2948	0.0000	SURCHARGED
480 minute winter	TANK IN 1	456	48.695	1.155	43.0	0.0000	0.0000	SURCHARGED
480 minute winter	TANK OUT	456	48.695	1.325	42.9	365.8524	0.0000	SURCHARGED
480 minute winter	13	456	48.694	1.344	6.3	2.3757	0.0000	SURCHARGED
480 minute winter	14	456	48.694	1.374	6.0	1.5541	0.0000	OK
480 minute winter	15 EXISTING MH ESR	456	48.694	1.359	6.1	0.3847	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	8.8	0.595	0.609	0.2905	
15 minute summer	2	1.001	3	18.7	1.071	1.031	0.0338	
15 minute summer	3	1.002	4	31.5	0.873	0.258	2.2181	
15 minute summer	LOADING BAY LDC	2.000	SEPARATOR	21.8	0.921	0.540	0.7557	
15 minute summer	SEPARATOR	2.001	4	18.6	0.917	0.443	0.1512	
15 minute summer	4	1.003	5	62.0	0.881	0.820	0.5281	
480 minute winter	5	1.004	9	8.6	0.585	0.122	1.4555	
30 minute summer	6	3.000	7	57.2	1.440	1.419	1.4118	
30 minute summer	7	3.001	8	58.7	1.476	1.417	0.4673	
15 minute summer	8	3.002	9	61.1	1.658	0.995	0.9723	
480 minute winter	9	1.005	12	35.8	1.128	0.170	0.5634	
15 minute summer	10	4.000	12	19.1	1.626	0.699	0.2753	
15 minute summer	11	5.000	12	39.8	2.259	2.708	0.1394	
480 minute winter	12	1.006	TANK IN 1	43.0	0.985	0.602	0.1690	
480 minute winter	TANK IN 1	1.007	TANK OUT	42.9	1.041	0.547	0.0704	
480 minute winter	TANK OUT	1.008	13	5.7	0.477	0.075	0.2941	
480 minute winter	13	1.009	ESR	6.1	0.419	0.081	0.2298	
480 minute winter	14	Pump		5.8				231.8
480 minute winter	ESR	1.010	14	6.0	0.342	0.075	0.2078	

Appendix J – Flood Exceedance Routes Plan

Reference	Title
DA-0541-HYD -ZZ-XX-DR-C-Ro-50-20-11-0001	Flood Exceedance Routes Plan



