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Coverack Road Phase 2

DRAINAGE STRATEGY REPORT

prepared for

Hedyn

Date: December 2024

Document ref no.

23005-R-650-DRAINAGE STRATEGY-A



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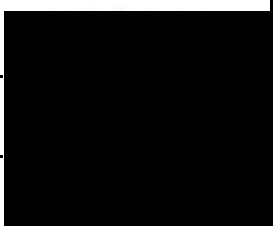
Registered Office: Columbus House, Village Way, Greenmeadow Springs Business Park, Cardiff CF15 7NE



DRAINAGE STRATEGY

23005

Document Control

Responsible for	Job Title	Name	Date	Signature
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Signatories in this approval box have checked this document in line with the requirements of QuadConsult QMS Procedures				

Revision History

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1			
2			
3			
4			
5			
6			

Distribution

	Function Title	Company	Name
1		Hedyn	
2			
3			

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References

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| 1 | CIRIA – The SuDS Manual (C753) |
| 2 | UK SUDS (www.uksuds.com) |
| 3 | Welsh Water Asset Plans |
| 5 | Google Maps |
| 6 | Ordnance Survey Mapping |
| 7 | BRE Digest 365 Soakaway Design |
| 8 | National Soil Resources Institute (SoilScapes) |
| 10 | NRW Online Flood Risk Map |
| 12 | - |

Abbreviations

DCWW	DWR Cymru Welsh Water
A.O.D.	Above Ordnance Datum
EA	Environment Agency
FW	Foul Water
SW	Surface Water
SuDS	Sustainable Drainage Systems
l/s	Litres Per Second
NRW	Natural Resources Wales
SAB	Suds Approval Body

This document has been created during the design stage of the project and should not be used as a replacement for the final operation and maintenance requirements of the proposed works. It shall remain relative only to those features identified on the attached plan. This document is intended to support the development of the official operation and maintenance document which shall be the responsibility of the principal contractor.

This document is for the exclusive use of the client and should not be used in whole or in part by any third parties without the express written permission of QuadConsult Limited.

1.0 INTRODUCTION

- 1.1 QuadConsult Ltd have been commissioned to produce a drainage strategy for Phase 2, of the Coverack Road development by Joshua Guy of Newport City Homes
- 1.2 This report will draw upon information supplied by the Client and that available within the public domain including the local authority Planning Portal.
- 1.3 The aim of this report is to demonstrate that a suitable site-specific surface and foul water drainage strategy can be implemented to service the proposed development.

2.0 SITE LOCATION & DESCRIPTION

- 2.1 The site is located, in the South of St George's Bridge, on Coverack road, Newport, nearest post code is NP19 0QD, site coordinates 332006,187760.
- 2.2 The existing site topography (Appendix 1) Is relatively flat, However, generally falls in a north-easterly direction. There is an earthworks stockpile to the south of the site with an approximate high point of 12.91mAOD. A low point of 9.97mAOD can be found in the north-east of the site. This has been confirmed by means of a topographical survey undertaken by Healers Surveys. The site is currently Brownfield in nature, consisting of Asphalt and rough ground (Previously a light industrial unit) and has been vacant for several years. The site is bounded by Coverack road to its south-east and south-west, St George's Bridge to its north-west and a private road serving Phase 1 of the development to the northeast. Nearest watercourse is the River Usk Approximately 30m southwest of the site.
- 2.3 The site boundary is Approximately 0.19ha with a existing impermeable area of 0.13ha.

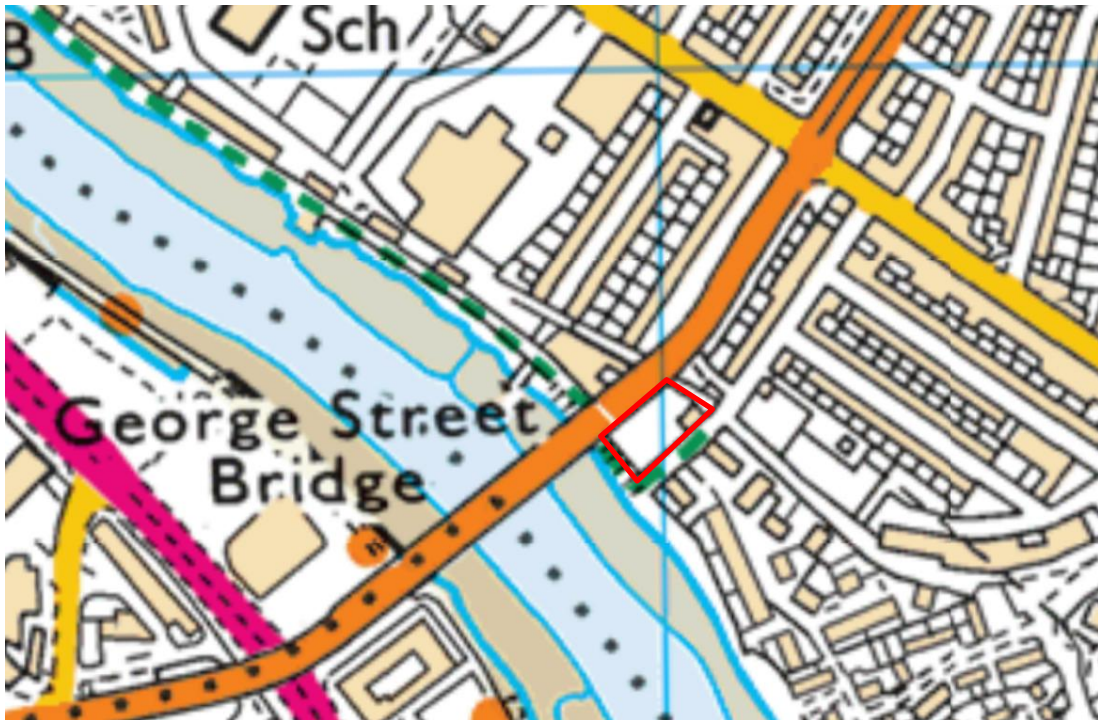


Figure 1: Site location plan

3.0 EXISTING DRAINAGE

3.1 Land Drainage

No existing land drainage is evident on the topographical survey.

3.2 Overland Flow & Exceedance Routes

Existing exceedance, overland flow paths would follow the existing topography and discharge flows onto the existing highway northeast of the site.

3.3 Surface Water Drainage Network

A Private surface water network consisting of 225Ø and 300Ø is located to the northeast of the site, discharging into the River Usk. This surface water network has been developed as part of Phase one of the development. (Refer to Appendix 2)
No DCWW or highway surface water networks have been located in the vicinity of the site.

3.4 Foul Water Drainage Network

Welsh Water Asset plans indicates no foul water networks in the vicinity of the site. There is a foul water network associated with Phase 1 of the development located to the north of George Street Bridge.(Refer to Appendix 3)

3.5 Combined / Other Drainage

Welsh Water Asset plans indicate two combined networks to the Northwest of the site, within Coverack road. (Refer to Appendix 3)

4.0 EXISTING FLOOD RISK

NRW development advice mapping indicates the development parcel is within a Flood Zone B – A floodplain known to have flooded in the past.

A FCA has been conducted by JBA with flood modelling, assessing the risks of flooding to the site.

4.1 Flood Risk from Rivers

NRW flood mapping (Refer to Appendix 5) indicates a little / no risk of flooding from Surface water / Local Watercourses.

4.2 Flood Risk from Sea

NRW flood mapping (Refer to Appendix 5) indicates the site partially lies within a TAN 15

Defended flood zone 3 - An area that benefits from risk management authority flood defences, With a minimum Standard of Protection: 1 in 200 year (present day) for the sea.

4.3 Flood Risk from Surface Water & Small Watercourses

NRW flood mapping (Refer to Appendix 5) indicates a little / no risk of flooding from Surface water / Local Watercourses.

4.4 Flood Risk from Reservoir

NRW flood mapping (Refer to Appendix 5) indicates no risk of flooding from the Reservoirs.

4.5 Other Flood Risk (Mines, Piped Network, etc)

NRW flood mapping (Refer to Appendix 5) indicates no recorded flood events. The presence of live Welsh Water assets adjacent to the site could pose a flood risk due to failure of infrastructure. The topography of the site would direct any exceedance flows onto the existing public highway.

5.0 APPLICATION OF DRAINAGE HIERARCHY

5.1 Discharge to Ground

Preliminary information from SoilScapes online information indicates Loamy and Clayey Soils of coastal flats with naturally high ground water. Existing catchment is indicated as draining to local groundwater stream network.

