

Report Title**Drainage Strategy and Design****Property Address**

Land Adjacent to B5344
Holmrook
Egremont
Cumbria

Client

Mr Nutsford

Our Reference

18-088r002_B

Date

20th August 2018

Prepared by

Colin Aimers
BEng Hons CEng MICE CEnv
Director

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Introduction

The purpose of this report is to provide a detailed strategy for the management and implementation of foul and surface water on the proposed development at land on the western boundary of Holmrook, Egremont, Cumbria (thereafter referred to as Site). The report has been commissioned by the site owners for the purposes of assisting the planning application process.

Little information pertaining the site and its history is known and as the proposed development is residential, it would be anticipated that new drainage (both surface water and foul) would be installed and no existing drainage would be adopted for the development.

The report should be read in conjunction with the documents referenced to it, generally appended to this report, and all works has been designed in accordance with the following standards :

- CIRIA Publication C753 The SuDS Manual
- CIRIA Publication C768 Guidance on the Construction of SuDS

Calculations associated with the drainage have been performed by hand, spreadsheet and Flow Analysis package. Where appropriate copies of calculations are provided in the Appendices of this report.

Existing Site and Drainage

Geology

From records published by the British Geological Survey, it appears that the site is underlain by Glacial Tills overlying St Bees Sandstones. Generally glacial tills comprise of mixed strata, including clays, sands, silts and gravels and is dependent very much on the local topography and strata present.

Map records obtained from the British Geological Survey are present in the Appendices of this report.

Surface Water

The site currently comprises of a parcel of land approx 14111 m² which is presently used as arable land.

The site is considered as Greenfield and as such allows for the natural percolation of any surface water into the underlying natural strata below. There appears to be no formal drainage on site, nor any direct open watercourses present adjacent to the site.

Foul Water

We have obtained the United Utilities records for the site, and there is an adjacent foul sewer installed for the adjacent development located in the public road nearby.

Proposed Drainage Strategy

Surface Water

It is proposed that the development will discharge into soakaways present on site designed to accommodate the ground conditions, flows and storage requirements following detailed design.. The principles of SUDS shall apply, with the flows restricted to mimic greenfield runoff rates if required. It is therefore considered that the effects of the development of the site shall be required to be addressed with the incorporation of SuDS principles on the site for the surface water management.

Roof Drainage

Rooves are to be pitched roof construction will drain into proprietary rainwater goods present on each side of the buildings. This will carry water into the surface water system located around the building.

Hard Surfaces

Hard surfaces are generally to comprise of the access roads and parking areas of the proposed development. Access roads will will surfaced in either bituminous surfacing or paviments and will form an impervious barrier for the percolation of water. The edges will be kerbed and surface water will fall into the kerb line and into the formalised drainage systems around the property. The parking areas, and driveways of the properties shall form the principles of SUDS and shall be constructed of pervious paviments to allow the natural percolation of water into the underlying ground strata.

Site Entrance

The entrance to the site shall be formed with bituminous surfacing and shall allow an appropriate sized apron to the development to facilitate the vehicle movements and meet with the requirements of the Highways Authority. The entrance shall adopt formal drainage, principally road gullies to accommodate surface water runoff from the entrance apron. The formal drainage shall discharge to a soakaway present within the boundary of the development.

Gardens

Gardens are proposed to each property and this will allow for water storage and natural attenuation in particular around the perimeter of the development.

Foul Water

It is proposed that the site will discharge into the adjacent United Utilities network located within the public highway.

Detailed Assessment and Design

Surface Water

Principally the surface drainage shall be calculated on the impermeable areas of the site, including rooves, hard surfacing and parking areas.

In considering the design of the surface water runoff, the design shall consider a 30% increase for Climate Change.

The following conditions shall be assessed for peak flows :

- 1 in 30 year event 30 min duration
- 1 in 100 year event 6 hour duration

A detailed design shall be conducted as part of a full planning application or discharge of planning conditions associated with the finalised scheme for the site. At the present time, no further details are provided by the developer in relation to property numbers, house types and arrangements.

