PLUVIAM ENVIRONMENTAL

Drainage Strategy Report

Alston Dairy
Alston Lane
Preston
PR3 3BN

PN0107-PEL-DS-01

26.10.23

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Project No: PN0107 Date: Dec 2023

Revision	Purpose	Date
1.0	First Issue.	26.10.23
1.1	Revised layout added.	16.11.23
1.2	Revised layout added.	14.12.23

Produced By:

[redacted]

John Roberts CSSW
Director

Checked By:

[redacted]

Rod Green MSc, BSc(Hons), IENG, FCIPHE, MSoPHE
Director

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Appendices

1. INTRODUCTION

The following proposal outlines the foul and storm water drainage management system proposed for the Alston Dairy development. The site is located at National Grid Reference (NGR) 360190, 435510 and postcode PR3 3BN.

The site is situated approximately 1.7km south of Longridge and 8.5km northeast of Preston. The site is bound by Pinfold Lane to the north, Preston Rd (B6243) to the west, residential houses and Bolton Fold Farm to the south and a residential house and farmland to the east.

This planning application seeks planning permission for the construction of a dairy extension and chill store. A farm shop with an associated car park and delivery area are also proposed.

Staff parking is to be extended with a dedicated staff car park and the internal driveway from Preston Road is to be widened.

To the north of the site, a building and hardstanding area are to be constructed.

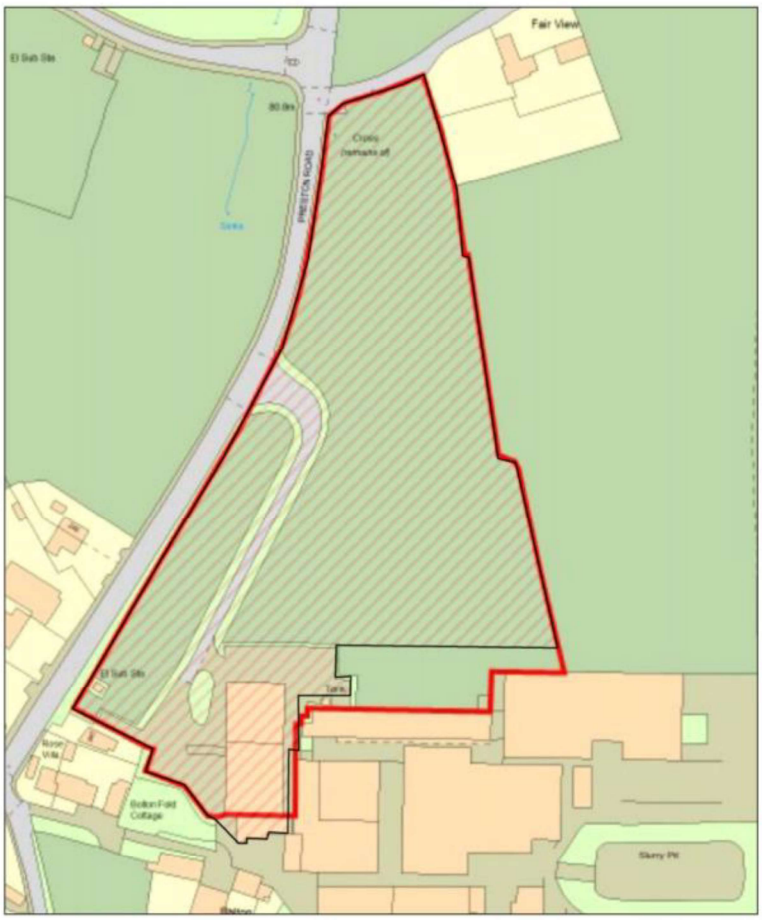


Figure 1. Site Location and Planning Boundary

2. DRAINAGE DESIGN PROPOSALS

3.1 Design Parameters

Accordingly, Pluviam Environmental has reviewed the information provided and considered an approach based on previous experience of similar sites and current SuDS guidance provided in:

- National Planning Policy Framework (NPPF 25)
- Lancashire County Council Strategic Flood Risk Assessment
- CIRIA report C753 (2016); The SUDS manual
- CIRIA report C680 (2008); Structural design of modular geocellular drainage tanks
- CIRIA Report C724 (2013) Creating water sensitive places-scoping the potential for water sensitive urban design in the UK
- BS 8582:2013, Code of practice for surface water management for development sites
- BS EN 752:2017, Drain and sewer systems outside buildings
- BS EN 12056-3:2000: Gravity drainage systems inside buildings- Part 3: Roof drainage, layout and design

3.2 Sustainable Drainage Systems

The NPPF requires that surface water arising from a developed site should as far as practicable be managed in a sustainable manner to mimic the surface water flows arising from the site prior to re-development. Opportunities to reduce the surface water run-off and the associated flood risk should be identified and climate change should be taken into account. Building Regulations (Part H), NPPF and Environment Agency advice notes require the consideration of sustainable drainage techniques based on a hierarchical approach to the management of surface water, with the emphasis on the use of Source Control techniques and a treatment train as the preferred option.

Surface water flows should be designed to discharge to:

1. Infiltration based systems e.g. soakaways / porous pavements etc.
2. Watercourses
3. Surface water sewers
4. Combined water sewers

Discharge via infiltration

Where possible, infiltration should be incorporated into the final design of the drainage. Infiltration should be the first consideration for drainage outfall.

However, boreholes adjacent to site show clay from surface level down to at least 5m below ground level. Therefore, it is unlikely that infiltration will be feasible.

See Appendix A for borehole logs.

Discharge via a watercourse

Discharge shall be to the surface water culvert via existing private connection if proven, or via a new connection to the culvert.

Surface water and combined sewers

The United Utilities sewer record is available in Appendix B. There are no public sewers close to site which do not involve crossing third party land for connection. Therefore, no drainage will go to the public assets.

3.3 Engineering Challenges

The key engineering challenges for this site from a drainage design perspective are:

- Managing the 100 year storm event with 50% added to peak flows for climate change;
- Treatment of surface water runoff;
- Attenuation and discharge into the local combined sewer at 9.9 l/s, greenfield runoff rate.

3.4 Stormwater Calculation Inputs

The SuDS system is designed to store and attenuate below ground a 100yr return period storm event plus an additional 50% for climate change (see Figure 2 below).

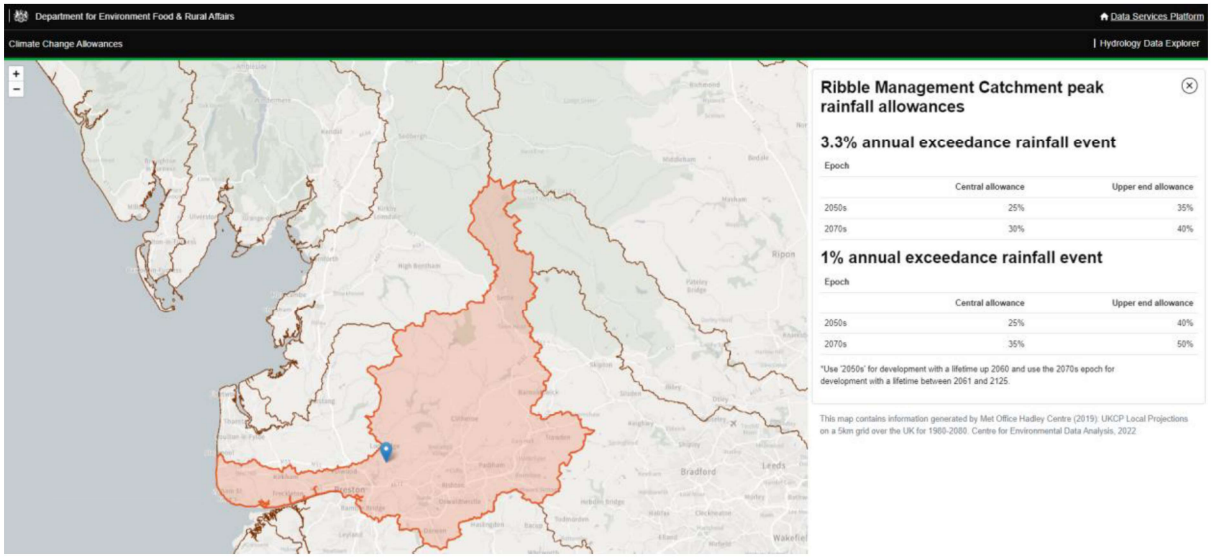


Figure 2. DEFRA climate change allowances for rainfall

Location:	Alston, Preston
FEH Data 2013	
Existing impermeable catchment area:	0 ha
Proposed impermeable Catchment area:	0.863 ha
Storm Event:	100 years
Climate Change Factor:	50% Upper End
Greenfield Flow Rate:	9.9 l/s
Proposed design 1in100 + 45% storm event flow rate:	**9.9 l/s**