A site investigation has been completed for Phase 1 of the site (North of George Street Bridge) and geotechnical investigation / summary, completed by Terra Firma indicate contaminated land on site. Though yet to be completed at the time of writing this report. A full site investigation for Phase 2 will be conducted prior to construction, However similar conditions are expected for Phase 2.

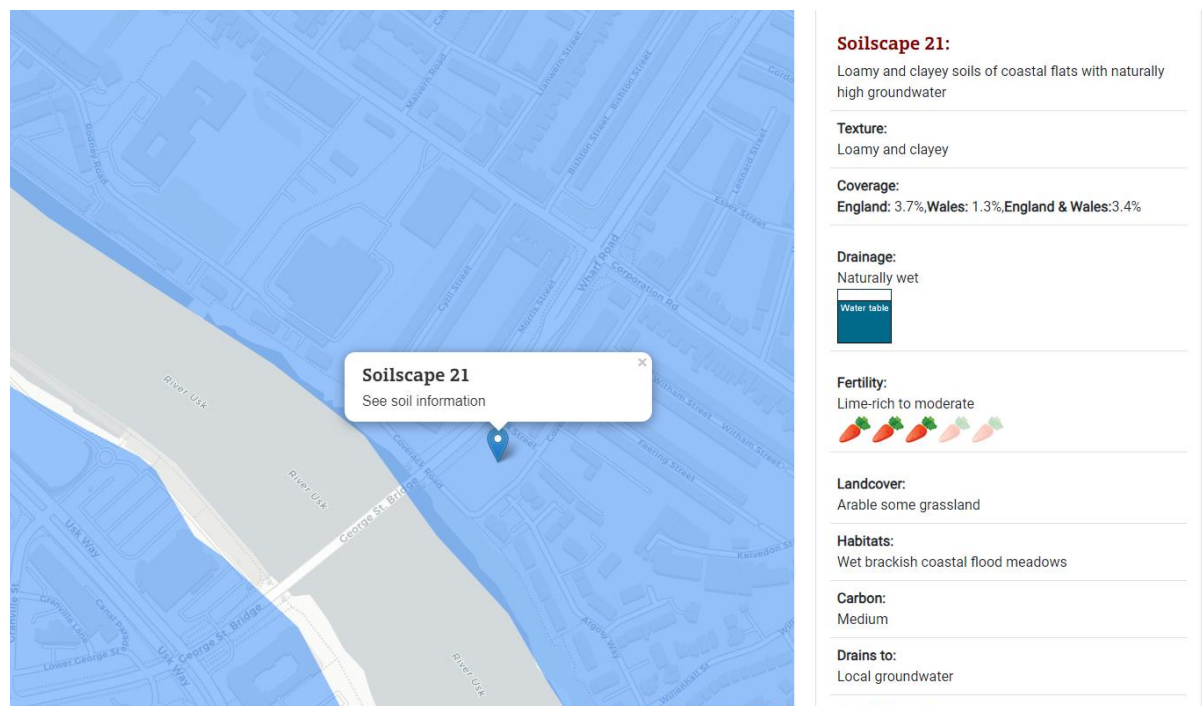


Figure 2 – Soilscape map

5.2 Discharge to Surface Water Body

An existing local watercourse 30m to the Southwest of the site. There is Existing surface water drainage serving Phase 1 and associated infrastructure. This Discharges directly into the River Usk, It is proposed to connect into this network and subsequently discharge into the River Usk.

5.3 Discharge to Surface Water Sewer (1. Highway Sewer, 2. Other SW Sewer)

Currently no highway sewers have been identified as a possible connection point. Confirmation from the local highway authority / SAB will be sort if this option were to be pursued.

As above (5.2), There is a proposed private surface water network located to the northeast of the site. It is proposed to use this as a discharge location.

6.0 PROPOSED DRAINAGE STRATEGY

The proposed development consists of 1 Apartment block, consisting of 40 dwellings with associated infrastructure including public open spaces and vehicular / pedestrian access arrangements (Appendix 6).

6.1 Surface Water

The surface water drainage for the proposal will comply with SAB/SuDS protocols, and work within the site layout & constraints of the proposed development.

There is an existing private surface water network associated with phase 1 of the development, located to the northwest of the site. It is proposed to connect into this network and discharge into the river Usk using the remaining capacity in the private network. Initial dialogue with Newport SAB has agreed this as a viable option (Appendix 7). The current proposals seek to maintain the existing overland flow arrangements as much as is possible utilising shallow SuDS features such as Bioretention trenches and permeable paving. The use of deep attenuation solutions has been kept to a minimum.

The proposed design will utilise attenuation volumes offered through the sub-base makeup of shared drive/carparking areas of the development. This will help to keep the size of the attenuation to a minimum. The proposed discharge rate based on free discharge into the existing into the River Usk, considering pre-existing capacity within the network. This is based on a catchment for the 0.19ha positively drained area for a 1 in 100-year storm event with 40% allowance climate change. No allowance for urban creep has been made.

Under the current Welsh Government policy, any surface water infrastructure conveying flows from more than 1 curtilage requires adoption by the local authority SAB.

Open market plots will fall under this arrangement. Council & housing association developments can be treated as a single curtilage where houses are to be kept under their ownership and not offered for open market sales in the future.

It is our understanding is that the client wishes to manage and maintain all features privately.

If any infrastructure being adopted by the local authority SAB in the future, it will be subject to commuted sums calculated for the lifetime maintenance and end of life replacement construction costs. Under a single development curtilage, the surface water elements can be kept private. In both instances the adopted / private network must be maintained in accordance with the project maintenance schedule and CIRIA SuDs manual guidance.

6.2 Foul Drainage

DCWW have confirmed capacity at preferred connection point in Coverack road (Appendix 11). The proposed dwellings (40 in total) could connect directly into the DCWW combine sewer within Coverack Road. A section 104 application with Welsh Water would be required for any sewers conveying flows from more than 1 dwelling or crossing land boundaries. A Section 106 agreement is required to allow a connection into any of the existing DCWW assets. The combined proposed Foul discharge rates for the development are as follows: -

1.85l/s average flow
11.11l/s peak flow

Based on SFA 7th edition: -

4000 l/per dwelling/day
Peak Flow Factor of 6

6.3 Land Drainage

No existing land drainage is evident on the topographical survey and as a result no diversions are likely to be required.

6.4 Other Drainage

No other drainage is noted within the land boundary.

7.0 COMPLIANCE WITH NATIONAL SUDS STANDARDS

The following sections detail the design principles that will be incorporated in the development proposals for the scheme, and the measures incorporated to satisfy the requirements for future SAB approval.

7.1 Standard S1 – Surface Water Destination

Priority Level 1 – Reuse of Rainwater

Rainwater butts will be installed where possible to collect rooftop rainwater for non-potable use like garden irrigation, reducing mains water demand. The use of bioretention trench & Rain Garden features are proposed to intercept roof runoff and act as a point of source control.

Priority Level 2 – Infiltration to Ground

Soilscapes mapping indicates, and Phase 1 Site Investigation indicates ground conditions are not suitable for the use of drainage systems based on permeable ground techniques. However, Further testing is required before deeming this method as unviable.

Priority Level 3 – Discharge to Water Body

The Private surface water network located to the northwest of the site discharges directly into the river Usk. It is proposed to discharge into this network.

Priority Level 4 – Discharge to Surface Water Sewer, Highway Drain, or other System

As above, It is proposed to connect into the Surface water network prior to discharge into the River Usk. No Highway Sewer has been located in the immediate vicinity of the site.

Priority Level 5: Discharge to a Combined Sewer – N/A

Deemed not required for this development.

7.2 Standard S2 – Surface Water Runoff Hydraulic Control

It is proposed that the attenuation system be designed such that it is sufficient to store critical storm duration flows in the 100yr+40% event. Calculations are appended. As noted above there have been no reductions made to the sizing of the attenuation to reflect reductions afforded by the Bioretention Trench or open space. Therefore, allowing for a worst-case scenario. No allowance has been made for urban creep.

First 5mm Interception

Interception mechanisms will be required to ensure compliance with the requirement of zero runoff for the first 5mm rainfall for 80% of storm events during the summer and 50% in winter.

The provision of SuDS planter features and rain gardens along with flows through permeable drive subbase will contribute to the objective of first 5mm interception. Deemed to comply with the SAB standards.

On-site contamination may necessitate the use of liners within drainage features to prevent pollutant leaching. However, liners may impact infiltration and the ability to meet interception criteria. Further dialogue with the Local SAB will confirm the criteria and explore mitigation measures.