Foul Water

A new connection will be made to the adjacent United Utilities network servicing the village. A new connection application will be made for the properties and the works will be installed in accordance with United Utilities requirements.

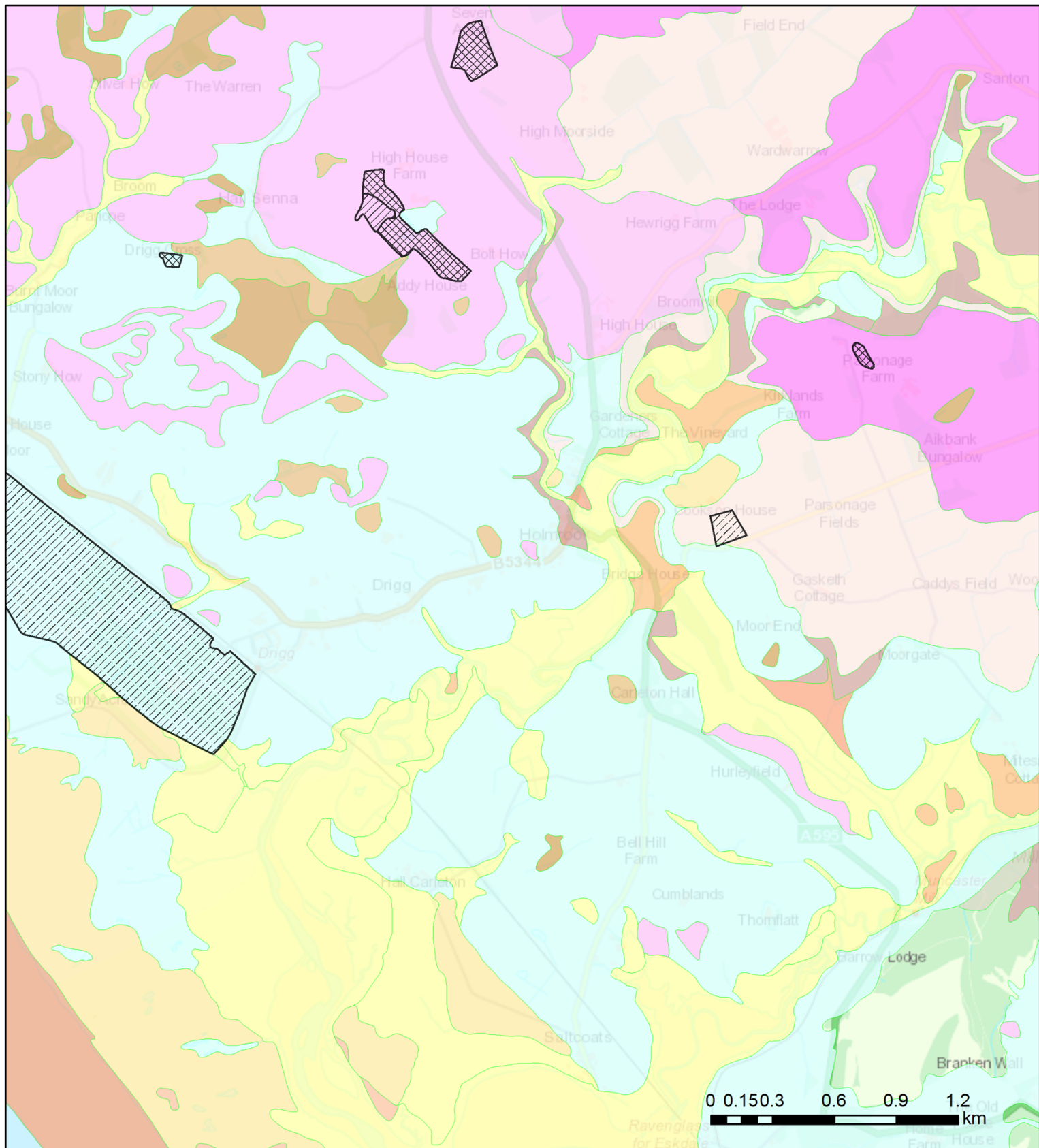
A map indicating the existing United Utilities Infrastructure is enclosed with this report.