3. OVERVIEW OF DRAINAGE PROPOSALS

4.1 Outline Design

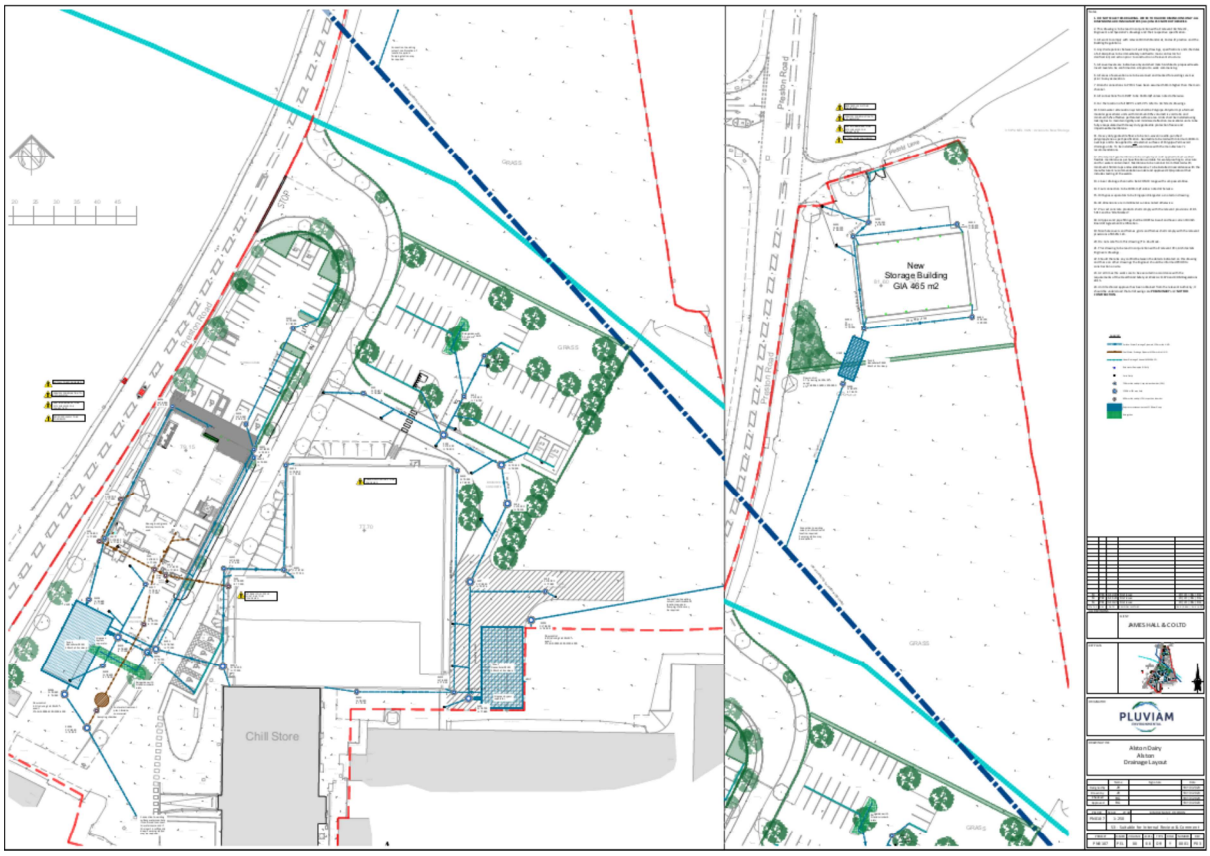


Figure 3. Outline drainage design and details (available full size in Appendix D)

The drainage design is based on achieving source control and treatment of the run-off from the proposed development.

The proposed drainage shall discharge to the existing onsite private surface water drainage connection to the ditch network or via a new connection to the existing culverted watercourse (drainage to be proven – CCTV currently being undertaken).

The collected hardstanding areas shall be collected in conventional gullies and channels and pass through bypass separators for treatment prior to discharging into a geocellular attenuation tank. It should be noted that the northern most area is below 400m2 and does not require a bypass separator.

The building roofs shall discharge to respective network geocellular attenuation tanks via silt trap manholes.

Due to site levels, the drainage is split into three separate surface water networks and one foul network. Each surface water system will contain a geocellular attenuation tank and a Hydrobrake device to limit the flows to Greenfield runoff rate. The Greenfield runoff rate for the three systems combined is 9.9 l/s. This flow rate will be used as the design flow rate during the 1in100+50% climate change storm event. The outline surface water calculations completed in Causeway can be found in Appendix C.

The foul water network collects interior pop-up connections and will pass through a commercial foul water treatment plant and sampling chamber prior to discharge.

Proprietary point of use grease traps shall be incorporated to allow for regular maintenance.

As there are no public sewers close to the development the foul water must be treated on site via a commercial treatment plant. The outfall will pass via a sampling chamber prior to connection into the surface water network. The treated water will eventually discharge to the onsite watercourse.

Please refer to: PEL outline layout drawing PN0107-PEL-XX-XX-DR-Y-0001, Appendix D, for proposed foul and surface water drainage layout and PN0107-PEL-XX-XX-DR-Y-0002 for the proposed details.

4.2 Surface Water Treatment Components

This section has been incorporated to provide evidence in relation to how the water quality from the site will be managed to ensure that the levels of contamination are within the guidelines set out within the Water Framework Directive (WFD).

It is proposed to incorporate an engineered drainage system which incorporates treatment and source control.

4.2.1 Catchpit Inspection Chambers

Catchpit inspection chambers are a traditional SuDS device that reduces the velocity of the flow of stormwater flowing through the chamber to allow the settling of detritus and silts in the pit at the bottom of the inspection chamber.

4.2.2 Linear Drainage Channels

The Linear channel system is typically used for the collection of run-off from surfaces of car parks, access road or similar. As siltation develops in the channel and sump outlets this traps oil within the contaminated silt in an aerobic environment and is then subject to biodegradation.

4.2.3 Modular Plastic Geocellular Units

PMS1 is a 1000 x 500 x 400mm deep modular interlocking plastic geocellular unit system designed for use as a subterranean drainage storage component and has a high compressive strength and a high void ratio (95%) to achieve highly efficient water storage capacity.

4.2.4 Permatex 300 SuDS Geotextile

The Permatex 300 SuDS geotextile is a heavy duty, non-woven, needle punched polypropylene geotextile designed to protect and separate sub base layers. It comprises a three-layer composite scrim reinforced with low elongation. The geotextile should be laid continuously around the Attenuation tank, 300mm joint lapping is recommended.

4.2.5 Impermeable Geomembrane

An impermeable robust and heavy duty liner that is resistant to puncture used to form water tight sustainable drainage systems. Jointing shall be formed using fusion or extrusion bead welding in accordance with manufacturing recommendations.

4.2.6 Separators

Separators are designed to capture oil and hazardous substances (such as hydrocarbons, metals and suspended solids) that would otherwise pollute the environment.

4.2.7 Wastewater Treatment Plant

Sewage treatment is a type of wastewater treatment which aims to remove contaminants from sewage to produce an effluent that is suitable to discharge to the surrounding environment or an intended reuse application, thereby preventing water pollution from raw sewage discharges.

4. MAINTENANCE

We would recommend that Pre-handover inspections and cleaning of all, rainwater inlet, flow control and overflow chambers is carried out. It is understood that Alston Dairy will be responsible for and undertake the following maintenance.

Separators and Treatment Plants should follow the maintenance and management plan specified by the supplier. They are specialist units which require the manufacturers guidance to be adhered to.

Routine maintenance

The following routine maintenance procedures are recommended:

- Remove silt/debris from back inlet gullies and yard gullies as required.
- Remove silt/debris from inspection chambers as required.
- Remove silt/debris from linear drainage channels as required.
- Remove siltation from attenuation tank via low flow high volume pressure jetting.
- Records of inspections and maintenance undertaken should be kept by the client.

Management of maintenance to be undertaken by Alston Dairy.

Specific Maintenance

Geocellular Tanks

Regular maintenance	**Frequency**
Inspect and identify any areas that are not operating correctly. If required take remedial action. Remove debris from the catchment surface (where it may cause risks to performance) Remove sediment from pre-treatment inlet structures and inspection chambers. Maintain vegetation (grass, hedges and trees) to designed limits within the vicinity of below ground drainage pipes and tanks to avoid damage to system. Remove nuisance plants.	Monthly for 3 mths then annually Monthly Annually or as required Monthly or as required
Remedial work	**Frequency**
Repair physical damage if necessary	As required
Monitoring	**Frequency**

Inspect all inlets, outlets and vents to ensure that they are in good condition and operating as designed Survey inside of tank and pipe runs for sediment build up and remove if necessary	Annually Every 5 years or as require

Inlet Structures/Chambers and Catchpits

Regular maintenance	**Frequency**
Inlet Structures Inspect rainwater down pipes, channel drains, silt traps, inspection chambers and road gullies, removing obstructions and silt as necessary. Check there is no physical damage Strim vegetation 1m min surround to structures and keep area free from silt and debris	Monthly Monthly
Inspection Chambers and below ground control chambers Remove cover and inspect, ensuring that the water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn	Annually
Occasional maintenance	**Frequency**
Check topsoil levels are 20mm above edges of chambers to avoid mower damage	As necessary
Remedial work	**Frequency**
Repair physical damage if necessary	As required

5. CONCLUSION

The proposed SuDS design meets the requirements of the CIRIA SuDS Manual C753.

The system is designed to collect, treat, and attenuate the rainwater runoff from the new impermeable areas and discharge into the existing surface water network.

The proposed surface water drainage system combines existing conventional drainage principles and products along with source control techniques and components.

Appendix A

Site Investigation – Borehole Extracts

LEONARD FAIRCLOUGH, LIMITED

SITE INVESTIGATION DIVISION
Chapel Street, Adlington, Lancashire PR7 4JP
Telephone: ADLINGTON 264 & 471 Telex: 67510

BOREHOLE LOG SHEET

SD 53 NE 19
[5934 3518]

B.H. No. [redacted] 46 Job No. 74/105 Date 5-5-75

Location HOGHTON TO WHITTINGHAM PIPELINE Rig 150mm PERCUSSION

Client PRESTON AND DISTRICT WATER SUPPLY UNIT Scale 1:50

Description	O.S.D.	Legend	Depth	Thickness	Sample	S.P.T. "N" Value	Water Levels
			0.00				
TOPSOIL			0.15	0.15			
Brown and Grey Sandy CLAY			1.20	1.05	1.00		BOREHOLE DRY
Firm to Stiff Brown Gravelly CLAY			5.00	3.80	2.00 3.00 4.00 5.00		BOREHOLE COMPLETED

Undisturbed Sample ☐ Disturbed Sample ◯ Water Sample △ Standard Penetration Test ✕

S102

Appendix B

United Utilities Sewer Record Map

United Utilities
Water for the North West

COMMERCIALDW
DRAINAGE AND WATER ENQUIRY

Commercial drainage and water enquiry

Responses to a drainage and water enquiry for commercial premises or development sites.

Client:

Searchflow

42
Kingshill Avenue,
West Malling, Kent
ME19 4AJ

FAO:

Client ref: SF31130325000

Order number: UUPS-ORD-380425
Received date: 24/03/2022
Response date: 25/03/2022

The following records were searched in compiling this report:

The map of public sewers
The map of waterworks
Water and sewerage billing records
Adoption of public sewers records
Building over public sewer records
Adoption of public water mains records
Water supply clarification

Property address: Land and surrounding area Pinfold Lane & Preston Road Longridge PRESTON

Please Note - We must make you aware that due to the introduction of the open market with effect from 1st April 2017 for commercial customers, Property Searches will no longer be able to resolve issues regarding some discrepancies within the report. Due to the change in the structure of the market the retailer is now responsible for taking ownership of certain issues, particularly relating to billing/tariff charges as well as, but not limited to change of usage of a property.

Enquiries and Responses
The records were searched by Nathan Vaughan for United Utilities who does not have, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

This search report was prepared by Nathan Vaughan for United Utilities who does not have, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

How to contact us:

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

Telephone: [redacted]

E-mail: [redacted]

What is included:

1. Summary of findings and key
2. Detailed findings of the CON29DW
3. Guidance for interpretation
4. Terms and conditions
5. Complaints policy

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

To help understand the implications of the drainage and water enquiries report a summary guide to the content of the full report is provided below.