Exceedance/Blockage

Any exceedance flows will follow surface topography. The topography is such that any excess flows will be directed in a north-eastern direction towards the existing highway.

7.3 Standard S3 – Water Quality

The proposed SuDS treatment train devices (Bioretention Trench and Permeable paving) will deliver the requisite cleansing and filtration of runoff for this residential (low pollution hazard level) development.

7.4 Standard S4 – Amenity

The soft suds features (Bioretention trench) will be carefully designed and integrated into the landscaping scheme for the development, to promote aesthetics and well-being as well as any designed drainage function.

7.5 Standard S5 – Biodiversity

The soft suds features (Bioretention trench) will be carefully designed with gradients/profiles, planting species and soil properties selected to ensure suitable habitat is delivered to promote biodiversity. Planting information is included within the SUDS planting information. These proposals will augment the green infrastructure element of the design proposals to demonstrate a robust response to this Standard.

7.6 Standard S6 - Construction, Operation and Maintenance and Structural Integrity

Much of the infrastructure maintenance will be dealt with at a property level as many of the systems employed are contained within a single curtilage application. All of the proposed SuDS infrastructure is in accessible areas for ease of maintenance. The surface water network including any land drainage will be designed to be fully roddable and jettable, with suitably positioned rodding eyes and mini-access chambers.

The SuDS devices are low maintenance surface/shallow items with established regular maintenance regimes.

The proposed design solution has been designed in accordance with the SuDS manual and is served by shallow SuDs features and accessible details. There are no inherent safety issues with the proposed scheme.

The principal issue is the management of the Bioretention Trench, which primarily involves periodic inspection to check the overflows are clear and ensure the free-flowing operation. These inspections will also serve to monitor the build-up of any silt in the system to facilitate any cleaning required.

8.0 SUMMARY & RECOMMENDATIONS

8.1 SUMMARY

The proposed development will follow current Welsh Government, local authority, and Welsh Water guidance in relation to drainage strategy. Any element of the proposed foul network conveying flows from more than one curtalage will be offered to DCWW through the Section 104 application process. The surface water network will follow the principles set out in the Ciria SuDs manual (C753) and Local SAB requirements. The surface water will be collected, treated, and discharged to a viable source at an acceptable rate following SAB hierarchy guidance. If appropriate, surface water elements will be adopted by the local authority through SAB application process.

8.2 RECOMMENDATIONS

The following actions are recommended to allow a robust suitable site-specific surface and foul water drainage strategy can be implemented to service the proposed development.

- Further dialogue with the local authority & SAB to forward the scheme.
- Further Site Investigation Works including Infiltration testing to BRE365/ Geotechnical statement confirming why infiltration is not suitable for the development.
- CCTV of Combined Sewer in Coverack road to finalise connection point.

APPENDIX 1 –EXISTING SITE LAYOUT

Notes:

Tree species is only annotated where known.
Service covers are surveyed where accessible.
Healer Surveys cannot accept liability for missing covers due to them being buried or obscured by parked vehicles at the time of site visit.

Station Table:			
U1	331987.954	187720.209	10.597
S1	332024.607	187693.092	10.526
S2	331974.408	187781.754	10.553
S3	331923.534	187831.754	10.531
S5	331996.112	187717.513	10.531
S6	331914.992	187804.433	10.572

Grid Origin and Level Datum:
Ordnance Survey GPS OSG836(15) Grid and Levels used.
GPS Grid to Ground Scale Factor used 1.000

Revisions:	
A:	
B:	
C:	
D:	
E:	
F:	
G:	
H:	

Client:

Landey
Consult

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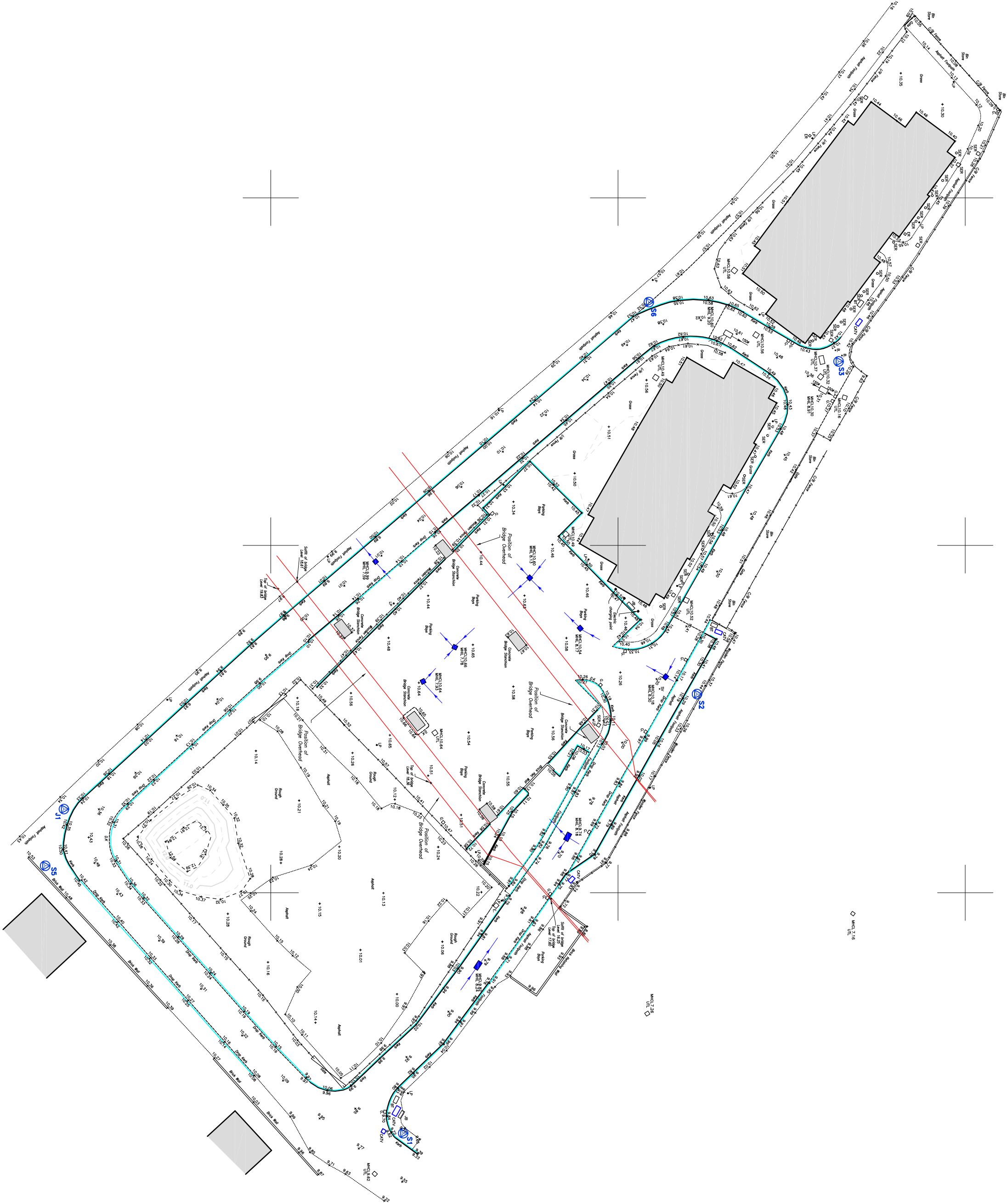
Land Surveys
8 Oldfield Road, Bocain Park, Penrith, Cumbria, CA35 5LJ
Tel: 01666 863506
Email: info@healersurveys.co.uk
Web: www.healersurveys.co.uk

Project:
Coverack road, Newport
Drawing:
Topographic Survey

Date:	May 2023
Surveyed:	JHP
Drawn:	JHP
Checked:	RE
Scale:	1:500
Sheet No:	A2
Sheet No:	1 of 1

Job No:

P3726



187900N
331850E

331900E

331950E

332000E

332050E

332100E

187850N

187800N

187750N

187850N

187800N

187750N

331850E

33190E

33195E

3320E

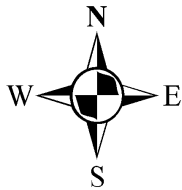
33205E

332100E

APPENDIX 2 – PHASE 1 ENGINEERING LAYOUT

APPENDIX 3 – DCWW ASSET MAP

South east of George Street Bridge,
Victoria, Newport, NP19 0DR



LEGEND

Clean network:	Sluice valve	Stop tap
Pressure reducing valve	Water Treatment Works	
Meter	Water Pumping Station	
Bulk meter	Existing main	
Hydrant	Non-operational main	
Cap end	Raw Water	
Air valve		

