West Cumberland Hospital Phase 2 Development

Planning Ref: 4/21/2294 Discharge of Panning Conditions (Drainage)

Project Ref: WCHPH2-CUR-VV-XX-RP-C-92004

Revision: V03

Issue Date: 16 September 2022

Client Name: North Cumbria Integrated Care NHS Foundation Trust

Client Address: West Cumberland Hospital, Homewood Rd, Whitehaven, CA28 8JG

Site Address: West Cumberland Hospital, Homewood Rd, Whitehaven, CA28 8JG

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Rev	Description	Issued by	Checked	Date
V01	First Issue	DM	CJS	31/03/22
V02	Potential flows from future phase of works to Sneckyeat Road Car Park removed from the surface water drainage system. Further comments from United Utilities also addressed.	DM	PT	28/07/22
V03	Updated surface water disposal strategy to watercourse following additional dye test.	AMB	CJS	22/09/22

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Author	Signature	Date
Dan Moore MEng (Hons) Engineer		31/03/2022

Reviewed	Signature	Date
Chris Scott IEng ACIWEM Principal Engineer		31/03/2022

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1.0 Introduction

1.1 Project Background

Curtins were instructed by North Cumbria Integrated Care NHS Foundation Trust to develop a Detailed Drainage Strategy (DS) for the development located at West Cumberland Hospital, CA28 8JG. The site is centred on NGR 298950, 516040. The purpose of the DS is to provide construction information and to deal with outstanding matters in respect to the discharge of planning conditions.

A planning application has been made to Copeland Borough Council with the reference 4/21/2294/0F1. Cumbria County Council have made comments as the Highways Authority and the Lead Local Flood Authority. Following on from these comments, conditions that relate to the drainage, as well other aspects of the works, need to be discharged in order to gain planning approval.

Condition 5, 6, 14 are related to the drainage for the scheme and will be responded to in this report.

This report is based on the currently available information, discussions, and correspondence.

Proposals contained or forming part of this report represent the design intent and maybe subject to alteration or adjustment in refining the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

The report is to be undertaken in accordance with the planning conditions set out by the Copeland Borough Council and the standing advice and requirements of Cumbria County Council.

The report will:

- Present background information on the proposed development and the drainage planning condition requirements.
- Discuss the drainage strategy and how it will address the planning condition.
- Include drawings and calculations to support the drainage strategy.

2.0 Site Details

2.1 History and Current Use

The proposed development site is located within the West Cumberland Hospital in Whitehaven, CA28 8JG.

Access to the site is made via Homewood Road to the north of the site.

The grid reference of the centre of the site is 298950, 516040 (see Figure 2.1 below).

Figure 2-1: Site Location

The site is located within a residential area with properties surrounding the site to the north, south and west and fields to the east. Within the site, the topography slopes relatively steeply from the northeast to the southwest.

2.2 Consented Development

The consented development comprises the following elements:

- Waste Compound
- Access Road
- Acute Hospital Building (Phase 2)
- Car Parking Area

2.3 Planning Conditions

This report addresses the following planning conditions:

Condition 5

No development shall commence until a surface water drainage scheme has been submitted to and approved in writing by the Local Planning Authority.

The drainage scheme must include:

1. *An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water;*
2. *A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations); and*
3. *A timetable for its implementation.*

The scheme shall also be in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards.

The points raised above are answered as follows and evidenced in the sections below where required.

1. *An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water;*

Infiltration testing has been carried out, the results of this are documented in Section 3.1 below and Appendix A.

2. *A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations); and*

The discharge rate for the site all storm events up to and including the Q100+40% climate change event is restricted to the greenfield Q100 rate, 18.66l/s/ha. This is in line with the guidance given in the *Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015)* document that is referenced in the condition. Attenuation has been provided to store the additional flows within the below ground network. Calculations have been provided in Appendix B that show the greenfield run off

calculations as well as proof that the proposed system works and is designed with this rate. The proposed drainage layouts and impermeable areas plans can be found in Appendix C.

Condition 6

No development shall commence until a survey of the piped drainage systems to be retained on site and connecting to the public sewer and a scheme of mitigation measures where it is deemed the improvements are required to bring existing pipe work up to current design standards has been be submitted to and approved in writing by the local planning authority.

A CCTV survey has been undertaken to confirm the route of the drainage that currently serves the site and that the proposed works are connecting to. A layout showing this route and locations of defects as well as suggested remediation methods can be found in **Appendix D** and a brief explanation can be found in Section 3.3.

Condition 14

The development hereby approved shall not be brought into operational use until a management and maintenance plan for the surface water drainage scheme for the lifetime of the development has been submitted to and approved in writing by the local planning authority.

As a minimum the plan shall include arrangements for inspection and ongoing maintenance of all elements of the surface water drainage scheme to secure its effective operation for the lifetime of the development.

A maintenance strategy has been produced for the site that includes a schedule and methods of maintenance, the document is WCHPH2-CUR-VV-XX-RP-C-92002-DRAINAGE MAINTENANCE STRATEGY and will be included in the handover pack to ensure maintenance requirements are known by the end user and is included as a stand-alone document accompanying the application to discharge conditions.

3.0 SuDS Assessment

3.1 Discharge by Infiltration

Site investigation by means of in-situ testing was undertaken in November 2021 by Curtins.

Soakaway tests were conducted in three of the six machine excavated trial pits (SA01, SA02 and TW TP01 (SA03)). All tests were conducted in natural strata of fine to medium grained SANDSTONE. SA01 infiltration test was repeated three times. One test was completed in SA02 and SA03 due to negligible infiltration rates and as such no rate could be calculated over 1.5 hr duration of the tests.

The locations of the tests are shown in **Appendix A**.

Table 3-1: Infiltration Testing Results

Location	Design Soil Infiltration Rate *f* (m/s)
SA01 – Test 1	2.12E-04
SA01 – Test 2	1.03E-04
SA01 – Test 3	7.05E-05
SA02 – Test 1	N/A
SA03 – Test 1	N/A

The variation in infiltration rates is likely due to variability in weathering and fracture spacings in the bedrock. Infill between fractures also appeared more clayey in SA02 and SA03 which may limit infiltration.

The site is overlain by clay and made ground with poor infiltration characteristics. Underlying sandstone at 1-3.5m BGL also has generally poor infiltration. One test provided positive infiltration results, but this is not in an area to which the site can drain to under gravity and is considered to be an anomaly due to a fissure in the bedrock, rather than indicative of good infiltration potential.

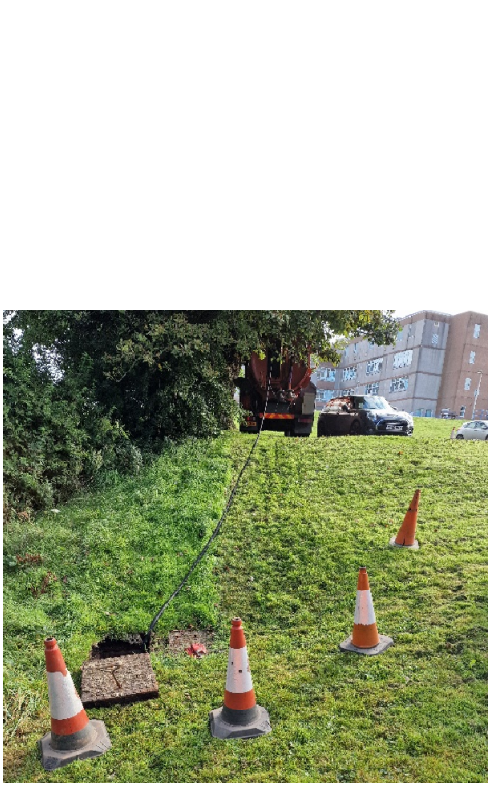
Curtins cannot reasonably quantify the size and locations of further fissures across the site and, as discussed previously with the LLFA, consider infiltration into unknown fissures on a site elevated about dense residential development to be a high-risk strategy due to the likelihood of water re-emerging downstream without control. We therefore conclude that infiltration is not the right drainage solution for this site and do not propose to carry out further testing to confirm this as the risks and limitations remain.

3.2 Discharge to Watercourse

Pow Beck lies approximately 800m to the west of the site boundary. The surface water drainage currently serving the site discharges to the Beck via private surface water drainage and a piped watercourse shown dashed blue line on UU record plans.

The line of the private drainage leading to the UU sewer is a relatively straight series of pipes and manholes, the piped watercourse then continues east to Pow Beck. Connectivity was proved by dye test on 14/09/2022 (see below photos)

A drawing has been produced showing the line of this drainage and the locations of defects found from the survey, along with potential remediation works, this can be found in **Appendix D** along with the UU sewer records.



Left to right: SW MH4C (the last manhole within the hospital ground) deposition point of 5000 litres of dyed water, dye entering the Pow Beck.

3.3 Discharge to Surface Water Sewer

United Utilities (UU) sewer records indicate that a 225mm diameter surface water sewer is present in Homewood Road to the northwest of the site, flowing west and increasing to 300mm diameter as it crosses Homewood Drive and then increases in diameter again to 375mm to then apparently discharge in to a 2000mm diameter culverted watercourse, flowing west.

UU records also show a connection from the hospital site into the 225mm diameter sewer in Homewood Road at UUMH 7001, as a 300mm diameter culverted watercourse from UUMH 8002.

Both visual inspection and GPR survey has found no evidence that the pipeline section between UUMH8002 and UUMH7001 exists.

Further investigations were undertaken of the existing drainage as it leaves the site at the western boundary. The drainage route has been traced by CCTV survey to the connection point with the piped culverted watercourse at SW MH4G, located in Homewood Drive as described in section 3.2 above.

Utility mapping of the existing hospital indicates that the existing surface water drainage leaves the site at 3 locations along the southern and western boundaries of the site.

3.4 Discharge to Combined Sewer

A surface water connection to the combined sewer is not proposed.

Table 3-2 below summarises the options for surface water disposal following site assessment.

Table 3-2: Summary of Surface Water Disposal

Surface Water Disposal Method	Potential	Description
Infiltration	✗	Infiltration testing resulted in little or no drainage from any of the test holes. Therefore, infiltration is confirmed as unsuitable.
Watercourse	✓	Pow Beck is approximately 800m to the west of the site. UU records show the watercourse is piped from near Ennerdale House on The Groves. CCTV survey and a dye test on 14/09/22 demonstrate this watercourse connects to Pow Beck. This is the proposed site surface water disposal method.
Surface Water Sewer	✗	Public surface water sewer to the west of the site that serves the existing site.
Combined Water Sewer	✗	Surface water sewer will be used.

The SuDS review concludes that the only viable means of dealing with drainage flows from site is to the existing surface water drainage that serves the site and connects to the Pow Beck via the piped watercourse.

4.0 Surface Water Drainage

4.1 Drainage Strategy

The surface water drainage is split across the site, firstly due to the steeply sloping nature of the development area but also because of the phasing of the works. The areas are split into:

- The Waste Compound and access road
- Phase 2
- Phase 2 Car Park and

Each area has a flow control device rated to the greenfield Q100 flow rate and the required attenuation to serve the surface water runoff generated for storms up to the 1 in 100 year + 40% climate change event. The total discharge rate for all of the proposed works is 24.8l/s this can be broken down as follows for the different areas of the site, listed from furthest upstream:

- 4.5l/s from the Waste Compound & Access Road
- 8l/s from the Phase 2 Car Park, and 1
- 12.3l/s from the Phase 2 Hospital Building.

There are 2 flow control devices at the outfall to ensure that the overall discharge rate is not exceeded one serving the Car Park, the Waste Compound & Access Road and the Phase 2 Hospital Building with the other serving the Phase 2 Car Park.

The piped network has been designed with capacity to accept potential future flows from a car park development of Sneckyeat Road, to the North of the site. However, no allowance has been made in the calculation of discharge rates for this development and specification of flow control devices. A separate planning application would be required prior to connection of this system, followed by alteration of flow control devices to pass forward the agreed flow rate.

The proposed surface water drainage connects to the private 300mm surface water sewer within the site boundary. This then flows west to the UU sewer in Homewood Drive.

The Surface Water Drainage Strategy Drawings and calculations are provided in **Appendix B, C and D** as: –

- Greenfield Run off Rate Estimation
- WCHPH2-CUR-VV-XX-CA-C-92000_Site Wide Surface Water Drainage
- WCHPH2-CUR-VV-XX-DR-C-04008_Existing Drainage Rehabilitation Sketch
- WCHPH2-CUR-VV-XX-DR-C-92001_Drainage Layout
- WCHPH2-CUR-VV-XX-DR-C-92002_Waste Compound & Access Road Drainage Layout
- WCHPH2-CUR-VV-XX-DR-C-92008_Impermeable Areas
- WCHPH2-CUR-VV-XX-DR-C-92009_Exceedance Flow Routes

- WCHPH2-CUR-VV-XX-DR-C-92010_Drainage Details

Specific elements of the surface water drainage design are described in the following sections.

4.2 Designing for Local Drainage System Failure

In accordance with general principles discussed in CIRIA Report C635, Designing for Exceedance in Urban Drainage the proposed surface water drainage, where practical, should be designed to ensure no increased risk of flooding to buildings on the site or elsewhere as a result of extreme rainfall, lack of maintenance, blockages or other causes.

Blockage

It is thought that the highest risk would be due to blockage of the flow control device prior to flow entering the new off-site pipeline.

Any overland flow from the site resulting from blockage or exceedance of the drainage system capacity would spill from the cover of the Hydro Brake chamber or the lowest point of the system.

The drainage model has been tested to failure to determine the locations of first flooding on the site should there be a blockage. The locations that would flood include gullies on the northern access route, the flow control chamber that serves phase 2, the waste compound and the lowest point of the overall system which is the rodding eye to the southwest of the proposed car park.

The hospital building would not be at risk due to the proposed topography around the areas where flooding may occur.

Exceedance

The site drainage has been designed to attenuate the 100-yr rainfall event, including a 40% allowance for climate change. The drainage system will also provide capacity for lower probability (longer duration design storm events) which are not critical duration.

Exceedance flows will be retained on site within the drainage system as far as practical however for rainfall events of a greater return period it may be necessary to pass forward more flow or to spill flow from the system.

Model simulations have been undertaken to assess at what return period flooding might occur, exceedance flow routes and flood volume.

The locations that would flood include gullies on the northern access route, the flow control chamber that serves phase 2, the waste compound and the lowest point of the overall system which is the rodding eye to the southwest of the proposed car park.

Runoff resulting from the flow control would flow to the southwest and into the drainage system serving the car park. If this area should then flood it will first occur from the rodding eye with exceedance water flowing west down the bank and onto the access road. From here the water will flow southwest and off

site. Flooding from the gullies on the northern access road will flow along the eastern section of the access road, until it also leaves site to the south. While the flood water is flowing along the access road, if the system that serves these areas is not at capacity, flood water will enter these systems, via the existing gullies, rather than flowing off site.

Overland Flow Routes

- Overland flow routes as described above are indicated on drawing WCHPH2-CUR-VV-XX-DR-C-92010_Exceedance Flow Routes in **Appendix C**.

Drainage Contingency

The proposed surface water drainage system has been designed to provide adequate storage volume against flooding for the 1 in 100 year critical storm event, including a 40% allowance to account for potential climate change.

Building Layout and Detail

Much of the building will have level access and therefore, external levels have been set to fall away from the building ensuring any flood water runs away from the building.

4.3 Water Quality Treatment

Surface Water run-off from hard paved areas at risk from contamination should receive water quality treatment. Non-residential car parks and in-site access roads, typical for hospitals, are considered Medium hazard in terms of contamination. Figure 4-1 illustrates the pollution hazard indices for different land use classifications from The CIRIA SuDS Manual C753 (2015).

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 4.1: Pollution Hazard indices for land use classification (Table 26.2 the CIRIA SuDS manual 2015)

Treatment could be provided using sustainable methods such as: filter strips, filter drains, swales, bio-retention systems, and/or permeable paving. Figure 4-3 illustrates the SuDS Component mitigation indices from The CIRIA SuDS Manual C753 (2015).

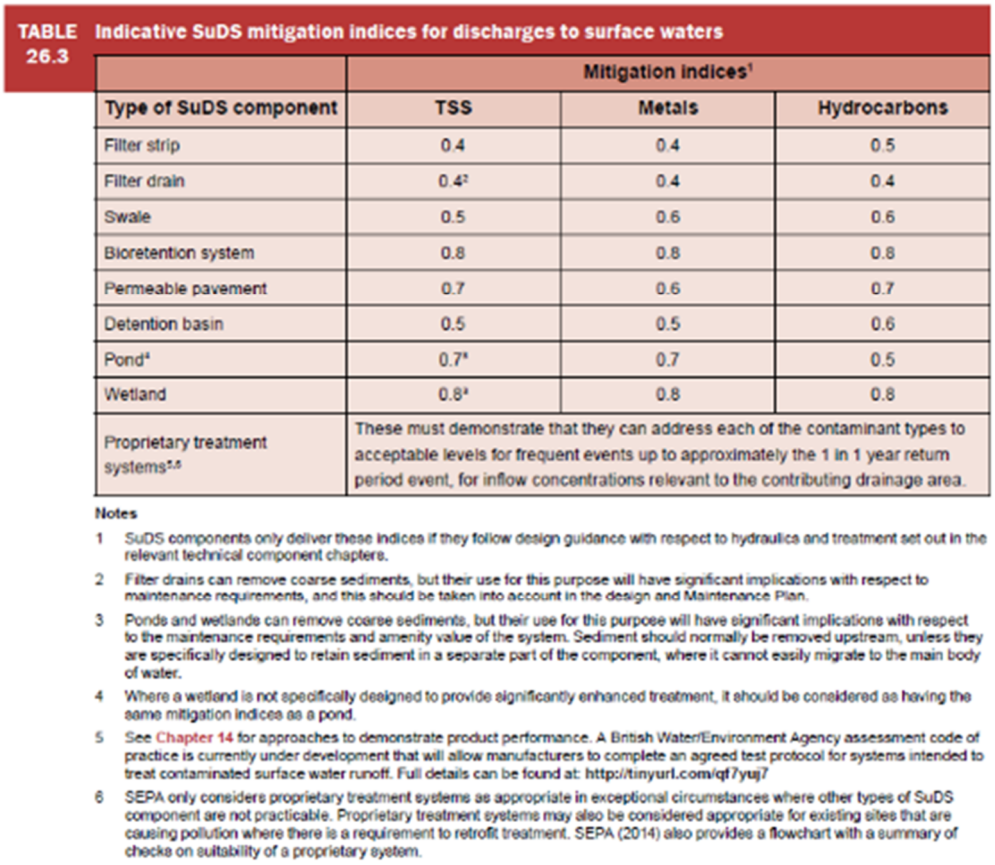


TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[4]	0.7	0.5
Wetland	0.8[4]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Notes

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: http://tinyurl.com/qf7yuj7

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

Figure 4.2: Indicative SuDS mitigation indices (Table 26.3 the CIRIA SuDS manual 2015)

The selection of treatment should ensure that the SuDS mitigation component index (Figure 4-1) exceeds the pollution hazard index (Figure 4-2). Where two stages of treatment are required, the second stage of treatment should account for reduced performance due to lower inflows; therefore 0.5 (mitigation index) should be used.

The type(s) of mitigation should be considered as the site design is finalised i.e. paving surfaces etc. The proposals for pollution protection should be agreed with Cumbria County Council, Lead Local Flood Authority. It is proposed that a permeable surface will be used in all parking bays as part of the phase 2 site, table 4-1 shows how the mitigation indices compare to the pollution indices.

Table 4-1: Summary of Pollution vs Mitigation Indices for a Permeable Non-Residential Car Park

Non-Residential Car Park vs Permeable Paving	TSS	Metals	Hydrocarbons
Pollution Indices	0.7	0.6	0.7
Mitigation Indices	0.7	0.6	0.7

The combination of the permeable paving, the filter drains below the car park and catchpit manholes will provide adequate mitigation for the pollution potential of the car park.

For the waste compound and access road an interceptor is being proposed due to the space constraints and heavy loading on the site.

5.0 Foul Water Disposal

A separate foul water drainage system has been designed for the site. The foul water drainage will serve a section of the Waste Compound as well as the proposed hospital building. The drainage will fall via gravity to the south where it connects into the existing 150mm foul drainage that serves the site. This existing drainage follows the same route as the surface water and eventually discharges into the UU sewer in Homewood Drive to the west.

The proposed foul water drainage layout is provided on drawing WCHPH2-CUR-VV-XX-DR-C-92001_Drainage Layout in **Appendix C**.

6.0 Drainage Construction

6.1 Timetable for Implementation

The drainage system will be constructed at an early stage of the development, prior to the roads, car parking and structures being finished. This will allow the system to be functioning at the time the site is completed.

7.0 Conclusions

7.1 Conclusions

This report has demonstrated Infiltration has been considered, following the SuDS hierarchy and presented evidence that clearly show that infiltration drainage is not viable for this site.

In doing so, it is concluded that part 1 of Planning Condition 5 has been satisfied.

A surface drainage design has been developed with restricted discharge rates in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015). Surface water drainage calculations, a drainage layout plan and component construction details have been provided to evidence.

In doing so, it is concluded that part 2 of Planning Condition 5 has been satisfied.

A statement confirming the intended timetable for the construction of the drainage in relation to the other construction elements and subsequent development completion has been stated.

In doing so, it is concluded that part 3 of Planning Condition 5 has been satisfied.

A CCTV survey has been completed to prove the connection and condition of the existing drainage to the UU sewers in Homewood Drive.

In doing so, it is concluded that Planning Condition 6 has been satisfied.

A maintenance report that includes procedures and a schedule has been provided for the proposed drainage system that will be provided in the handover pack for the end user to refer to.

In doing so, it is concluded that Condition 14 has been satisfied.

Comments received from United Utilities with respect to Sneckyeat Road car park have been addressed, the proposed system is designed with hydraulic capacity to accept an increased flow rate in the event that this is separately approved via the planning process but no flows from Sneckyeat Road (outside of the current red line boundary) are included in the re-submitted design.

The existing site is considered brownfield so the proposed discharge rate has been restricted to the greenfield Q100 rate, which is as per the requirements given in the *Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015)* document that is referenced in condition 5. This is also industry standard and has been approved without comment by the LLFA as part of this application.

8.0 Appendices

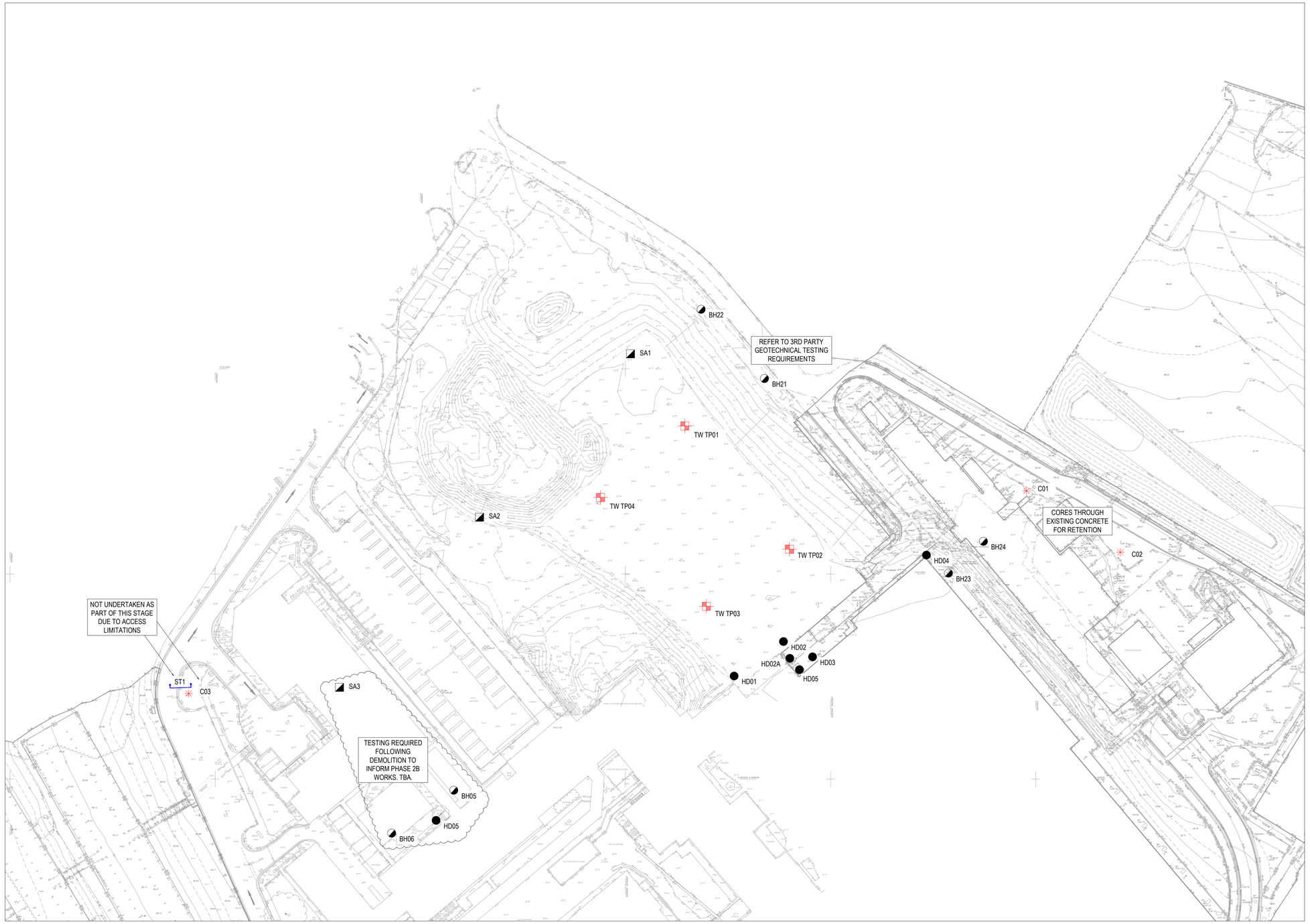
Appendix A **Site Infiltration Locations and Calculations**

Appendix B **Drainage Design Calculations**

Appendix C **Proposed Drainage Layouts**

Appendix D **Existing Drainage Layout**

Appendix A Site Infiltration Locations and Calculations



1:500 0 10m 20m 30m 40m 50m

1:1 0 10 20 30 40 50 60 70 80 90 100

SCALEBAR
(INDICATIVE ONLY)

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.