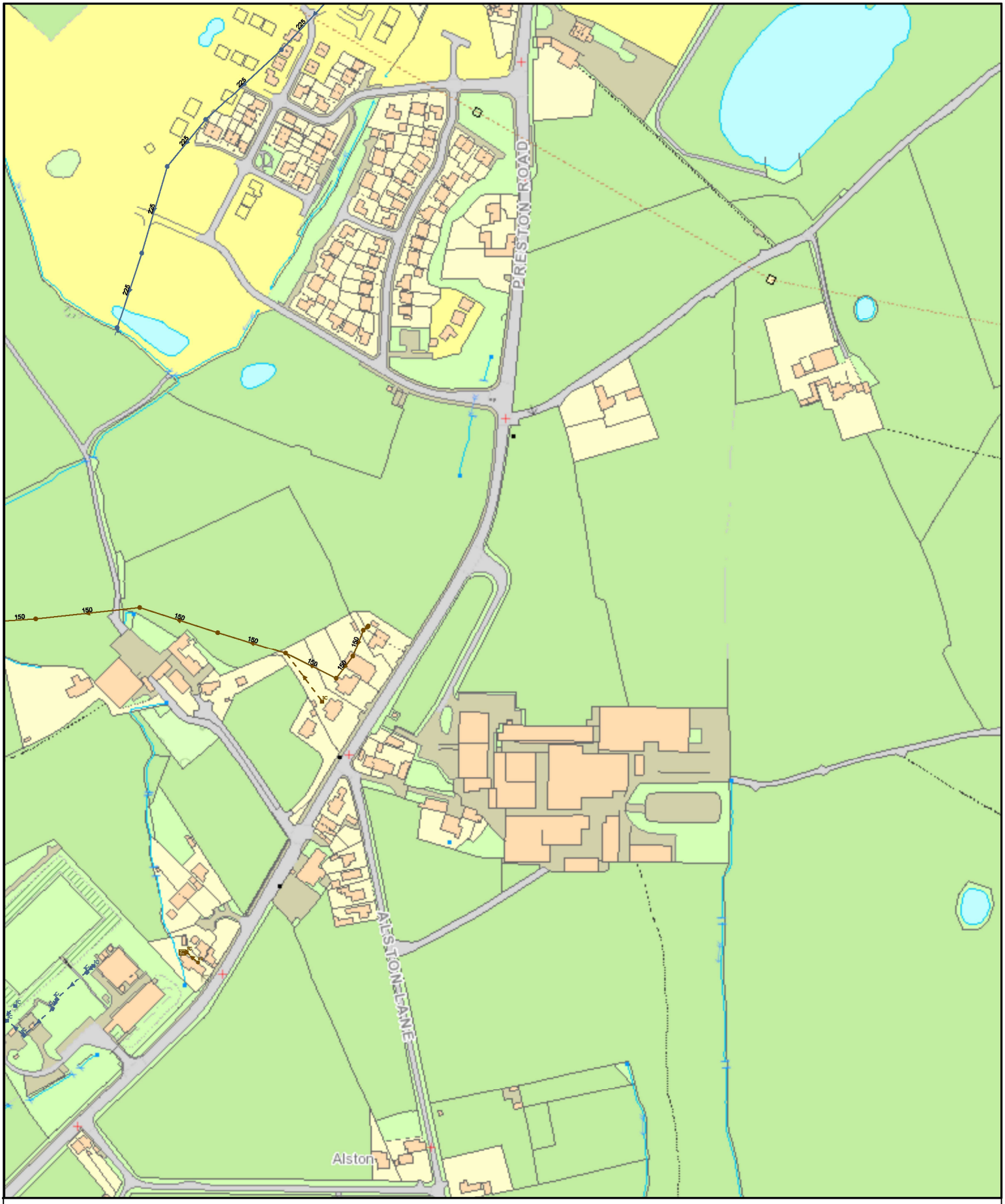
✓ *This response represents the typical situation for a property.*

× *This response represents an uncommon situation for a property and the purchaser should carefully consider its implications.*

⚑ *The attention of the purchaser is drawn to this response. The purchaser may wish to make further investigations into this situation.*

Question	Report Schedule	Answer	
1.1	Where relevant, please include a copy of an extract from the public sewer map.	Yes & in vicinity	✓
1.2	Where relevant, please include a copy of an extract from the map of waterworks.	Yes & in vicinity	✓
2.1	Does foul water from the property drain to a public sewer?	Plot of land	⚑
2.2	Does surface water from the property drain to a public sewer?	Plot of land	⚑
2.3	Is a surface water drainage charge payable?	No	×
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	None	✓
2.4.1	Does the public sewer map indicate any pumping station or any other ancillary apparatus within the boundaries of the property?	None	✓
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	None	⚑
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?	None	✓
2.6	Are any foul sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?	No	✓
2.6.1	Are any surface water pipes or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No	✓
2.7	Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	None	✓
2.8	Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?	No	✓
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	Yes	✓
3.1	Is the property connected to mains water supply?	Plot of Land	⚑
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property	Yes	×

Question	Report Schedule	Answer	
3.3	Is any water main or service pipe serving or which is proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?	No	✓
3.4	Is the building at risk of receiving low water pressure or flow?	No	✓
3.5	What is the clarification of the water supply for the property?	Very Soft	✓
3.6	Is there a meter installed at the property?	No	✓
3.7	Please include details of the location of any water meter serving the property.	No meter	✓
4.1.1	Who is responsible for providing the sewerage services for the property?	United Utilities	✓
4.1.2	Who is responsible for providing the water services for the property?	United Utilities	✓
4.2	Who bills the property for sewerage services?	Retailer sewer	✓
4.3	Who bills the property for water services?	Retailer water	✓
5.1	Is there Consent, on this property, to discharge Trade Effluent under S118 of the Water Industry Act (1991) into the public sewerage system?	No	✓
6.1	Is there a wayleave/easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?	No	✓



Date: 25/03/2022

Extract from Map of Public Sewers

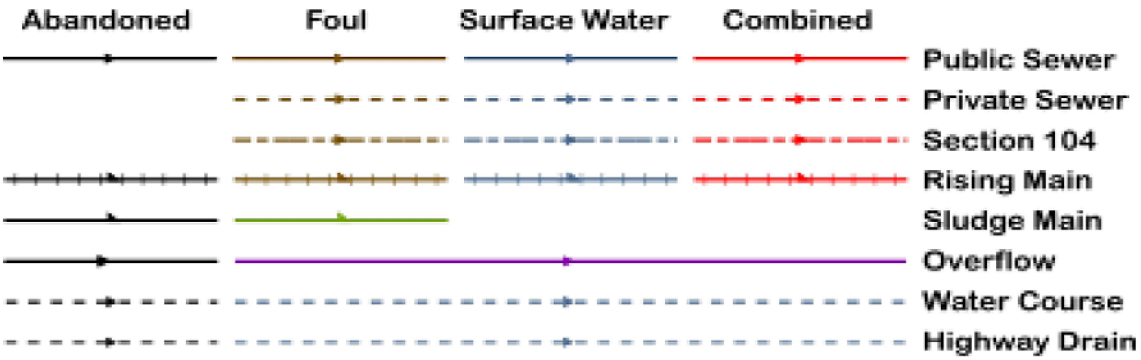
Printed By:
Property Searches

Land and surrounding area Pinfold Lane & Preston Road Longridge Pl

United Utilities
Water for the North West

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

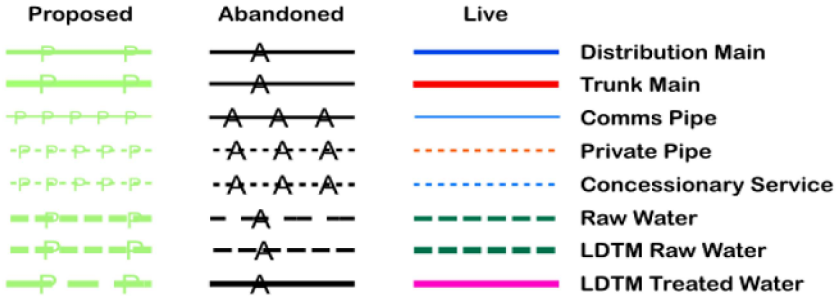
Wastewater Symbology



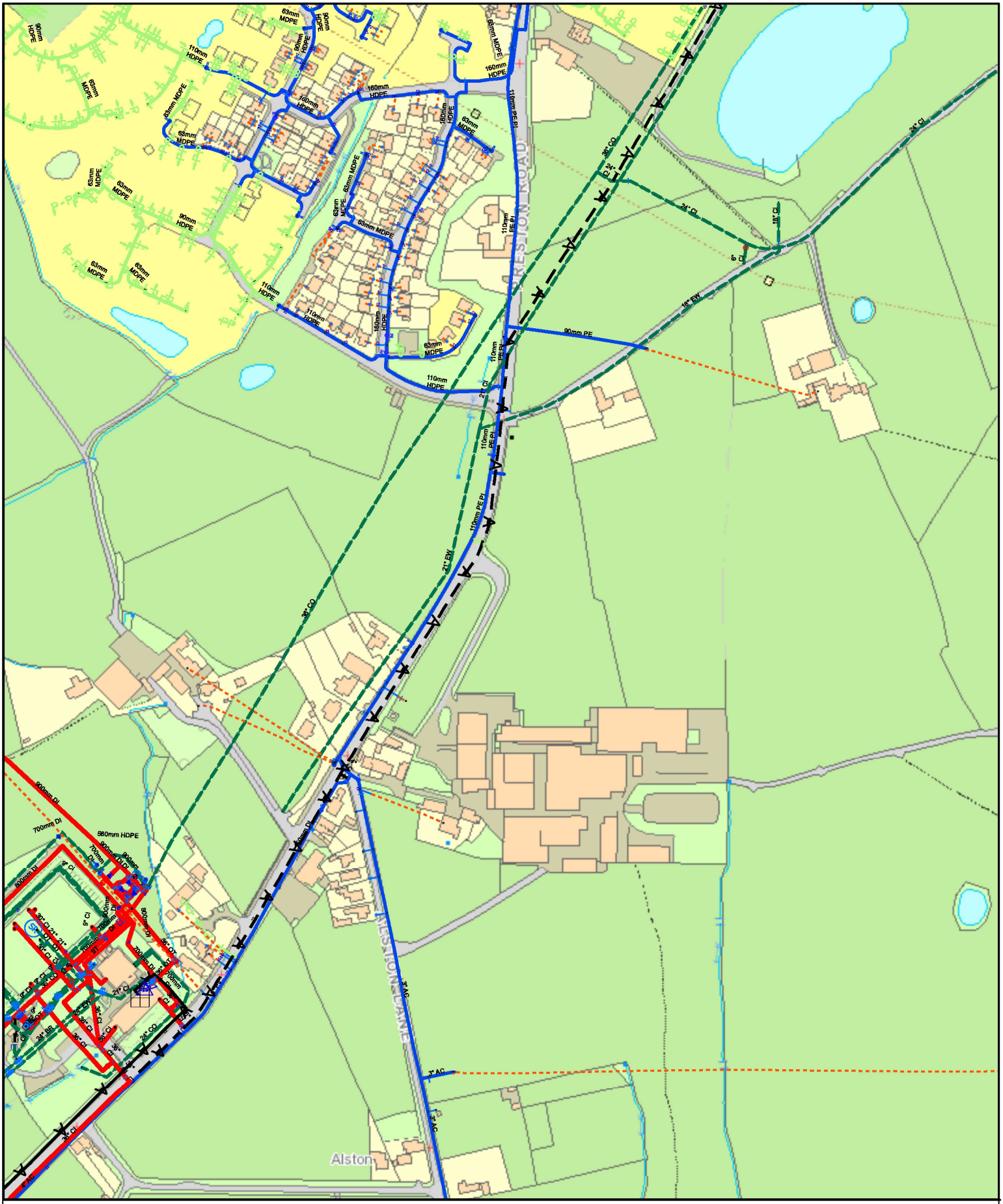
All point assets follow the standard colour convention: red – combined, brown - foul, blue – surface water, purple - overflow