NB: Water main symbol colour indicates the type.
LIGHT BLUE - Trunk
DARK BLUE - Distribution
YELLOW - Raw Water

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

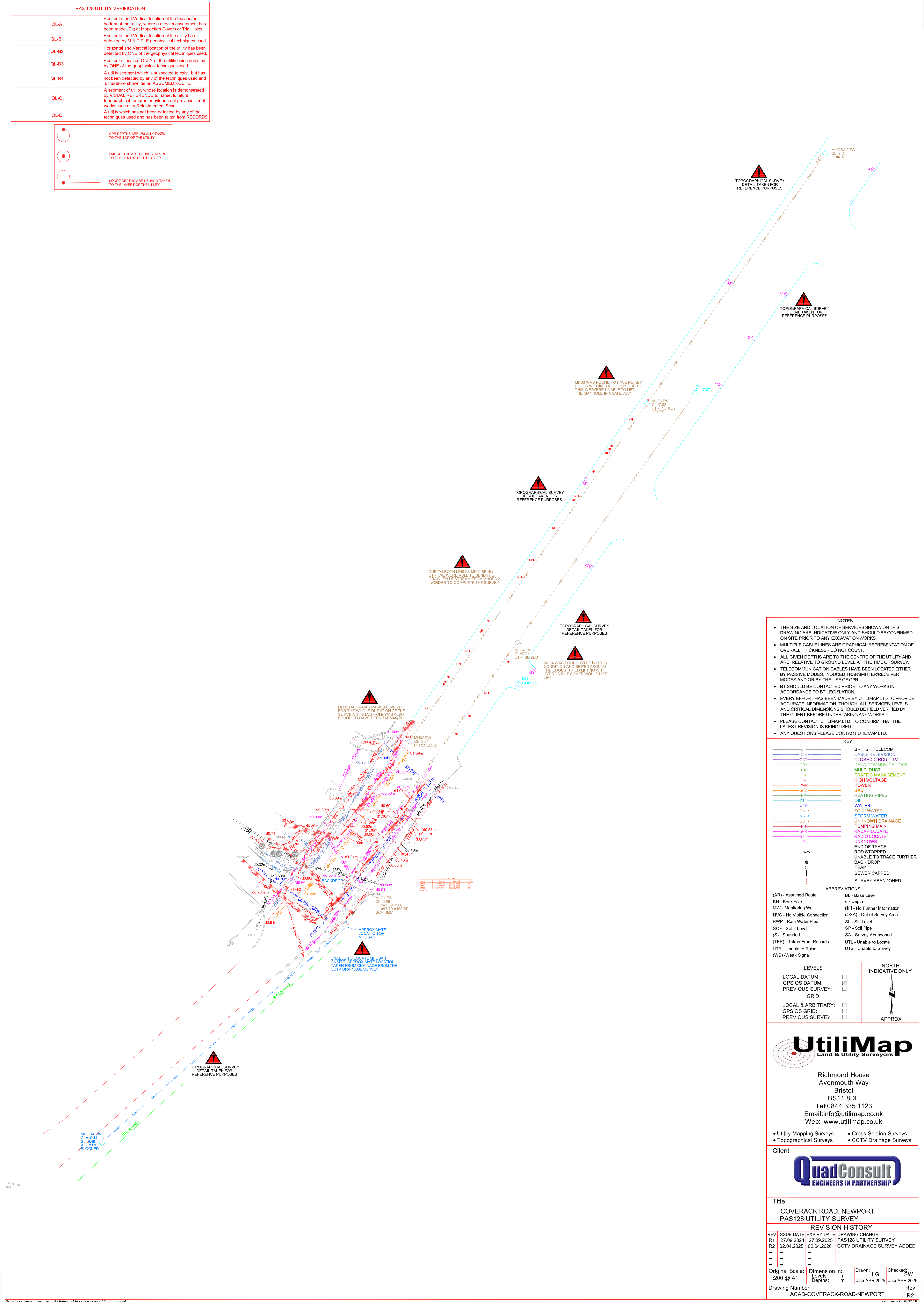
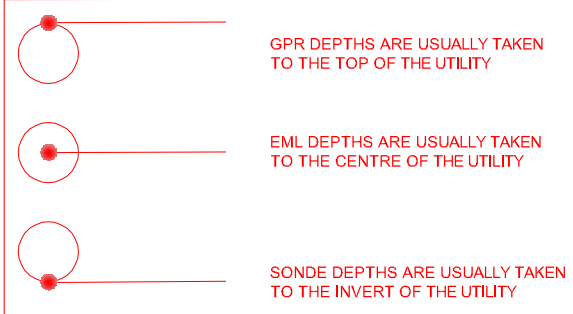
**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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Map Ref: 332002,187760
Map scale: 1:2000
Printed by: Trisha Sherman
Printed on: 29 Jan 2024

APPENDIX 4 – CCTV DRAINAGE SURVEY (to be included upon completio

PAS 128 UTILITY VERIFICATION	
QL-A	Horizontal and Vertical location of the top and/or bottom of the utility, where a direct measurement has been made. E.g at Inspection Covers or Trial Holes.
QL-B1	Horizontal and Vertical location of the utility has detected by MULTIPLE geophysical techniques used.
QL-B2	Horizontal and Vertical location of the utility has been detected by ONE of the geophysical techniques used.
QL-B3	Horizontal location ONLY of the utility being detected by ONE of the geophysical techniques used.
QL-B4	A utility segment which is suspected to exist, but has not been detected by any of the techniques used and is therefore shown as an ASSUMED ROUTE.
QL-C	A segment of utility, whose location is demonstrated by VISUAL REFERENCE to, street furniture, topographical features or evidence of previous street works such as a Reinstatement Scar.
QL-D	A utility which has not been detected by any of the techniques used and has been taken from RECORDS.



NOTES

- THE SIZE AND LOCATION OF SERVICES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY AND SHOULD BE CONFIRMED ON SITE PRIOR TO ANY EXCAVATION WORKS.
- MULTIPLE CABLE LINES ARE GRAPHICAL REPRESENTATION OF OVERALL THICKNESS - DO NOT COUNT.
- ALL GIVEN DEPTHS ARE TO THE CENTRE OF THE UTILITY AND ARE RELATIVE TO GROUND LEVEL AT THE TIME OF SURVEY.
- TELECOMMUNICATION CABLES HAVE BEEN LOCATED EITHER BY PASSIVE MODES, INDUCED TRANSMITTER/RECEIVER MODES AND/OR BY THE USE OF GPR.
- BT SHOULD BE CONTACTED PRIOR TO ANY WORKS IN ACCORDANCE TO BT LEGISLATION.
- EVERY EFFORT HAS BEEN MADE BY UTILIMAP LTD TO PROVIDE ACCURATE INFORMATION, THOUGH ALL SERVICES LEVELS AND CRITICAL DIMENSIONS SHOULD BE FIELD VERIFIED BY THE CLIENT BEFORE UNDERTAKING ANY WORKS.
- PLEASE CONTACT UTILIMAP LTD. TO CONFIRM THAT THE LATEST REVISION IS BEING USED.
- ANY QUESTIONS PLEASE CONTACT UTILIMAP LTD.

KEY

BT	BRITISH TELECOM
CCTV	CABLE TELEVISION
CCT	CLOSED CIRCUIT TV
COM	DATA COMMUNICATIONS
MD	MULTI DUCT
TM	TRAFFIC MANAGEMENT
HV	HIGH VOLTAGE
PWR	POWER
GAS	GAS
HP	HEATING PIPES
OIL	OIL
WTR	WATER
FW	FOUL WATER
SW	STORM WATER
UD	UNKNOWN DRAINAGE
PM	PUMPING MAIN
GRP	RADAR LOCATE
RFL	RADIO LOCATE
UNK	UNKNOWN
END OF TRACE	END OF TRACE
ROD STOPPED	ROD STOPPED
UNABLE TO TRACE FURTHER	UNABLE TO TRACE FURTHER
BACK DROP	BACK DROP
TRAP	TRAP
SEWER CAPPED	SEWER CAPPED
SURVEY ABANDONED	SURVEY ABANDONED

ABBREVIATIONS

(AR) - Assumed Route	BL - Base Level
BH - Bore Hole	d - Depth
MW - Monitoring Well	NFI - No Further Information
NVC - No Visible Connection	(OSA) - Out of Survey Area
RWP - Rain Water Pipe	SL - Silt Level
SOF - Soffit Level	SP - Soil Pipe
(S) - Sounded	SA - Survey Abandoned
(TFR) - Taken From Records	UTL - Unable to Locate
UTR - Unable to Raise	UTS - Unable to Survey
(WS) -Weak Signal	

LEVELS

LOCAL DATUM: ☐ GPS OS DATUM: ☒ PREVIOUS SURVEY: ☐

GRID

LOCAL & ARBITRARY: ☐ GPS OS GRID: ☒ PREVIOUS SURVEY: ☐

NORTH INDICATIVE ONLY

APPROX.