SITE DRAWINGS

BGS MAPPING

Superficial Geology

**GEOINDEX
ONSHORE**



Contains OS data © Crown Copyright and database right 2017

GeoIndex Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Map Key

Superficial deposits 1:50,000 scale

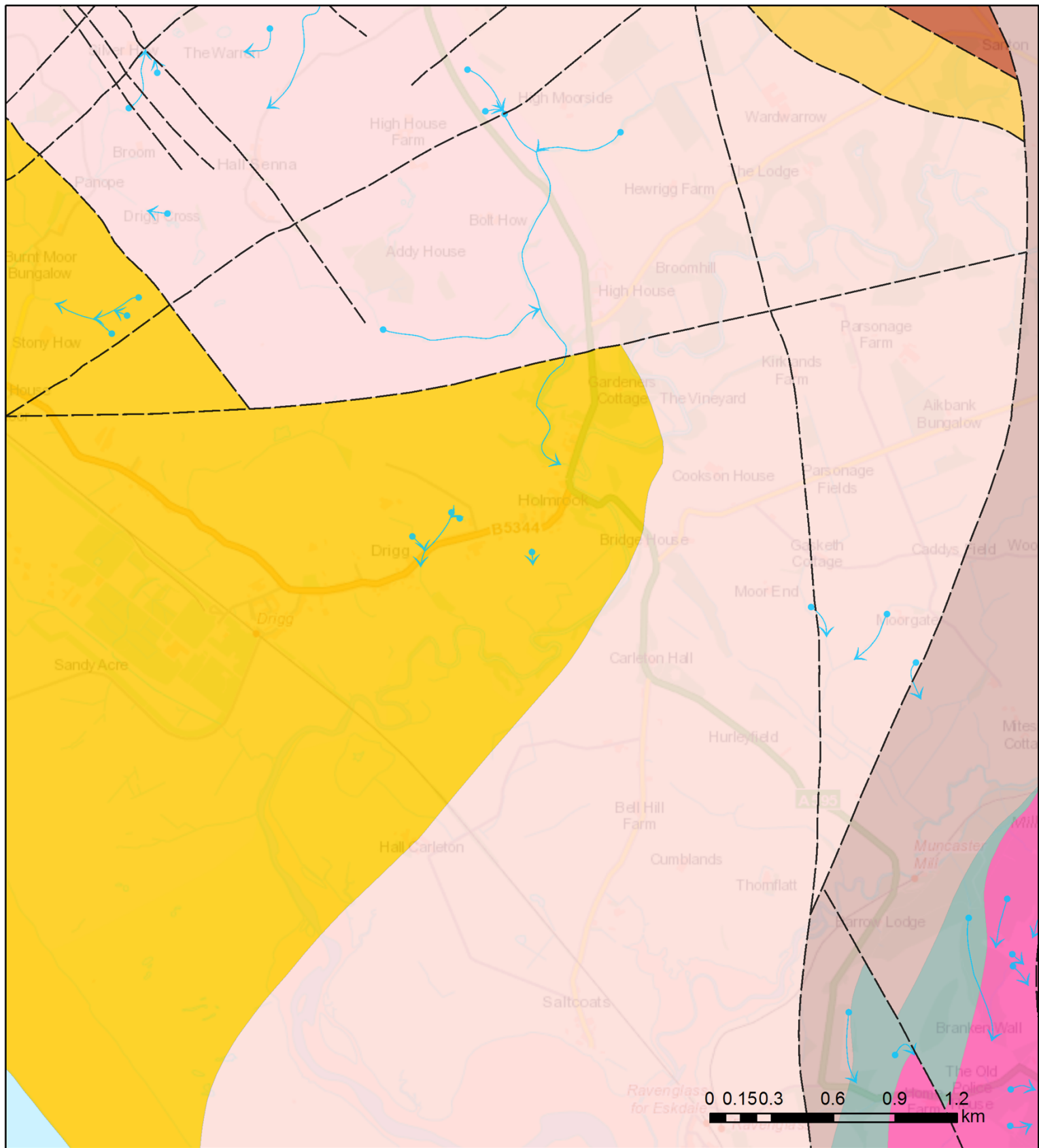
-  [GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL](#)
-  [GLACIOFLUVIAL DELTAIC \(AND/OR SUBAQUEOUS FAN\) DEPOSITS - SAND](#)
-  [TILL, DEVENSIAN - DIAMICTON](#)
-  [GLACIOLACUSTRINE DEPOSITS, DEVENSIAN - CLAY AND SILT](#)
-  [TALUS - ROCK FRAGMENTS, ANGULAR, UNDIFFERENTIATED SOURCE ROCK](#)
-  [ALLUVIUM - CLAY, SILT, SAND AND GRAVEL](#)
-  [BLOWN SAND - SAND](#)
-  [RAISED MARINE DEPOSITS - SAND, GRAVEL AND BOULDERS](#)
-  [HEAD - CLAY, SILT, SAND AND GRAVEL](#)
-  [RIVER TERRACE DEPOSITS \(UNDIFFERENTIATED\) - SAND AND GRAVEL](#)
-  [ALLUVIAL FAN DEPOSITS - GRAVEL](#)
-  [LACUSTRINE DEPOSITS - CLAY AND SILT](#)
-  [MARINE BEACH DEPOSITS - SAND AND GRAVEL](#)
-  [TIDAL FLAT DEPOSITS - CLAY AND SILT](#)
-  [PEAT - PEAT](#)