LEGEND

- SLIT TRENCH FROM BACK OF KERB
- BRE 365 SOAKAWAY TEST
- CORE EXISTING SLAB TO DETERMINE DEPTH. DCP/CBR TEST ON SUBGRADE MATERIAL WITHIN ROAD AND ADJACENT AREA
- HAND DIG TO EXISTING FOUNDATIONS
- BOREHOLE LOCATION
- TRIAL PIT LOCATION AS PER GCL TEMPORARY WORKS REQUIREMENTS

Rev:	Description:	Date:	By:	Chkd:
P01	FIRST ISSUE	16/07/21	DM	PT

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Status: ISSUED FOR INFORMATION **S2**

Client: GRAHAM

Project: PROCURE 22 — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title:

SITE INVESTIGATION TEST REQUIREMENTS & LOCATIONS

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A1	JUL 21	DM	PT	PT
	Scale: 1:500				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
WCHPH2-CUR	VV	XX	DR	C		04004	P01

07309-CUR-VV-XX-DR-C-04004.dwg

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curtins

CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA01
Test Date:	03/08/2021
Test No.:	1 of 3

2.50	m	Length of trial pit
0.90	m	Width of trial pit
0.95	m	Depth (total) of trial pit
2.25	m^2	Area of trial pit base
0.53	m bgl	Water level at start of test (approximate invert level)
0.95	m bgl	Water level at end of test
0.420	m	Effective storage depth
0.635	m bgl	Effective storage depth (75% full)
0.845	m bgl	Effective storage depth (25% full)
0.473	**m^3**	**Effective storage volume (V_{75-25})**
3.678	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
605	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

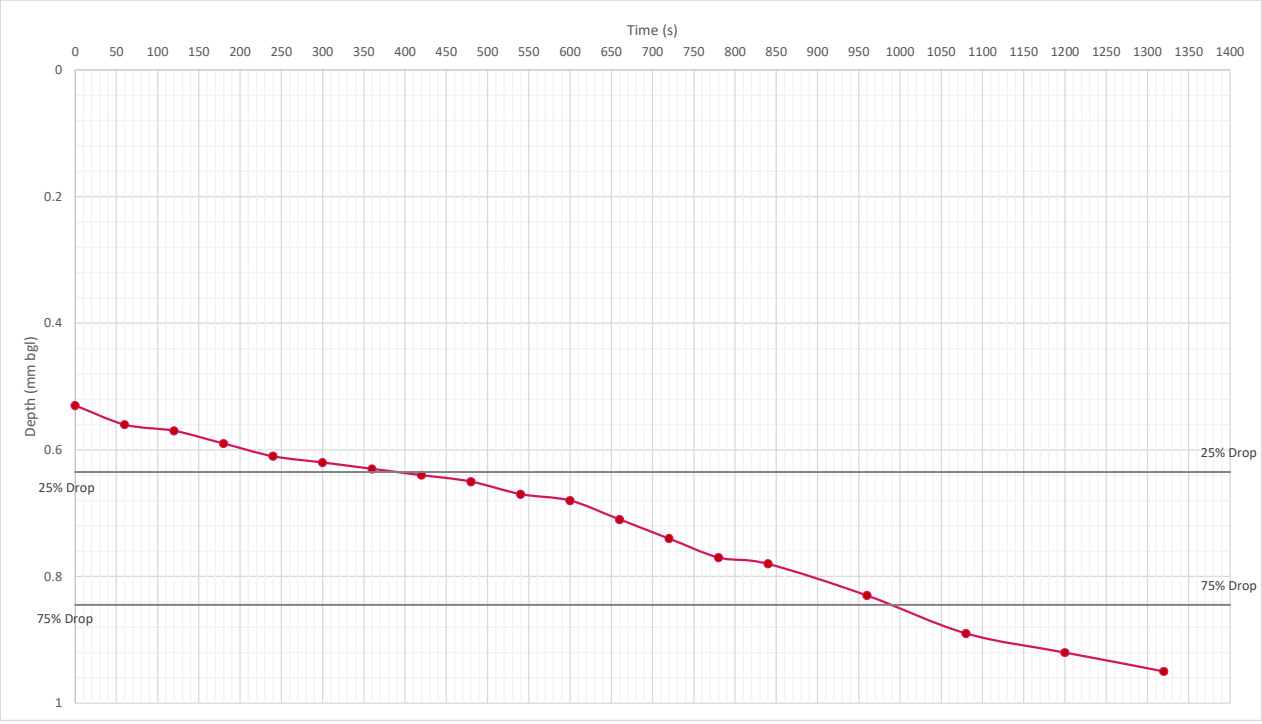
2.12E-04	**m/s**	**Soil infiltration rate (f)**

RAW DATA

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA01
Test Date:	03/08/2021
Test No.:	1 of 3

Time (min)	Time (s)	Depth (mm bgl)	Stratum
0	0	0.53	Grey and brown slightly weathered SANDSTONE with clay infill between fractures.
1	60	0.56	
2	120	0.57	
3	180	0.59	
4	240	0.61	
5	300	0.62	
6	360	0.63	
7	420	0.64	
8	480	0.65	
9	540	0.67	
10	600	0.68	
11	660	0.71	
12	720	0.74	
13	780	0.77	
14	840	0.78	
16	960	0.83	
18	1080	0.89	
20	1200	0.92	
22	1320	0.95	



Note 1: Pit backfilled with arisings.

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CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA01
Test Date:	03/08/2021
Test No.:	2 of 3

2.50	m	Length of trial pit
0.90	m	Width of trial pit
0.95	m	Depth (total) of trial pit
2.25	m^2	Area of trial pit base
0.53	m bgl	Water level at start of test (approximate invert level)
0.90	m bgl	Water level at end of test
0.420	m	Effective storage depth
0.635	m bgl	Effective storage depth (75% full)
0.845	m bgl	Effective storage depth (25% full)
0.473	**m^3**	**Effective storage volume (V_{75-25})**
3.678	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
1250	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

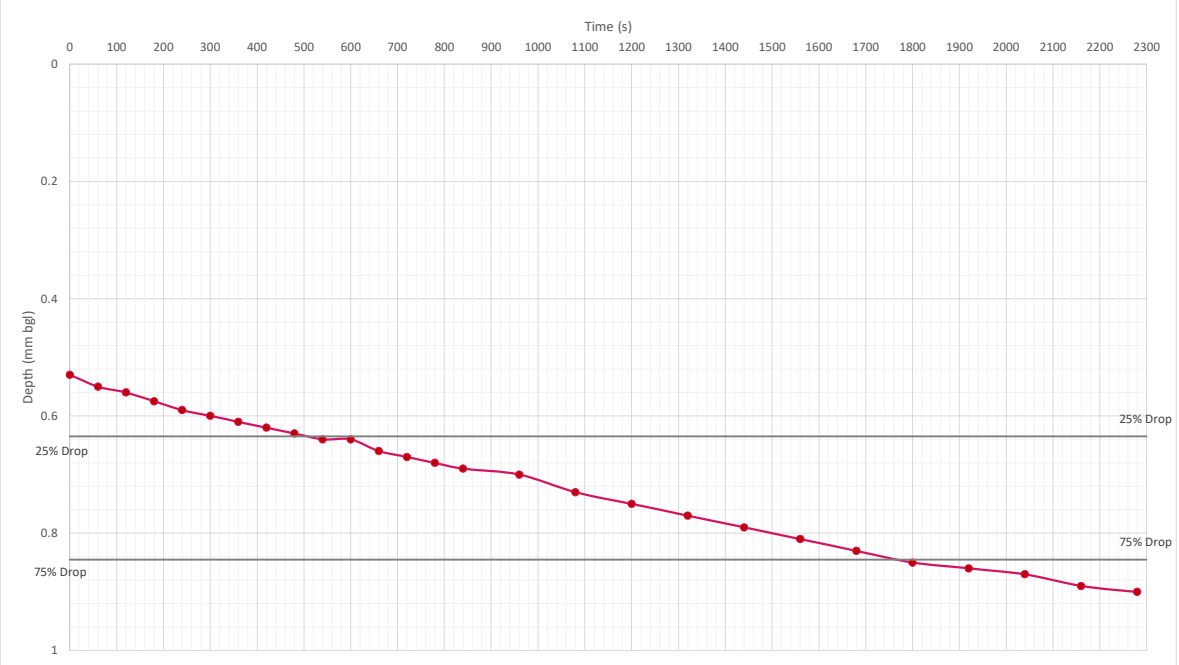
1.03E-04	**m/s**	**Soil infiltration rate (f)**

RAW DATA

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA01
Test Date:	03/08/2021
Test No.:	2 of 3

Time (min)	Time (s)	Depth (mm bgl)	Stratum
0	0	0.53	Grey medium to coarse graind crystalline SANDSTONE
1	60	0.55	
2	120	0.56	
3	180	0.575	
4	240	0.59	
5	300	0.6	
6	360	0.61	
7	420	0.62	
8	480	0.63	
9	540	0.64	
10	600	0.64	
11	660	0.66	
12	720	0.67	
13	780	0.68	
14	840	0.69	
16	960	0.7	
18	1080	0.73	
20	1200	0.75	
22	1320	0.77	
24	1440	0.79	
26	1560	0.81	
28	1680	0.83	
30	1800	0.85	
32	1920	0.86	
34	2040	0.87	
36	2160	0.89	
38	2280	0.9	



Note 1: Pit backfilled with arisings.

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CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA01
Test Date:	03/08/2021
Test No.:	3 of 3

2.50	m	Length of trial pit
0.90	m	Width of trial pit
0.95	m	Depth (total) of trial pit
2.25	m^2	Area of trial pit base
0.50	m bgl	Water level at start of test (approximate invert level)
0.90	m bgl	Water level at end of test
0.450	m	Effective storage depth
0.613	m bgl	Effective storage depth (75% full)
0.838	m bgl	Effective storage depth (25% full)
0.506	**m^3**	**Effective storage volume (V_{75-25})**
3.780	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
1900	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

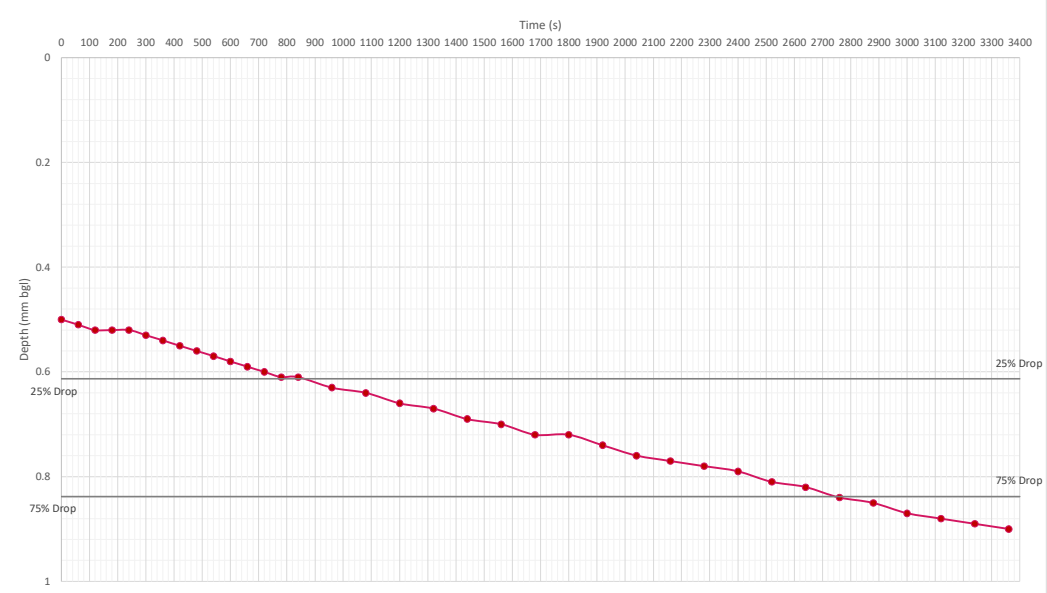
7.05E-05	**m/s**	**Soil infiltration rate (f)**

RAW DATA

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA01
Test Date:	03/08/2021
Test No.:	3 of 3

C	Time (min)	ui	Time (s)	Depth (mm bgl)	Stratum
	0		0	0.5	Grey medium to coarse graind crystalline SANDSTONE
	1		60	0.51	
	2		120	0.52	
	3		180	0.52	
	4		240	0.52	
	5		300	0.53	
	6		360	0.54	
	7		420	0.55	
	8		480	0.56	
	9		540	0.57	
	10		600	0.58	
	11		660	0.59	
	12		720	0.6	
	13		780	0.61	
	14		840	0.61	
	16		960	0.63	
	18		1080	0.64	
	20		1200	0.66	
	22		1320	0.67	
	24		1440	0.69	
	26		1560	0.7	
	28		1680	0.72	
	30		1800	0.72	
	32		1920	0.74	
	34		2040	0.76	
	36		2160	0.77	
	38		2280	0.78	
	40		2400	0.79	
	42		2520	0.81	
	44		2640	0.82	
	46		2760	0.84	
	48		2880	0.85	
	50		3000	0.87	
	52		3120	0.88	
	54		3240	0.89	
	56		3360	0.9	



Note 1: Pit backfilled with arisings.

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CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA02
Test Date:	03/08/2021
Test No.:	1 of 1

2.20	m	Length of trial pit
0.90	m	Width of trial pit
1.65	m	Depth (total) of trial pit
1.98	m^2	Area of trial pit base
1.16	m bgl	Water level at start of test (approximate invert level)
1.16	m bgl	Water level at end of test
0.490	m	Effective storage depth
1.283	m bgl	Effective storage depth (75% full)
1.528	m bgl	Effective storage depth (25% full)
0.485	**m^3**	**Effective storage volume (V_{75-25})**
3.499	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
N/A	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

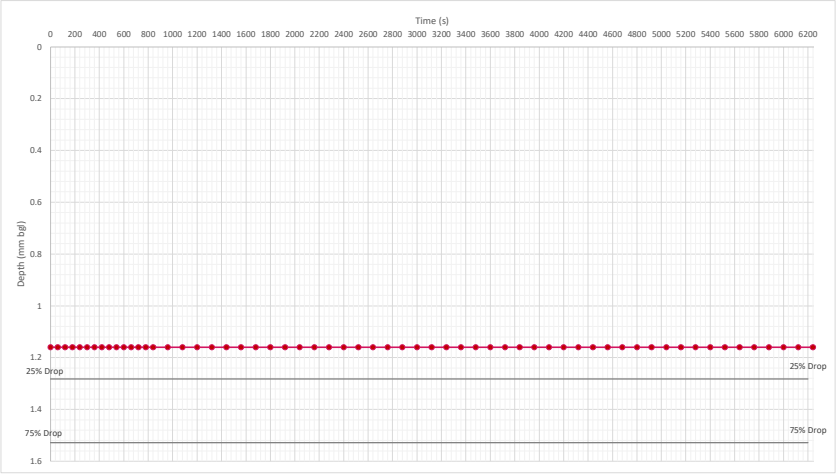
N/A	**m/s**	**Soil infiltration rate (f)**

RAW DATA

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA02
Test Date:	03/08/2021
Test No.:	1 of 1

C	Time (min)		Time (s)	Depth (mm bgl)	Stratum
	0		0	1.16	Light brown and grey weathered SANDSTONE, recovered as a sandy slightly clayey gravel of angular to subrounded sandstone.
	1		60	1.16	
	2		120	1.16	
	3		180	1.16	
	4		240	1.16	
	5		300	1.16	
	6		360	1.16	
	7		420	1.16	
	8		480	1.16	
	9		540	1.16	
	10		600	1.16	
	11		660	1.16	
	12		720	1.16	
	13		780	1.16	
	14		840	1.16	
	16		960	1.16	
	18		1080	1.16	
	20		1200	1.16	
	22		1320	1.16	
	24		1440	1.16	
	26		1560	1.16	
	28		1680	1.16	
	30		1800	1.16	
	32		1920	1.16	
	34		2040	1.16	
	36		2160	1.16	
	38		2280	1.16	
	40		2400	1.16	
	42		2520	1.16	
	44		2640	1.16	
	46		2760	1.16	
	48		2880	1.16	
	50		3000	1.16	
	52		3120	1.16	
	54		3240	1.16	
	56		3360	1.16	
	58		3480	1.16	
	60		3600	1.16	
	62		3720	1.16	
	64		3840	1.16	
	66		3960	1.16	
	68		4080	1.16	
	70		4200	1.16	
	72		4320	1.16	
	74		4440	1.16	
	76		4560	1.16	
	78		4680	1.16	
	80		4800	1.16	
	82		4920	1.16	
	84		5040	1.16	
	86		5160	1.16	
	88		5280	1.16	
	90		5400	1.16	
	92		5520	1.16	
	94		5640	1.16	
	96		5760	1.16	
	98		5880	1.16	
	100		6000	1.16	
	102		6120	1.16	
	104		6240	1.16	



Note 1: Negligble infiltration, infiltration rate could not be calculated. Pit backfilled with arisings.

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CALCULATION SHEET - SOIL INFILTRATION RATE

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA03
Test Date:	03/08/2021
Test No.:	1 of 1

2.80	m	Length of trial pit
1.00	m	Width of trial pit
1.40	m	Depth (total) of trial pit
2.80	m^2	Area of trial pit base
1.07	m bgl	Water level at start of test (approximate invert level)
1.11	m bgl	Water level at end of test
0.330	m	Effective storage depth
1.153	m bgl	Effective storage depth (75% full)
1.318	m bgl	Effective storage depth (25% full)
0.462	**m^3**	**Effective storage volume (V_{75-25})**
4.054	**m^2**	**Internal surface area (50% effective depth) (a_{50})**
N/A	**s**	**Time for head to fall from 75% to 25% effective depth (t_{75-25})**

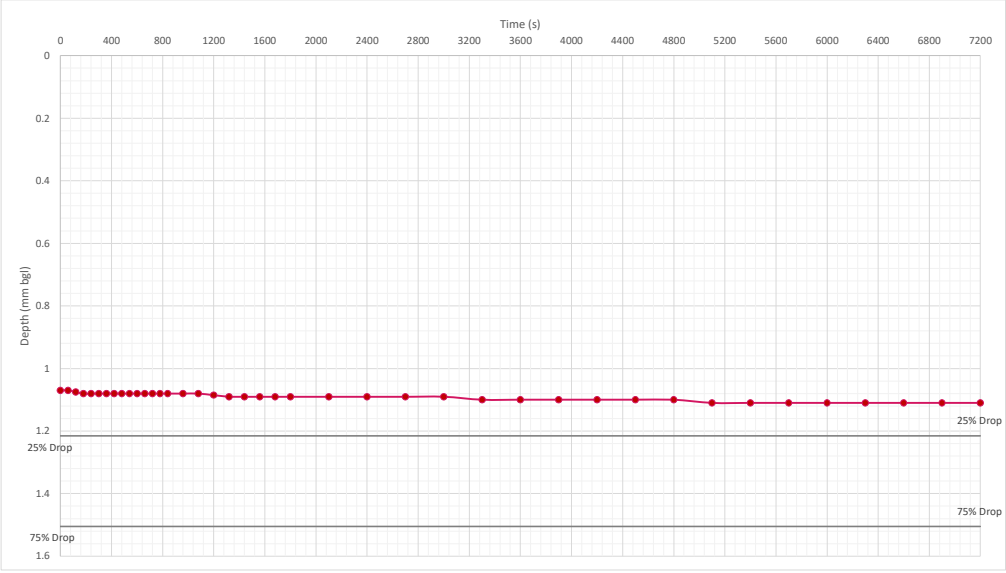
N/A	**m/s**	**Soil infiltration rate (f)**

RAW DATA

Project:	West Cumberland Hospital
Job Number:	73039
Author:	ZH

Hole Ref.:	SA03
Test Date:	03/08/2021
Test No.:	1 of 1

Time (min)	Time (s)	Depth (mm bgl)	Stratum
0	0	1.07	Light brown and grey weathered SANDSTONE, recovered as a sandy slightly clayey gravel of angular to subrounded sandstone.
1	60	1.07	
2	120	1.075	
3	180	1.08	
4	240	1.08	
5	300	1.08	
6	360	1.08	
7	420	1.08	
8	480	1.08	
9	540	1.08	
10	600	1.08	
11	660	1.08	
12	720	1.08	
13	780	1.08	
14	840	1.08	
16	960	1.08	
18	1080	1.08	
20	1200	1.085	
22	1320	1.09	
24	1440	1.09	
26	1560	1.09	
28	1680	1.09	
30	1800	1.09	
35	2100	1.09	
40	2400	1.09	
45	2700	1.09	
50	3000	1.09	
55	3300	1.1	
60	3600	1.1	
65	3900	1.1	
70	4200	1.1	
75	4500	1.1	
80	4800	1.1	
85	5100	1.11	
90	5400	1.11	
95	5700	1.11	
100	6000	1.11	
105	6300	1.11	
110	6600	1.11	
115	6900	1.11	
120	7200	1.11	



Note 1: Negligble infiltration, infiltration rate could not be calculated. Pit backfilled with arisings.