Richmond House
Avonmouth Way
Bristol
BS11 8DE
Tel:0844 335 1123
Email:info@utilimap.co.uk
Web: www.utilimap.co.uk

- Utility Mapping Surveys
- Topographical Surveys
- Cross Section Surveys
- CCTV Drainage Surveys

Client

ENGINEERS IN PARTNERSHIP

Title

COVERACK ROAD, NEWPORT
PAS128 UTILITY SURVEY

REVISION HISTORY

REV	ISSUE DATE	EXPIRY DATE	DRAWING CHANGE
R1	27.09.2024	27.09.2025	PAS128 UTILITY SURVEY
R2	02.04.2025	02.04.2026	CCTV DRAINAGE SURVEY ADDED
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Original Scale:	Dimension In:	Drawn:	Checked:
1:200 @ A1	Levels: m Depths: m	LG	SW
Drawing Number:		Date: APR 2025	Date: APR 2025
ACAD-COVERACK-ROAD-NEWPORT		Rev	R2

Utilimap Ltd 2025



Site Report

Client:
Quad Consult Ltd
Columbus House
Coryton
Cardiff
CF15 7NE

Project:
Coverack Road
Newport
NP19 0DS

Date of Survey: 1st April 2025

Weather Conditions: Dry

Site Location





APPENDIX 5 – NRW DEVELOPMENT ADVICE MAP

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Project Name:
Coverack Road, Newport

Project number:

Date:
02/04/2025

Contact:

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Legend of Classification	4
Section: 1, Backdrop --- MH01 A	5
Section: 2, MH01 X --- MH04 UTR	7
Section: 3, MH02 UTR --- MH03 UTR	17
Section: 4, MH02 UTR ---	20
Section: 5, MH03 UTR ---	22
Section: 6, MHOSA --- MHOSA.1	24
Section: 7, MHOSA.1 --- MH01 A	26

Service / Operational Defects (SRM 4)

Project name :
Coverack Road, Newport

Project Number :

Contact :

Date :
02/04/2025

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	Backdrop	U	S	C 150	02/04/2025	VC	0.34	0.34	-	0	1	0	0
2	MH01 X	D	F	C 300	02/04/2025	VC	42.33	42.33	2	2	3	0.74	31.4
3	MH02 UTR	U	F	C 300	02/04/2025	VC	61.01	61.01	-	6	4	0.46	27.8
4	MH02 UTR	D	F	C 300	02/04/2025	VC	0.00	0.00	-				
5	MH03 UTR	D	F	C 300	02/04/2025	VC	0.00	0.00	-				
6	MHOSA	D	S	C 150	02/04/2025	PVC	44.46	44.46	3	3	3	0.1	4.5
7	MHOSA.1	D	S	C 150	02/04/2025	PVC	5.28	5.28	-	0	1	0	0

Structural Defects (SRM 4)

Project name :
Coverack Road, Newport

Project Number :

Contact :

Date :
02/04/2025

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	Backdrop	U	S	C 150	02/04/2025	VC	0.34	0.34	-	0	1	0	0
2	MH01 X	D	F	C 300	02/04/2025	VC	42.33	42.33	5	320	5	50.13	2122
3	MH02 UTR	U	F	C 300	02/04/2025	VC	61.01	61.01	-	0	1	0	0
4	MH02 UTR	D	F	C 300	02/04/2025	VC	0.00	0.00	-				
5	MH03 UTR	D	F	C 300	02/04/2025	VC	0.00	0.00	-				
6	MHOSA	D	S	C 150	02/04/2025	PVC	44.46	44.46	-	0	1	0	0
7	MHOSA.1	D	S	C 150	02/04/2025	PVC	5.28	5.28	-	0	1	0	0

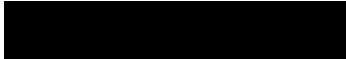
Project-information

Project name :
Coverack Road, Newport

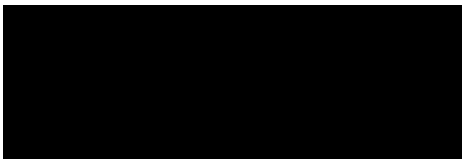
Project Number :

Contact :

Date :
02/04/2025

Client: **Quad Consult Ltd**
Contact Name:
Department: **Columbus House**
Road: **Green Meadow Springs Business Park**
Town: **Coryton**
County: **Cardiff**
Telephone: 
Fax:
Mobile:
E-mail: 

Site: **Coverack Road**
Contact Name:
Department:
Road: **Coverack Road**
Town: **Newport**
County: **Monmouthshire**
Telephone:
Fax:
Mobile:
E-mail:

Contractor **Utilimap Ltd**
Contact Name: **Stephen Willis**
Department: **Office 9**
Road: **Richmond House, Avonmouth Way**
Town: **Avonmouth, BS11 8DE**
County: **Bristol**
Telephone: 
Fax: 
Mobile:
E-mail: 

Defect Grade Description

Project Name :
Coverack Road, Newport

Project number :

Contact :

Date :
02/04/2025

1:

Brick: No Structural Defects
 Pipe: No Structural Defects

Acceptable Structural Condition

2:

Brick: Minor cracking, Surface mortar loss, Spalling slight, wear slight
 Pipe: Circumfrential crack, Moderate joint defects, Spalling slight, Wear slight

Minor collapse risk in short term but potential for further deterioration

3:

Brick: Total mortarloss without other defects, single brick displaced, Deformation up to 5%, Spalling medium, Wear medium
 Pipe: Fractures with deformation up tp 5%, Longitudinal cracking or mulitlpe cracking, Minor loss of level, More severe joint

! Collapse unlikely in near future but future deterioration likely !

4:

Brick: Total mortarloss with deformation greater than 10%, Deformation up to 10% and fractured, Displaced/hanging brickwork, Small number of missing bricks
 Pipe: Broken, Deformation up to 10% and broken,, Fractured with deformation 5 - 10%, Multipl

!! Collapse likely in foreseeable future !!

5:

Brick: Already Collapsed, Missing invert, Deformation over 10% and fractured, Displaced/hanging brickwork and deformation over 10%, Extensive missing bricks
 Pipe: Already collapsed, Deformation over 10% and broken, Extensive areas of fabric missin

!!! Collapsed or collapse imminent !!!

Inspection report

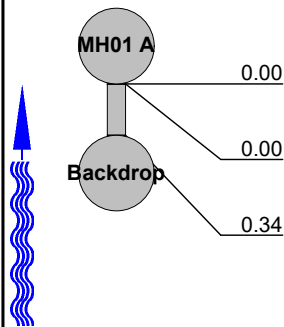
Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 1	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MH01 A (U/S) Backdrop	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	Backdrop MH01 A 2.4
Use: Year laid : Purpose : Total length :	Surface water Routine inspection of condition 0.34 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	150 mm Vitrified clay		

Comment :

1:50 Position
Depth: 2.4

Observation



Start node type, manhole, reference number : MH01 A

Water level, 0% of the vertical dimension

Finish node type, other special chamber reference number: Backdrop
 Remarks: Backdrop from MHOSA.1



0.34 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Place :

Utilimap Ltd
Richmond House, Avonmouth Way
Avonmouth, BS11 8DE
Tel: 0844 335 1123
Fax:
Email: info@utilimap.co.uk

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
1

PLR Suffix :