Artificial ground 1:50,000 scale

-  [DISTURBED GROUND \(UNDIVIDED\) - ARTIFICIALLY MODIFIED GROUND](#)
-  [WORKED GROUND \(UNDIVIDED\) - VOID](#)
-  [INFILLED GROUND - ARTIFICIAL DEPOSIT](#)

Selection Results

Solid Geology



Map Key

Bedrock geology 1:50,000 scale

-  [BIRKBY FELL ANDESITE MEMBER - BASALTIC-ANDESITE](#)
-  [WILMSLOW SANDSTONE FORMATION - SANDSTONE](#)
-  [ESKDALE INTRUSIONS - GRANITE](#)
-  [BIRKER FELL ANDESITE FORMATION - BASALTIC-ANDESITE](#)
-  [BIRKER FELL ANDESITE FORMATION - ANDESITE](#)
-  [DEVOKE WATER TUFF MEMBER - PYROCLASTIC-ROCK, BASALTIC](#)
-  [SKIDDAW GROUP - MUDSTONE](#)
-  [BIRKER FELL ANDESITE FORMATION - DACITE](#)
-  [ST BEES SANDSTONE MEMBER - SANDSTONE](#)
-  [FLEMING HALL TUFF FORMATION - TUFF, ANDESITIC](#)
-  [SELLAFIELD MEMBER - SANDSTONE](#)
-  [ESKDALE INTRUSIONS - MICROGRANITE](#)
-  [BIRKER FELL ANDESITE FORMATION - VOLCANICLASTIC-SANDSTONE](#)
-  [BROCKRAM - BRECCIA](#)

Linear features 1:50,000 scale

-  [Glacial_meltwater_channel_Centre_Undiff](#)
-  [Mineral_Vein_Inf](#)

Selection Results

UNITED UTILITIES MAPPING

Kingmoor Consulting Ltd

**6B Clifford Court
Clifford Way, Parkhouse
Carlisle, Cumbria
CA3 0JG**

FAO:

How to contact us:

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

**Your Ref: 18-088
Our Ref: UUPS-ORD-24291
Date: 13/04/2018**

Dear Sirs

Location: Holmrook

I acknowledge with thanks your request dated 13/04/2018 for information on the location of our services.