- 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
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- CK Control Kiosk
- Change of Characteristic

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



Date: 25/03/2022

Extract from Map Of Water Mains

Printed By:
Property Searches

Land and surrounding area Pinfold Lane & Preston Road Longridge P

United Utilities
Water for the North West

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

Question 1.1	**Where relevant, please include a copy of an extract from the public sewer map.**
Answer	**A copy of an extract of the public sewer map within the vicinity of the property is included.**
Guidance	1. The Water Industry Act 1991 defines Public Sewers as those which (United Utilities) have responsibility for. Other assets and rivers, water courses, ponds, culverts or highway drains may be shown for information purposes only. 2. Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer. 3. The Sewerage Undertaker has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Sewerage Undertaker or its contractors needing to enter the property to carry out work.
Question 1.2	**Where relevant, please include a copy of an extract from the map of waterworks.**
Answer	**A copy of an extract of the map of waterworks is included, showing water mains, resource mains or discharge pipes in the vicinity of the property.**
Guidance	The "water mains" in this context are those which are vested in and maintainable by the Water Undertaker under statute. Assets other than public water mains may be shown on the plan, for information only. Water Undertakers are not responsible for private supply pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal. If an extract of the public water main record is enclosed, it will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network. The presence of a public water main running within the boundary of the property may restrict further development within it. Water Undertakers have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the Water Undertaker or its contractors needing to enter the property to carry out work.
Question 2.1	**Does foul water from the property drain to a public sewer?**
Answer	**This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer.**
Guidance	Sewerage Undertakers are not responsible for any private drains or sewers that connect the property to the public sewerage system, and do not hold details of these. The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal. If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant. If an extract from the public sewer map is enclosed, this will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.2 **Does surface water from the property drain to a public sewer?**

Answer **This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer. If the property was constructed after the 6th April 2015 the surface water drainage may be served by a sustainable drainage system.**

Guidance

Sewerage Undertakers are not responsible for any private drains or sewers that connect the property to the public sewerage system and do not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

In some cases, Sewerage Undertakers' records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Sewerage Undertaker.

If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse. If an extract from the public sewer map is enclosed, this will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.3 **Is a surface water drainage charge payable?**

Answer **Records indicate that a surface water drainage charge is not applicable for the property.**

Guidance

Since 1st April 2017 commercial customers can choose their retailer for clean, waste or both services. For more information on any applicable surface water charges you will need to contact the current owner of the property to find out who the current retailer is. Details of the retailer for a property can be found on the current occupiers bill. For a list of all potential retailers of water and waste water services for the property please visit www.open-water.org.uk.

Please note if the property was constructed after 6th April 2015 the Surface Water drainage may be served by a Sustainable Drainage System. Further information may be available from the Developer.

Question 2.4 **Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?**

Answer **The public sewer map included indicates that there are no public sewers, disposal mains or lateral drains within the boundary of the property. However from the 1st October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map which may further prevent or restrict development of the property. If you are considering any future development at this property which may require build over consent, please complete the enquiry form by accessing the following link http://www.unitedutilities.com/planning-wastewater-guidance.aspx.**

Guidance

The approximate boundary of the property has been determined by reference to the Ordnance Survey record. A property of this type will normally be served by a shared sewer passing through the boundaries of several properties. It is therefore likely that a public sewer or lateral drain is present within the property boundary.

Please note that from 1st October 2011 the majority of private sewers and lateral drains connected to the public network as of 1st July 2011 transferred into public ownership and therefore it is possible there may be additional public assets which may not be shown on the public sewer plan.

The presence of public assets running within the boundary of the property may restrict further development. If there are any plans to develop the property further enquiries should be made to United Utilities Build Over department.

United Utilities Water has a legal right of access to carry out work on its assets, subject to notice. This may result in employees of the Company or its contractors needing to enter the property to carry out work.

Question 2.4.1 **Does the public sewer map indicate any pumping station or any other ancillary apparatus within the boundaries of the property?**

Answer **The public sewer map included indicates that there is no public pumping station or other ancillary apparatus within the boundaries of the property. However, from the 1st October 2016 private pumping stations which serve more than one property will be transferred into public ownership but may not be recorded on the public sewer map until that time**

Guidance

From 1 October 2016 United Utilities will be responsible for private pumping stations (though we may take ownership of some stations before this date) that either:

* serve a single property, and are outside the property boundary or

* serves two or more properties

Only private pumping stations installed before 1st July 2011 will be transferred into our ownership. United Utilities will be responsible for all associated costs, maintenance, repairs and any necessary upgrade work.

Where the property is part of a very recent or ongoing development and the sewers/pumping station are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains, sewers and pumping stations for which they will hold maintenance and renewal liabilities.

Question 2.5 **Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?**

Answer **The public sewer map included indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the boundary of the property. However from the 1st October 2011 private sewers will be transferred into public ownership and may not be recorded on the public sewer map and it is our professional opinion that there will be a public sewer within 30.48 (100 feet) of a building within the boundary of the property.**

Guidance

From 1st October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.

The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the Local Authority requiring a property to be connected to the public sewer.

The measure is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.

Sewers indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer, if any.

Assets other than public sewers may be shown on the copy extract for information only.

Question 2.5.1 **Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?**

Answer **The public sewer map included indicates that there is no public pumping station or other ancillary apparatus within 50 metres of any buildings within the property. However, from 1st October 2016 private pumping stations which serve more than one property will be transferred into public ownership but may not be recorded on the public sewer map until that time.**

Guidance

From 1 October 2016 United Utilities will be responsible for private pumping stations (though we may take ownership of some stations before this date) that either:

* serve a single property, and are outside the property boundary or

* serves two or more properties.

Only private pumping stations installed before 1st July 2011 will be transferred into our ownership. United Utilities will be responsible for all associated costs, maintenance, repairs and any necessary upgrade work.

If you think there might be a private pumping station on your land or near your business property, please let us know by completing this questionnaire with as much information as possible, please visit our website http://www.unitedutilities.com/ppstransfer.aspx.

Where the property is part of a very recent or ongoing development and the sewers/pumping station are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains, sewers and pumping stations for which they will hold maintenance and renewal liabilities.

Question 2.6

Are any foul sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?

Answer

Records confirm that foul sewers and/or lateral drains serving the development, of which the property forms part are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance

This enquiry is of interest to purchasers of new property who will want to know whether or not the property will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991.

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Question 2.6.1

Are any surface water pipes or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

Answer

Records confirm that the surface water sewer(s) and/or surface water lateral drain(s) are not the subject of an adoption agreement and it is recommended that responsibility for maintenance of these is checked with the developer as this may be due to a Sustainable Drainage Scheme (SUDS)

Guidance

This enquiry is of interest to purchasers of new property who will want to know whether or not the property will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991.

Question 2.7

Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

Answer

There are no records in relation to any approval or consultation about plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage

undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

Guidance

From the 1st October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have granted approval or been consulted about any plans to erect a building or extension on the property over or in the vicinity of these assets.

Prior to 2003 United Utilities Water Limited had sewerage agency agreements with the local authorities therefore details of any agreements/consents or rejections may not have been forwarded on to our offices before this date.

Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

Question 2.8 **Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?**

Answer **The building is not recorded as being at risk of internal flooding due to overloaded public sewers. From the 1st October 2011 private sewers, disposal mains and lateral drains were transfered into public ownership it is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.**

Guidance

1. A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.

2. "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

3.These are defined as properties that have suffered or are likely to suffer internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Sewerage Undertaker's reporting procedure.

4. Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included.

5. Properties may be at risk of flooding but not included where flooding incidents have not been reported to the Sewerage Undertaker.

6. Public sewers are defined as those for which the Sewerage Undertaker holds statutory responsibility under the Water Industry Act 1991.

7. It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Sewerage Undertaker.

8. This report excludes flooding from private sewers and drains and the Sewerage Undertaker makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

Question 2.9 **Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.**

Answer **The nearest Sewage Treatment Works is 1.69 miles (2.72 km), North East of the property. The name of the Sewage treatment works is Ribchester Hospital WwTW. The owner is United Utilities**

Guidance

The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated i.e. the property may not necessarily drain to this works.

The Sewerage Undertaker's records were inspected to determine the nearest sewage treatment works.

It should be noted therefore that there may be a private sewage treatment works closer than the one detailed above that has not been identified. As a responsible utility operator, United Utilities Water Limited seeks to manage the impact of odour from operational sewage works on the surrounding area.

This is done in accordance with the "Code of Practice on Odour Nuisance from Sewage Treatment Works" issued via the Department of Environment, Food and Rural Affairs (DEFRA).

This Code recognises that odour from sewage treatment works can have a detrimental impact on the quality of the local environment for those living close to works.

However DEFRA also recognises that sewage treatment works provide important services to communities and are essential for maintaining standards in water quality and protecting aquatic based environments. For more information visit www.unitedutilities.com.

Question 3.1 **Is the property connected to mains water supply?**

Answer **This enquiry relates to a plot of land or a recently built property. It is recommended that the water supply proposals are checked with the developer.**

Guidance If the property is suplied by private water mains please note that details of private supplies are not kept by the Water Undertaker. The situation should be checked with the current owner of the property.

Question 3.2 **Are there any water mains, resource mains or discharge pipes within the boundaries of the property**

Answer **The map of waterworks indicates that there are water mains, resource mains or discharge pipes within the boundaries of the property.**

Guidance The boundary of the property has been determined by reference to the Ordnance Survey record.