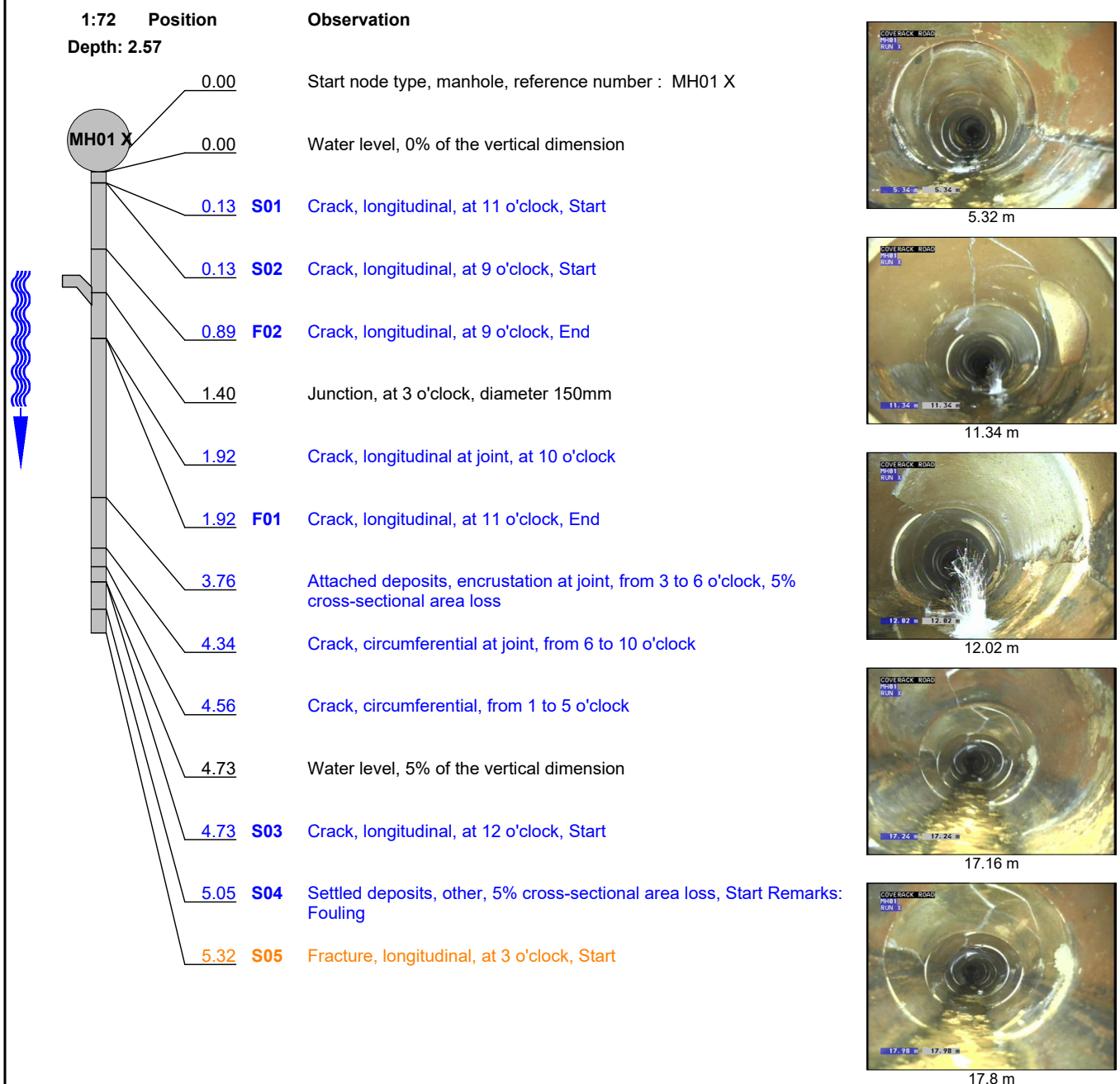
Photo: 1_1_4_A.jpg, 00:00:28
0.34m, Finish node type, other special chamber reference
number: Backdrop

Inspection report

Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 2	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MH01 X (D/S) MH04 UTR	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	MH01 X 2.57 MH04 UTR
Use: Year laid : Purpose : Total length :	Foul Routine inspection of condition 42.33 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 300 mm Vitrified clay		

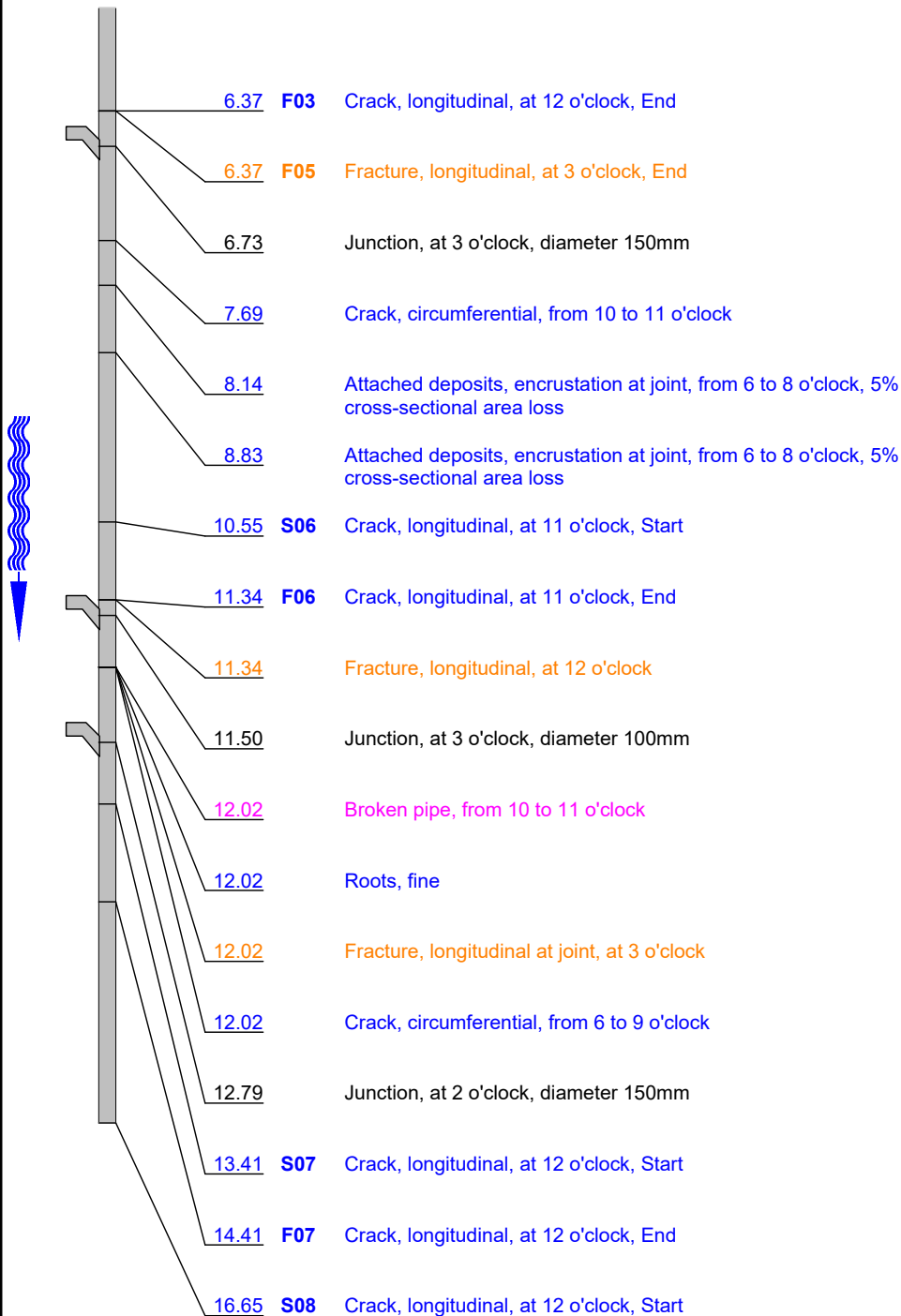
Comment :



Inspection Report

Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 2	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