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

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

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

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

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,

Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTERWATER AND WATER DISTRIBUTION PLANS

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

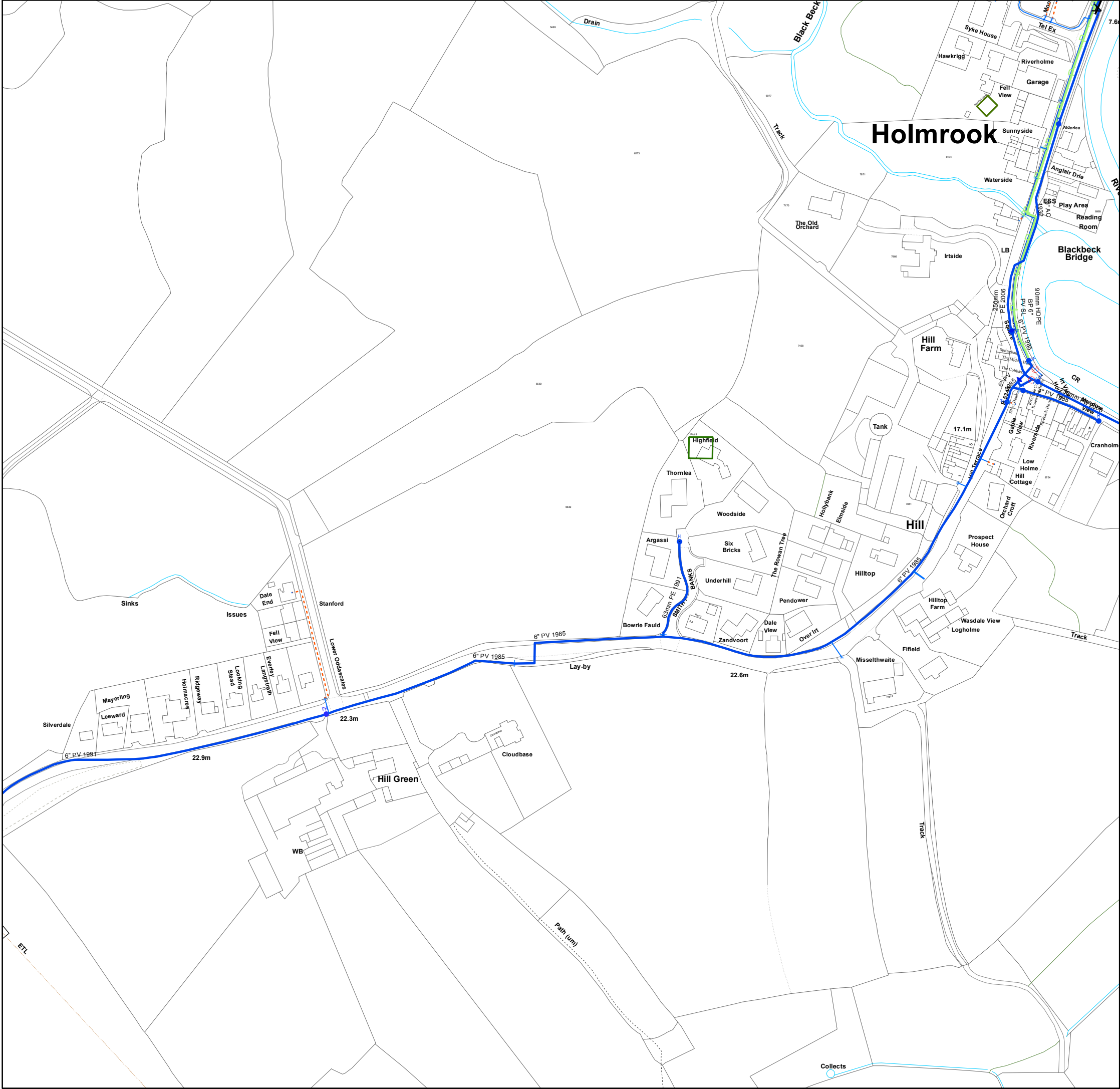
TERMS AND CONDITIONS:

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

Clean Water Symbolology

Proposed	Abandoned	Live	
			Distribution Main
			Trunk Main
			Comms Pipe
			Private Pipe
			Concessionary Service
			Raw Water
			LDTM Raw Water
			LDTM Treated Water
			Air Valve
			AC Valve, open
			AC Valve, closed
			CC Valve, open
			CC Valve, closed
			Non Return Valve
			Pressure Management Valve
			OMS Valve
			Stop Tap
			Flow Meter
			Domestic Meter
			Commercial Meter
			Pump
			Hydrant
			Fire Hydrant
			Anode
			Chlorination Point
			De-chlorination Point
			Strainer Point
			Access Point
			Hatch Box
			IP Point
			Sampling Station
			Logger Box
			Bore Hole
			Inlet Point
			Bulk Supply Point
			End Cap
			Site Termination
			Change of Characteristic
			Condition Report
			<u>Property Types</u>
			Water Tower
			Valve House
			Booster Pumping Station
			Intake Pumping Station
			Water Treatment Works
			Supply Reservoir
			Service Reservoir
			Impounding Reservoir
			Pipe Bridge

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**



Extract from Map of Water Mains

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available

The actual positions may be different from those shown on the plan, private service pipes may be shown where a known record is available.

United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown. Crown copyright and database rights [2016] Ordnance Survey 100022432.

United Utilities Water Limited 2014
The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office.Crown and United Utilities copyrights are reserved. Unauthorised reproduction will infringe these copyrights.

Holmrook

Printed By: Property Searches Date: 13/04/2018

DO NOT SCALE
Approximate Scale: 1:2500





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

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6402		FO	0	150			VC	25.36007	1 in 10
7402	21.75	CO	19.5	150			VC	42.94266	1 in 11
8401	16.06	CO	15.11	150			VC	39.51157	1 in 20
8601	9.33	CO	7.95	150			VC	42.2019	1 in 20
6404		FO	0	150			VC	12.6657	
6403		FO	0	150			VC	16.40431	
6405		FO	0	150			VC	21.87484	
6406		FO	0	150			VC	20.56976	
6407		FO	0	150			VC	12.71068	
6401	23.16	CO	21.8	150			VC	7.383966	1 in 115
7401	23.91	CO	21.38	150			VC	47.12068	1 in 38
								71.59771	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad

LEGEND

Abandoned

Foul

Surface Water

Combined

Public Sewer

Private Sewer

Section 104

Rising Main

Sludge Main

Overflow

Water Course

Highway Drain

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

Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Washout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate

Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Ww Pumping Station

Septic Tank

Control Kiosk

Change of Characteristic

MANHOLE FUNCTION

FO Foul

SW Surface Water

CO Combined

OV Overflow

SEWER SHAPE

CI Circular

EG Egg

OV Oval

FT Flat Top

RE Rectangular

SQ Square

TR Trapezoidal

AR Arch

BA Barrel

HO HorseShoe

UN Unspecified

SEWER MATERIAL

AC Asbestos Cement

BR Brick

PE Polyethylene

RP Reinforced Plastic Matrix

CO Concrete

CSB Concrete Segment Bolted

CSU Concrete Segment Unbolted

CC Concrete Box Culverted

PSC Plastic / Steel Composite

GRC Glass Reinforced Plastic

DI Ductile Iron

PVC Polyvinyl Chloride

CI Cast Iron

SI Spun Iron

ST Steel

VC Vitrified Clay

PP Polypropylene

PF Pitch Fibre

MAC Masonry, Coursed

MAR Masonry, Random

U Unspecified

Address or Site Reference:

Holmrook,

Scale: 1:1250 Date: 13/04/2018

Sheet: 1 of 1

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SEWER
RECORDS


United
Utilities
helping life flow smoothly