The presence of a public water main within the boundary of the property may restrict further development within it. Water Undertakers have a statutory right of access to carry out work on their assets, subject to notice.

This may result in employees of the Water Undertaker or its contractors needing to enter the property to carry out work.

Question 3.3 **Is any water main or service pipe serving or which is proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?**

Answer **Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.**

Guidance This enquiry is of interest to purchasers of new premises who will want to know whether or not the property will be linked to the mains water supply.

Question 3.4 **Is the building at risk of receiving low water pressure or flow?**

Answer **Records confirm that the building is not recorded by the water undertaker as being at risk of receiving low water pressure or flow.**

Guidance The boundary of the property has been determined by reference to the Ordnance Survey record. "Low water pressure" means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal. Water undertakers report properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level). Reference level: The reference level of service is a flow of 9l/min at a pressure of 10m head on the customer's side of the main stop tap (mst). The reference level applies to a single property. The reference level of

service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap. Where a common service pipe serves more than one property, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served. Surrogate for the reference level: Because of the difficulty in measuring pressure and flow at the mst, companies may measure against a surrogate reference level. Companies should use a surrogate of 15m head in the adjacent distribution main unless a different level can be shown to be suitable. In some circumstances companies may need to use a surrogate pressure greater than 15m to ensure that the reference level is supplied at the customer's side of the mst (for example in areas with small diameter or shared communication pipes).

There are a number of circumstances under which properties identified as receiving low pressure should be excluded from the reported figure. The aim of these exclusions is to exclude properties which receive a low pressure as a result of a one-off event and which, under normal circumstances (including normal peaks in demand), will not receive pressure or flow below the reference level. Companies must maintain verifiable, auditable records of all the exclusions that they apply in order to confirm the accuracy and validity of their information. Allowable exclusions includes Abnormal demand, Planned maintenance, One off incidents, Low pressure incidents of short duration and common supply.

Abnormal demand:

This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand, which are normally expected. Water undertakers exclude figures from properties which are affected by low pressure only on those days with the highest peak demands. During the yearly report water undertakers may exclude, for each property, up to five days of low pressure caused by peak demand.

Planned maintenance:

Water undertakers will not report low pressures caused by planned maintenance. It is not intended that water undertakers identify the number of properties affected in each instance. However, water undertakers must maintain sufficiently accurate records to verify that low-pressure incidents that are excluded because of planned maintenance, are actually caused by maintenance.

One-off incidents:

This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as pressure reducing valves or booster pumps); fire fighting and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration:

Properties affected by low pressures that only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded.

A company must maintain a minimum pressure in the communication pipe of seven metres static head (0.7 bar). If pressure falls below this on two occasions, each occasion lasting more than one hour, within a 28-day period, the company must automatically make a GSS payment to the customer. There are exceptions to the requirement to make a GSS payment if the pressure standard is not met. These are: a payment has already been made to the same customer in respect of the same financial year; it is impractical for the company to have identified the particular customer as being affected, and the customer has not made a claim within three months of the date of the latter occasion; industrial action by the company's employees makes it not feasible to maintain the pressure standard; the act or default of a person other than the company's representative make it not feasible to maintain the pressure standard; or the pressure falls below the minimum standard due to necessary works taking place or due to a drought.

It should be noted that low water pressure can occur from private water mains, private supply pipes (the pipework from the external stop cock to the property) or internal plumbing which are not the responsibility of the Water Undertaker. This report excludes low water pressure from private water mains, supply pipes and internal plumbing and the Water Undertaker makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

Question 3.5 **What is the clarification of the water supply for the property?**

Answer **The water supplied to the property has an average water hardness of 56mg/l calcium carbonate, which is defined as very soft by United Utilities**

Guidance

The hardness of water is due to the presence of calcium and magnesium minerals that are naturally present in the water. The usual signs of a hard water supply are scaling inside kettles, poor lathering of soaps and scum.

What is water hardness?

Hard water is formed when water passes through or over limestone or chalk areas and calcium and magnesium ions dissolve into the water. The hardness is made up of two parts: temporary (carbonate) and permanent (non-carbonate) hardness. When water is boiled, calcium carbonate scale can form, which can deposit on things like kettle elements. The scale will not stick to kettles that have a plastic polypropylene lining but will float on the surface. The permanent hardness that comprises calcium and magnesium sulphate does not go on to form scale when heated or boiled.

How is water hardness measured?

Hardness is usually expressed in terms of the equivalent quantity of calcium carbonate (CaCO3) in milligrams per litre or parts per million. You may also see hardness expressed as degrees of hardness in Clark (English) degrees, French or German degrees. Interconversion between the different measurements can be made by using the appropriate conversion factors below. There are no standard levels as to what constitutes a hard or a soft water. Table 1 gives an indication of the equivalents of calcium and calcium carbonate and the relative degree of hardness.

Water quality standards

There are no regulatory standards for water hardness in drinking water.

Water hardness in the North West

The majority of raw water in the United Utilities region comes from upland surface water reservoirs. The water in the reservoirs has little chance of passing through rocks and to dissolve the minerals that make water hard. Therefore, the majority of water in this region is soft or very soft. We supply water from a number of boreholes in the south of the region that are reasonably hard, but these tend to be blended with softer sources to meet demand. No water supply in the North West is artificially softened.

Can hard water be softened?

Yes, water can be softened artificially by the installation of a water softener or the use of 'jug type' filters. Medical experts recommend that a non-softened supply is maintained for drinking purposes because softened water may contain high levels of sodium. Softeners should be fitted after the drinking water tap and comply with the requirements of the Water Supply (Water Fittings) Regulations 1999. They should be maintained in accordance with manufacturers' instructions.

If you're interested in finding out more about the quality of your drinking water, please visit www.unitedutilities.com/waterquality and enter your postcode.

The Drinking Water Inspectorate is responsible for ensuring the quality of public water supplies. Visit their website at: www.dwi.defra.gov.uk.

Question 3.6 **Is there a meter installed at the property?**

Answer **Records indicate that the property is not served by a water meter**

Guidance

Not applicable

Question 3.7 **Please include details of the location of any water meter serving the property.**

Answer	**Records indicate that the property is not served by a water meter.**
Guidance	Where the property is not served by a meter the current occupier can contact the retailer directly to advise on the current charging method, details of the retailer can also be found on the current occupiers bill.
Question 4.1.1	**Who is responsible for providing the sewerage services for the property?**
Answer	**United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP**
Guidance	Not applicable
Question 4.1.2	**Who is responsible for providing the water services for the property?**
Answer	**United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP**
Guidance	Not Applicable
Question 4.2	**Who bills the property for sewerage services?**
Answer	**Since 1st April 2017 commercial customers can choose their retailer. If you wish to know who currently bills the property for sewerage services you will need to contact the owner of the property to find out who the retailer is.**
Guidance	For a list of all potential retailers of wastewater services for the property please visit www.open-water.org.uk
Question 4.3	**Who bills the property for water services?**
Answer	**Since 1st April 2017 commercial customers can choose their retailer. If you wish to know who currently bills the property for water services you will need to contact the owner of the property to find out who the retailer is.**
Guidance	For a list of all potential retailers of water services for the property please visit www.open-water.org.uk
Question 5.1	**Is there Consent, on this property, to discharge Trade Effluent under S118 of the Water Industry Act (1991) into the public sewerage system?**
Answer	**There is no record of a Trade Effluent consent at this property. Applications for Trade Effluent consents should be submitted via your retailer for info please visit https://www.unitedutilities.com/services/wholesale-services/trade-effluent/**
Guidance	The owner/occupiers of Trade Premises do not have the right to discharge Trade Effluent to the public wastewater network. Any Trade Effluent Discharge Consent will be issued under Section 118 of the Water Industry Act 1991 and will be subject to conditions set by the Sewerage Undertaker. Generally these conditions are to ensure: a) The Health and Safety of staff working within the wastewater network and at wastewater treatment plants. b) The apparatus of the wastewater network is not damaged. c) The flow of the contents of the wastewater network is not restricted.

d) Equipment, plant, and processes at treatment works are not disrupted or damaged.

e) Treatment of sewage sludge is not impeded and sludges are disposed of in an environmentally friendly manner.

f) Final effluent discharge from wastewater treatment plants has no impact on the environment or prevents the receiving waters from complying with EU Directives.

g) Potential damage to the environment via storm water overflows is minimised.

Disputes between an occupier of a Trade Premise and the Sewerage Undertaker can be referred to the Director General of Water Services (OFWAT).

Protecting Public Sewers - Discharges Section 111 of the Water Industry Act 1991, places prohibition on the discharge of the following into a public sewer, drain or a sewer that communicates with a public sewer.

i) Any matter likely to injure the sewer or drain, to interfere with the free flow of its contents or to affect prejudicially the treatment or disposal of its contents.

ii) Any chemical refuse or waste steam or any liquid of temperature higher than 43.3 degrees Celsius (110 degrees Fahrenheit).

iii) Any petroleum spirit or carbide of calcium. On summary conviction offences under this Section carry a fine not exceeding the statutory maximum or a term of imprisonment not exceeding two years, or both.

Please note any existing consent is dependant on the business being carried out at the property and will not transfer automatically upon change of ownership.