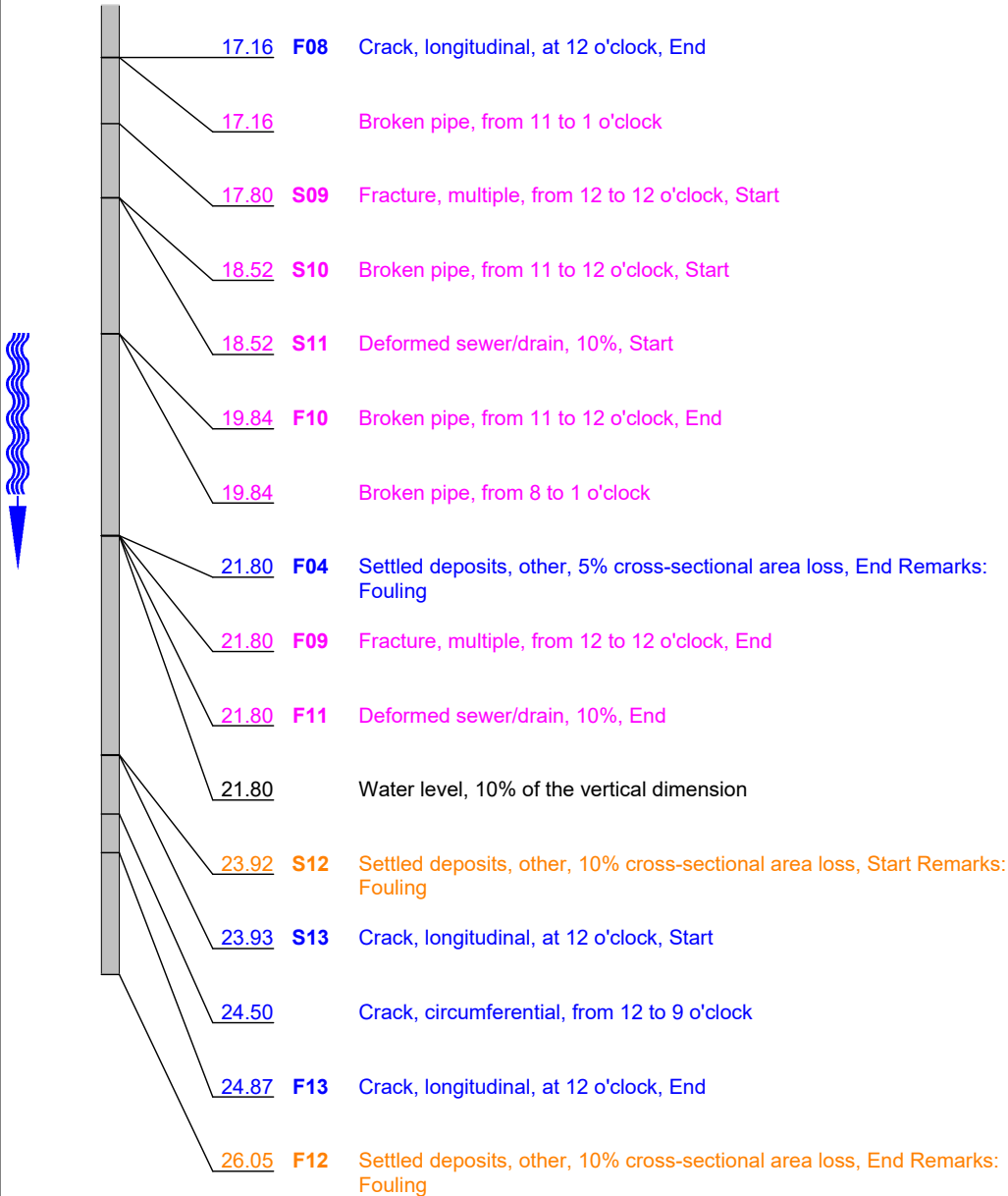
1:72 Position Observation



Inspection Report

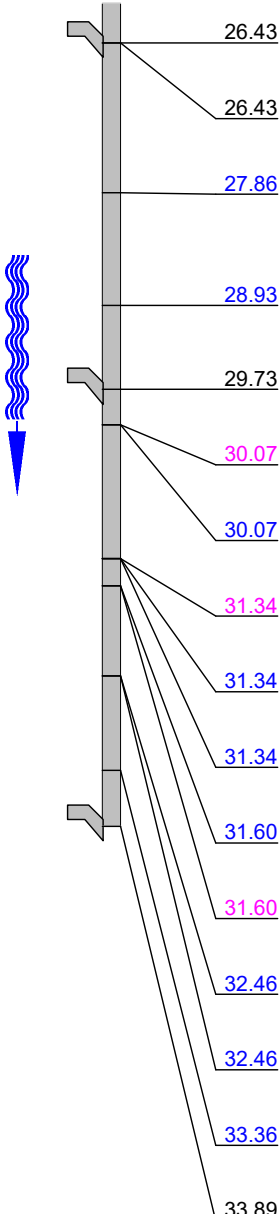
Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 2	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

1:72 Position Observation



Inspection Report

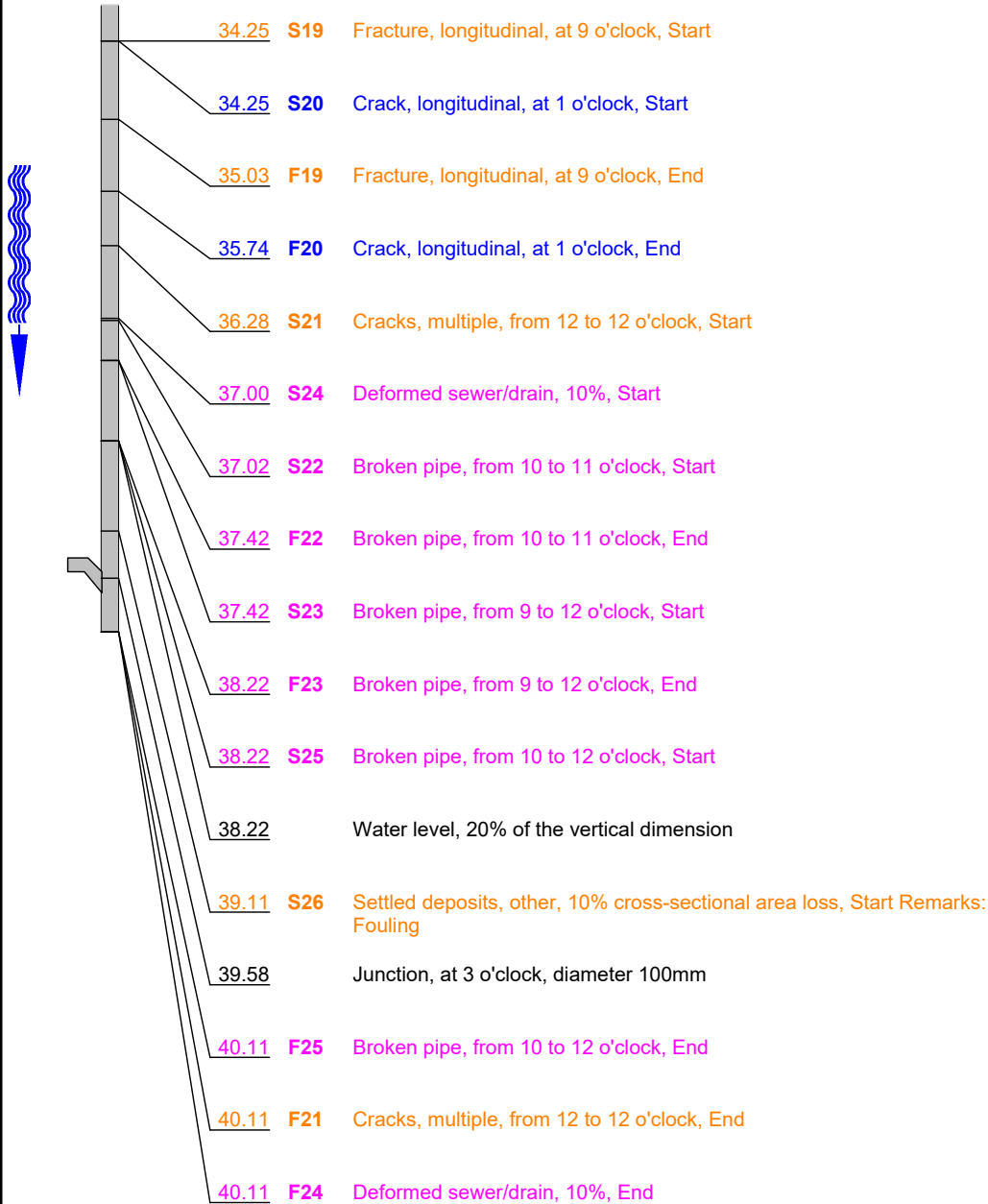
Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 2	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

1:72	Position	Observation
	<u>26.43</u>	Water level, 5% of the vertical dimension
	<u>26.43</u>	Junction, at 3 o'clock, diameter 150mm
	<u>27.86</u> S14	Crack, longitudinal, at 12 o'clock, Start
	<u>28.93</u> F14	Crack, longitudinal, at 12 o'clock, End
	<u>29.73</u>	Junction, at 3 o'clock, diameter 150mm
	<u>30.07</u> S15	Fracture, multiple, from 12 to 12 o'clock, Start
	<u>30.07</u> S16	Deformed sewer/drain, 5%, Start
	<u>31.34</u> F15	Fracture, multiple, from 12 to 12 o'clock, End
	<u>31.34</u> F16	Deformed sewer/drain, 5%, End
	<u>31.34</u> S17	Crack, longitudinal, at 12 o'clock, Start
	<u>31.60</u>	Settled deposits, other, 5% cross-sectional area loss Remarks: Fouling
	<u>31.60</u>	Broken pipe at joint, from 11 to 12 o'clock
	<u>32.46</u> F17	Crack, longitudinal, at 12 o'clock, End
	<u>32.46</u> S18	Crack, longitudinal, at 3 o'clock, Start
	<u>33.36</u> F18	Crack, longitudinal, at 3 o'clock, End
	<u>33.89</u>	Junction, at 3 o'clock, diameter 100mm