Appendix B Drainage Design Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Dan Moore
Site name:	P22
Site location:	WEST CUMBERLAND HOSPITAL

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

Site Details

Latitude:	54.52043° N
Longitude:	3.55227° W
Reference:	2477628765
Date:	May 07 2021 15:36

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 1

Methodology

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

Soil characteristics

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	1189	1189
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	8.97	8.97
1 in 1 year (l/s):	7.81	7.81
1 in 30 years (l/s):	15.25	15.25
1 in 100 year (l/s):	18.66	18.66
1 in 200 years (l/s):	21.27	21.27

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	1.000
Ratio-R	0.300	Preferred Cover Depth (m)	0.900
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SAR1	0.129	5.00	95.031	1800	299075.086	516095.205	1.451
G1	0.014	5.00	94.200	350	299073.477	516065.132	0.500
SAR2	0.035	5.00	94.756	1800	299061.379	516083.924	1.806
SAR3		5.00	95.183	1350	299039.597	516124.361	2.383
SAR4	0.075	5.00	95.403	1800	299014.510	516140.627	2.583
SAR5			94.775	2100	299032.774	516118.444	2.015
SAR6			95.043	1800	299030.243	516116.414	2.297
S1	0.076	5.00	91.074	1200	298995.213	516081.956	1.076
S2	0.069	5.00	91.324	1350	299011.932	516101.222	1.566
S3	0.059	5.00	92.104	1350	298970.597	516151.899	2.626
s3a			91.095	1350	298945.924	516136.236	1.837
S4	0.187	5.00	90.964	1200	298963.603	516078.459	1.974
S5			90.883	1350	298926.853	516121.105	2.283
RE1	0.039	5.00	90.810	150	298937.847	516084.501	1.050
S6			90.294	1500	298915.382	516111.185	1.734
RE2	0.116	5.00	92.433	150	298953.531	516165.422	1.125
S7	0.100	5.00	90.300	1800	298903.483	516125.018	1.785
RE3	0.106	5.00	89.763	150	298892.239	516043.469	1.125
RE4	0.070	5.00	88.253	150	298857.711	516083.320	0.753
S8			88.733	1350	298869.774	516070.153	1.542
RE5	0.087	5.00	90.404	150	298905.309	516055.152	1.047

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
RE6	0.142	5.00	88.418	150	298867.542	516098.518	1.027
S9			89.306	1500	298882.844	516081.836	2.214
RE7	0.042	5.00	90.823	150	298928.234	516072.034	1.048
S10			89.809	1500	298904.035	516100.778	2.859
S11			89.481	1350	298890.457	516116.805	2.821
EXSMH2			87.721	1200	298866.027	516107.452	2.021

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.002	SAR1	SAR2	17.752	0.600	93.580	93.475	0.105	169.1	225	5.30	50.0
3.000	G1	SAR2	22.350	0.600	93.700	93.550	0.150	149.0	150	5.13	50.0
1.003	SAR2	SAR5	44.832	0.600	92.950	92.760	0.190	236.0	750	6.27	50.0
2.000	SAR3	SAR5	9.031	0.600	92.800	92.760	0.040	225.8	300	5.28	50.0
1.004	SAR4	SAR5	28.734	0.600	92.820	92.760	0.060	478.9	750	6.38	50.0
1.005	SAR5	SAR6	3.245	0.600	92.760	92.746	0.014	231.8	300	6.53	50.0
1.005_1	SAR6	S2	23.793	0.600	92.746	89.833	2.913	8.2	225	6.84	50.0
5.000	S1	S2	25.509	0.600	89.998	89.833	0.165	154.6	225	5.47	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.002	1.002	39.9	24.5	1.226	1.056	0.129	0.0	128	1.053
3.000	0.821	14.5	2.7	0.350	1.056	0.014	0.0	44	0.628
1.003	1.817	802.8	33.8	1.056	1.265	0.178	0.0	103	0.922
2.000	1.042	73.7	0.0	2.083	1.715	0.000	0.0	0	0.000
1.004	1.272	561.8	14.2	1.833	1.265	0.075	0.0	81	0.556
1.005	1.028	72.7	48.0	1.715	1.997	0.253	0.0	178	1.096
1.005_1	4.606	183.1	48.0	2.072	1.266	0.253	0.0	79	3.904
5.000	1.049	41.7	14.4	0.851	1.266	0.076	0.0	91	0.954

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.006	S2	S3	65.397	0.600	89.758	89.478	0.280	233.6	300	7.97	50.0
1.007_1	S3	s3a	29.225	0.600	89.478	89.258	0.220	132.8	300	8.86	50.0
1.006_1	s3a	S5	24.344	0.600	89.258	88.750	0.508	47.9	300	9.04	50.0
6.000_1	S4	S5	56.296	0.600	88.990	88.752	0.238	237.0	300	5.85	50.0
1.007	S5	S6	15.165	0.600	88.600	88.560	0.040	379.1	450	9.11	50.0
6.000	RE1	S6	34.881	0.600	89.760	88.860	0.900	38.8	150	5.47	50.0
1.008	S6	S7	18.247	0.600	88.560	88.515	0.045	405.5	450	9.26	50.0
7.000	RE2	S7	64.322	0.600	91.308	88.590	2.718	23.7	225	5.42	50.0
1.009	S7	S11	15.399	0.600	88.515	88.281	0.234	65.8	300	9.35	50.0
8.000	RE3	S8	34.881	0.600	88.638	88.038	0.600	58.1	225	5.34	50.0
9.000	RE4	S8	17.857	0.600	87.500	87.394	0.106	168.5	225	5.28	50.0
8.001	S8	S9	17.530	0.600	87.191	87.092	0.099	177.1	450	5.63	50.0
10.000	RE5	S9	34.881	0.600	89.357	88.194	1.163	30.0	150	5.32	50.0
11.000	RE6	S9	22.637	0.600	87.391	87.242	0.149	151.9	300	5.38	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.006	1.024	72.4	75.5	1.266	2.326	0.398	0.0	262	1.155
1.007_1	1.362	96.3	86.7	2.326	1.537	0.457	0.0	224	1.534
1.006_1	2.276	160.9	86.7	1.537	1.833	0.457	0.0	157	2.316
6.000_1	1.017	71.9	35.5	1.674	1.831	0.187	0.0	149	1.014
1.007	1.038	165.1	122.2	1.833	1.284	0.644	0.0	289	1.131
6.000	1.621	28.7	7.4	0.900	1.284	0.039	0.0	52	1.362
1.008	1.003	159.5	129.6	1.284	1.335	0.683	0.0	309	1.112
7.000	2.701	107.4	22.0	0.900	1.485	0.116	0.0	69	2.138
1.009	1.941	137.2	170.6	1.485	0.900	0.899	0.0	300	1.966
8.000	1.718	68.3	20.1	0.900	0.470	0.106	0.0	83	1.496
9.000	1.004	39.9	13.3	0.528	1.114	0.070	0.0	89	0.905
8.001	1.524	242.4	33.4	1.092	1.764	0.176	0.0	112	1.083
10.000	1.845	32.6	16.5	0.897	0.962	0.087	0.0	75	1.848
11.000	1.273	90.0	26.9	0.727	1.764	0.142	0.0	112	1.116

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
8.002	S9	S10	28.423	0.600	87.092	86.950	0.142	200.2	450	6.10	50.0
12.000	RE7	S10	37.574	0.600	89.775	88.755	1.020	36.8	150	5.38	50.0
8.003	S10	S11	21.005	0.600	86.950	86.810	0.140	150.0	150	6.53	50.0
1.010	S11	EXSMH2	26.159	0.600	86.660	85.700	0.960	27.2	300	9.48	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
8.002	1.433	227.9	76.8	1.764	2.409	0.405	0.0	180	1.299
12.000	1.663	29.4	8.0	0.898	0.904	0.042	0.0	53	1.414
8.003	0.818	14.5	84.8	2.709	2.521	0.447	0.0	150	0.833
1.010	3.023	213.7	255.4	2.521	1.721	1.346	0.0	300	3.062

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.002	17.752	169.1	225	1 STANDARD	95.031	93.580	1.226	94.756	93.475	1.056
3.000	22.350	149.0	150	1 STANDARD	94.200	93.700	0.350	94.756	93.550	1.056
1.003	44.832	236.0	750	1 STANDARD	94.756	92.950	1.056	94.775	92.760	1.265
2.000	9.031	225.8	300	1 STANDARD	95.183	92.800	2.083	94.775	92.760	1.715
1.004	28.734	478.9	750	1 STANDARD	95.403	92.820	1.833	94.775	92.760	1.265
1.005	3.245	231.8	300	1 STANDARD	94.775	92.760	1.715	95.043	92.746	1.997

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	SAR1	1800	Manhole	1 STANDARD	SAR2	1800	Manhole	1 STANDARD
3.000	G1	350	Manhole	1 STANDARD	SAR2	1800	Manhole	1 STANDARD
1.003	SAR2	1800	Manhole	1 STANDARD	SAR5	2100	Manhole	1 STANDARD
2.000	SAR3	1350	Manhole	1 STANDARD	SAR5	2100	Manhole	1 STANDARD
1.004	SAR4	1800	Manhole	1 STANDARD	SAR5	2100	Manhole	1 STANDARD
1.005	SAR5	2100	Manhole	1 STANDARD	SAR6	1800	Manhole	1 STANDARD

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.005_1	23.793	8.2	225	1 STANDARD	95.043	92.746	2.072	91.324	89.833	1.266
5.000	25.509	154.6	225	1 STANDARD	91.074	89.998	0.851	91.324	89.833	1.266
1.006	65.397	233.6	300	1 STANDARD	91.324	89.758	1.266	92.104	89.478	2.326
1.007_1	29.225	132.8	300	1 STANDARD	92.104	89.478	2.326	91.095	89.258	1.537
1.006_1	24.344	47.9	300	1 STANDARD	91.095	89.258	1.537	90.883	88.750	1.833
6.000_1	56.296	237.0	300	1 STANDARD	90.964	88.990	1.674	90.883	88.752	1.831
1.007	15.165	379.1	450	1 STANDARD	90.883	88.600	1.833	90.294	88.560	1.284
6.000	34.881	38.8	150	1 STANDARD	90.810	89.760	0.900	90.294	88.860	1.284
1.008	18.247	405.5	450	1 STANDARD	90.294	88.560	1.284	90.300	88.515	1.335
7.000	64.322	23.7	225	1 STANDARD	92.433	91.308	0.900	90.300	88.590	1.485
1.009	15.399	65.8	300	1 STANDARD	90.300	88.515	1.485	89.481	88.281	0.900
8.000	34.881	58.1	225	1 STANDARD	89.763	88.638	0.900	88.733	88.038	0.470
9.000	17.857	168.5	225	1 STANDARD	88.253	87.500	0.528	88.733	87.394	1.114
8.001	17.530	177.1	450	1 STANDARD	88.733	87.191	1.092	89.306	87.092	1.764
10.000	34.881	30.0	150	1 STANDARD	90.404	89.357	0.897	89.306	88.194	0.962

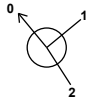
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.005_1	SAR6	1800	Manhole	1 STANDARD	S2	1350	Manhole	1 STANDARD
5.000	S1	1200	Manhole	1 STANDARD	S2	1350	Manhole	1 STANDARD
1.006	S2	1350	Manhole	1 STANDARD	S3	1350	Manhole	1 STANDARD
1.007_1	S3	1350	Manhole	1 STANDARD	s3a	1350	Manhole	1 STANDARD
1.006_1	s3a	1350	Manhole	1 STANDARD	S5	1350	Manhole	1 STANDARD
6.000_1	S4	1200	Manhole	1 STANDARD	S5	1350	Manhole	1 STANDARD
1.007	S5	1350	Manhole	1 STANDARD	S6	1500	Manhole	1 STANDARD
6.000	RE1	150	Manhole	1 STANDARD	S6	1500	Manhole	1 STANDARD
1.008	S6	1500	Manhole	1 STANDARD	S7	1800	Manhole	1 STANDARD
7.000	RE2	150	Manhole	1 STANDARD	S7	1800	Manhole	1 STANDARD
1.009	S7	1800	Manhole	1 STANDARD	S11	1350	Manhole	1 STANDARD
8.000	RE3	150	Manhole	1 STANDARD	S8	1350	Manhole	1 STANDARD
9.000	RE4	150	Manhole	1 STANDARD	S8	1350	Manhole	1 STANDARD
8.001	S8	1350	Manhole	1 STANDARD	S9	1500	Manhole	1 STANDARD
10.000	RE5	150	Manhole	1 STANDARD	S9	1500	Manhole	1 STANDARD

Pipeline Schedule

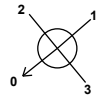
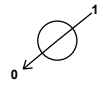
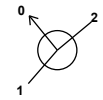
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
11.000	22.637	151.9	300	1 STANDARD	88.418	87.391	0.727	89.306	87.242	1.764
8.002	28.423	200.2	450	1 STANDARD	89.306	87.092	1.764	89.809	86.950	2.409
12.000	37.574	36.8	150	1 STANDARD	90.823	89.775	0.898	89.809	88.755	0.904
8.003	21.005	150.0	150	1 STANDARD	89.809	86.950	2.709	89.481	86.810	2.521
1.010	26.159	27.2	300	1 STANDARD	89.481	86.660	2.521	87.721	85.700	1.721

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
11.000	RE6	150	Manhole	1 STANDARD	S9	1500	Manhole	1 STANDARD
8.002	S9	1500	Manhole	1 STANDARD	S10	1500	Manhole	1 STANDARD
12.000	RE7	150	Manhole	1 STANDARD	S10	1500	Manhole	1 STANDARD
8.003	S10	1500	Manhole	1 STANDARD	S11	1350	Manhole	1 STANDARD
1.010	S11	1350	Manhole	1 STANDARD	EXSMH2	1200	Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SAR1	299075.086	516095.205	95.031	1.451	1800	 0	1.002	93.580	225
G1	299073.477	516065.132	94.200	0.500	350	 0	3.000	93.700	150
SAR2	299061.379	516083.924	94.756	1.806	1800	 1 2 0	1.002 3.000 1.003	93.475 93.550 92.950	225 150 750

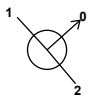
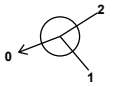
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SAR3	299039.597	516124.361	95.183	2.383	1350				
						0	2.000	92.800	300
SAR4	299014.510	516140.627	95.403	2.583	1800				
						0	1.004	92.820	750
SAR5	299032.774	516118.444	94.775	2.015	2100		1	2.000	92.760	300
							2	1.004	92.760	750
							3	1.003	92.760	750
							0	1.005	92.760	300
SAR6	299030.243	516116.414	95.043	2.297	1800		1	1.005	92.746	300
							0	1.005_1	92.746	225
S1	298995.213	516081.956	91.074	1.076	1200				
						0	5.000	89.998	225
S2	299011.932	516101.222	91.324	1.566	1350		1	5.000	89.833	225
							2	1.005_1	89.833	225
							0	1.006	89.758	300
S3	298970.597	516151.899	92.104	2.626	1350		1	1.006	89.478	300
							0	1.007_1	89.478	300
s3a	298945.924	516136.236	91.095	1.837	1350		1	1.007_1	89.258	300
							0	1.006_1	89.258	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S4	298963.603	516078.459	90.964	1.974	1200	0	6.000_1	88.990	300
S5	298926.853	516121.105	90.883	2.283	1350	1	6.000_1	88.752	300
						2	1.006_1	88.750	300
						0	1.007	88.600	450
RE1	298937.847	516084.501	90.810	1.050	150	0	6.000	89.760	150
S6	298915.382	516111.185	90.294	1.734	1500	1	6.000	88.860	150
						2	1.007	88.560	450
						0	1.008	88.560	450
RE2	298953.531	516165.422	92.433	1.125	150	0	7.000	91.308	225
S7	298903.483	516125.018	90.300	1.785	1800	1	7.000	88.590	225
						2	1.008	88.515	450
						0	1.009	88.515	300
RE3	298892.239	516043.469	89.763	1.125	150	0	8.000	88.638	225
RE4	298857.711	516083.320	88.253	0.753	150	0	9.000	87.500	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S8	298869.774	516070.153	88.733	1.542	1350		1	9.000	87.394	225
							2	8.000	88.038	225
							0	8.001	87.191	450
RE5	298905.309	516055.152	90.404	1.047	150		0	10.000	89.357	150
RE6	298867.542	516098.518	88.418	1.027	150		0	11.000	87.391	300
S9	298882.844	516081.836	89.306	2.214	1500		1	11.000	87.242	300
							2	10.000	88.194	150
							3	8.001	87.092	450
							0	8.002	87.092	450
RE7	298928.234	516072.034	90.823	1.048	150		0	12.000	89.775	150
S10	298904.035	516100.778	89.809	2.859	1500		1	12.000	88.755	150
							2	8.002	86.950	450
							0	8.003	86.950	150
S11	298890.457	516116.805	89.481	2.821	1350		1	8.003	86.810	150
							2	1.009	88.281	300
							0	1.010	86.660	300
EXSMH2	298866.027	516107.452	87.721	2.021	1200		1	1.010	85.700	300

Simulation Settings

Rainfall Methodology	FSR	Winter CV	0.840	Check Discharge Rate(s)	✓
FSR Region	England and Wales	Analysis Speed	Detailed	100 year (l/s)	50.0
M5-60 (mm)	17.000	Skip Steady State	✓	Check Discharge Volume	x
Ratio-R	0.300	Drain Down Time (mins)	240		
Summer CV	0.750	Additional Storage (m³/ha)	20.0		

Storm Durations

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

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

Pre-development Discharge Rate

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

Node SAR6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	92.746	Product Number	CTL-SHE-0110-6200-1460-6200
Design Depth (m)	1.460	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	6.2	Min Node Diameter (mm)	1200

Node S10 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	86.950	Product Number	CTL-SHE-0116-6600-1290-6600
Design Depth (m)	1.290	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	6.6	Min Node Diameter (mm)	1200

Node S7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	88.515	Product Number	CTL-SHE-0179-1820-1780-1820
Design Depth (m)	1.780	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	18.2	Min Node Diameter (mm)	1500

Node SAR5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	92.780
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	200

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	42.5	0.0	1.000	42.5	0.0	1.001	0.0	0.0

Node S6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	88.560
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	288

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	255.0	0.0	1.000	255.0	0.0	1.001	0.0	0.0

Node S9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	87.092
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	180.0	0.0	1.000	180.0	0.0	1.001	0.0	0.0

Node RE4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	87.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	156

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	120.0	0.0	0.300	120.0	0.0	0.301	0.0	0.0

Node S8 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	9.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	87.394	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	525

Node S9 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	11.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	87.242	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)		Diameter (mm)	600

Node S8 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	8.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	88.038	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	525

Node S9 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	10.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	88.194	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	0	Diameter (mm)	450

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SAR1	10	93.674	0.094	14.0	0.4084	0.0000	OK
15 minute winter	G1	11	93.732	0.032	1.5	0.0211	0.0000	OK
15 minute winter	SAR2	10	93.028	0.078	18.7	0.2298	0.0000	OK
60 minute winter	SAR3	46	92.938	0.138	0.4	0.1972	0.0000	OK
60 minute winter	SAR4	47	92.938	0.118	4.6	0.3679	0.0000	OK
60 minute winter	SAR5	46	92.938	0.178	14.4	7.0077	0.0000	OK
60 minute winter	SAR6	46	92.937	0.191	5.7	0.4871	0.0000	OK
15 minute winter	S1	10	90.066	0.068	8.2	0.1729	0.0000	OK
15 minute winter	S2	11	89.864	0.106	19.2	0.2443	0.0000	OK
15 minute winter	S3	11	89.586	0.108	25.0	0.2035	0.0000	OK
15 minute winter	s3a	12	89.340	0.082	24.5	0.1172	0.0000	OK
15 minute winter	S4	11	89.098	0.108	20.3	0.3256	0.0000	OK
15 minute winter	S5	8	88.827	0.227	42.8	0.3248	0.0000	OK
15 minute winter	RE1	10	89.799	0.039	4.2	0.0295	0.0000	OK
120 minute winter	S6	88	88.721	0.161	22.3	39.1721	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SAR1	1.002	SAR2	13.6	0.891	0.340	0.2704	
15 minute winter	G1	3.000	SAR2	1.4	0.524	0.099	0.0613	
15 minute winter	SAR2	1.003	SAR5	19.0	0.791	0.024	1.6242	
15 minute winter	SAR3	2.000	SAR5	-1.3	-0.138	-0.018	0.2576	
15 minute winter	SAR4	1.004	SAR5	7.9	0.442	0.014	1.3067	
30 minute winter	SAR5	1.005	SAR6	5.8	0.470	0.080	0.1390	
60 minute winter	SAR6	Hydro-Brake®	S2	5.6				
15 minute winter	S1	5.000	S2	8.0	0.805	0.191	0.2526	
15 minute winter	S2	1.006	S3	19.0	0.845	0.263	1.4715	
15 minute winter	S3	1.007_1	s3a	24.5	1.282	0.255	0.5611	
15 minute winter	s3a	1.006_1	S5	24.6	1.626	0.153	0.3684	
15 minute winter	S4	6.000_1	S5	19.4	0.869	0.270	1.2579	
15 minute winter	S5	1.007	S6	43.4	1.687	0.263	0.6114	
15 minute winter	RE1	6.000	S6	4.1	1.145	0.143	0.1247	
60 minute winter	S6	1.008	S7	13.8	0.311	0.086	1.0012	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	RE2	10	91.359	0.051	12.6	0.1069	0.0000	OK
120 minute winter	S7	88	88.719	0.204	16.0	0.7463	0.0000	OK
15 minute winter	RE3	10	88.701	0.063	11.5	0.1192	0.0000	OK
15 minute winter	RE4	10	87.568	0.068	7.6	0.1270	0.0000	OK
15 minute winter	S8	10	87.280	0.089	18.5	0.1281	0.0000	OK
15 minute winter	RE5	10	89.413	0.056	9.4	0.0934	0.0000	OK
15 minute winter	RE6	10	87.477	0.086	15.4	0.2385	0.0000	OK
120 minute winter	S9	90	87.230	0.138	16.4	23.7592	0.0000	OK
15 minute winter	RE7	10	89.815	0.040	4.6	0.0327	0.0000	OK
60 minute winter	S10	48	87.250	0.300	18.2	0.5302	0.0000	SURCHARGED
120 minute winter	S11	88	86.727	0.067	22.3	0.0959	0.0000	OK
120 minute winter	EXSMH2	88	85.765	0.065	22.3	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	RE2	7.000	S7	12.4	1.472	0.115	0.6040	
120 minute winter	S7	Hydro-Brake®	S11	15.8				
15 minute winter	RE3	8.000	S8	11.2	1.261	0.163	0.3092	
15 minute winter	RE4	9.000	S8	7.4	0.758	0.184	0.1740	
15 minute winter	S8	8.001	S9	18.7	1.319	0.077	0.3038	
15 minute winter	RE5	10.000	S9	9.2	1.571	0.282	0.2043	
15 minute winter	RE6	11.000	S9	15.0	0.935	0.166	0.3638	
120 minute winter	S9	8.002	S10	18.4	0.324	0.081	2.1283	
15 minute winter	RE7	12.000	S10	4.4	1.194	0.151	0.1399	
60 minute winter	S10	Hydro-Brake®	S11	6.5				
120 minute winter	S11	1.010	EXSMH2	22.3	1.946	0.104	0.3001	153.5