Question 6.1	**Is there a wayleave/easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?**
Answer	**There is no record of a formal easement affecting this property.**
Guidance	Not Applicable

Appendix 1- General interpretation

1. (1) In this Schedule-

"the 1991 Act" means the Water Industry Act 1991(a);

"the 2000 Regulations" means the Water Supply (Water Quality) Regulations 2000(b);

"the 2001 Regulations" means the Water Supply (Water Quality) Regulations 2001(c);

"adoption agreement" means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act (d);

"bond" means a surety granted by a developer who is a party to an adoption agreement;

"bond waiver" means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;

"calendar year" means the twelve months ending with 31st December;

"discharge pipe" means a pipe from which discharges are made or are to be made under Section 165(1) of the 1991 Act;

"disposal main" means (subject to Section 219(2) of the 1991 Act) any outfall pipe or other pipe which-
(a) is a pipe for the conveyance of effluent to or from any sewage disposal works, whether of a sewerage undertaker or of any other person; and
(b) is not a public sewer;

"drain" means (subject to Section 219(2) of the 1991 Act) a drain used for the drainage of one building or any buildings or yards appurtenant to buildings within the same curtilage;

"effluent" means any liquid, including particles of matter and other substances in suspension in the liquid;

"financial year" means the twelve months ending with 31st March;

"lateral drain" means-
(a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or
(b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under Section 102 of the 1991 Act or in an agreement made under Section 104 of that Act (e);

"licensed water supplier" means a company which is the holder for the time being of a water supply licence under Section 17A(1) of the 1991 Act(f);

"maintenance period" means the period so specified in an adoption agreement as a period of time-
(a) from the date of issue of a certificate by a Sewerage Undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker's satisfaction; and
(b) until the date that private sewer or lateral drain is vested in the Sewerage Undertaker;

"map of waterworks" means the map made available under Section 198(3) of the 1991 Act (g) in relation to the information specified in subsection (1A);

"private sewer" means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a Sewerage Undertaker;

"public sewer" means, subject to Section 106(1A) of the 1991 Act(h), a sewer for the time being vested in a Sewerage Undertaker in its capacity as such, whether vested in that undertaker-
(a) by virtue of a scheme under Schedule 2 to the Water Act 1989(i);
(b) by virtue of a scheme under Schedule 2 to the 1991 Act (j);

(c) under Section 179 of the 1991 Act (k); or
(d) otherwise;

"public sewer map" means the map made available under Section 199(5) of the 1991 Act (l);

"resource main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of-
(a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or
(b) giving or taking a supply of water in bulk;

"sewerage services" includes the collection and disposal of foul and surface water and any other services which are required to be provided by a Sewerage Undertaker for the purpose of carrying out its functions;

"Sewerage Undertaker" means the company appointed to be the Sewerage Undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated;

"surface water" includes water from roofs and other impermeable surfaces within the curtilage of the property;

"water main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the water Undertaker, which is used or to be used by a Water Undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers;

"water meter" means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises;

"water supplier" means the company supplying water in the water supply zone, whether a water undertaker or licensed water supplier;

"water supply zone" means the names and areas designated by a Water Undertaker within its area of supply that are to be its water supply zones for that year; and

"Water Undertaker" means the company appointed to be the Water Undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated.

(2) In this Schedule, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

(a) 1991 c. 56.
(b) S.I. 2000/3184. These Regulations apply in relation to England.
(c) S.I. 2001/3911. These Regulations apply in relation to Wales.
(d) Section 51A was inserted by Section 92(2) of the Water Act 2003 (c. 37). Section 104(1) was amended by Section 96(4) of that Act.
(e) Various amendments have been made to Sections 102 and 104 by Section 96 of the Water Act 2003.
(f) Inserted by Section 56 of and Schedule 4 to the Water Act 2003.
(g) Subsection (1A) was inserted by Section 92(5) of the Water Act 2003.
(h) Section 106(1A) was inserted by Section 99 of the Water Act 2003.
(i) 1989 c. 15.
(j) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
(k) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
(l) Section 199 was amended by Section 97(1) and (8) of the Water Act 2003.

Appendix 2 - DRAINAGE AND WATER ENQUIRY (COMMERCIAL) AGREEMENT

The Customer, the Client and the Purchaser are asked to note this Agreement which govern the basis on which this drainage and water report is supplied

Definitions

Company' means United Utilities Water Limited who produce the Report; its registered office being at Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington WA5 3LP, company number 2366678.

'Order' means any request completed by the Customer requesting the Report.

'Report' means the drainage and water report prepared by the Company in respect of the Property.

'Property' means the address or location supplied by the Customer in the Order.

'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.

'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property.

'Purchaser' means the actual or potential purchaser of the Property including their mortgage lender.

Agreement

1.1 The Company agrees to supply the Report to the Customer and the Client subject to this Agreement. The scope and limitations of the Report are described in clause 2 of this Agreement.

Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing this Agreement to the attention of the Client and the Purchaser.

1.2 The Customer, the Client and the Purchaser agree that the placing of an Order for a Report and the subsequent provision of a copy of the Report to the Client and/ or the Purchaser indicates their acceptance of this Agreement.

The Report

Whilst the Company will use reasonable care and skill in producing the Report, it is provided to the Customer, the Client and the Purchaser on the basis that they acknowledge and agree to the following:

2.1 The information contained in the Report can change on a regular basis so the Company cannot be responsible to the Customer, the Client and the Purchaser for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.

2.2 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

2.3 The information contained in the Report is based upon the accuracy, completeness and legibility of the address and/or plans supplied by the Customer or Client or Purchaser.

2.4 The Report provides information as to the location and connection status of existing services and other information in relation to drainage and water enquiries and should not be relied on for any other purpose. The Report may contain opinions or general advice to the Customer, the Client and the Purchaser. The Company cannot ensure that any such opinion or general advice is accurate, complete or valid and therefore accepts no liability in relation thereto.

2.5 The position and depth of apparatus shown on any maps attached to the Report are approximate and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made in the vicinity of the Company's apparatus.

Liability

3.1 The Company shall not be liable to the Client or the Purchaser for any failure defect or non-performance of its obligations arising from any failure to provide or delay in providing the Report to the extent that such failure or delay is due to an event or circumstance beyond the reasonable

control of the Company including but not limited to any delay, failure of or defect in any machine, processing system or transmission link or any failure or default of a supplier or sub-contractor of the Company or any provider of any third party Information except to the extent that such failure or delay is caused by the negligence of the Company.

3.2 Where a Report is requested for an address falling within a geographical area where two different companies separately provide Water and Sewerage Services, then it shall be deemed that liability for the information given by either company will remain with that company in respect of the accuracy of the information supplied.

A company supplying information which has been provided to it by another company for the purposes outlined in this agreement will therefore not be liable in any way for the accuracy of that information and will supply that information as an agent for the company from which the information was obtained.

3.3 The Report is produced for use in relation to individual commercial propertytransactions where the property is used soley for carrying on a trade or business, the property is intended to be developed for commercial gain or the property is not a single residential, domestic property. The Company's entire liability (except to the extent provided by clause 3.5) in respect of all causes of action arising by reason of or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall be limited to £2,000,000

In any event, the Company shall not have any liability in contract, negligence or any other tort or for breach of statutory duty or otherwise in respect of any loss of profit, loss of revenue, loss of opportunity or anticipated savings, or any indirect or consequential loss or damage that may be suffered by the Customer, the Client or the Purchaser howsoever arising. The plans attached to the report are provided pursuant to the Company's statutory duty to make such plans available for inspection (notwithstanding the provisions of this clause) and attention is drawn to the notice on the plan(s) attached to the report which applies to the plan and its contents.

3.4 Where the Customer sells this Report to a Client or Purchaser under its own name or as a reseller of the Company (other than in the case of a bona fide legal adviser recharging the cost of the Report as a disbursement) the Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to the Customer for any loss (whether direct, indirect or consequential loss (all three of which terms include without limitation, pure economic loss, loss of profit, loss of business, depletion of goodwill and like loss)) or damage whatsoever caused in respect of the Report or any use of the Report or reliance placed upon it and the Customer shall indemnify and keep indemnified the Company in respect of any claim by the Client or the Purchaser that the Company may incur or suffer.

3.5 Nothing in this Agreement shall exclude the Company's liability for death or personal injury arising from its negligence or for fraud.

Copyright and Confidentiality

4.1 The Customer, the Client and the Purchaser acknowledge that the Report is confidential and is intended for the personal use of the Client and the Purchaser. The copyright and any other intellectual property rights in the Report shall remain the property of the

Company. No intellectual or other property rights are transferred or licensed to the Customer, the Client or the Purchaser except to the extent expressly provided herein.

4.2 The Customer or the Client or the Purchaser is entitled to make copies of the Report but may only copy Ordnance Survey mapping or data contained in or attached to the Report if they have an appropriate licence from the originating source of that mapping or data.

4.3 The Customer, The Client and the Purchaser agree (in respect of both the original and any copies made) to respect and not to alter any part of the Report including but not limited to the trademark, copyright notice or other property marking which appears on the Report.

4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.5 The enquiries in the Report are protected by copyright by the Law Society of 113 Chancery Lane, London WC2A 1PL and must not be used for any purpose outside the context of the Report.

4.6 The Customer, the Client and the Purchaser agree to indemnify the Company against any losses, costs, claims and damage suffered by the Company as a result of any breach by either of them of the provisions of clauses 4.1 to 4.4 inclusive.

Payment

5.1 Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay the price of the Report specified by the Company, without any set off, deduction or counterclaim.

5.2 Payment must be received in advance unless an account has been set up with the Company. In these cases, payment terms will be as agreed with the Company, but in any event any invoice must be paid within 30 days.

5.3 The Company reserves the right to increase fees on reasonable prior written notice at any time.

Data Protection

6.1 We will process any personal data you provide to us in accordance with applicable data protection laws and our Data Protection and Privacy Notice (https://www.unitedutilities.com/privacy/). In addition we will use your personal data to manage and administer the provision of the Report under this Agreement and to develop and improve the business and services we provide to our customers. We may also disclose it to other companies in the United Utilities group (being United Utilities Water Limited, its holding companies (and their subsidiary companies) and its subsidiary companies) and their sub-contractors in connection with those purposes, but it will not be processed for other purposes or disclosed to other third parties without your express permission or without lawful purpose under data protection law.

General

7.1 If any provision of this Agreement is or becomes invalid or unenforceable, it will be taken to be removed from the rest of this Agreement to the extent that it is invalid or unenforceable. No other provision of this Agreement shall be affected.

7.2 This Agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

7.3 Nothing in this Agreement and conditions shall in any way restrict the Customer's the Client's or the Purchaser's statutory or any other rights of access to the information contained in the Report.

7.4 This Agreement and conditions may be enforced by the Customer, the Client and the Purchaser.

7.5 Before you agree to this Agreement, please note it is your responsibility to ensure your client/customer is aware of them and that any objections are raised accordingly.

Property Searches complaints procedure

In the event of any queries relating to this Report please e-mail, write or phone our customer team quoting the United Utilities reference detailed on the Report, We will endeavor to resolve any telephone contact or complaint at the time of the call.

Whilst we always try to resolve all complaints straight away, if this is not possible and you are not happy with the course of action taken by us you can ask us to escalate the issues internally via the complaints process detailed below.

We will listen to your complaint and do our best to deal with it immediately.

If we fail to give you a written substantive response within 5 working days the Company will compensate the Customer or the Client (as applicable) the amount of the original fee paid to the Company for the Report, regardless of the outcome of your complaint.

If it is a complex issue requiring more time, we will still get back to you within 5 working days and notify you of progress and update you with the new timescales.