NOTES

1. ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT WATER SERVICES ASSOCIATION "SEWERS FOR ADOPTION" AND ADOPTING WATER AUTHORITY/SEWERAGE AGENCY REQUIREMENTS AND SPECIFICATIONS.
2. ALL PRIVATE DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BUILDING REGULATIONS CURRENT EDITION.
3. CONTRACTOR TO ESTABLISH POSITION SIZE AND DEPTH OF ALL EXISTING SEWERS AND SERVICES PRIOR TO COMMENCEMENT ON SITE.
4. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
5. THE CONTRACTOR SHALL ALLOW FOR ALL TRAFFIC MANAGEMENT IN CONNECTION WITH ROAD AND SEWER WORKS.
6. THE CONTRACTOR SHALL ALLOW FOR KEEPING SEWER TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DEWATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY.
7. PIPES UP TO AND INCLUDING 300mmØ TO BE UNPLASTICISED PVC. PIPES 375mmØ AND GREATER TO BE CONCRETE CLASS H.
8. ALL PIPEWORK TO BE 100mm DIAMETER UNLESS NOTED OTHERWISE.
9. INSITU AND PRECAST CONCRETE UNITS SHALL HAVE SULPHATE RESISTING PORTLAND CEMENT TO BS 4027, UNLESS AGREED OTHERWISE WITH THE ADOPTING AUTHORITY.
10. PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 5911 AND BE KITEMARKED. CONCRETE PIPES TO BE CLASS H UNLESS NOTED OTHERWISE.
11. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN124, HAVE MINIMUM 675 x 675 CLEAR OPENINGS WITH 150 DEEP FRAMES UNLESS OTHERWISE SPECIFIED. MANHOLE COVERS AND FRAMES TO BE OF A NON-ROCKING DESIGN WITHOUT CUSHION INSERTS AND BE KITEMARKED. LOAD CLASS D400 IN VEHICULAR TRAFFICKED AREAS AND LOAD CLASS B125 IN FOOTWAYS AND PEDESTRIAN AREAS.
12. GULLY GRATES AND FRAMES SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN124 AND BE OF A NON-ROCKING DESIGN WITH CAPTIVE HINGE ACCESS AND BE KITEMARKED. LOAD CLASS D400 FOR ROADS REGULARLY CARRYING FAST MOVING HEAVY VEHICLES. CLASS C250 TO BE USED IN LESSER TRAFFICKED AREAS eg. ESTATE ROADS, CUL-DE-SACS, RESIDENTIAL CAR PARKING AREAS ETC.
13. CLASS Z BEDDING DETAIL SHALL BE PROVIDED WHERE COVER TO THE PIPE BARREL IS LESS THAN 1.2M IN VEHICULAR TRAFFICKED AREAS AND 0.9M ELSEWHERE. TO ALL ROAD GULLY CONNECTIONS AND WITHIN AREAS OF DEEP ROOTING VEGETATION.
14. WHERE CLASS Z TRENCH BEDDING DETAIL IS USED, THE CONCRETE BED AND SURROUND SHALL BE DISCONTINUED AT EACH PIPE JOINT OVER THE FULL CROSS SECTION BY MEANS OF A SHAPED COMPRESSIBLE FILLER.
15. SELECTED BACKFILL MATERIAL SHALL CONSIST OF UNIFORM MATERIAL FREE FROM STONES LARGER THAN 40mm, CLAY LUMPS LARGER THAN 75mm, TREE ROOTS, ORGANIC MATTER AND FROZEN SOIL. SELECTED BACKFILL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING 225mm, EACH LAYER COMPACTED TO FORM A STABLE TRENCH BACKFILL.
16. GENERAL BACKFILL MATERIAL TO BE FREE FROM STONES LARGER THAN 40mm. GENERAL BACKFILL MATERIAL IS TO BE PLACED IN LAYERS NOT EXCEEDING 150mm THICKNESS AND EACH LAYER COMPACTED BY HAND. NO MECHANICAL COMPACTION OF FILL MATERIAL SHALL BE PERMITTED WITHIN 300mm ABOVE THE CROWN/BARREL OF THE PIPE.
17. BACKFILLING AND REINSTATEMENT TO TRENCHES IN PUBLIC HIGHWAYS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS AND SPECIFICATIONS OF THE ADOPTING AUTHORITY, OR, IN THE ABSENCE OF SUCH, IN ACCORDANCE WITH THE REQUIREMENTS OF "THE STREET WORKS REGULATIONS 1992" AND RELEVANT PROVISIONS OF H.A.U.C. "SPECIFICATION FOR THE REINSTATEMENT OF OPENINGS IN HIGHWAYS" JUNE 1992, BOTH UNDER SECTION 71 OF THE NEW ROADS AND STREET WORKS ACT 1991.
18. BACKFILL TO DRAINAGE TRENCHES IN HARD PAVED AREAS SHALL BE G.S.B. TYPE 1.
19. ALL ROAD GULLIES ARE TO BE TRAPPED GULLIES.
20. ALL GULLY LEADS TO BE 150mm DIAMETER.
21. ALL REDUNDANT EXISTING DRAINAGE TO BE GRUBBED UP OR GROUTED, ANY EXISTING LIVE DRAINAGE SHOULD BE REPORTED TO THE ENGINEER AND RECONNECTED.
22. ALL ROAD GULLIES & LEADS TO BE CLEARED OF DEBRIS UPON COMPLETION OF WORKS.
23. ANY EXISTING DRAINAGE WHICH BECOMES UNDER TRAFFICKED AREAS IN THE NEW SCHEME SHOULD BE SUBJECT TO THE FOLLOWING REMEDIALS/REVISIONS. WHERE DEPTH OF COVER IS LESS THAN 1200MM, THE EXISTING PIPEWORK SHALL BE EXPOSED & SURROUNDED WITH 150MM CONCRETE AS CLASS "Z" BEDDING. WHERE THE EXISTING MANHOLE COVER & FRAME IS NOT AS MANHOLE DETAIL A OR B, OR TO BS497 GRADE A, OR EN124 CLASS D, THEN IT SHOULD BE CHANGED FOR SUCH.
24. THE CONTRACTOR MUST ENSURE THAT ANY OF THE EXISTING DRAINAGE WHICH IS LIVE IS KEPT CLEAR OF DEBRIS AND SHOULD ALLOW FOR JETTING THROUGH THE NEW & EXISTING DRAINAGE UPON COMPLETION.
25. CONTRACTOR TO TAKE MEASURES TO PROTECT HIS OPERATIVES WITH RESPECT TO THE PRESENCE OF GAS IN SEWER TRENCHES AND MANHOLES THROUGH THE USE OF GAS MONITORING EQUIPMENT AND BREATHING APPARATUS AS REQUIRED.
26. CONTRACTOR TO APPLY FOR SEWER PERMITS AND ROAD OPENING PERMITS AS NECESSARY FROM THE APPROPRIATE AUTHORITIES, PRIOR TO COMMENCING WORKS.
27. ALL PERFORATED PIPES TO BE TWIN WALL UPVC.
28. ALL MANHOLE COVERS TO BE ALIGNED WITH SURROUNDING FEATURES WHERE POSSIBLE TO SUIT INTERNAL PIPE LAYOUT AND ACCESS REQUIREMENTS.