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SAR1	10	93.749	0.169	34.1	0.7304	0.0000	OK
15 minute winter	G1	10	93.752	0.052	3.7	0.0340	0.0000	OK
120 minute winter	SAR2	94	93.212	0.262	17.3	0.7672	0.0000	OK
120 minute winter	SAR3	94	93.213	0.413	0.5	0.5912	0.0000	SURCHARGED
120 minute winter	SAR4	94	93.213	0.393	7.3	1.2284	0.0000	OK
120 minute winter	SAR5	94	93.213	0.453	21.0	19.0761	0.0000	SURCHARGED
120 minute winter	SAR6	94	93.213	0.467	6.6	1.1880	0.0000	SURCHARGED
15 minute winter	S1	10	90.111	0.113	20.1	0.2871	0.0000	OK
15 minute winter	S2	11	89.926	0.168	43.2	0.3891	0.0000	OK
15 minute winter	S3	11	89.655	0.177	57.8	0.3334	0.0000	OK
15 minute winter	s3a	11	89.389	0.131	57.8	0.1878	0.0000	OK
15 minute winter	S4	11	89.173	0.183	49.4	0.5549	0.0000	OK
180 minute winter	S5	140	89.023	0.423	35.1	0.6054	0.0000	OK
15 minute winter	RE1	10	89.823	0.063	10.3	0.0478	0.0000	OK
180 minute winter	S6	140	89.023	0.463	36.7	112.9056	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SAR1	1.002	SAR2	33.0	1.093	0.828	0.5371	
15 minute winter	G1	3.000	SAR2	3.6	0.677	0.247	0.1184	
15 minute winter	SAR2	1.003	SAR5	45.7	0.890	0.057	5.3317	
15 minute summer	SAR3	2.000	SAR5	-2.2	-0.187	-0.030	0.6049	
15 minute winter	SAR4	1.004	SAR5	17.4	0.501	0.031	4.5917	
15 minute summer	SAR5	1.005	SAR6	7.8	0.541	0.107	0.2280	
60 minute winter	SAR6	Hydro-Brake®	S2	6.2				
15 minute winter	S1	5.000	S2	19.5	1.017	0.467	0.4914	
15 minute winter	S2	1.006	S3	43.1	1.026	0.595	2.7457	
15 minute winter	S3	1.007_1	s3a	57.8	1.584	0.600	1.0658	
15 minute winter	s3a	1.006_1	S5	57.2	2.024	0.356	0.6893	
15 minute winter	S4	6.000_1	S5	47.8	1.109	0.664	2.4235	
15 minute winter	S5	1.007	S6	104.7	1.981	0.634	1.2294	
15 minute winter	RE1	6.000	S6	10.1	1.464	0.351	0.2400	
15 minute winter	S6	1.008	S7	-39.1	-0.777	-0.245	1.8238	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	RE2	10	91.389	0.081	30.6	0.1690	0.0000	OK
180 minute winter	S7	140	89.022	0.507	19.2	1.8586	0.0000	SURCHARGED
15 minute winter	RE3	10	88.740	0.102	28.0	0.1948	0.0000	OK
15 minute winter	RE4	10	87.612	0.112	18.5	0.2103	0.0000	OK
180 minute winter	S8	148	87.538	0.347	13.0	0.6686	0.0000	OK
15 minute winter	RE5	10	89.452	0.095	23.0	0.1599	0.0000	OK
180 minute winter	RE6	152	87.538	0.147	10.5	0.4098	0.0000	OK
180 minute winter	S9	148	87.538	0.446	31.0	77.6149	0.0000	OK
15 minute winter	RE7	10	89.839	0.064	11.1	0.0527	0.0000	OK
180 minute winter	S10	148	87.547	0.597	18.3	1.0553	0.0000	SURCHARGED
180 minute winter	S11	120	86.731	0.071	24.6	0.1010	0.0000	OK
180 minute winter	EXSMH2	116	85.768	0.068	24.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	RE2	7.000	S7	30.2	1.471	0.281	1.3741	
180 minute winter	S7	Hydro-Brake®	S11	18.2				
15 minute winter	RE3	8.000	S8	27.4	1.599	0.401	0.5975	
15 minute winter	RE4	9.000	S8	18.1	0.956	0.453	0.3387	
15 minute winter	S8	8.001	S9	45.0	1.487	0.185	1.2164	
15 minute winter	RE5	10.000	S9	22.5	1.954	0.691	0.4022	
15 minute winter	RE6	11.000	S9	36.7	1.180	0.408	0.7064	
960 minute summer	S9	8.002	S10	18.2	0.322	0.080	3.3074	
15 minute winter	RE7	12.000	S10	10.8	1.521	0.368	0.2675	
15 minute summer	S10	Hydro-Brake®	S11	6.6				
180 minute winter	S11	1.010	EXSMH2	24.6	1.999	0.115	0.3224	422.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	SAR1	156	94.178	0.598	17.5	2.5854	0.0000	SURCHARGED
180 minute winter	G1	156	94.177	0.477	1.9	0.3132	0.0000	FLOOD RISK
180 minute winter	SAR2	156	94.177	1.227	24.1	3.5984	0.0000	SURCHARGED
180 minute winter	SAR3	156	94.178	1.378	0.9	1.9712	0.0000	SURCHARGED
180 minute winter	SAR4	156	94.177	1.357	10.2	4.2409	0.0000	SURCHARGED
180 minute winter	SAR5	156	94.177	1.417	26.2	45.3247	0.0000	SURCHARGED
180 minute winter	SAR6	156	94.177	1.431	7.1	3.6418	0.0000	SURCHARGED
15 minute winter	S1	10	90.169	0.171	36.1	0.4353	0.0000	OK
240 minute winter	S2	228	90.124	0.366	22.3	0.8474	0.0000	SURCHARGED
240 minute winter	S3	228	90.120	0.642	28.9	1.2079	0.0000	SURCHARGED
240 minute winter	s3a	228	90.118	0.860	28.9	1.2300	0.0000	SURCHARGED
240 minute winter	S4	228	90.116	1.126	20.9	3.4069	0.0000	SURCHARGED
240 minute winter	S5	228	90.115	1.515	48.9	2.1684	0.0000	SURCHARGED
240 minute winter	RE1	228	90.116	0.356	4.4	0.2706	0.0000	SURCHARGED
240 minute winter	S6	228	90.115	1.555	55.5	245.1186	0.0000	FLOOD RISK

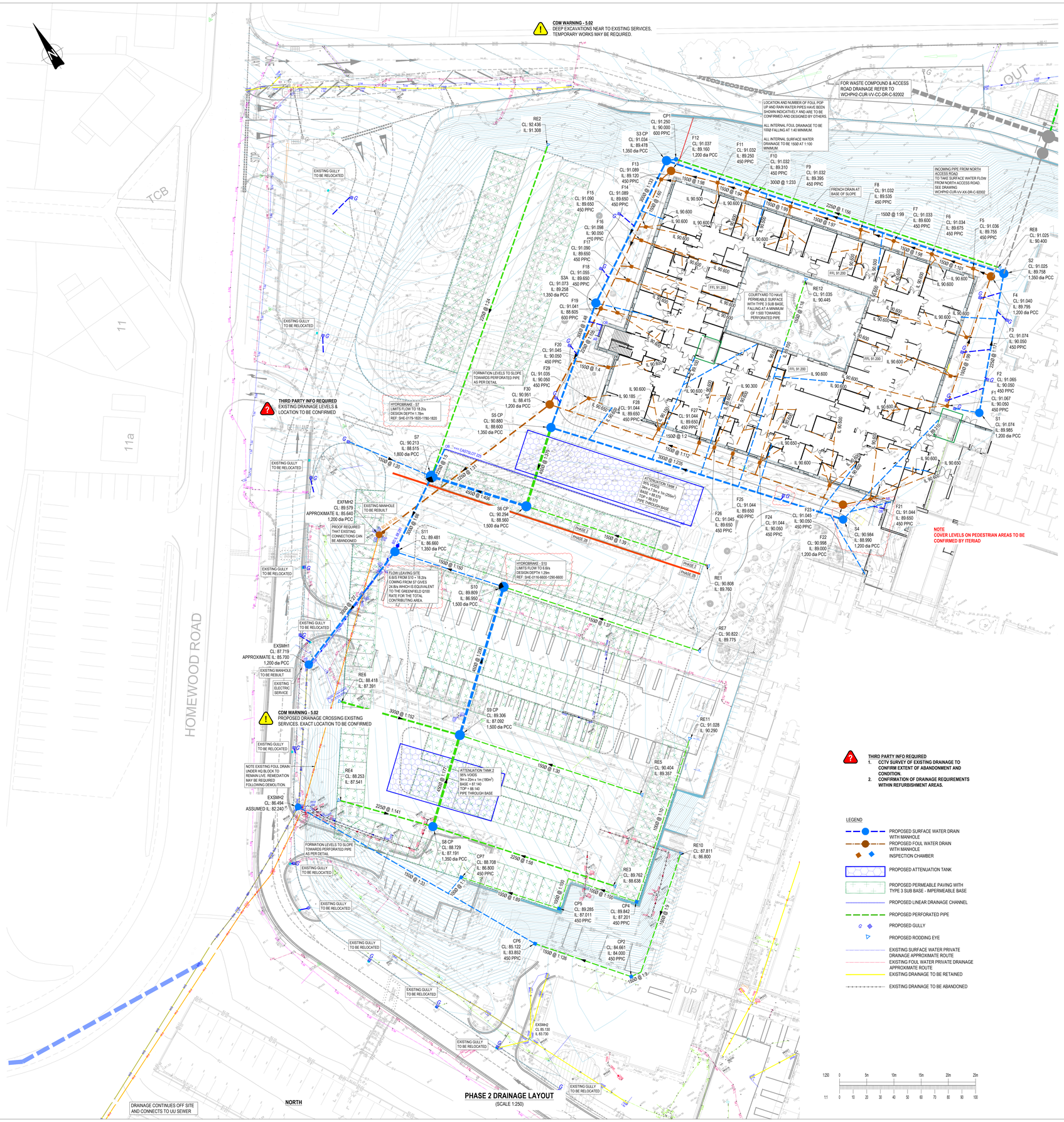
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SAR1	1.002	SAR2	58.8	1.481	1.476	0.6828	
15 minute winter	G1	3.000	SAR2	6.4	0.788	0.443	0.1830	
15 minute winter	SAR2	1.003	SAR5	80.5	0.958	0.100	12.4455	
15 minute winter	SAR3	2.000	SAR5	-3.4	-0.184	-0.046	0.6360	
15 minute summer	SAR4	1.004	SAR5	26.3	0.522	0.047	8.2564	
15 minute winter	SAR5	1.005	SAR6	9.4	0.549	0.129	0.2285	
15 minute summer	SAR6	Hydro-Brake®	S2	6.2				
15 minute winter	S1	5.000	S2	35.3	1.103	0.847	0.8421	
15 minute winter	S2	1.006	S3	72.3	1.113	0.999	4.2533	
15 minute winter	S3	1.007_1	s3a	98.5	1.761	1.023	1.6213	
15 minute winter	s3a	1.006_1	S5	98.5	2.236	0.612	1.2107	
15 minute winter	S4	6.000_1	S5	84.2	1.235	1.171	3.5880	
15 minute winter	S5	1.007	S6	179.3	2.120	1.086	2.3823	
15 minute winter	RE1	6.000	S6	18.1	1.687	0.633	0.3747	
15 minute winter	S6	1.008	S7	-81.0	-1.043	-0.508	2.8911	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	RE2	10	91.421	0.113	55.1	0.2349	0.0000	OK
240 minute winter	S7	228	90.114	1.599	24.2	5.8617	0.0000	FLOOD RISK
15 minute winter	RE3	10	88.787	0.149	50.3	0.2838	0.0000	OK
240 minute winter	RE4	232	88.211	0.711	7.8	12.1711	0.0000	FLOOD RISK
240 minute winter	S8	232	88.211	1.020	18.7	3.4815	0.0000	SURCHARGED
15 minute winter	RE5	11	89.940	0.583	41.3	0.9794	0.0000	SURCHARGED
240 minute winter	RE6	232	88.212	0.821	15.9	2.2842	0.0000	FLOOD RISK
240 minute winter	S9	232	88.211	1.119	48.9	176.2277	0.0000	SURCHARGED
15 minute winter	RE7	10	89.867	0.092	19.9	0.0756	0.0000	OK
240 minute winter	S10	232	88.211	1.261	18.2	2.2274	0.0000	SURCHARGED
240 minute summer	S11	120	86.731	0.071	24.7	0.1010	0.0000	OK
360 minute winter	EXSMH2	168	85.768	0.068	24.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	RE2	7.000	S7	54.5	1.708	0.508	1.9200	
240 minute summer	S7	Hydro-Brake®	S11	18.2				
15 minute winter	RE3	8.000	S8	49.3	1.829	0.722	0.9416	
15 minute winter	RE4	9.000	S8	32.5	1.085	0.814	0.5350	
15 minute winter	S8	8.001	S9	80.2	1.584	0.331	2.5914	
15 minute winter	RE5	10.000	S9	36.4	2.069	1.117	0.6139	
15 minute winter	RE6	11.000	S9	66.1	1.349	0.735	1.2523	
30 minute winter	S9	8.002	S10	21.8	0.268	0.096	4.5034	
15 minute winter	RE7	12.000	S10	19.5	1.751	0.664	0.4186	
15 minute summer	S10	Hydro-Brake®	S11	6.6				
360 minute winter	S11	1.010	EXSMH2	24.6	1.999	0.115	0.3225	741.1

Appendix C Proposed Drainage Layouts



PHASE 2 DRAINAGE LAYOUT
(SCALE 1:250)

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

PRIVATE DRAINAGE NOTES:

1. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 AND TO THE SATISFACTION OF THE BUILDING INSPECTOR.
2. ALL PROPRIETARY ITEMS ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURERS DETAILS, INSTRUCTIONS & SPECIFICATIONS.
3. ALL EXISTING DRAINS AND SERVICES (LINE AND LEVELS) TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO FINALISING NEW DRAINAGE LINES AND LEVELS.
4. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
5. INVERT LEVELS QUOTED AT MANHOLES AND INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
6. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE.
7. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
8. ALL INTERNAL CONNECTIONS ARE TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
9. PIPES AND FITTINGS TO BE:
   - CONCRETE PIPES AND ANCILLARY PRODUCTS TO BS 5911-1:2002+AR:2010 AND BS EN 1916:2002.
   - VITRIFIED CLAY PIPES AND FITTINGS TO BS EN 295:2013 (ALL PARTS).
   - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
   - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
   - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE AND SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL ONLY, STRUCTURED WALL PIPES ARE NOT ACCEPTABLE FOR USE IN DRAINAGE SYSTEMS UNLESS AGREED.
   - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
   - PLASTIC INSPECTION CHAMBERS FOR DRAINS AND SEWERS TO BS EN 13598-1:2010.
   - GULLY AND MANHOLE TOPS FOR VEHICULAR AND PEDESTRIAN AREAS TO BS EN 124:1994.
   - DRAINAGE CHANNELS FOR VEHICULAR AND PEDESTRIAN AREAS TO BS EN 1433:2002.
10. ALL MANHOLE COVERS, ROAD GULLY COVERS AND FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

    UNLESS NOTED OTHERWISE USE:

    CLASS A15 AREAS INACCESSIBLE TO VEHICLES, ACCESSED ONLY BY PEDESTRIANS AND PEDAL CYCLISTS.

    CLASS B125 FOOTPATHS, FOOTWAYS, PEDESTRIAN AREAS WITH ONLY OCCASIONAL LIGHT VEHICULAR ACCESS INCLUDING DOMESTIC DRIVEWAYS & SMALL CAR PARKS.

    CLASS C250 GULLY TOPS IN CARRIAGEWAY WITHIN 500mm OF KERB AND UP TO 200mm INTO THE FOOTWAY.

    CLASS D400 CARRIAGEWAYS, HARD SHOULDERS, PARKING AREAS AND PEDESTRIAN AREAS ACCESSED BY ALL TYPES OF VEHICLES.

    CLASS E600 AREAS IMPOSING HIGH WHEEL LOADS SUCH AS INDUSTRIAL ESTATES AND SERVICE YARDS.
11. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS, RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
12. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY.

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - 100 - 600Ø PIPES (CLASS 120 CLAYWARE OR CLASS M CONCRETE)

      FIELDS AND GARDENS - LESS THAN 600mm COVER TO CROWN.

      ROADS - LESS THAN 1200mm COVER TO CROWN
    - 100 - 3000 PIPES (PLASTIC)

      FIELDS AND GARDENS - LESS THAN 600mm COVER TO CROWN.

      ROADS - LESS THAN 900mm COVER TO CROWN
13. PIPES BELOW CONCRETE GROUND FLOOR SLABS

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED AND SURROUND CAST INTEGRALLY WITH SLAB.

    OTHERWISE USE CLASS S BEDDING
14. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
15. BACKFILL TO DRAINS NEAR FOUNDATIONS IS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
16. SURFACE WATER MANHOLE SIZE TO BE MAXIMUM PIPE SIZE +900mm (ASSUME 1350Ø).
17. ALL CHAMBERS DOWNSTREAM OF PERFORATED PIPES TO BE A SILT TRAP

Rev:	Description:	Date:	By:	Chkd:
C04	REVISION CLOUDS ADDED	21/07/22	DM	
C03	S4 AND HYDROBRAKE REFERENCES UPDATED	15/07/22	DM	PT
C02	UPDATED TO REFLECT DSSR POP UP LOCATIONS AND LANDSCAPE ARCHITECT COMMENTS	28/06/22	DM	PT
C01	CONSTRUCTION ISSUE	19/05/22	DM	PT

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Status: CONSTRUCTION ISSUE — A1

Client: GRAHAM

Project: PROCURE — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title: DRAINAGE LAYOUT

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A0	MAY 21	DM	DM	PT
	Scale: 1:250				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
WCHPH2-	CUR -	VV -	XX -	DR -	C -	92001 -	C04

Dwg Path: C:\3D\WCHPH2-CUR-VV-XX-DR-C-92001-C04- Drainage Layout.dwg

SPUR REQUIRED FOR POTENTIAL DEVELOPMENT OF SNECKYEAT ROAD CAR PARK.

THE DOWNSTREAM DRAINAGE SYSTEM WILL NEED TO BE REMODELLED AND FLOW CONTROLS REPLACED TO ALLOW FOR THE ADDITIONAL FLOW.

A SEPARATE PLANNING APPLICATION IS REQUIRED SHOWING THE DETAILS OF THE DRAINAGE SYSTEM(S).

TOTAL FLOW FROM WASTE COMPOUND, PHASE 2 AND PHASE 2B CAR PARK MUST BE 24.8/s. FLOW FROM SNECKYEAT ROAD CAR PARK WILL BE ON TOP OF THIS.

PROPOSED DRAINAGE DEEPER THAN EXISTING DRAINAGE - EXISTING DRAINAGE MAY BE ABLE TO BE ABANDONED. SURVEY REQUIRED

INTERCEPTOR 'KLARGESTER NSFA050' TO SERVE FLOW OF 50l/s
CL – 95.100
INLET IL 93.530
OUTLET IL 93.480

SAR1
CL: 95.031
IL: 93.580
1,800 dia PCC

SAR2
CL: 94.760
IL: 92.950
1,800 dia PCC

SAR3 CP
CL: 95.176
IL: 92.800
1,350 dia PCC

SAR4
CL: 95.403
IL: 92.820
1,800 dia PCC

SAR5 CP
CL: 94.775
IL: 92.760
2,100 dia PCC

SAR6
CL: 95.043
IL: 92.746
1,800 dia PCC

ATTENUATION TANK 4
8.5m x 5m x 1m DEEP
(42.5m³) WITH 95% VOIDS
SOFFIT 93.780
BASE 92.780

HYDROBRAKE - SAR6
LIMITS FLOW 6.2 l/s
DESIGN DEPTH 1.46m
REF: SHE-0110-6200-1460-6200

F51
CL: 95.128
IL: 92.500
450 PPIC

F50
CL: 95.059
IL: 93.800
450 PPIC

F4
CL: 94.760
IL: 92.950
450 PPIC

WASTE COMPOUND
ACCESS ROAD

CONNECTION TO EXISTING SYSTEM TO BE CONFIRMED

<<< CASTSLOT 150
CASTSLOT 150 >>>

SHALLOW BEDROCK ANTICIPATED - GROUND WORKER TO ALLOW FOR EXCAVATION INTO HARD SANDSTONE.

FOR MANHOLES S2 AND F4 SEE DRAWING WCHPH2-CUR-VV-XX-DR-C-92001

EXISTING GULLY TO BE RELOCATED

REFER TO S278 PLANS FOR DRAINAGE REQUIREMENTS IN THIS AREA WCHPH2-CUR-VV-XX-DR-C-95501

CDM WARNING - 5.02
PROPOSED DRAINAGE CROSSING EXISTING SERVICES. EXACT LOCATION TO BE CONFIRMED

NOTE
DRAINAGE TO BE CONSTRUCTED TO CONNECTION POINT WITH EXISTING DRAINAGE AS PART OF WASTE COMPOUND DRAINAGE

WASTE COMPOUND & ACCESS ROAD PROPOSED DRAINAGE LAYOUT
(SCALE 1:200)

1:200 0 5m 10m 15m 20m
1:1 0 10 20 30 40 50 60 70 80 90 100

SCALEBAR
(INDICATIVE ONLY)

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.
5. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH CURTINS' DRAINAGE SPECIFICATION, BS EN 752, THE BUILDING REGULATIONS AND TO THE SATISFACTION OF THE BUILDING INSPECTOR.
6. ALL PROPRIETARY ITEMS ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
7. ALL EXISTING DRAINS AND SERVICES (LINE AND LEVELS) TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO FINALISING NEW DRAINAGE LINES AND LEVELS.
8. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
9. INVERT LEVELS QUOTED AT MANHOLES AND INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
10. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE.
11. PIPES AND FITTINGS TO BE:
    - CONCRETE PIPES AND ANCILLARY PRODUCTS TO BS 5911-1:2002+AR:2010 AND BS EN 1916:2002.
    - VITRIFIED CLAY PIPES AND FITTINGS TO BS EN 295:2013 (ALL PARTS).
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE AND SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL ONLY, STRUCTURED WALL PIPES ARE NOT ACCEPTABLE FOR USE IN DRAINAGE SYSTEMS UNLESS AGREED.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS AND SEWERS TO BS EN 13598-1:2010.
    - GULLY AND MANHOLE TOPS FOR VEHICULAR AND PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR AND PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS AND FRAMES TO COMPLY WITH BS EN124 NON-ROCKING TYPE.
    UNLESS NOTED OTHERWISE USE:
    CLASS A15 AREAS INACCESSIBLE TO VEHICLES, ACCESSED ONLY BY PEDESTRIANS AND PEDAL CYCLISTS.
    CLASS B125 FOOTPATHS, FOOTWAYS, PEDESTRIAN AREAS WITH ONLY OCCASIONAL LIGHT VEHICULAR ACCESS INCLUDING DOMESTIC DRIVEWAYS & SMALL CAR PARKS.
    CLASS C250 GULLY TOPS IN CARRIAGEWAY WITHIN 500mm OF KERB AND UP TO 200mm INTO THE FOOTWAY.
    CLASS D400 CARRIAGEWAYS, HARD SHOULDERS, PARKING AREAS AND PEDESTRIAN AREAS ACCESSED BY ALL TYPES OF VEHICLES.
    CLASS E600 AREAS IMPOSING HIGH WHEEL LOADS SUCH AS INDUSTRIAL ESTATES AND SERVICE YARDS.
13. PIPE BEDDING
    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY
    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - 100 - 3000 PIPES (PLASTIC)
    - FIELDS AND GARDENS - LESS THAN 600mm COVER TO CROWN.
    - ROADS - LESS THAN 900mm COVER TO CROWN
14. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:
    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS
    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS.
15. PIPE SIZES ARE INDICATIVE, TO BE CONFIRMED AT DETAILED DESIGN.
16. DISCHARGE RATE TO CONFIRMED.
17. INVERT LEVELS TO BE CONFIRMED UPON RECEIPT OF LEVELS OF EXISTING SEWER IN ROAD.
18. ALL LEVELS & DRAINAGE TO BE CONFIRMED FOLLOWING RECEIPT OF APPROVED COORDINATED LAYOUT.