If we consider your complaint to be justified or we have made any errors that substantially change the outcome of the search we will:

- Refund your Report fee
- Provide you with a revised Report (if requested)
- Take the necessary action within our power to put things right which may (where appropriate) include, at our complete discretion, financial compensation or the relocation/removal/installation of our affected water or sewerage assets.
- Keep you informed of any action required

If your complaint has gone through our full internal complaints procedure and you are not satisfied with the response or you believe that we have failed to comply with our internal complaints procedure you may be able to refer your complaint for consideration under The Property Ombudsman Scheme (TPOs). You can obtain further information by visiting www.tpos.co.uk or email admin@tpos.co.uk

Appendix C

Outline Causeway Hydraulic Calculations

Calculation of QBAR

Project: Alston Dairy

Calculations to IoH 124

Location:	Preston	
SAAR	970	
Soil Type	4	
SPR	0.47	
Area (Ha)	1.4	
Qbar	**9.9 l/s**	(greenfield run-off)
Region	10	
Growth Curve	2.08	
Qbar$_{100}$	**20.59 l/s**	(greenfield run-off in 100 year event)
Qbar$_{100+20\%}$	**24.71 l/s**	(greenfield run-off in 100 year event + 20% CCF)
Qbar$_{100+40\%}$	**28.83 l/s**	(greenfield run-off in 100 year event + 40% CCF)

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	35	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	6.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Depth/Area 1	0.381	100.000	-19.536	90.766	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	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 %)
2	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	35	0	0
100	50	0	0

Node Depth/Area 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.500	Product Number	CTL-SHE-0092-4000-1200-4000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.0	Min Node Diameter (mm)	1200

Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	192.0	0.0	1.200	192.0	0.0	1.210	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Depth/Area 1	176	98.684	0.184	10.9	36.2816	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	Depth/Area 1	Hydro-Brake®	3.7	56.6

Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	148	98.817	0.317	20.6	62.4157	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	4.0	76.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	172	98.917	0.417	25.7	82.1907	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	4.0	85.1

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	176	99.047	0.547	31.9	107.7228	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	4.0	87.5

Results for 100 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Depth/Area 1	236	99.308	0.808	34.9	159.2017	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	Depth/Area 1	Hydro-Brake®	4.0	91.0

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Depth/Area 1	344	99.419	0.919	28.5	181.1771	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
360 minute winter	Depth/Area 1	Hydro-Brake®	4.0	111.6

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	35	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	6.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Depth/Area 1	0.392	100.000	-19.536	90.755	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	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 %)
2	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	35	0	0
100	50	0	0

Node Depth/Area 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.500	Product Number	CTL-SHE-0093-4100-1200-4100
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.1	Min Node Diameter (mm)	1200

Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	195.0	0.0	1.200	195.0	0.0	1.210	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Depth/Area 1	176	98.687	0.187	11.2	37.4152	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	Depth/Area 1	Hydro-Brake®	3.8	58.4

Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	148	98.821	0.321	21.2	64.3596	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	4.1	79.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	172	98.923	0.423	26.5	84.7269	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	4.1	87.3

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m^3)	Flood (m^3)	Status
180 minute winter	Depth/Area 1	176	99.054	0.554	32.9	110.9601	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m^3)
180 minute winter	Depth/Area 1	Hydro-Brake®	4.1	89.5

Results for 100 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Depth/Area 1	236	99.318	0.818	35.9	163.8584	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	Depth/Area 1	Hydro-Brake®	4.1	92.7

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Depth/Area 1	344	99.431	0.931	29.3	186.4394	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
360 minute winter	Depth/Area 1	Hydro-Brake®	4.1	114.4

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	35	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	6.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Depth/Area 1	0.090	100.000	-19.536	90.755	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	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 %)
2	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	35	0	0
100	50	0	0

Node Depth/Area 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.500	Product Number	CTL-SHE-0061-1800-1200-1800
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.8	Min Node Diameter (mm)	1200

Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	224

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	40.0	0.0	1.200	40.0	0.0	1.210	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Depth/Area 1	88	98.656	0.156	4.1	6.4395	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute winter	Depth/Area 1	Hydro-Brake®	1.5	11.5

Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Depth/Area 1	60	98.811	0.311	11.3	12.7994	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	Depth/Area 1	Hydro-Brake®	1.6	16.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Depth/Area 1	114	98.945	0.445	9.1	18.3399	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute winter	Depth/Area 1	Hydro-Brake®	1.6	25.4

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Depth/Area 1	118	99.166	0.666	12.3	27.4302	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute winter	Depth/Area 1	Hydro-Brake®	1.6	28.8

Results for 100 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	176	99.452	0.952	12.2	39.2311	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	1.6	34.2

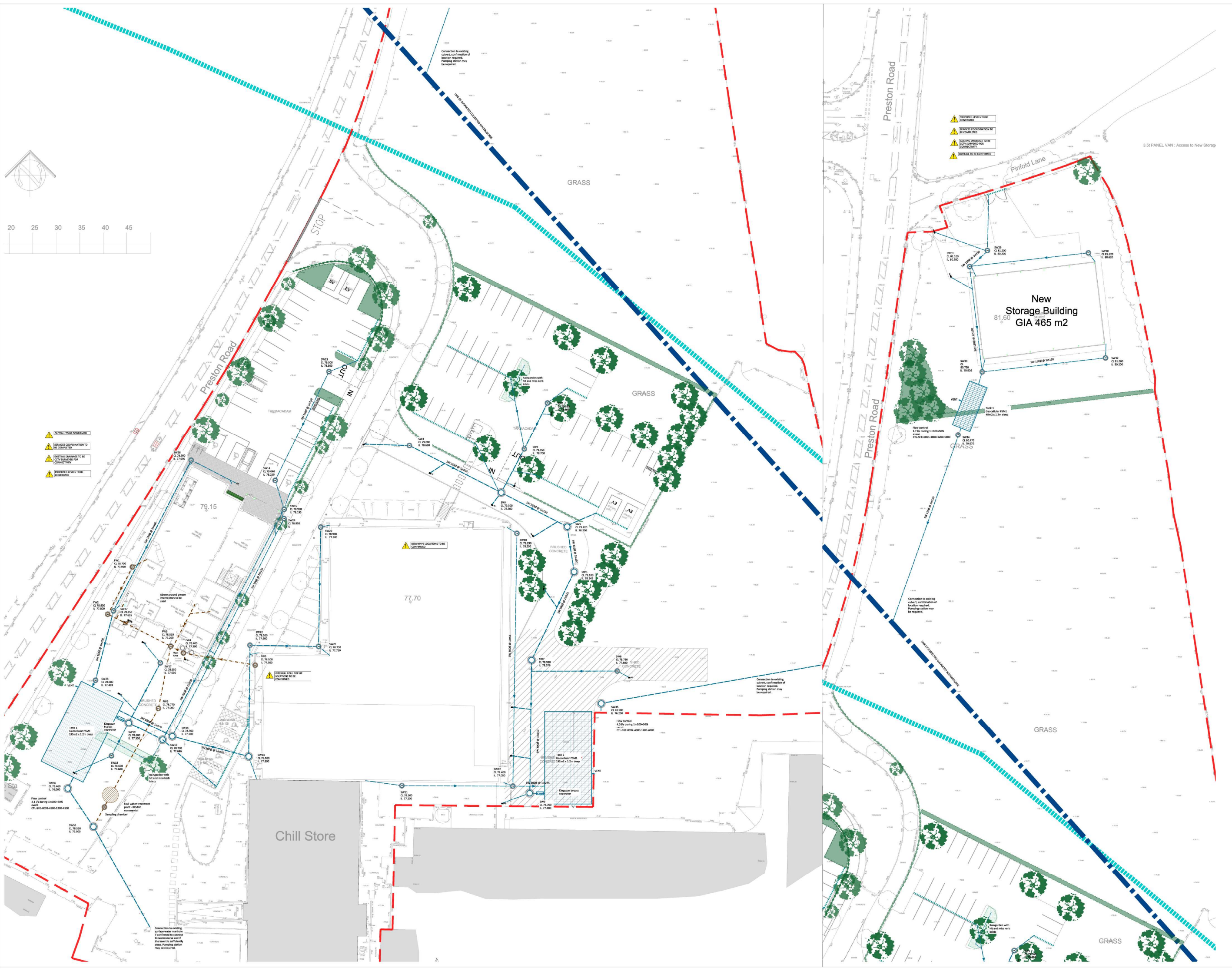
Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Depth/Area 1	176	99.580	1.080	13.6	44.4799	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	Depth/Area 1	Hydro-Brake®	1.7	35.8

Appendix D

Proposed Outline Drainage Layout and Details



Notes.

1. DO NOT SCALE THIS DRAWING. WORK TO FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.

2. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and Specialist's drawings and their respective specification.

3. All work to comply with relevant British Standards, Codes of practice and the Building Regulations.

4. Any discrepancies between all working drawings, specifications and schedules of all disciplines to be immediately notified to main contractor for clarification/correction prior to construction of relevant structure.

5. All cover levels are indicative only and shall match Architects proposed levels. Invert levels to be confirmed on site prior to work commencing.

6. All areas of excavation are to be scanned and marked for existing services prior to any excavation.

7. Branch connections to PPIC's have been assumed 50mm higher than the main channel.

8. All connections from RWP to be 160mmØ unless noted otherwise.

9. For the location of all RWP's and SVP's refer to Architects drawings.

10. Stormwater attenuation system shall be Polypipe-Polystorm pre-formed modular geocellular units with minimum 94% volumetric void ratio and minimum 52% effective perforated surface area. Units shall be installed using locking ties to maintain rigidity and minimise deflection. Geocellular units to be fully encapsulated with Heavy duty geotextile protection fleece and impermeable membrane.

11. Heavy duty geotextile fleece to be non-woven needle-punched polypropylene as per Specification. Geotextile to be laid with minimum 300mm overlaps and to be applied to all external surfaces of Polypipe-Permavoid drainage units. To be installed in accordance with the manufacturer's recommendations.

12. Waterproof geomembrane to be single layer cold applied robust welded flexible membrane as per Specification suitable for waterproofing to structure and for water containment. Membrane to be nominal 1mm thick laid with minimum 150mm laps and welded seams. To be installed in accordance with the manufacturer's recommendations under and approved CQA protocol that includes testing of the welds.

13. Linear drainage channel to be ACO MD range with sump assemblies.

14. Foul connection to be 100mm Ø unless noted otherwise.

15. Oil bypass separators to be Kingspan Klargester as noted on drawing.

16.All dimensions are in millimeters unless noted otherwise.

17. Pre-cast concrete products shall comply with the relevant provisions of BS 5911 and be 'Kite Marked'.

18. All pipes and pipe fittings shall be HDPE twinwall and have current British Board of Agreement Certification.

19. Manhole covers and frames, grids and frames shall comply with the relevant provisions of BS EN 124.

20. Do not scale from this drawing. If in doubt ask.

21. This drawing to be read in conjunction with all relevant PEL, Architects & Engineers drawings.

22. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.

23. At all times the works are to be executed in accordance with the requirements of the Health And Safety at Work Act 1974 and CDM Regulations 2015.

24. Until technical approval has been obtained from the relevant Authority, It should be understood that all drawings are **PRELIMINARY** and **NOT FOR CONSTRUCTION**.