REV	DATE	DESCRIPTION	DRW	CHK
P01	07/02/2024	PRELIMINARY ISSUE	JF	GS

HEALTH & SAFETY

1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

ROADS & DRAINAGE

2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO INSTALLING DRAINAGE
3. THE TIME THAT EXCAVATIONS ARE OPEN ON SITE SHOULD BE KEPT TO A MINIMUM AND ALL TRENCHES SHOULD BE SURROUNDED BY A BARRIER.
4. CONNECTIONS TO EXISTING SEWERS TO BE MADE BY NWL APPROVED CONTRACTOR ONLY
5. CONTRACTOR TO MAKE OPERATIVES AWARE OF ASSOCIATED DANGERS TO HEALTH SUCH AS LEPTOSPIROSIS (WEILS DISEASE) AND RECOMMENDED PRECAUTIONS. ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING TO BE PROVIDED AS REQUIRED.
6. UNFINISHED MANHOLES MUST BE COVERED WITH LOAD BEARING MATERIALS AND SURROUNDED WITH BARRIER.

PIPES & CABLES

7. SERVICE RECORDS TO BE REFERRED TO PRIOR TO WORK COMMENCING. CONTRACTOR TO PROCEED WITH CAUTION AND SERVICES TO BE LOCATED BY HAND DIG AND PROTECTED ACCORDINGLY.

EXCAVATION/FILL

8. CONTRACTOR TO ENSURE RELEVANT MEASURES ARE TAKEN TO KEEP PLANT AND PEOPLE A SAFE DISTANCE FROM STEEP SLOPES DURING THE WORKS.
9. CONTRACTOR TO ENSURE THAT PROCEDURES ARE IN PLACE TO KEEP PEOPLE A SAFE DISTANCE FROM WORKING PLANT WHERE NECESSARY.
10. CONTRACTOR TO REFER TO GROUND INVESTIGATION REPORT FOR CONTAMINATION TESTS AND TO PROVIDE ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING AS REQUIRED.

KEY

- Existing adopted surface water sewer
- Existing adopted combined water sewer
- Proposed surface water sewer
- Proposed foul water sewer
- Proposed cellular storage
- Proposed filter drain with perforated pipe wrapped in impermeable membrane and clean stone aggregate
- Proposed surface water rising main
- ACO — Proposed channel drain with D400 rated pedestrian type covers with sump outlet units
- Flooded area

Client
Aldi Stores Ltd.