NOTE
PIPES TO BE POLYPROPYLENE TWINWALL

MANHOLE SCHEDULE
* INDICATES IL TO BE CONFIRMED ON SITE

MH NAME	EASTING NORTHING	COVER LEVEL & CLASS	PIPE INVERT LEVEL	PIPE SOFFIT LEVEL	PIPE DIA.	PIPE SLOPE	PIPE LENGTH	DS/MH NAME	TYPE
F50	E 299038.162 N 516115.533	95.059m D400	93.800m 93.800m	93.900m 93.900m	Ø100 Ø100	1:12 1:5	6.937m 7.089m	F51	450 PPIC MAX 350 ACCESS PPIC
F51	E 299033.389 N 516120.774	95.128m D400	92.500m 92.500m	92.600m 92.600m	Ø100 Ø100	1:5 1:111	7.089m 29.636m	F4	450 PPIC MAX 350 ACCESS PPIC

MANHOLE SCHEDULE
* INDICATES IL TO BE CONFIRMED ON SITE

MH NAME	EASTING NORTHING	COVER LEVEL & CLASS	PIPE INVERT LEVEL	PIPE SOFFIT LEVEL	PIPE DIA.	PIPE SLOPE	PIPE LENGTH	DS/MH NAME	TYPE
SAR1	E 299075.086 N 516095.205	95.031m D400	93.580m 93.655m 93.580m	93.805m 93.805m 93.805m	Ø225 Ø150 Ø225	1:100 1:28 1:137	22.082m 19.128m 17.752m	SAR2	1,800 DIA PCC 1220X685 ACCESS
SAR2	E 299061.379 N 516083.924	94.760m D400	93.450m 93.550m 92.950m	93.675m 93.700m 93.700m	Ø225 Ø150 Ø750	1:137 1:149 1:236	17.752m 22.285m 44.832m	SAR5 CP	1,800 DIA PCC 1220X685 ACCESS MANHOLE PCC -3M
SAR3 CP	E 299039.597 N 516124.361	95.176m D400	92.800m	93.100m	Ø300	1:226	9.031m	SAR5 CP	1,350 DIA PCC 600X600 ACCESS 300MM SUMP
SAR4	E 299014.510 N 516140.627	95.403m D400	93.420m 92.820m	93.570m 93.570m	Ø150 Ø750	1:14 1:479	13.345m 28.734m	SAR5 CP	1,800 DIA PCC 600X600 ACCESS MANHOLE PCC -3M
SAR5 CP	E 299032.774 N 516118.444	94.775m D400	92.760m 92.760m 92.760m 92.910m	93.510m 93.510m 93.060m 93.210m	Ø750 Ø750 Ø300 Ø300	1:236 1:479 1:226 1:20	44.832m 28.734m 9.031m 3.244m	SAR6	2,100 DIA PCC 600X600 ACCESS 300MM SUMP
SAR6	E 299030.243 N 516116.414	95.043m D400	92.746m 92.746m	93.046m 92.971m	Ø300 Ø225	1:20 1:8	3.244m 23.220m	S2	1,800 DIA PCC 1220X685 ACCESS FLOW CONTROL

LEGEND:
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED OIL INTERCEPTOR
- PROPOSED ATTENUATION TANK
- PROPOSED LINEAR DRAINAGE CHANNEL
- PROPOSED GULLY
- EXISTING PRIVATE DRAINGE
- PROPOSED FOUL WATER DRAINAGE
- CAPPED PIPE
- PERFORATED PIPE IN TANK

Rev:	Description:	Date:	By:	Chkd:
C03	REVISION CLOUDS ADDED	21/07/22	DM	
C02	GULLIES UPDATED, SNEKYEAT CAR PARK DRAINAGE REMOVED FROM SYSTEM	15/07/22	DM	PT
C01	CONSTRUCTION ISSUE	19/05/22	DM	PT

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Status: CONSTRUCTION ISSUE A1

Client: GRAHAM

Project: PROCURE WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title: WASTE COMPOUND & ACCESS ROAD DRAINAGE LAYOUT

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A0 Scale: 1:200	MAY 21	DM	DM	PT

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
WCHPH2-	CUR -	VV -	XX -	DR -	C -	92002 -	C03

WCHPH2-CUR-VV-XX-DR-C-92002-C03 - Waste Compound and Access Road Drainage Layout.dwg

GENERAL NOTES:

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3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

LEGEND

841m²
144m² FOUL
1,294m²
351m²
176m²
689m²
595m²
1,156m²
759m²
1,966m²
1,016m²
393m²
1,424m²
416m²
868m²
739m²
1,060m²
EXISTING CL 85.130 IL 83.730
OUT
IN
UP
SCALEBAR (INDICATIVE ONLY)
NORTH (INDICATIVE ONLY)

Rev:	Description:	Date:	By:	Chkd:
P01	FIRST ISSUE	31/03/22	DM	AMB

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Status: ISSUED FOR INFORMATION S2

Client: GRAHAM

Project: PROCURE — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title: IMPERMEABLE AREAS LAYOUT

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A0 Scale: 1:250	MAR 22	DM	DM	PT

Project Code: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:
WCHPH2- CUR - VV - XX - DR - C - 92008 - P01

X:\Cdr\JP\DWG\ALE_AREAS.dwg

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

LEGEND

EXCEEDANCE FLOW DIRECTION

FLOODING WILL OCCUR IN THE WASTE COMPOUND AND ACCESS ROAD DRAINAGE SYSTEM FOR STORM EVENTS ABOVE THE 1 IN 100 YR + 40% CLIMATE CHANGE STORM EVENT OR IF THERE IS A BLOCKAGE.

FLOODING WILL FIRST OCCUR AT THE GULLIES, THE LOW POINT OF THE 2 PHASES, AND SURROUNDING AREAS. THIS FLOODING WILL FLOW TO THE WEST OF THE ACCESS, WHERE IT WILL POND UP TO 100mm WHERE THERE IS A KERB FACE TO HOLD THE WATER AND CONTOURS BEFORE THE ROAD FALLS TO THE SOUTH.

THE KERB WILL NOT OVERTOP AS IT HAS A 300mm FACE THE SURFECAE WATER WILL INSTEAD RUN TO THE SOUTH ALONG THE RING ROAD AND EVENTUALLY OFF SITE.

FLOODING WILL OCCUR IN THE PHASE 2 DRAINAGE SYSTEM FOR STORM EVENTS ABOVE THE 1 IN 100 YR + 40% CLIMATE CHANGE STORM EVENT.

FLOODING WILL FIRST OCCUR AT MANHOLES S7 & RE4, THE LOW POINTS OF THE 2 PHASES, AND SURROUNDING AREAS. THIS FLOODING WILL FLOW TO THE NORTH WEST OF THE CAR PARK, WHERE IT WILL POND UP TO 125mm WHERE THERE IS A KERB FACE TO HOLD THE WATER.

IF THIS OVERTOPS, THE WATER WILL CONTINUE TO FLOW TO THE NORTH WEST AND ONTO THE EXISTING RING ROAD WHERE IT WILL FLOW TO THE SOUTHWEST AND EVENTUALLY OFF OF THE SITE.

SCALEBAR (INDICATIVE ONLY)

NORTH (INDICATIVE ONLY)

Rev:	Description:	Date:	By:	Chkd:
P02	UPDATED TO REFLECT THE DRAINAGE LAYOUT	31/03/22	DM	AMB
P01	FIRST ISSUE	18/06/21	DM	PT

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Status: ISSUED FOR INFORMATION — S2

Client: GRAHAM

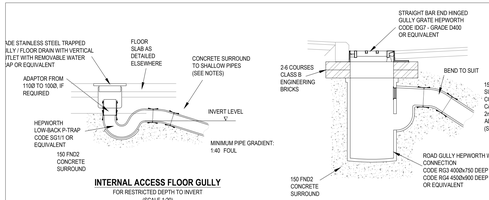
Project: PROCURE — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title: EXCEEDANCE FLOW ROUTES

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A0	MAY 21	DM	DM	PT
	Scale: 1:250				

Project Code: WCHPH2 Originator: CUR Zone: - Level: VV Type: XX Discipline: DR Category / Number: C - 92009 Rev: P02

WCHPH2-CUR-VV-XX-DR-C-92009.DWG Exceedance Flow Routes.dwg

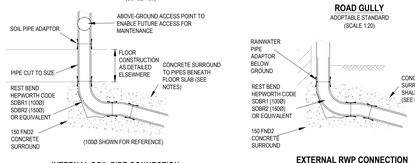


INTERNAL ACCESS FLOOR GULLY

FOR RESTRICTED DEPTH TO INVERT
(SCALE 1:20)

ROAD GULLY

ADOPTABLE STANDARD
(SCALE 1:20)



INTERNAL SOIL PIPE CONNECTION

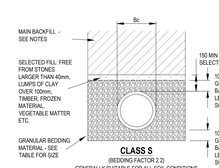
DENOTED SP ON PLAN
(PIPE RUN BENEATH FLOOR SLAB)
(SCALE 1:20)

EXTERNAL RWP CONNECTION

(SCALE 1:20)

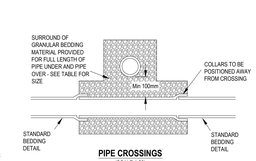
NOTES: HARDSTANDING AREAS BACKFILL: DETR TYPE 1 GRANULAR MATERIAL	GRANULAR MATERIAL IN ACCORDANCE WITH BS EN 1610 ANNEX B TABLE B.15 - SINGLE SIZED OR GRADED 5mm UP TO MAXIMUM SIZE OF DIAMETER:
SOFT LANDSCAPE AREAS BACKFILL: SELECTED BACKFILL MATERIAL UP TO UNDERSIDE OF TOP-SOIL	
PIPE SIZE (mm)	
100	10
150	14
>150<600	20
> 600	40

SIZES FOR GRANULAR PIPE BEDDING MATERIAL



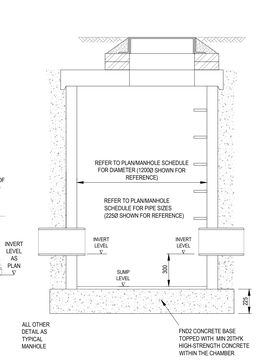
CLASS S

(BEDDING FACTOR 2.2)
GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



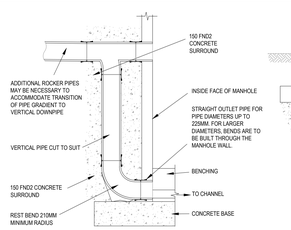
PIPE CROSSINGS

(SCALE 1:20)



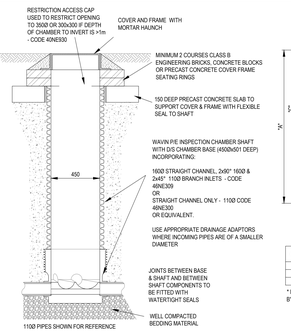
SILT TRAP MANHOLE (ST)

(SCALE 1:20)



TYPICAL VERTICAL BACKDROP (150Ø)

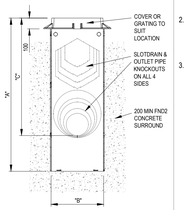
INVERT OF TUMBLING BAY NOT MORE THAN 1.5m ABOVE BENCHING
(SCALE 1:20)



PIPE JOINTS TO BE AS CLOSE AS POSSIBLE TO FACE OF CHAMBER TO PERMIT SATISFACTORY JOINT AND SUBSEQUENT MOVEMENT

450Ø PPIC

MAX DEPTH FROM COVER TO SOFFIT OF PIPE 3.0M
(SCALE 1:20)



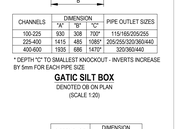
DIMENSION		
CHANNELS	"A"	"B"
100-225	530	308
225-400	1415	486
400-600	1935	686

DIMENSION				PIPE OUTLET SIZES
CHANNELS	"A"	"B"	"C"	
100-225	530	308	700*	115/160/205/255
225-400	1415	486	1080*	205/255/320/360/440
400-600	1935	686	1470*	320/360/440

* DEPTH "C" TO SMALLEST KNOCKOUT - INVERTS INCREASE BY 5mm FOR EACH PIPE SIZE

GATIC SILT BOX

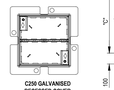
DENOTED OB ON PLAN
(SCALE 1:20)

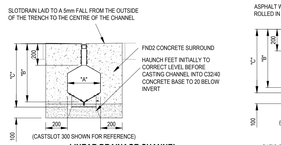


DIMENSION		
CHANNELS	"A"	"B"
100-225	475	308
225-400	675	485
400-600	1055	686

GATIC ACCESS BOX

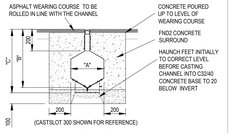
DENOTED AB ON PLAN
(SCALE 1:20)





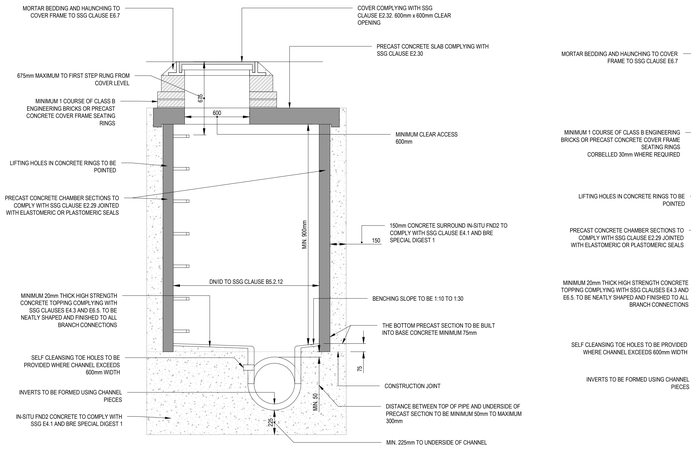
LINEAR DRAINAGE CHANNEL

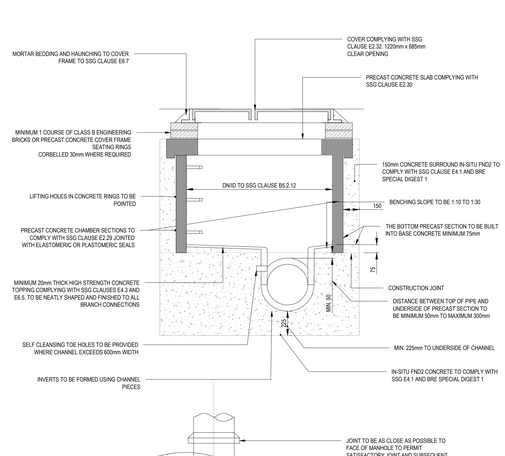
GATIC ULTRASLOT TREADSAFE INSTALLED WITH CONCRETE SURROUND
(SCALE 1:20)



LINEAR DRAINAGE CHANNEL

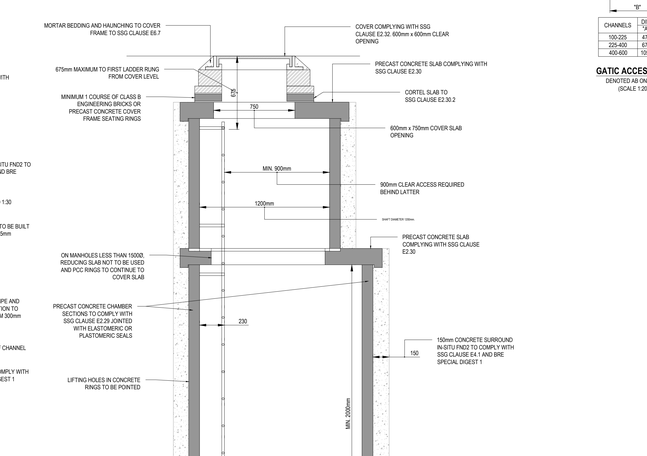
GATIC CASTSLOT TREADSAFE INSTALLED WITH ASPHALT SURROUND
(SCALE 1:20)





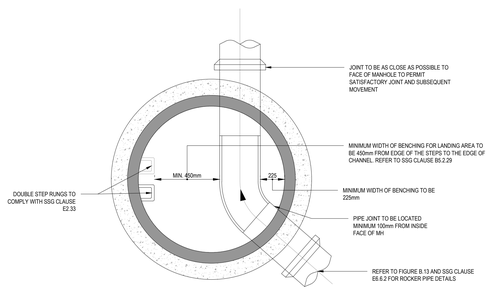
SEWERAGE SECTOR GUIDANCE FIGURE B.15
TYPICAL MANHOLE DETAIL - TYPE C

DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE LESS THAN 1.5m
RIGID MATERIAL CONSTRUCTION WITH CONCRETE SURROUND



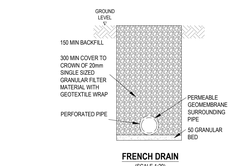
SEWERAGE SECTOR GUIDANCE FIGURE B.5
TYPICAL MANHOLE DETAIL - TYPE A1

DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3m TO 6m WITH LADDER AND REDUCING SLAB
RIGID MATERIAL CONSTRUCTION WITH CONCRETE SURROUND



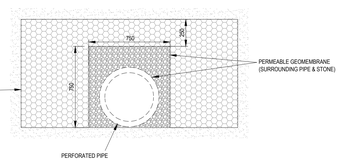
SEWERAGE SECTOR GUIDANCE FIGURE B.10
TYPICAL MANHOLE DETAIL - TYPE B

DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m TO 3m WITH STEPS
RIGID MATERIAL CONSTRUCTION WITH CONCRETE SURROUND



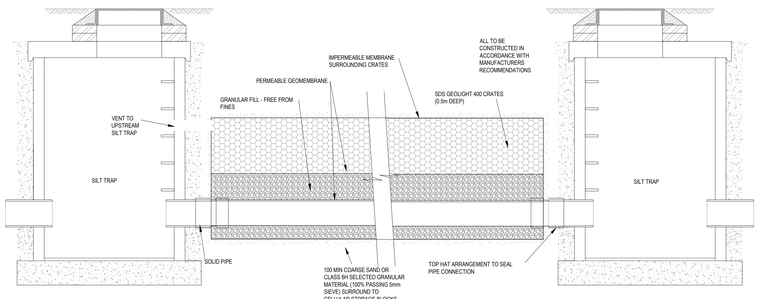
FRENCH DRAIN

(SCALE 1:20)



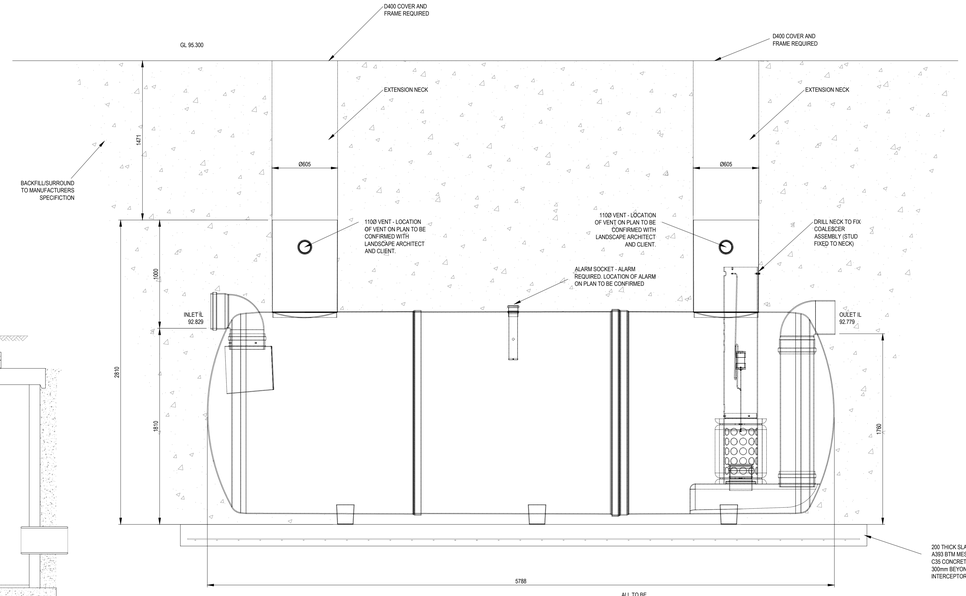
TYPICAL SECTION THROUGH TANK

(NTS)



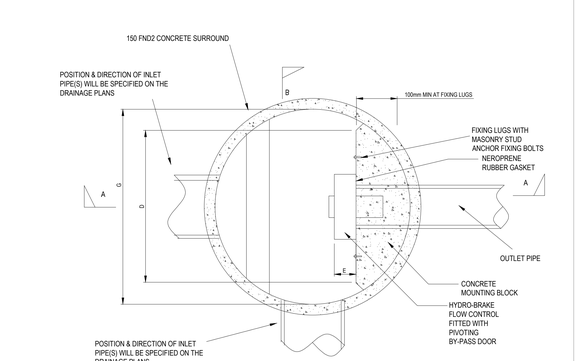
TYPICAL LONG SECTION THROUGH TANK

(NTS)



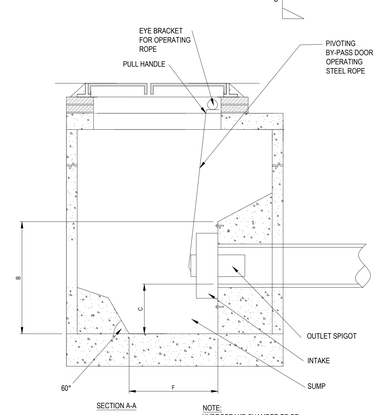
KLARGESTER NSFA050 TYPICAL DETAIL

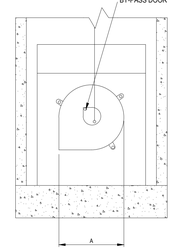
(NTS)



PIPES PASSING THROUGH TRENCH FILL FOUNDATIONS & SUB-STRUCTURE PERPENDICULAR TO LINE OF THIS

(NOT TO SCALE)





MIN FLOW CONTROL CHAMBER DIMENSIONS			
MH	S7	S10	SAR6
A	870	600	630
B	1220	950	980
C	480	380	390
D	1075	805	835
E	185	125	115
F	370	250	230
G	1800	1500	1800

NOTE:
HYDROBRAKE CHAMBER TO BE CONSTRUCTED GENERALLY AS A TYPE C MANHOLE.
TO BE INSTALLED AS PER MANUFACTURERS REQUIREMENTS

TYPICAL HYDROBRAKE CHAMBER

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

Rev:	Description:	Date:	By:	Chkd:
C03	REVISION CLOUDS ADDED	21/07/22	DM	
C02	HYDROBRAKE TABLE AND PERFORATED PIPE UPDATED	15/07/22	DM	PT
C01	CONSTRUCTION ISSUE	26/05/22	DM	AMB

Curtins
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Status: CONSTRUCTION ISSUE — A1

Client: GRAHAM

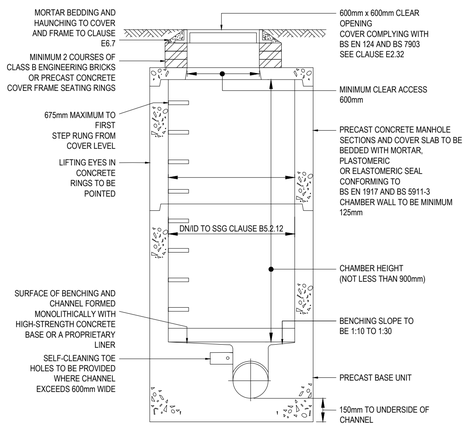
Project: PROCURE — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

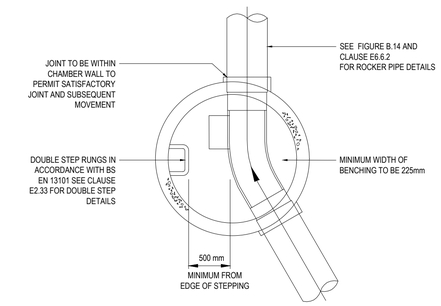
Drg Title: DRAINAGE DETAILS

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A0	MAY 21	DM	DM	PT
	Scale: AS SHOWN				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
WCHPH2-	CUR -	VV -	XX -	DR -	C -	92010	- C03

WCHPH2-CUR-XX-XX-DR-C-92010-C03- Drainage Details.dwg





SEWERAGE SECTOR GUIDANCE FIGURE B.9
TYPICAL MANHOLE DETAIL - TYPE B
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m TO 3m WITH STEPS
RIGID MATERIAL CONSTRUCTION WITHOUT CONCRETE SURROUND

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.

Rev:	Description:	Date:	By:	Chkd:
C01	FIRST ISSUE	21/07/22	DM	AMB

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Status: CONSTRUCTION ISSUE — A1

Project: GRAHAM

Project: PROCURE 22 — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title: DRAINAGE DETAILS SHEET 2

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A1	JUL 22	DM	DM	AMB
	Scale: AS SHOWN				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
WCHPH2	CUR	VV	XX	DR	C	92011	C01

WCHPH2-CUR-VV-XX-DR-C-92011-C01 - Drainage Details Sheet 2.dwg

Appendix D Existing Drainage Layout

How to contact us:

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

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Curtins Consulting Ltd

51-55
Tithebarn Street,
Liverpool,
L2 2SB

FAO:

Your Ref: B071551
Our Ref: UUPS-ORD-118253
Date: 14/08/2019

Dear Sirs

Location: West Cumberland Hospital

I acknowledge with thanks your request dated 13/08/2019 for information on the location of our services.