Legend.

- Surface Water Drainage Pipework 150mm dia U.N.O
- Foul Water Drainage Pipework 150mm dia U.N.O
- Linear Drainage Channel MD150 ACO
- Rainwater Downpipe & Gully
- Yard Gully
- 750mm dia catchpit inspection chamber (SW)
- 1200 dia SW manhole
- 600mm dia catchpit FW inspection chamber
- Polystorm attenuation tank 1200mm Deep
- Raingarden

STATUS	REV	DATE	REVISION HISTORY	DSG | DRW | CHK | APP
S3	P03	14.12.23	First issue	JR | JR | RG | RG
S3	P02	16.11.23	First issue	JR | JR | RG | RG
S3	P01	23.10.23	First issue	JR | JR | RG | RG

ALL REVISIONS

CLIENT

JAMES HALL & CO LTD

KEY PLAN

ORIGINATOR

PLUVIAM ENVIRONMENTAL

DRAWING TITLE

Alston Dairy
Alston
Drainage Layout

	Name	Signature	Date
Designed by	JR		18/10/2023
Drawn by	JR		18/10/2023
Checked	RG		18/10/2023
Approved	RG		18/10/2023

PEL REF	SCALE @ A0	BIM FILE NAME - REVISION
PN0107	1:250	-
	S3 - Suitable for Internal Review & Comment	

PROJECT	ISSUER	VOLUME	LEVEL	TYPE	ROLE	NUMBER	REV
PN0107	PEL	XX	XX	DR	Y	0001	P03

TYPICAL DETAILS FOR A CAR PAR RAIN GARDEN

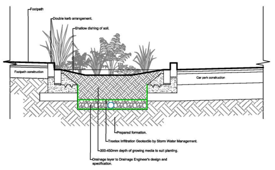


Table of aggregat sizes for pipe bedding
For rigid pipe materials only

Pipe diameter	Alternative aggregate sizes		Aggregate material
	Single size	Graded	
100Ø	10mm	Not suitable	Natural aggregate
150Ø	10mm or 14mm	14mm - 5	To BS 882
225Ø - 450Ø	10mm or 14mm or 20mm	14mm - 5 or 20mm - 5	Either crushed or as dug
500Ø and above	14mm or 20mm	14mm - 5 or 20mm - 5 or 40 - 5	Must be crushed stone

Table 1
Capping layer & sub base thickness

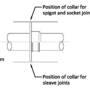
Granular sub base type 1
Thickness to depend on in-situ CBR

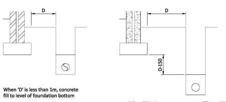
CBR (%)	Sub-base thickness
< 2%	610mm
2%	420mm
2.5%	370mm
3%	310mm
4%	300mm (Minimum)

Pipe bedding details
Class A bedding shall be used on all pipelines with less than 1.2m depth to soffit in adoptable highways and other vehicular areas, and all other areas where depth to soffit is less than 0.9m

Flexible joint to pipe bedding

Flexibility maintained in pipeline at every joint by break in bed formed by collar of bitumen impregnated insulating board.
1 No 18mm thick for pipes DN100mm - 400mm
2 No 18mm thick for pipes DN 450mm - 1200mm





When 'D' is less than 1m, concrete fill to level of foundation bottom

When 'D' is 1m or more, concrete fill to within D-150mm of level of foundation bottom.

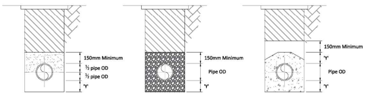
Pipes near buildings
Trenches within 1m of load bearing walls should be filled with concrete at least to the level of the underside of the foundation. Where the distance is more than 1m from the wall, the concrete fill should be to a level below the underside of the foundation equal to the distance from the wall to the nearside of the trench, less 150mm.

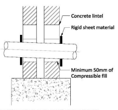
Structural concrete C20P

Class B
180° Granular bed
Fb 1.9 Concrete pipes
Fb 2.5 Clay pipes

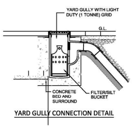
Class S
360° Granular bed
Fb 2.2 Concrete pipes
Fb 2.5 Clay pipes

Class S
360° Plain concrete surround
Fb 4.5 (CPDA)

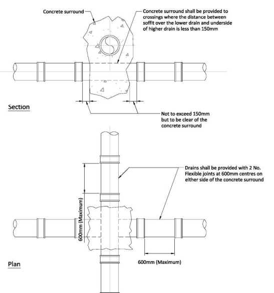




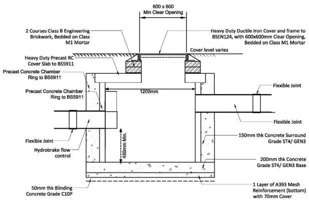
DRAIN PENETRATING THROUGH WALLS



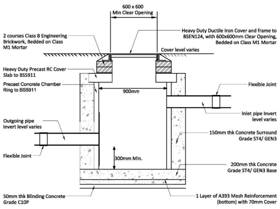
YARD GULLY CONNECTION DETAIL



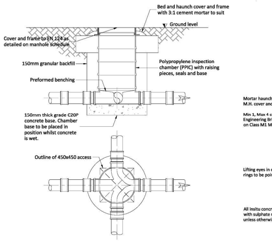
TYPICAL DETAIL OF PIPE CROSSOVER



TYPICAL 1200mm FLOW CONTROL CATCHPIT

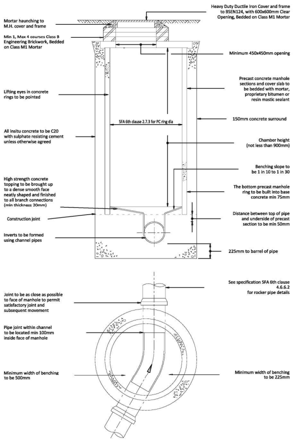


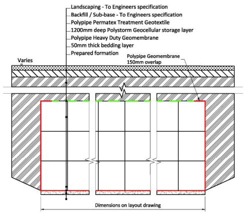
900Ø CATCHPIT INSPECTION CHAMBER (750Ø Similar)
SUMP REQUIRED ON SURFACE WATER NETWORK ONLY



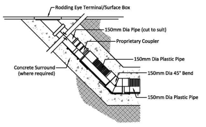
DETAIL OF 500mm/600mm POLYPROPYLENE INSPECTION CHAMBER MAXIMUM DEPTH TO SOFFIT 1.20m MANHOLE TYPE A

TYPICAL MANHOLE DETAIL - TYPE B
Max depth from cover level to soffit of pipe 3.0m
Steps or otherwise to be fitted as required by Undertaker's policy

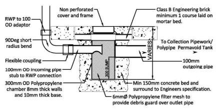




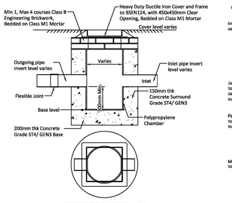
TYPICAL SECTION THROUGH 1200MM DEEP PSM1 ATTENUATION TANK



TYPICAL RODDING EYE DETAIL



TYPICAL 300mmØ RWP BACK INLET GULLY



POLYPROPYLENE CATCHPIT INSPECTION CHAMBER

Notes.
1. DO NOT SCALE THIS DRAWING. WORK TO FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.

2. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and Specialist's drawings and their respective specification.

3. All work to comply with relevant British Standards, Codes of practice and the Building Regulations.

4. Any discrepancies between all working drawings, specifications and schedules of all disciplines to be immediately notified to main contractor for clarification/correction prior to construction of relevant structure.

5. All cover levels are indicative only and shall match Architects proposed levels. Invert levels to be confirmed on site prior to work commencing.

6. All areas of excavation are to be scanned and marked for existing services prior to any excavation.

7. Branch connections to PPIC's have been assumed 50mm higher than the main channel.

8. All connections from RWP to be 160mmØ unless noted otherwise.

9. For the location of all RWP's and SVP's refer to Architects drawings.

10. Stormwater attenuation system shall be Polypipe-Polystorm pre-formed modular geocellular units with minimum 94% volumetric void ratio and minimum 52% effective perforated surface area. Units shall be installed using locking ties to maintain rigidity and minimise deflection. Geocellular units to be fully encapsulated with Heavy duty geotextile protection fleece and impermeable membrane.

11. Heavy duty geotextile fleece to be non-woven needle-punched polypropylene as per Specification. Geotextile to be laid with minimum 300mm overlaps and to be applied to all external surfaces of Polypipe-Permavoid drainage units. To be installed in accordance with the manufacturer's recommendations.

12. Waterproof geomembrane to be single layer cold applied robust welded flexible membrane as per Specification suitable for waterproofing to structure and for water containment. Membrane to be nominal 1mm thick laid with minimum 150mm laps and welded seams. To be installed in accordance with the manufacturer's recommendations under and approved CQA protocol that includes testing of the welds.

13. Linear drainage channel to be ACO MD range with sump assemblies.

14. Foul connection to be 100mm Ø unless noted otherwise.

15. Oil bypass separators to be Kingspan Klargester as noted on drawing.

16.All dimensions are in millimeters unless noted otherwise.

17. Pre-cast concrete products shall comply with the relevant provisions of BS 5911 and be 'Kite Marked'.

18. All pipes and pipe fittings shall be HDPE twinwall and have current British Board of Agreement Certification.

19. Manhole covers and frames, grids and frames shall comply with the relevant provisions of BS EN 124.

20. Do not scale from this drawing. If in doubt ask.

21. This drawing to be read in conjunction with all relevant PEL, Architects & Engineers drawings.

22. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.

23. At all times the works are to be executed in accordance with the requirements of the Health And Safety at Work Act 1974 and CDM Regulations 2015.

24. Until technical approval has been obtained from the relevant Authority, It should be understood that all drawings are **PRELIMINARY** and **NOT FOR CONSTRUCTION**.

STATUS	REV	DATE	REVISION HISTORY	DSG | DRW | CHK | APP
S3	P01	23.10.23	First issue	JR | JR | RG | RG

ALL REVISIONS

CLIENT
JAMES HALL & CO LTD

KEY PLAN

ORIGINATOR
PLUVIAM ENVIRONMENTAL

DRAWING TITLE
Alston Dairy
Alston
Drainage Details

	Name	Signature	Date
Designed by	JR		18/10/2023
Drawn by	JR		18/10/2023
Checked	RG		18/10/2023
Approved	RG		18/10/2023

PEL REF	SCALE @ A1	BIM FILE NAME - REVISION
PN0107	1:25	-
	S3 - Suitable for Internal Review & Comment	

PROJECT	ISSUER	VOLUME	LEVEL	TYPE	ROLE	NUMBER	REV
PN0107	PEL	XX	XX	DR	Y	0002	P01