Project Title
Aldi - Egremont (New Build)

Project Address
Wydnham Place
Egremont

Drawing Title
Flood Exceedance Routes Plan

Job No.	Originator	Zone	Level	Type	Role
DA-0541	HYD	ZZ	XX	DR	C

System Classification	Drawing No.	Suitability	Revision
Ro_50_20_11	-0001	S2	P01

Drawn	Checked	Date	Scale	Size
JF	GS	Feb 2024	1:250	A1

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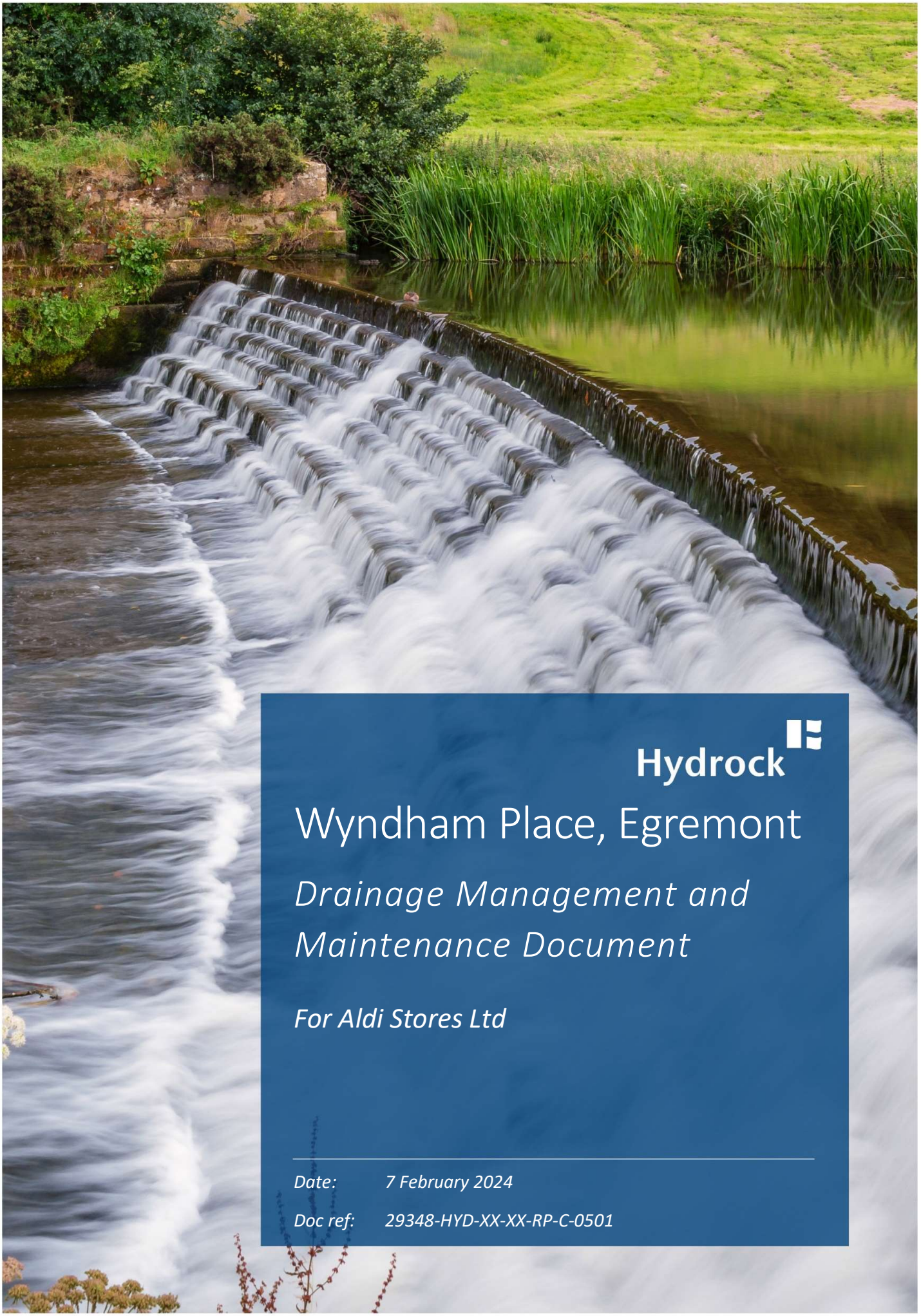
Appendix K – Drainage Management and Maintenance Plan

Reference	Title
29348-HYD-XX-XX-RP-C-0501	Drainage Management and Maintenance Plan