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

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

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

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

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

Yours Faithfully,

Karen McCormack
Property Searches Manager

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

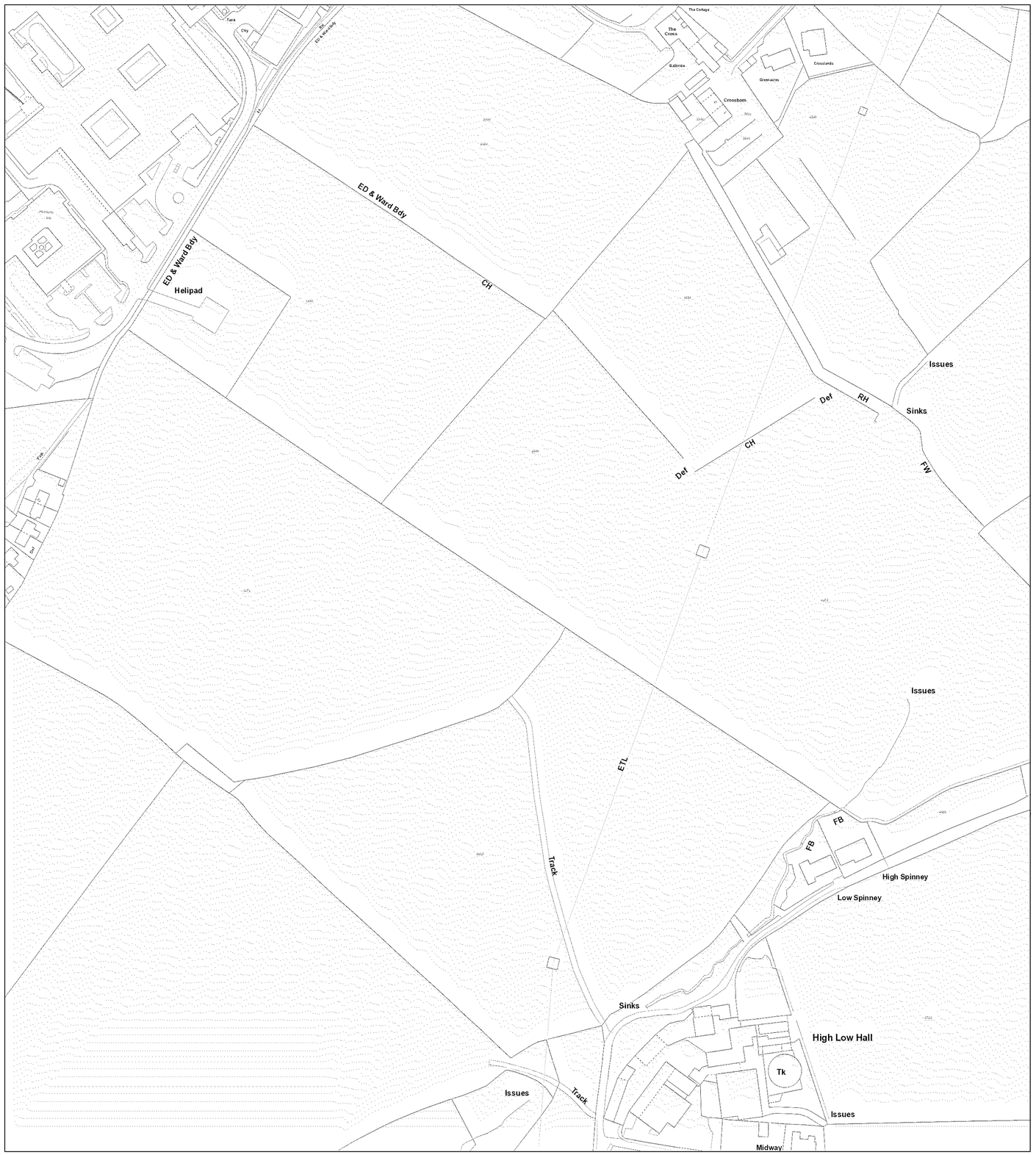
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

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

TERMS AND CONDITIONS:

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

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



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.

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

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	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

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 Reinforecd 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:

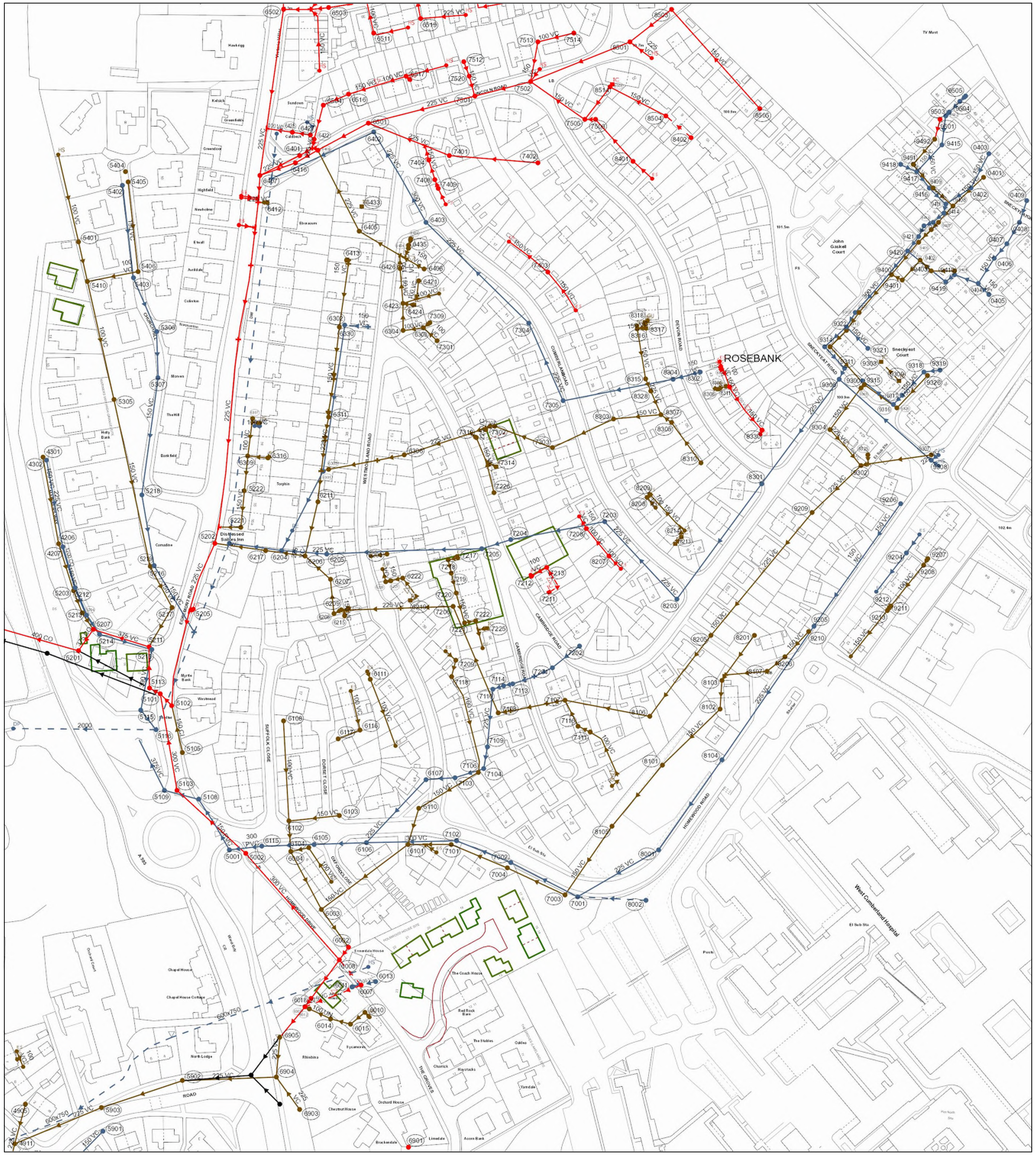
West Cumberland Hospital,

OS sheet Number: NX9915NW
Scale: 1:1250 **Date:** 14/08/2019
Nodes: 0
Sheet: 1 of 5

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly



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.

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6001	59.71	CO	58.16	225			VC	22.02271	1 in 17
6001	59.71	CO	58.16	225			VC	22.02271	1 in 17
8310		FO		150			VC	27.67902	
9505		SW	0	150			VC	4.24264	
9505		SW	0	150			VC	4.24264	
0401		FO	0	150			VC	23.34524	
0401		FO	0	150			VC	23.34524	
5307		SW		150			VC	65.57507	
5108	58.71	SW	57.06	375			VC	19.64688	1 in 20
8304	96.15	SW	94.73	225			VC	62.16912	1 in 8
5103	58.55	CO	56	300			VC	54.28561	1 in 71
6403	85.49	SW	83.88	300			VC	28.6531	1 in 61
5002	61.5	CO	56.6	300			VC	51.66236	1 in 86
7109	74.88	SW	73.88	225			VC	12.16553	1 in 10
5201	56.4	CO	52.62	400			CO	46.11607	1 in 24
7512	91.5	CO	90.77	150			VC	8.544003	1 in 26
5903	50.87	FO	49.67	225			VC	52	1 in 12
5903	50.87	FO	49.67	225			VC	52	1 in 12
8105	83.8	FO	79	150			VC	46.04346	1 in 8
7114	76.75	SW	75.64	225			VC	6.324555	1 in 14
9210	94.5	FO	93.58	150			VC	19.10497	1 in 22
6215		FO		150			VC	3.370812	
6302	79.16	SW	77.18	225			VC	81.88406	1 in 13
6402	84.8	SW	82.95	225			VC	62.15188	
6330		FO	0	150			VC	26.1725	
8104	88.96	SW	87.76	225			VC	61.03278	1 in 8
8208		FO		100			VC	2.255198	
7104	74.14	SW	72.62	225			VC	16.76305	1 in 6
9501		CO	0	150			VC	11.40175	
9501		CO	0	150			VC	11.40175	
5102	59.23	CO	57.55	225			VC	9.143506	1 in 11
7101	69.44	FO	67.52	150			VC	24	1 in 13
5410		FO		100			VC	67.00884	
6519	89.64	CO	0	225			VC	16.27882	
6304		FO		150			VC	15.11182	
7402	93.71	CO	92.41	225			VC	49.16299	1 in 9
8311		CO		150			VC	1.882831	
0402		SW	0	150			VC	16.64332	
0402		SW	0	150			VC	16.64332	
7206	78.19	FO	74.56	225			VC	29.01724	
6305	73.15	FO	70.85	225			VC	21.24035	
6217		FO	0	225			VC	28.28427	
9503		SW	0	150			VC	2.828427	
9503		SW	0	150			VC	2.828427	
9211		FO		100			VC	1.830842	
6007	63	CO	60.77	300			VC	16.15549	1 in 0.27377553
6007	63	CO	60.77	300			VC	16.15549	1 in 0.27377553
6301	72.98	SW	71.08	225			VC	37.12142	
7102	69.58	SW	68.08	300			VC	50.01	1 in 23
7202	83.46	SW	81.84	225			VC	19.20937	1 in 6
6406	84.32	FO	82.57	150			VC	8.062258	
8328		FO		225			VC	14.29498	
6103	67	FO	66.04	150			VC	28.16026	1 in 8
5901	50.18	SW	49.28	150			VC	65.76473	1 in 15
5901	50.18	SW	49.28	150			VC	65.76473	1 in 15
7108	75.84	FO	74.68	225			VC	64.07808	1 in 534
9404		FO	0	150			VC	13	
9404		FO	0	150			VC	13	
9305		FO	0	150			VC	28.6007	
6222		FO		100			VC	6.748543	
9326		FO	0	150			VC	24.75884	
9326		FO	0	150			VC	24.75884	
9308	102.73	SW	100.13	225			VC	68.0147	1 in 77
9308	102.73	SW	100.13	225			VC	68.0147	1 in 77
5401		FO		100			VC	22.50025	
6110	68.9	FO	67.3	150			VC	20.88061	1 in 12
6221		FO		100			VC	2.867628	
5219		SW		150			VC	43.31205	
7118		FO		100			VC	56.01379	
6427		CO		100			VC	10.0583	
5218		SW		150			VC	39.71027	
6008	62.8	CO	60.67	300			VC	78.64477	1 in 67
6008	62.8	CO	60.67	300			VC	78.64477	1 in 67
6905	58.7	FO	58.7	225			VC	22.09072	
6905	58.7	FO	58.7	225			VC	22.09072	
7213		CO		100			VC	9.773593	
9325		FO		225			VC	5	1 in
9204		SW		0			VC	26.94139	
9204		SW		0			VC	26.94139	
6517	88.17	CO	86.96	100			VC	16.76305	1 in 8
7409		CO		150			VC	5.065056	
7218		FO		150			VC	7.465043	
7004	72.53	FO	70.51	150			VC	33.61547	1 in 11
6426		FO		150			VC	7.297792	
9413	107.45	SW	105.75	225			VC	5.385165	1 in 4
9413	107.45	SW	105.75	225			VC	5.385165	1 in 4
5216		FO		150			VC	25.81408	
6216		FO		225			VC	1	1 in
5305		FO		150			VC	94.7526	
4911	47.33	FO	45.48	225			VC	26.68333	1 in 40
4911	47.33	FO	45.48	225			VC	26.68333	1 in 40
9415		SW	0	150			VC	20.51828	
9415		SW	0	150			VC	20.51828	
9207		FO		100			VC	4.359111	
9207		FO		100			VC	4.359111	
6311	74.98	FO	73.63	150			VC	11.18034	
6903	60.03	FO	57.45	225			VC	22.2036	
6903	60.03	FO	57.45	225			VC	22.2036	
5306		SW		150			VC	25.50625	
9311		SW	0	300			VC	6.708204	
6407	77.77	CO	76.57	225			VC	15.0333	
7208		CO		150			VC	7.790169	
7404		CO		150			VC	8.396434	
9314		FO	0	150			VC	28.3196	
9405		FO	0	150			VC	23.43075	
9405		FO	0	150			VC	23.43075	
6422		CO		225			VC	5.09902	1 in
6104		FO		100			VC	10.1987	
5402		SW		150			VC	51.58201	
9319		SW	0	150			VC	9.055386	
9319		SW	0	150			VC	9.055386	
8402		CO		150			VC	18.43909	1 in
6516	83.45	CO	82.71	150			VC	15.23155	
5203	9.81	FO	4.15	150			VC	13.15617	1 in 29
8209		FO		150			VC	0.5021425	
7501	91.41	CO	89.93	225			VC	60.87693	1 in 6
6207		FO	0	225			VC	19.10497	
8509		CO	0	150			VC	22.80351	
8316		FO		150			VC	28.07528	
6416		CO		225			VC	20.89049	
8305	95.48	FO		150			VC	7.237054	
4905	48.62	FO	46.15	225			VC	22.80351	1 in 34
4905	48.62	FO	46.15	225			VC	22.80351	1 in 34
5116	10.05	SW	4.35	2000				78.91244	
7217		FO		150			VC	5.401602	
6007	63	CO	60.77	300			VC	18.43909	1 in 0.31444558
6007	63	CO	60.77	300			VC	18.43909	1 in 0.31444558
6014	1	FO		100			UN	12.96326	
6014	1	FO		100			UN	12.96326	
9412	106.17	SW	104.47	225			VC	6.708204	1 in 8
9412	106.17	SW	104.47	225			VC	6.708204	1 in 8
9302	100.24	FO	98.58	225			VC	37.48333	1 in 13
8001	81.42	SW	79.75	225			VC	51.97115	1 in 9
8503	100.87	CO	99.22	225			VC	29.20616	1 in 28
6115	61.95	SW	60.9	300			PVC	9.055386	1 in 8
9206	100.5	SW	99.12	150			VC	41.61731	1 in 14
7219		FO		150			VC	11.44081	
7111		FO		100			VC	7.424032	
9306	100.65	SW	98.53	225			VC	72.20111	1 in 22
6108		FO		100			VC	55.67823	
5101	59.45	CO	55.13	375			VC	6.848336	
9414	107	SW	104.85	225			VC	7.81025	
9414	107	SW	104.85	225			VC	7.81025	
6106	67.48	SW	65.88	300			VC	29.01724	1 in 13
5214	9.72	SW	7.11	300			VC	30.26404	1 in 112
7506		CO	0	150			VC	6	
5109	57.51	SW	55	375			VC	31.30495	
6501	80.82	CO	79.7	225			VC	31.76476	1 in 199
9402		FO	0	150			VC	14.86607	
9402		FO	0	150			VC	14.86607	
8101	87.77	FO	84.77	150			VC	44.04543	1 in 8
5113		CO		375			VC	22.91126	
9205	94.7	SW	93.2	225			VC	89.87213	1 in 17
8203	91.46	SW	89.91	225			VC	58.72819	1 in 33
6405	81.63	FO	80.01	225			VC	50.53711	1 in 108
6204	68.3	SW	66.8	300			VC	29.27456	1 in 7
5207		CO		375			CO	14.41117	
0404		SW	0	150			VC	13.92839	
0404		SW	0	150			VC	13.92839	
7220		FO		150			VC	17.02695	
7520	91.49	CO	90.4	150			VC	11.40175	1 in 26
7205	80.33	SW	78.5	300			VC	43.01163	1 in 12
8102	91.17	FO	89.37	150			VC	44.55334	1 in 10
8401		CO		150			VC	31.07613	
4301	11.55	FO	7.63	150			VC	48.91954	1 in 326
7110	76.43	SW	75.18	225			VC	32.14032	1 in 25
6408	80.78	CO	79.54	150			VC	1.414214	
6105	65.18	SW	63.7	300			VC	29.01724	1 in 10
9213		FO		150			VC	32.30826	
7209		FO		100			VC	9.304545	
8504		CO	0	150			VC	34.88553	
8107		FO	0	150			VC	23.08679	
7303	86.66	FO	84.29	225			VC	34.17601	1 in 11
6208	72.55	FO	70.64	225			VC	19.10497	
0405		SW	0	150			VC	8.485281	
0405		SW	0	150			VC	8.485281	
6011	63.21	SW	60.91	600				3.162278	1 in 5.39177776
6011	63.21	SW	60.91	600				3.162278	1 in 5.39177776
7401	88.88	CO	87.23	225			VC	48.46779	1 in 7
4207	10.13	SW	7.37	1200			CO	23.59021	1 in 197
7505	95.98	CO	95.21	150			VC	36.61967	1 in 18
7107	80.48	FO	78.48	225			VC	10.19804	
5001	59.57	SW	58.68	150			PVC	16.12452	1 in 20
9421	105.76	SW	103.66	225			VC	10	1 in 11
9421	105.76	SW	103.66	225			VC	10	1 in 11
4302	11.53	SW	9.8	225			VC	48.94367	1 in 20
6436		FO		100			VC	3.7855	
9313	102.1	SW	100.27	300			VC	9.433981	1 in 23
8505		CO	0	150			VC	73.66138	
7403		CO		150			VC	27.34769	
9321		SW	0	150			VC	16.97056	
6306	78.02	FO	76.47	225			VC	15.29706	
5212	9.66	SW	7.25	1200			CO	16.45719	1 in 206
6205	73.13	SW	71.23	225			VC	12.04159	1 in 5
7301		FO		100			VC	10.43008	
6107	70.12	SW	68.44	225			VC	48.10405	1 in 19
7103	71.42	SW	69.81	225			VC	16.03122	1 in 12
8301	96.86	SW	95.26	225			VC	79.40403	1 in 15
9312	101.51	SW	99.81	300			VC	16.27882	1 in 39
9409		FO	0	150			VC	14.86607	
9409		FO	0	150			VC	14.86607	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6111		FO		100			VC	39.41388	
7304	89.58	SW	86.67	225			VC	79.9062	1 in 29
9320		FO	0	150			VC	22.2036	
7203	89.77	SW	88.1	225			VC	52.95281	1 in 6
9406		FO	0	150			VC	9.899495	
9406		FO	0	150			VC	9.899495	
5221		FO		150			VC	12.37279	
7116		FO		100			VC	16.17083	
5105	58.72	FO	58.07	150			CI	26.60563	1 in 83
9401		FO	0	150			VC	6.708204	
9304	99.88	FO	0	225			VC	13.45362	
8002		SW		300			VC	38.0526	1 in
5403		SW		150			VC	32.51481	
6904		FO	0	225			VC	52.03845	
6904		FO	0	225			VC	52.03845	
5210	64.54	SW		0				53.06074	
7001	76.45	SW	74.13	300			VC	41.59327	1 in 11
6502	82.18	CO	80.56	225			VC	92.91394	1 in 23
9407		FO	0	150			VC	5.656854	
9407		FO	0	150			VC	5.656854	
7302	83.64	FO	81.16	225			VC	2	
6303		FO		100			VC	11.44424	
9212		FO		100			VC	1.523291	
7309		FO		100			VC	4.366651	
7305	89.86	SW	87.26	225			VC	47.01064	1 in 85
9400		FO	0	150			VC	27.65863	
5215	11.16	SW	6.84	300			VC	34.04999	1 in 170
6013	64.09	SW	61.94	300			VC	8.246211	1 in 0.13810435
6013	64.09	SW	61.94	300			VC	8.246211	1 in 0.13810435
6401	79.32	CO	77.94	225			VC	24.59675	1 in 18
9492		FO	0	150			VC	18.43909	
9492		FO	0	150			VC	18.43909	
7513		CO	0	150			VC	22.36068	
6412		FO		225			VC	5	
6435		FO		100			VC	5.693299	
8315		FO		225			VC	7.358759	
5902	54.85	FO	53.77	225			VC	47.43417	1 in 12
5902	54.85	FO	53.77	225			VC	47.43417	1 in 12
7502	94.71	CO	93.16	225			VC	32.01562	1 in 10
8303	92.42	FO	90.74	225			VC	37.57659	1 in 6
9323		FO	0	150			VC	12.20656	
0403		SW	0	150			VC	21.47091	
0403		SW	0	150			VC	21.47091	
9420	104.89	SW	102.68	225			VC	22.02271	1 in 17
9420	104.89	SW	102.68	225			VC	22.02271	1 in 17
6209		FO	0	225			VC	4.472136	
8205	92.82	FO	91.33	150			VC	27.80288	1 in 9
8206	93.14	FO	92.71	150			VC	12.80625	
8330		CO		150			VC	2.447339	
6012	1.2	FO		100			UN	2.707188	
6012	1.2	FO		100			UN	2.707188	
0408		SW	0	150			VC	13.89244	
0408		SW	0	150			VC	13.89244	
9316		SW	0	150			VC	21.40093	
8207		CO		100			VC	19.85966	
5213	9.71	SW	7.17	1200			CO	12.84985	1 in 214
7408		CO		150			VC	11.40206	
6003	63.8	FO	61.87	225			VC	25.80698	1 in 70
6003	63.8	FO	61.87	225			VC	25.80698	1 in 70
6206		FO	0	225			VC	22.2036	
9300		FO	0	150			VC	2.828427	
9410		SW	0	150			VC	6.403124	
9410		SW	0	150			VC	6.403124	
8302	97.28	SW	96.03	150			VC	7.28011	1 in 12
5217		FO		150			VC	25.29301	
0409		SW	0	150			VC	12.64911	
0409		SW	0	150			VC	12.64911	
6413	80.33	FO	79.37	150			VC	1	
7201	80.48	SW	78.45	225			VC	11.18034	
4206	10.11	FO	7.48	150			VC	27.25008	1 in 8
0407		SW	0	150			VC	10.63015	
0407		SW	0	150			VC	10.63015	
5406		FO		100			VC	28.58987	
6511	86.39	CO	85.8	100			VC	18.43909	
7106	73.76	FO	0	150			VC	38.58756	
8307		FO		150			VC	26.31764	
6421		FO		100			VC	18.06347	
6004	63.76	FO	62.76	150			VC	36.23534	1 in 41
9419	105.14	SW	103.24	225			VC	27.01851	1 in 52
9419	105.14	SW	103.24	225			VC	27.01851	1 in 52
7002	72.57	SW	70.37	300			VC	32.31099	1 in 14
8501	99.79	CO	98.17	225			VC	59.23681	1 in 12
8103	91.53	FO	90.75	150			VC	16.03122	1 in 12
9502		SW	0	150			VC	16.12452	
9502		SW	0	150			VC	16.12452	
9307	102.69	FO	0	225			VC	35.35534	
9307	102.69	FO	0	225			VC	35.35534	
6211		FO	0	225			VC	30.80584	
9411	107.52	SW	104.92	225			VC	5.09902	1 in 73
9411	107.52	SW	104.92	225			VC	5.09902	1 in 73
7312		FO		150			VC	3.867599	
5204	9.69	FO	3.7	375			VC	11.08652	
9208		FO		100			VC	28.90358	
9208		FO		100			VC	28.90358	
5211		CO		375			VC	32.31872	
9318		SW	0	150			VC	17.69181	
9318		SW	0	150			VC	17.69181	
6203		FO		100			VC	8.73541	
9416	107.31	SW	105.06	225			VC	12.72792	1 in 91
9416	107.31	SW	105.06	225			VC	12.72792	1 in 91
6503	84.41	CO	82.26	225			VC	10.04988	
9418		SW	0	150			VC	9.848858	
7514	96.98	CO	96.2	100			VC	20.61553	
8106	86.67	FO	85.14	225			VC	47.85394	1 in 7
7307		FO		225			VC	1	1 in
9408		FO	0	150			VC	12.04159	
9408		FO	0	150			VC	12.04159	
6428		CO		100			VC	14.48718	
6101	67.88	FO	65.62	150			VC	60	1 in 16
9310	100.81	SW	99.36	300			VC	16.27882	
9322		FO	0	150			VC	12.72792	
7204	82.14	SW	79.86	225			VC	16.76305	1 in 12
8201	93.47	FO	92.67	150			VC	27.20294	
6504	82.98	CO	0	150			VC	19.64688	
9209	97.6	FO	95.69	225			VC	44.04543	1 in 20
5202	64.59	CO	63.43	225			VC	93.80418	1 in 13
9417		SW	0	150			VC	11.40175	
9417		SW	0	150			VC	11.40175	
6220		FO		150			VC	7.126692	
9317		SW	0	150			VC	7.071068	
7113	77.47	SW	75.9	225			VC	5.09902	1 in 20
6002	63.41	CO	61.5	225			VC	8.602325	1 in 10
6002	63.41	CO	61.5	225			VC	8.602325	1 in 10
7003	76.64	FO	73	150			VC	35.34119	1 in 14
9491		FO	0	150			VC	17.02939	
9491		FO	0	150			VC	17.02939	
6102	64.26	FO	62.66	150			VC	17.02939	
9504		SW	0	150			VC	8.485281	
9504		SW	0	150			VC	8.485281	
5115	10.19	SW	6.64	300			VC	13.63866	1 in 6
6423		FO		150			VC	19.42896	
6434		FO		100			VC	1.655486	
9403		FO	0	150			VC	8.485281	
9403		FO	0	150			VC	8.485281	
0406		SW	0	150			VC	16.64332	
0406		SW	0	150			VC	16.64332	
6307		FO		100			VC	20.92479	
5222		FO		150			VC	20.27811	
7221		FO		150			VC	6.286202	
6010	1.4	FO		100			UN	10.38323	
6010	1.4	FO		100			UN	10.38323	
7222		FO		150			VC	15.70882	
6015	1	FO		100			UN	11.39401	
6015	1	FO		100			UN	11.39401	
6309		FO		150			VC	19.51291	