Hydrock

Wyndham Place, Egremont

Drainage Management and Maintenance Document

For Aldi Stores Ltd

Date: *7 February 2024*

Doc ref: *29348-HYD-XX-XX-RP-C-0501*

DOCUMENT CONTROL SHEET

Issued by	Hydrock Consultants Limited 2 Esh Plaza Sir Bobby Robson Way Great Park Newcastle upon Tyne NE13 9BA	Tel: 0191 2302993 www.hydrock.com
Client	Aldi Stores Ltd	
Project name	Wyndham Place, Egremont	
Title	Drainage Management and Maintenance Document	
Doc ref	29348-HYD-XX-XX-RP-C-0501	
Project no.	29348	
Status	S2 - For Information	
Date	07/02/2024	

Document Production Record		
Issue Number	P01	Name
Prepared by		James Foster
Checked by		Gary Spence
Approved by		Martin Pearse

Document Revision Record			
Issue Number	Status	Date	Revision Details
P01	S2	07/02/2024	First Issue

CONTENTS

1. INTRODUCTION

This Drainage Management and Maintenance Plan has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of our client Aldi Stores Ltd as a guide to the implementation, management, and maintenance of the drainage system for Wyndham Place, Egremont.

This document should be read in conjunction with Hydrock's Proposed Drainage Layout drawing 79-EXXX-3E-ZZ-XX-DR-C-Ro-50-20-11-1000.

2. OPERATION AND MAINTENANCE REQUIREMENTS

Proprietary Treatment Systems

The responsibility for this maintenance will be placed with Aldi Stores Ltd.

Proprietary treatment systems will require routine maintenance to ensure continuing operation to design performance standards.

Many proprietary systems are beneath the ground, and malfunctioning is not easy to detect, and it is therefore often ignored unless alarms are provided or the system is designed to cause localised surface ponding if full. If systems lead to other surface features, early warning of maintenance being required may be easily observed at the inlet to the feature which should be designed to prevent it entering the main part of the component.

Lack of routine maintenance is more likely to cause poor outflow water quality than with other SuDS due to resuspension of solids and anaerobic conditions developing within the device. For example, anaerobic conditions can develop in deep sumps and catchpits that result in nutrients and metals being released from captured sediments.

During the first few months after installation, subsurface treatment units should be visually inspected after rainfall events, and the amount of deposition measured to give the operator an idea of the expected rate of sediment and oil deposition. After this initial period, systems should be inspected every six months to verify the appropriate level of maintenance. During these inspections, the floating debris and any floating oils should normally be removed. This may be done using a van-mounted system, without the need for a large tanker.

Silt should be removed when it reaches 75% of the capacity of the sump. In most situations, the units should be fully cleaned out at least annually. If there is a significant spill of oil (or other pollutant) the system should be cleaned immediately.

Proper disposal of oil, solids and floating debris removed from components must be ensured, and the environmental regulator should be approached for advice where there are any doubts concerning disposal options. A small portion of water will be removed along with the pollutants during the clean-out process, which should be considered when costing sediment disposal processes.

Harmful vapours may develop in subsurface filtration or hydrodynamic separation units, as hydrocarbons may remain there for extended periods of time. Appropriate testing for harmful vapours and venting should be undertaken whenever access for maintenance is required. Removal of oil, silt and other pollutants must be in accordance with the appropriate waste management legislation.

Table 14.2 of The CIRIA SuDS Manual provides guidance on the type of operation and maintenance schedule that may be appropriate for a proprietary treatment system. The list of actions is not exhaustive and some actions may not always be required

CIRIA SuDS Manual Table 14.2 - An Example of Operation and Maintenance Requirements for a Proprietary Treatment System

Maintenance Schedule	Required Action	Typical Frequency
Routine Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections o immediately following significant spill
Remedial Actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect filter media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

2.1 Filter Strips

The responsibility for this maintenance will be placed with Aldi Stores Ltd.

Filter strips will require regular maintenance to ensure continuing operation to design performance standards.

The treatment performance of filter strips is dependent on maintenance, and robust management plans will be required to ensure that maintenance is carried out in the long term.

Maintenance of filter strips is relatively straightforward for landscape contractors and typically there should only be a small amount of extra work (if any) required for a filter strip over and above what is necessary for standard public open space. Providing landscape management is already required at site, filter strip maintenance should therefore have marginal cost implications. However, regular inspection and maintenance is important for the effective operation of filter strips as designed. Maintenance responsibility for a filter strip should always be placed with an appropriate organisation. If filter strips are implemented within private property, owners should be educated on their routine maintenance needs, and should understand the long-term Maintenance Plan and any legally binding maintenance agreement.