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
- TR Trapezoidal
- EG Egg
- AR Arch
- OV Oval
- BA Barrel
- FT Flat Top
- HO HorseShoe
- RE Rectangular
- UN Unspecified
- SQ Square

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:

West Cumberland Hospital,

OS sheet Number: NX9816SE

Scale: 1:1250

Date: 14/08/2019

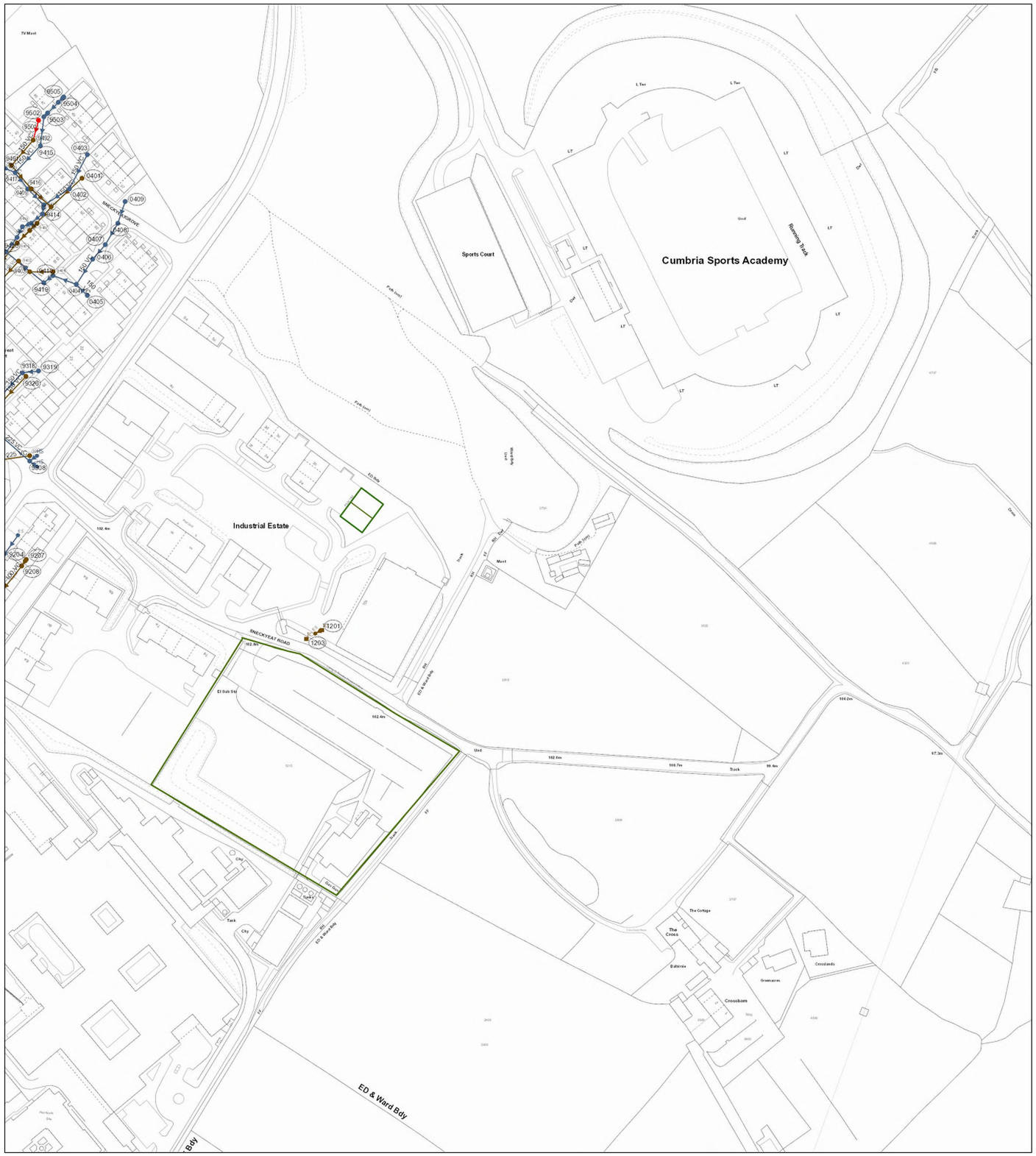
Nodes: 346

Sheet: 2 of 5

Printed by: Property Searches

SEWER RECORDS

United Utilities – helping life flow smoothly



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.

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
9413	107.45	SW	105.75	225			VC	5.385165	1 in 4
9413	107.45	SW	105.75	225			VC	5.385165	1 in 4
9412	106.17	SW	104.47	225			VC	6.708204	1 in 8
9412	106.17	SW	104.47	225			VC	6.708204	1 in 8
9307	102.69	FO	0	225			VC	35.35534	
9307	102.69	FO	0	225			VC	35.35534	
9505		SW	0	150			VC	4.24264	
9505		SW	0	150			VC	4.24264	
0401		FO	0	150			VC	23.34524	
0401		FO	0	150			VC	23.34524	
9411	107.52	SW	104.92	225			VC	5.09902	1 in 73
9411	107.52	SW	104.92	225			VC	5.09902	1 in 73
9406		FO	0	150			VC	9.899495	
9406		FO	0	150			VC	9.899495	
9415		SW	0	150			VC	20.51828	
9415		SW	0	150			VC	20.51828	
9207		FO		100			VC	4.359111	
9207		FO		100			VC	4.359111	
9208		FO		100			VC	28.90358	
9208		FO		100			VC	28.90358	
0405		SW	0	150			VC	8.485281	
0405		SW	0	150			VC	8.485281	
9318		SW	0	150			VC	17.69181	
9318		SW	0	150			VC	17.69181	
9416	107.31	SW	105.06	225			VC	12.72792	1 in 91
9416	107.31	SW	105.06	225			VC	12.72792	1 in 91
9418		SW	0	150			VC	9.848858	
9404		FO	0	150			VC	13	
9404		FO	0	150			VC	13	
0408		SW	0	150			VC	13.89244	
0408		SW	0	150			VC	13.89244	
9326		FO	0	150			VC	24.75884	
9326		FO	0	150			VC	24.75884	
9421	105.76	SW	103.66	225			VC	10	1 in 11
9421	105.76	SW	103.66	225			VC	10	1 in 11
9408		FO	0	150			VC	12.04159	
9408		FO	0	150			VC	12.04159	
9308	102.73	SW	100.13	225			VC	68.0147	1 in 77
9308	102.73	SW	100.13	225			VC	68.0147	1 in 77
9414	107	SW	104.85	225			VC	7.81025	107
9414	107	SW	104.85	225			VC	7.81025	
9407		FO	0	150			VC	5.656854	
9407		FO	0	150			VC	5.656854	
9405		FO	0	150			VC	23.43075	
9405		FO	0	150			VC	23.43075	
9402		FO	0	150			VC	14.86607	
9402		FO	0	150			VC	14.86607	
9319		SW	0	150			VC	9.055386	
9319		SW	0	150			VC	9.055386	
9410		SW	0	150			VC	6.403124	
9410		SW	0	150			VC	6.403124	
0409		SW	0	150			VC	12.64911	
0409		SW	0	150			VC	12.64911	
9501		CO	0	150			VC	11.40175	
9501		CO	0	150			VC	11.40175	
9417		SW	0	150			VC	11.40175	
9417		SW	0	150			VC	11.40175	
0404		SW	0	150			VC	13.92839	
0404		SW	0	150			VC	13.92839	
0407		SW	0	150			VC	10.63015	
0407		SW	0	150			VC	10.63015	
9491		FO	0	150			VC	17.02939	
9491		FO	0	150			VC	17.02939	
9504		SW	0	150			VC	8.485281	
9504		SW	0	150			VC	8.485281	
9492		FO	0	150			VC	18.43909	
9492		FO	0	150			VC	18.43909	
9204		SW		0			VC	26.94139	
9204		SW		0			VC	26.94139	
0402		SW	0	150			VC	16.64332	
0402		SW	0	150			VC	16.64332	
9403		FO	0	150			VC	8.485281	
9403		FO	0	150			VC	8.485281	
0406		SW	0	150			VC	16.64332	
0406		SW	0	150			VC	16.64332	
9419	105.14	SW	103.24	225			VC	27.01851	1 in 52
9419	105.14	SW	103.24	225			VC	27.01851	1 in 52
9409		FO	0	150			VC	14.86607	
9409		FO	0	150			VC	14.86607	
9503		SW	0	150			VC	2.828427	
9503		SW	0	150			VC	2.828427	
0403		SW	0	150			VC	21.47091	
0403		SW	0	150			VC	21.47091	
9420	104.89	SW	102.68	225			VC	22.02271	1 in 17
9420	104.89	SW	102.68	225			VC	22.02271	1 in 17
9502		SW	0	150			VC	16.12452	
9502		SW	0	150			VC	16.12452	

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	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

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:

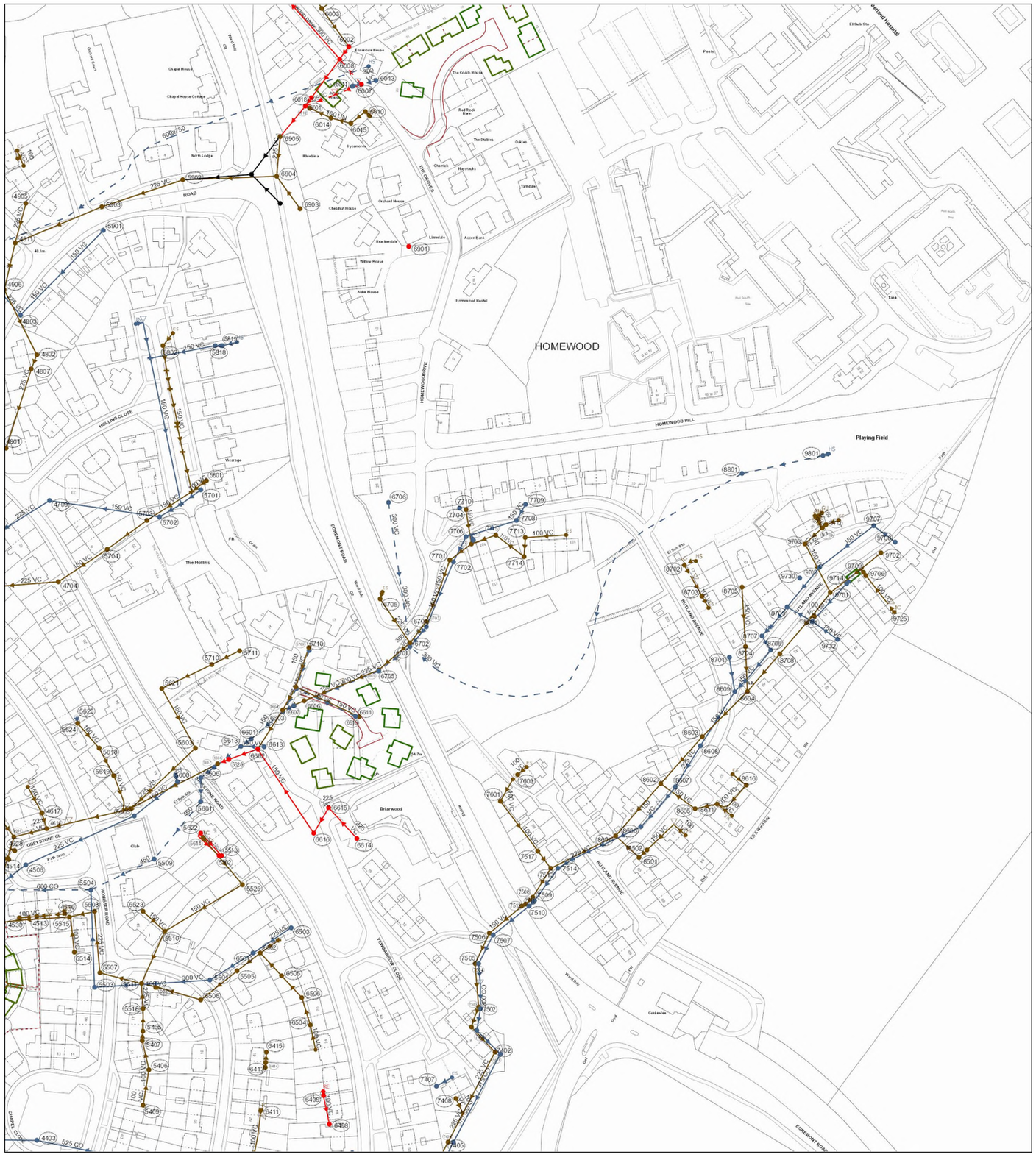
West Cumberland Hospital,

OS sheet Number: NX9916SW
Scale: 1:1250 **Date:** 14/08/2019
Nodes: 87
Sheet: 3 of 5

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6001	59.71	CO	58.16	225			VC	22.02271	1 in 17
6001	59.71	CO	58.16	225			VC	22.02271	1 in 17
5605	33.53	SW	32.13	225			VC	65.79514	1 in 13
6701	55.04	SW	50.78	300			VC	22.02953	1 in 137.686449
6603	46.88	SW	45.35	300			VC	23.4031	1 in 9.00119430
5608	38.32	SW	36.87	150			VC	30.61046	1 in 7
5903	50.87	FO	49.67	225			VC	52	1 in 12
5903	50.87	FO	49.67	225			VC	52	1 in 12
6502	35.16	FO	34.06	225			VC	16.40122	1 in 4
6502	35.16	FO	34.06	225			VC	16.40122	1 in 4
9714	80.37	SW	0	150			VC	28.3196	
5409		FO		100			VC	20.01115	
5409		FO		100			VC	20.01115	
8501	63.78	FO	62.12	150			VC	17.69181	1 in 61
5506	29.66	FO	27.86	225			VC	34.21954	1 in 71
5506	29.66	FO	27.86	225			VC	34.21954	1 in 71
6616		CO		150			VC	56.06404	
6615		CO		225			VC	16.37895	
6610	49.51	FO	47.62	150			VC	39.25717	1 in 27.4525660
5710	45.51	FO	44.4	150			VC	30.67964	1 in 9
8708	76.28	FO	74.15	150			VC	27.65863	1 in 14
8605	67.67	FO	66.37	150			VC	23.60085	1 in 41
7509	56.55	SW	54.6	225			VC	4.24264	
5711	46.51	FO	45.12	150			VC	17.2714	1 in 25
6611	49.47	SW	47.9	150			VC	36.1031	1 in 24.2302685
6007	63	CO	60.77	300			VC	16.15549	1 in 0.27377553
6007	63	CO	60.77	300			VC	16.15549	1 in 0.27377553
5405		FO		100			VC	12.36931	
5405		FO		100			VC	12.36931	
7512	55.2	FO	54.3	150			VC	2.236068	
6503	40.08	SW	38.7	225			VC	25.23886	1 in 4
6503	40.08	SW	38.7	225			VC	25.23886	1 in 4
5901	50.18	SW	49.28	150			VC	65.76473	1 in 15
5901	50.18	SW	49.28	150			VC	65.76473	1 in 15
7708	65	SW	63.95	150			VC	29.41109	1 in 7
9715		FO		100			VC	12.94631	
7404	41.83	SW	40.2	375			CO	15.65248	1 in 21
7404	41.83	SW	40.2	375			CO	15.65248	1 in 21
7717	66.33	SW	64.78	100			VC	3.162278	
8604	73.98	FO	72.15	150			VC	35.35534	1 in 12
4802	45.42	FO	43.77	225			VC	8.544003	
6414		FO		100			VC	2.759144	
6414		FO		100			VC	2.759144	
5602	33.95	FO	32.09	225			VC	2	
8703		FO		100			VC	7.357398	
4505	28.45	SW	27.1	225			VC	21.68619	1 in 23
6008	62.8	CO	60.67	300			VC	78.64477	1 in 67
6008	62.8	CO	60.67	300			VC	78.64477	1 in 67
6905	58.7	FO	58.7	225			VC	22.09072	
6905	58.7	FO	58.7	225			VC	22.09072	
5704		FO	0	150			VC	32.44996	
6702	55.04	FO	50.76	300			VC	10.80979	1 in 154
6703	56.32	FO	54.54	225			VC	15	1 in 15
9801	78.17	SW	74.87	0				46.09772	1 in 15
6704	56.31	SW	54.47	225			VC	6.403124	1 in 3
8606	64.94	SW	62.64	225			VC	23.25941	
7405	41.74	FO	39.85	225			VC	25.94224	1 in 15
7405	41.74	FO	39.85	225			VC	25.94224	1 in 15
5702	46.78	SW	45.43	150			VC	61.66036	1 in 13
5624		FO		100			VC	18.20085	
7401	45.32	SW	43.2	375			CO	55.47071	1 in 19
7401	45.32	SW	43.2	375			CO	55.47071	1 in 19
4911	47.33	FO	45.48	225			VC	26.68333	1 in 40
4911	47.33	FO	45.48	225			VC	26.68333	1 in 40
9711	78.53	FO	76.79	100			VC	1	
9708	82.26	SW	80.91	150			VC	15	1 in 22
6903	60.03	FO	57.45	225			VC	22.2036	
6903	60.03	FO	57.45	225			VC	22.2036	
5510		FO	0	150			VC	31.7805	
5510		FO	0	150			VC	31.7805	
4807		FO	0	225			VC	46.17358	
5818		SW	0	150			VC	36.67424	
5514		FO		100			VC	19.99409	
5514		FO		100			VC	19.99409	
5404	28.99	SW	27.44	525			CO	56.08921	1 in 42
6413		FO		100			VC	5.739352	
6413		FO		100			VC	5.739352	
7713		FO		100			VC	10.53182	
6604	46.9	FO	44.63	150			VC	25.75065	1 in 14
8709	77.5	SW	75.63	150			VC	14.21267	
7601		FO		100			VC	34.57288	
6706		FO	0	300			VC	80.895	
4905	48.62	FO	46.15	225			VC	22.80351	1 in 34
4905	48.62	FO	46.15	225			VC	22.80351	1 in 34
7709	66.18	SW	64.83	150			VC	10.29563	1 in 12
6602		CO		150			VC	17.04596	
6007	63	CO	60.77	300			VC	18.43909	1 in 0.31444558
6007	63	CO	60.77	300			VC	18.43909	1 in 0.31444558
4617		FO		150			VC	9.226533	
6014	1	FO		100			UN	12.96326	
6014	1	FO		100			UN	12.96326	
9705	79.58	SW	77.42	150			VC	28.42534	1 in 16
5607	41.45	SW	39.93	300			VC	9.433059	1 in 11.9405804
5603	40.75	FO	39.36	225			VC	34.41863	
6504		FO		100			VC	15.91971	
6504		FO		100			VC	15.91971	
7703	61.92	FO	59.58	150			VC	15	1 in 14
9710	78.38	SW	76.68	150			VC	16.12452	1 in 15
7505	49.67	SW	48.36	225			VC	12.04159	1 in 9
7505	49.67	SW	48.36	225			VC	12.04159	1 in 9
5508	29.11	FO	27.01	225			VC	14.31782	
5508	29.11	FO	27.01	225			VC	14.31782	
5511	29.1	FO	0	225			VC	23.76973	
5511	29.1	FO	0	225			VC	23.76973	
6601	44.52	SW	42.75	300			VC	6.945468	
5802	50.54	FO	49.67	150			VC	14.14214	
6506		FO		100			VC	16.48307	
6506		FO		100			VC	16.48307	
4906	46.26	FO	44.81	225			VC	40.24922	1 in 39
5819		SW	0	150			VC	4	
7503	46.78	SW	45.71	375			CO	12.16553	1 in 5
7503	46.78	SW	45.71	375			CO	12.16553	1 in 5
9701	79.47	FO	77.45	150			VC	44.05985	1 in 13
9706		FO		100			VC	2.239773	
5507	28.95	FO	27.17	225			VC	34.1321	1 in 213
5507	28.95	FO	27.17	225			VC	34.1321	1 in 213
5509	34.68	SW	33.29	450				38.91015	1 in 9
6602		CO		150			VC	6.536495	
4530		FO		100			VC	1.376528	
4530		FO		100			VC	1.376528	
6011	63.21	SW	60.91	600				3.162278	1 in 5.39177776
6011	63.21	SW	60.91	600				3.162278	1 in 5.39177776
7506	53.73	FO	50.38	150			VC	18.78829	1 in 10
7506	53.73	FO	50.38	150			VC	18.78829	1 in 10
7502	46.78	FO	45.75	150			VC	5.385165	1 in 5
7502	46.78	FO	45.75	150			VC	5.385165	1 in 5
5604	41.89	FO		150			VC	53.55499	
6505		FO		100			VC	17.31768	
6505		FO		100			VC	17.31768	
6605	52.57	SW	50.62	300			VC	50.94532	
7501	43.85	FO	43.31	225			VC	19.10421	1 in 50
7501	43.85	FO	43.31	225			VC	19.10421	1 in 50
8616		FO		100			VC	21.69431	
8601	63.88	FO	61.83	150			VC	40.24922	1 in 11
6710	49.72	SW	48.15	150			VC	22.29396	1 in 13
5407		FO		100			VC	5.308584	
5407		FO		100			VC	5.308584	
5505	31.31	FO	30.28	225			VC	25.6125	1 in 11
5505	31.31	FO	30.28	225			VC	25.6125	1 in 11
8701	73.51	SW	71.73	150			VC	19.23538	1 in 51
9707	81.69	SW	80.24	150			VC	37.80212	1 in 13
5619		FO		150			VC	20.55012	
8607	67.66	SW	65.86	225			VC	14.21267	1 in 13
6709	49.39	FO	47.59	150			VC	22.97539	1 in 16.4109902
4803	46.65	SW	44.67	225			VC	31.89044	1 in 17
4513		FO		100			VC	9.620073	
4513		FO		100			VC	9.620073	
8603	70.18	FO	69.13	150			VC	34.71311	1 in 10
8609	72.45	SW	71.35	225			VC	35.51056	1 in 11
7403	43.85	SW	43.11	375			CO	18.38478	
7403	43.85	SW	43.11	375			CO	18.38478	
7513	60.48	FO	58.08	150			VC	18.86796	1 in 5
6904		FO	0	225			VC	52.03845	
6904		FO	0	225			VC	52.03845	
9706		FO		100			VC	2.239773	
7508	56.55	FO	54.6	150			VC	5.656854	1 in 19
6612	47.98	SW	46.41	150			VC	14.77557	1 in 9
5613		SW		300			VC	18.76549	
6008	62.8	CO		225			VC	5.62038	
6008	62.8	CO		225			VC	5.62038	
8705	76.67	FO	74.99	150			VC	33.06055	1 in 13
4709	42.93	SW	40.78	225			VC	56.60389	1 in 8
5503	28.97	SW	27.65	300			VC	54.03703	1 in 35
5503	28.97	SW	27.65	300			VC	54.03703	1 in 35
6614		CO		225			VC	23.23131	
7408		FO		100			VC	9.018431	
7408		FO		100			VC	9.018431	
5518		FO	0	225			VC	14.03567	
5518		FO	0	225			VC	14.03567	
7402	44.28	FO	42.93	225			VC	56.35601	1 in 19
7402	44.28	FO	42.93	225			VC	56.35601	1 in 19
6013	64.09	SW	61.94	300			VC	8.246211	1 in 0.13810435
6013	64.09	SW	61.94	300			VC	8.246211	1 in 0.13810435
8801	76.36	SW	71.86	0				236.4736	
7517		FO		100			VC	11.92194	
5902	54.85	FO	53.77	225			VC	47.43417	1 in 12
5902	54.85	FO	53.77	225			VC	47.43417	1 in 12
8502		FO		150			VC	5.895051	
6606		FO	0	150			VC	12.9908	
6613	45.45	SW	43.88	150			VC	12.86137	1 in 5.76742921
8707	75.96	SW	73.63	150			VC	9.433981	1 in 13
7507	53.73	SW	50.38	225			VC	17.88854	1 in 9
7507	53.73	SW	50.38	225			VC	17.88854	1 in 9
7701	60.1	FO	58.4	150			VC	18.02776	1 in 9
7715		FO		100			VC	14.36438	
4704	40.29	FO	39.16	225			VC	52.15362	1 in 8
8608	70	SW	68.24	225			VC	26.92582	1 in 11
7514	60.65	SW	58.01	225			VC	22.2036	1 in 7
6012	1.2	FO		100			UN	2.707188	
6012	1.2	FO		100			UN	2.707188	
5504	31.59	SW	29.19	600			CO	52.28185	1 in 17
6003	63.8	FO	61.87	225			VC	25.80698	1 in 70
6003	63.8	FO	61.87	225			VC	25.80698	1 in 70
8706	74.84	SW	72.89	150			VC	22.02271	
8602	67.44	FO	65.79	150			VC	38.28838	1 in 10
5601	39.48	SW	37.86	450				41.23106	1 in 9
9703	79.45	FO	77.95	150			VC	30.41381	1 in 61
6409		CO		100			VC	16.23578	
6409		CO		100			VC	16.23578	
5501	30.02	SW	28.22	300			VC	30.06659	
5501	30.02	SW	28.22	300			VC	30.06659	

Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
4601	29.39	FO	27.68	225			VC	43.38344	1 in 37
5406		FO		100			VC	16.51454	
5406		FO		100			VC	16.51454	
7511		FO	0	150			VC	23.43075	
7511		FO	0	150			VC	23.43075	
6501	34.04	SW	32.84	225			VC	28.30194	1 in 6
6501	34.04	SW	32.84	225			VC	28.30194	1 in 6
7706	61.6	SW	0	150			VC	15.65248	
6607		SW		300			VC	6.738397	
7504	49.68	FO	48.48	150			VC	24.08319	1 in 9
7504	49.68	FO	48.48	150			VC	24.08319	1 in 9
6004	63.76	FO	62.76	150			VC	36.23534	1 in 41
4616		FO		225			VC	18.83547	
7704	62.76	FO	60.66	150			VC	19.23538	1 in 18
5701	48.95	SW	47.47	150			VC	13.60147	
4801	40.81	FO	39.21	225			VC	40.22437	1 in 10
8704	74.41	FO	72.51	150			VC	25.01999	1 in 69
5525		FO	0	150			VC	50.24938	
5520	28.75	FO	27.94	100			VC	1	
5520	28.75	FO	27.94	100			VC	1	
4403	27.81	SW	26.11	525			CO	64.00781	1 in 20
4403	27.81	SW	26.11	525			CO	64.00781	1 in 20
4528		FO		225			VC	2.701522	
6705		FO		225			VC	59.55906	
5801	48.99	FO	48.02	100			VC	5	1 in 0
5523		SW	0	300			VC	16.27882	
5523		FO	0	150			VC	16.27882	
6101	67.88	FO	65.62	150			VC	60	1 in 16
5618		FO		150			VC	17.28155	
9702	81.85	FO	80.25	150			VC	35.61361	1 in 13
6705	52.57	FO	50.62	225			VC	21.8683	1 in 0.84097320
8611		FO		100			VC	12.5538	
9732		SW	0	150			VC	17.09465	
5703	46.34	FO	44.61	150			VC	27.20294	
5621	41.57	FO	40.96	150			VC	37.95677	1 in 42
5606	40.41	SW	39.14	300			VC	2.305402	1 in 3.60219034
7702	60.06	SW	58.6	150			VC	39	1 in 10
7714		FO		100			VC	19.66671	
7510	55.17	SW	0	225			VC	25.6125	
7510	55.17	SW	0	225			VC	25.6125	
6002	63.41	CO	61.5	225			VC	8.602325	1 in 10
6002	63.41	CO	61.5	225			VC	8.602325	1 in 10
5622		CO		150			VC	18.26448	
5622		CO		150			VC	17.09685	
6609	48.09	FO	46.19	150			VC	14.80399	1 in 15.9182671
6015	1	FO		100			UN	11.39401	
6015	1	FO		100			UN	11.39401	
6010	1.4	FO		100			UN	10.38323	
6010	1.4	FO		100			UN	10.38323	

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
- Reducing 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	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

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:

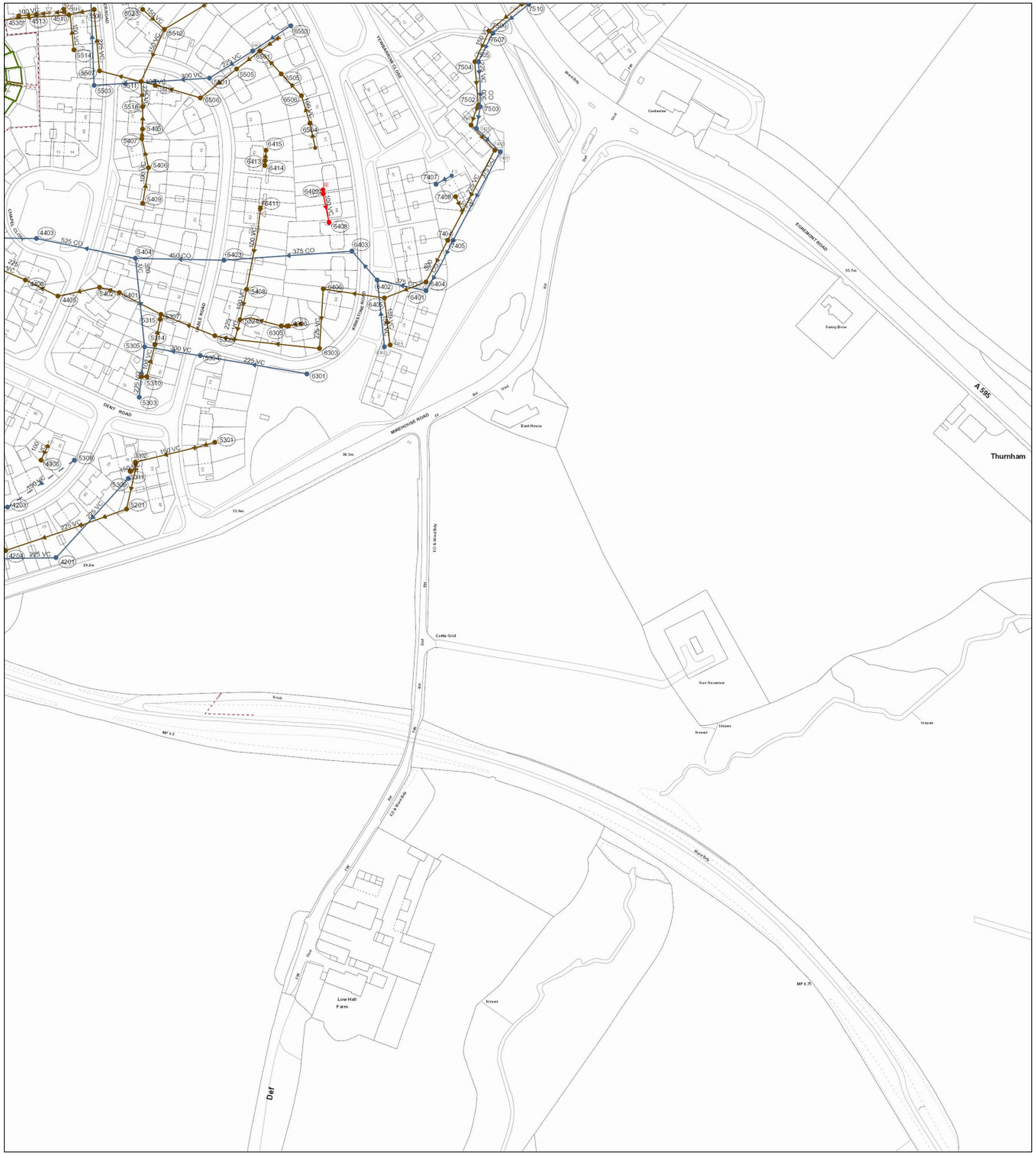
West Cumberland Hospital,

OS sheet Number: NX9815NE
Scale: 1:1250 **Date:** 14/08/2019
Nodes: 250
Sheet: 4 of 5

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6305		FO		100			VC	23.40878	
4530		FO		100			VC	1.376528	
4530		FO		100			VC	1.376528	
5311		FO		150			VC	3.162278	1 in
7506	53.73	FO	50.38	150			VC	18.78829	1 in 10
7506	53.73	FO	50.38	150			VC	18.78829	1 in 10
6304	38.53	FO	37.56	150			VC	26.1725	1 in 40
6402	38.3	SW	36.96	375			CO	21.26029	1 in 19
7502	46.78	FO	45.75	150			VC	5.385165	1 in 5
7502	46.78	FO	45.75	150			VC	5.385165	1 in 5
6502	35.16	FO	34.06	225			VC	16.40122	1 in 4
6502	35.16	FO	34.06	225			VC	16.40122	1 in 4
5409		FO		100			VC	20.01115	
5409		FO		100			VC	20.01115	
5302	29.44	FO	0	150			VC	4	
6505		FO		100			VC	17.31768	
6505		FO		100			VC	17.31768	
5506	29.66	FO	27.86	225			VC	34.21954	1 in 71
5506	29.66	FO	27.86	225			VC	34.21954	1 in 71
6302	38.51	SW	37.54	150			VC	37.21559	1 in 64
7501	43.85	FO	43.31	225			VC	19.10421	1 in 50
7501	43.85	FO	43.31	225			VC	19.10421	1 in 50
4201	29.17	SW	27.42	225			VC	66.00758	1 in 106
5407		FO		100			VC	5.308584	
5407		FO		100			VC	5.308584	
5401	29.01	FO	27.31	225			VC	11.40175	1 in 190
5505	31.31	FO	30.28	225			VC	25.6125	1 in 11
5505	31.31	FO	30.28	225			VC	25.6125	1 in 11
4406	28.17	FO	26.77	225			VC	84.18546	1 in 19
5328		FO		225			VC	11.40175	1 in
5304	29.85	SW	28.05	300			VC	31.40064	1 in 157
5306	30.29	FO	28.57	225			VC	32.31099	1 in 32
6401	39.85	SW	38.71	375			CO	27.65863	1 in 16
5305	29.37	SW	27.85	300			VC	49.25444	1 in 120
4405	28.95	FO	26.99	225			VC	20.12461	1 in 91
5308	29.74	SW	28.64	150			VC	45.22168	1 in 1.64802027
7509	56.55	SW	54.6	225			VC	4.24264	
5310		FO		100			VC	18.27649	
4513		FO		100			VC	9.620073	
4513		FO		100			VC	9.620073	
5405		FO		100			VC	12.36931	
5405		FO		100			VC	12.36931	
7512	55.2	FO	54.3	150			VC	2.236068	
6503	40.08	SW	38.7	225			VC	25.23886	1 in 4
6503	40.08	SW	38.7	225			VC	25.23886	1 in 4
7403	43.85	SW	43.11	375			CO	18.38478	
7403	43.85	SW	43.11	375			CO	18.38478	
5303	29.33	SW	28.33	225			VC	28.16026	1 in 59
7404	41.83	SW	40.2	375			CO	15.65248	1 in 21
7404	41.83	SW	40.2	375			CO	15.65248	1 in 21
6414		FO		100			VC	2.759144	
6414		FO		100			VC	2.759144	
6406	37	FO	34.87	225			VC	33.06055	1 in 107
5503	28.97	SW	27.65	300			VC	54.03703	1 in 35
5503	28.97	SW	27.65	300			VC	54.03703	1 in 35
7408		FO		100			VC	9.018431	
7408		FO		100			VC	9.018431	
5518		FO	0	225			VC	14.03567	
5518		FO	0	225			VC	14.03567	
7402	44.28	FO	42.93	225			VC	56.35601	1 in 19
7402	44.28	FO	42.93	225			VC	56.35601	1 in 19
7405	41.74	FO	39.85	225			VC	25.94224	1 in 15
7405	41.74	FO	39.85	225			VC	25.94224	1 in 15
4204	29.01	FO	27.21	225			VC	47.92703	1 in 47
6404	39.84	FO	38.08	225			VC	24.69818	1 in 20
7507	53.73	SW	50.38	225			VC	17.88854	1 in 9
7507	53.73	SW	50.38	225			VC	17.88854	1 in 9
6306		FO		100			VC	4.183614	
7401	45.32	SW	43.2	375			CO	55.47071	1 in 19
7401	45.32	SW	43.2	375			CO	55.47071	1 in 19
5510		FO	0	150			VC	31.7805	
5510		FO	0	150			VC	31.7805	
6303	36.1	FO	34.56	225			VC	47.26521	
5514		FO		100			VC	19.99409	
5514		FO		100			VC	19.99409	
6403	37.61	SW	35.72	375			CO	71.17584	1 in 11
5307	29.25	FO	27.55	225			VC	25.94224	1 in 108
5309	29.53	SW	28.56	225			VC	59.46428	1 in 52
5404	28.99	SW	27.44	525			CO	56.08921	1 in 42
6409		CO		100			VC	16.23578	
6409		CO		100			VC	16.23578	
5501	30.02	SW	28.22	300			VC	30.06659	
5501	30.02	SW	28.22	300			VC	30.06659	
5315		FO		100			VC	2.951841	
6413		FO		100			VC	5.739352	
6413		FO		100			VC	5.739352	
5406		FO		100			VC	16.51454	
5406		FO		100			VC	16.51454	
7511		FO	0	150			VC	23.43075	
7511		FO	0	150			VC	23.43075	
6501	34.04	SW	32.84	225			VC	28.30194	1 in 6
6501	34.04	SW	32.84	225			VC	28.30194	1 in 6
7504	49.68	FO	48.48	150			VC	24.08319	1 in 9
7504	49.68	FO	48.48	150			VC	24.08319	1 in 9
4203	29.29	SW	28.09	150			VC	34.0147	
5408		FO		100			VC	17.21699	
5525		FO	0	150			VC	50.24938	
6504		FO		100			VC	15.91971	
6504		FO		100			VC	15.91971	
5314		FO		100			VC	14.23171	
5520	28.75	FO	27.94	100			VC	1	
5520	28.75	FO	27.94	100			VC	1	
4403	27.81	SW	26.11	525			CO	64.00781	1 in 20
4403	27.81	SW	26.11	525			CO	64.00781	1 in 20
7505	49.67	SW	48.36	225			VC	12.04159	1 in 9
7505	49.67	SW	48.36	225			VC	12.04159	1 in 9
5523		FO	0	150			VC	16.27882	
5523		FO	0	150			VC	16.27882	
5301	29.85	FO	28.45	150			VC	11.40175	
5508	29.11	FO	27.01	225			VC	14.31782	
5508	29.11	FO	27.01	225			VC	14.31782	
5511	29.1	FO	0	225			VC	23.76973	
5511	29.1	FO	0	225			VC	23.76973	
6301	35.13	SW	33.66	225			VC	59.84146	1 in 11
5402	28.98	FO	27.25	225			VC	23.5372	1 in 91
6506		FO		100			VC	16.48307	
6506		FO		100			VC	16.48307	
7510	55.17	SW	0	225			VC	25.6125	
7510	55.17	SW	0	225			VC	25.6125	
6405	38.51	FO	36.74	225			VC	34.36568	1 in 18
5403	30.8	SW	29.16	450			CO	49.0102	1 in 28
5201	29.45	FO	27.83	225			VC	26.57066	
7503	46.78	SW	45.71	375			CO	12.16553	1 in 5
7503	46.78	SW	45.71	375			CO	12.16553	1 in 5
5507	28.95	FO	27.17	225			VC	34.1321	1 in 213
5507	28.95	FO	27.17	225			VC	34.1321	1 in 213

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 TR Trapezoidal
EG Egg AR Arch
OV Oval BA Barrel
FT Flat Top HO HorseShoe
RE Rectangular UN Unspecified
SQ Square

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:

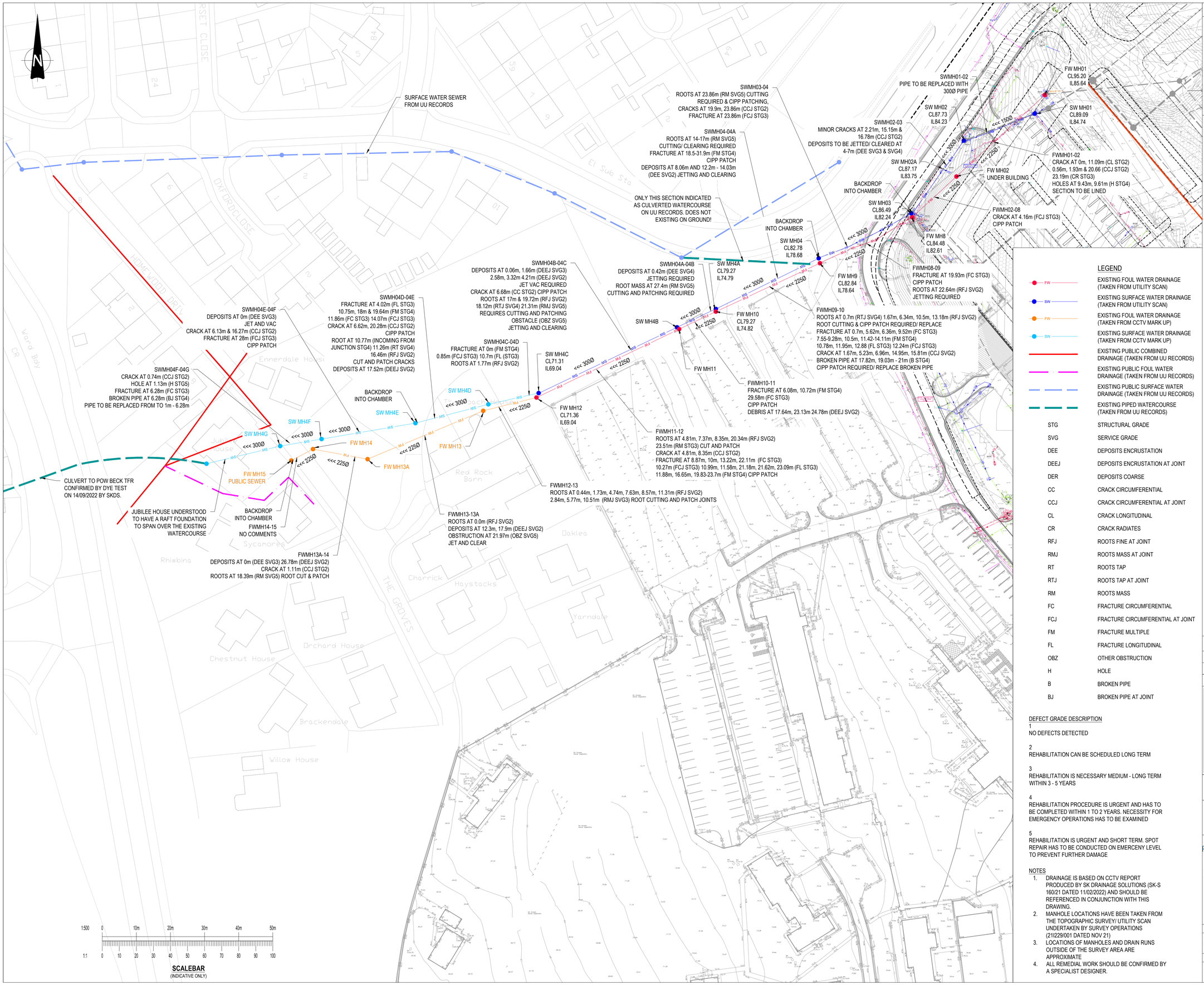
West Cumberland Hospital,

OS sheet Number: NX9815SE
Scale: 1:1250 Date: 14/08/2019
Nodes: 126
Sheet: 5 of 5

Printed by: Property Searches

SEWER RECORDS

United Utilities
helping life flow smoothly



GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.

LEGEND

FW	EXISTING FOUL WATER DRAINAGE (TAKEN FROM UTILITY SCAN)
SW	EXISTING SURFACE WATER DRAINAGE (TAKEN FROM UTILITY SCAN)
FW	EXISTING FOUL WATER DRAINAGE (TAKEN FROM CCTV MARK UP)
SW	EXISTING SURFACE WATER DRAINAGE (TAKEN FROM CCTV MARK UP)
	EXISTING PUBLIC COMBINED DRAINAGE (TAKEN FROM UU RECORDS)
	EXISTING PUBLIC FOUL WATER DRAINAGE (TAKEN FROM UU RECORDS)
	EXISTING PUBLIC SURFACE WATER DRAINAGE (TAKEN FROM UU RECORDS)
	EXISTING PIPED WATERCOURSE (TAKEN FROM UU RECORDS)

STG	STRUCTURAL GRADE
SVG	SERVICE GRADE
DEE	DEPOSITS ENCRUSTATION
DEEJ	DEPOSITS ENCRUSTATION AT JOINT
DER	DEPOSITS COARSE
CC	CRACK CIRCUMFERENTIAL
CCJ	CRACK CIRCUMFERENTIAL AT JOINT
CL	CRACK LONGITUDINAL
CR	CRACK RADIATES
RFJ	ROOTS FINE AT JOINT
RMJ	ROOTS MASS AT JOINT
RT	ROOTS TAP
RTJ	ROOTS TAP AT JOINT
RM	ROOTS MASS
FC	FRACTURE CIRCUMFERENTIAL
FCJ	FRACTURE CIRCUMFERENTIAL AT JOINT
FM	FRACTURE MULTIPLE
FL	FRACTURE LONGITUDINAL
OBZ	OTHER OBSTRUCTION
H	HOLE
B	BROKEN PIPE
BJ	BROKEN PIPE AT JOINT

DEFECT GRADE DESCRIPTION

1
NO DEFECTS DETECTED

2
REHABILITATION CAN BE SCHEDULED LONG TERM

3
REHABILITATION IS NECESSARY MEDIUM - LONG TERM WITHIN 3 - 5 YEARS

4
REHABILITATION PROCEDURE IS URGENT AND HAS TO BE COMPLETED WITHIN 1 TO 2 YEARS. NECESSITY FOR EMERGENCY OPERATIONS HAS TO BE EXAMINED

5
REHABILITATION IS URGENT AND SHORT TERM. SPOT REPAIR HAS TO BE CONDUCTED ON EMERCENY LEVEL TO PREVENT FURTHER DAMAGE

NOTES

1. DRAINAGE IS BASED ON CCTV REPORT PRODUCED BY SK DRAINAGE SOLUTIONS (SK-S 160/21 DATED 11/02/2022) AND SHOULD BE REFERENCED IN CONJUNCTION WITH THIS DRAWING.
2. MANHOLE LOCATIONS HAVE BEEN TAKEN FROM THE TOPOGRAPHIC SURVEY/ UTILITY SCAN UNDERTAKEN BY SURVEY OPERATIONS (21I229/001 DATED NOV 21)
3. LOCATIONS OF MANHOLES AND DRAIN RUNS OUTSIDE OF THE SURVEY AREA ARE APPROXIMATE
4. ALL REMEDIAL WORK SHOULD BE CONFIRMED BY A SPECIALIST DESIGNER.

Rev:	Description:	Date:	By:	Chkd:
P03	UPDATED FOLLOWING DYE TEST PROOF OF CONNECTION FROM SW MH4C AND POW BECK.	22/09/22	AMB	CJS
P02	PROPOSED DRAINAGE ADDED	31/03/22	DM	PT
P01	FIRST ISSUE	04/03/22	DM	PT

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Status: ISSUED FOR INFORMATION S2

Client: GRAHAM

Project: PROCURE 22 — WEST CUMBERLAND HOSPITAL PHASE 2 DEVELOPMENT

Drg Title:

EXISTING DRAINAGE REHABILITATION SKETCH

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
072419	A1 Scale: 1:500	JUL 21	DM	PT	PT

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
WCHPH2	CUR	VV	XX	DR	C	04008	P03

WCHPH2-CUR-VV-XX-DR-C-04008-P03_Existing Drainage Rehabilitation Sketch.dwg

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