Access for maintenance vehicles should always be available. However, this is not usually a constraint due to the likely location of the filter strip adjacent to impermeable areas. Litter and debris removal should be undertaken as part of general landscape maintenance for the site and before any other SuDS management task. All litter should be removed from site.

The major maintenance requirement for filter strips is mowing. This should ideally retain grass lengths of 75-150mm across the main “treatment” surface to assist in filtering pollutants and retaining sediments and to reduce the risk of flattening during runoff events. However, longer vegetation lengths, where appropriate, are not considered to pose a significant risk to functionality.

Grass clippings should be disposed of either off site or outside the area of the filter strip to remove nutrients and pollutants. All vegetation management activities should take account of the need to maximise biosecurity and prevent the spread of invasive species.

Occasionally, sediment will need to be removed (e.g. once deposits exceed 25mm in depth), although this can be minimised by ensuring that upstream areas are fully stabilised in advance. Sediments excavated from a filter strip that receives runoff from residential or standard road and roof areas are generally not of toxic or hazardous material and can therefore be safely disposed of by either land application or landfilling. However, consultation should take place with the environmental regulator to confirm appropriate protocols. Sediment testing may be required before sediment excavation to determine its classification and appropriate disposal methods.)or runoff from streets with high vehicle traffic, sediment testing will be essential. In the majority of cases, it will be acceptable to distribute the sediment on site if there is an appropriate safe and acceptable location to do so.

Any damage due to sediment removal or erosion should be repaired and immediately reseeded or planted.

Table 15.1 of The CIRIA SuDS Manual provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.

CIRIA SuDS Manual Table 15.1 - Operation and Maintenance Requirements for Filter Strips

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly (at start, the as required)
	Inspect filter strip surface to identify evidence of erosion, poor vegetation growth, compaction, ponding, sedimentation and contamination (e.g. oils)	Monthly (at start, then half yearly)
	Check flow spreader and filter strip surface for even gradients	Monthly (at start, then half yearly)
	Inspect gravel flow spreader upstream of filter strip for clogging	Monthly (at start, then half yearly)
	Inspect silt accumulation rates and establish appropriate removal frequencies	Monthly (at start, then half yearly)
Occasional Maintenance	Reseed areas of poor vegetation growth; alter plant types to better suit conditions, if required	As required or if bare soil is exposed over > 10% of the filter strip area
Remedial Actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practice	As required

2.2 Filter Drains

The responsibility for this maintenance will be placed with Aldi Stores Ltd.

Filter drains will require regular maintenance to ensure continuing operation to design performance standards. The treatment performance of filter drains is dependent on maintenance, and robust management plans will be required to ensure that maintenance is carried out in the long term.

Regular inspection and maintenance is important for the effective operation of filter drains as designed. Maintenance responsibility for a filter drain should always be placed with an appropriate organisation. Adequate access should always be provided to the filter drain for inspection and maintenance. If filter drains are implemented within private property, owners should be educated on their routine maintenance needs, and should understand the long-term Maintenance Plan and any legally binding maintenance agreement.

Litter (including leaf litter) and debris removal should be undertaken as part of general landscape maintenance for the site and before any other 6u'6 management task. All litter should be removed from site.

Table 16.1 of The CIRIA SuDS Manual provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.

Sediments excavated from upstream pre-treatment devices that receive runoff from residential or standard road and roof areas are generally not toxic or hazardous material and can therefore be safely disposed of by either land application or landfilling. However, consultation should take place with the environmental regulator to confirm appropriate waste management protocols and compliance with legislation. Sediment testing may be required before sediment excavation to determine its classification and appropriate disposal methods. For industrial site runoff, sediment testing will be essential. In the majority of cases, it will be acceptable to distribute the sediment on site, if there is an appropriate safe and acceptable location to do so. Any damage due to sediment removal or erosion should be repaired and immediately reseeded or planted.

CIRIA SuDS Manual Table 16.1 - Operation and Maintenance Requirements for Filter Drains

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required