Inspection Report

Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 2	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

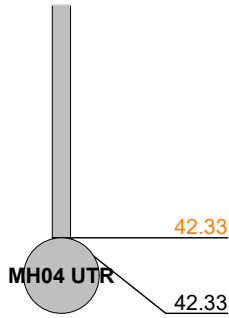
1:72 Position Observation



Inspection Report

Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 2	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

1:72 Position Observation



F26 Settled deposits, other, 10% cross-sectional area loss, End Remarks: Fouling

Finish node type, manhole reference number: MH04 UTR

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
36	320	50.13	2122	5	7	2	0.74	31.4	3

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
2

PLR Suffix :



Photo: 3_3_19_A.jpg, 00:00:20
 5.32m, Fracture, longitudinal, at 3 o'clock, Start

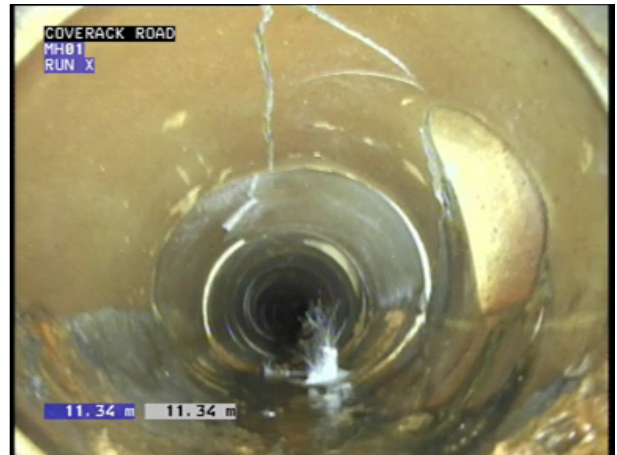


Photo: 3_3_30_A.jpg, 00:00:40
 11.34m, Fracture, longitudinal, at 12 o'clock



Photo: 3_3_32_A.jpg, 00:00:44
 12.02m, Broken pipe, from 10 to 11 o'clock



Photo: 3_3_41_A.jpg, 00:01:07
 17.16m, Broken pipe, from 11 to 1 o'clock

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
2

PLR Suffix :



Photo: 3_3_42_A.jpg, 00:01:07
 17.8m, Fracture, multiple, from 12 to 12 o'clock, Start



Photo: 3_3_43_A.jpg, 00:01:14
 18.52m, Broken pipe, from 11 to 12 o'clock, Start



Photo: 3_3_46_A.jpg, 00:01:21
 19.84m, Broken pipe, from 8 to 1 o'clock



Photo: 3_3_63_A.jpg, 00:02:51
 30.07m, Fracture, multiple, from 12 to 12 o'clock, Start

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
2

PLR Suffix :



Photo: 3_3_69_A.jpg, 00:03:03
 31.6m, Broken pipe at joint, from 11 to 12 o'clock



Photo: 3_3_78_A.jpg, 00:03:35
 36.28m, Cracks, multiple, from 12 to 12 o'clock, Start



Photo: 3_3_79_A.jpg, 00:03:39
 37.02m, Broken pipe, from 10 to 11 o'clock, Start



Photo: 3_3_81_A.jpg, 00:03:46
 37.42m, Broken pipe, from 9 to 12 o'clock, Start

Place :

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Email: info@utilimap.co.uk

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
2

PLR Suffix :



Photo: 3_3_84_A.jpg, 00:03:49
38.22m, Broken pipe, from 10 to 12 o'clock, Start

Inspection report

Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 3	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MH03 UTR (U/S) MH02 UTR	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	MH02 UTR MH03 UTR
Use: Year laid : Purpose : Total length :	Foul Routine inspection of condition 61.01 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 300 mm Vitrified clay		

Comment :

1:216	Position	Observation
	0.00	Start node type, manhole, reference number : MH03 UTR
	0.00	Water level, 10% of the vertical dimension
	0.00 S01	Settled deposits, other, 5% cross-sectional area loss, Start Remarks: Fouling
	0.73	Junction, at 3 o'clock, diameter 100mm
	1.19 F01	Settled deposits, other, 5% cross-sectional area loss, End Remarks: Fouling
	3.13 S02	Settled deposits, other, 5% cross-sectional area loss, Start Remarks: Fouling
	5.56	Junction, at 3 o'clock, diameter 150mm
	5.65	Water level, 15% of the vertical dimension
	8.71 F02	Settled deposits, other, 5% cross-sectional area loss, End Remarks: Fouling
	8.71 S03	Settled deposits, other, 10% cross-sectional area loss, Start Remarks: Fouling
	9.93	Connection other than junction, at 3 o'clock, diameter 150mm
	10.42	Connection other than junction, at 3 o'clock, diameter 150mm
	11.27	Junction, at 3 o'clock, diameter 100mm
	12.87	Water level, 20% of the vertical dimension
	13.68	Junction, at 2 o'clock, diameter 100mm

Inspection Report

Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 3	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

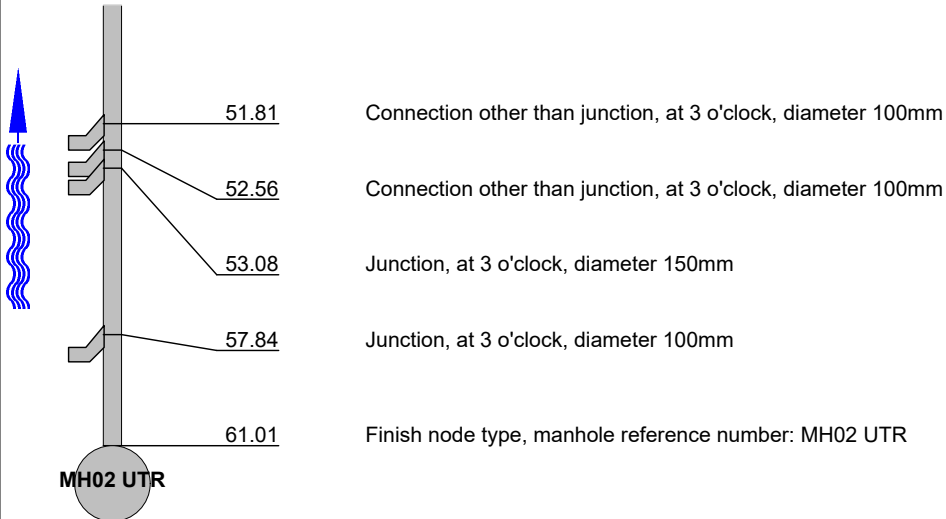
1:216	Position	Observation
	14.51	Water level, 10% of the vertical dimension
	14.51 F03	Settled deposits, other, 10% cross-sectional area loss, End Remarks: Fouling
	15.99	Water level, 5% of the vertical dimension
	15.99	Junction, at 3 o'clock, diameter 100mm
	19.41	Connection other than junction, at 3 o'clock, diameter 150mm
	19.69	Connection other than junction, at 3 o'clock, diameter 100mm
	19.69 S04	Settled deposits, other, 5% cross-sectional area loss, Start Remarks: Fouling
	21.45	Junction, at 3 o'clock, diameter 100mm
	26.70 F04	Settled deposits, other, 5% cross-sectional area loss, End Remarks: Fouling
	26.70	Junction, at 3 o'clock, diameter 100mm
	29.32	Connection other than junction, at 3 o'clock, diameter 150mm
	32.37	Junction, at 3 o'clock, diameter 100mm
	38.25	Junction, at 3 o'clock, diameter 150mm
	43.33	Junction, at 3 o'clock, diameter 100mm
	43.96	Connection other than junction, at 3 o'clock, diameter 150mm
	44.69 S05	Settled deposits, other, 5% cross-sectional area loss, Start Remarks: Fouling
	47.03 F05	Settled deposits, other, 5% cross-sectional area loss, End Remarks: Fouling
	48.42	Junction, at 3 o'clock, diameter 150mm

Inspection Report

Date : 02/04/2025	Job number :	Weather : no rain or snow	Operator : MM	Section number : 3	PLR :
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Grade:

1:216 Position

Observation



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	5	6	0.46	27.8	4

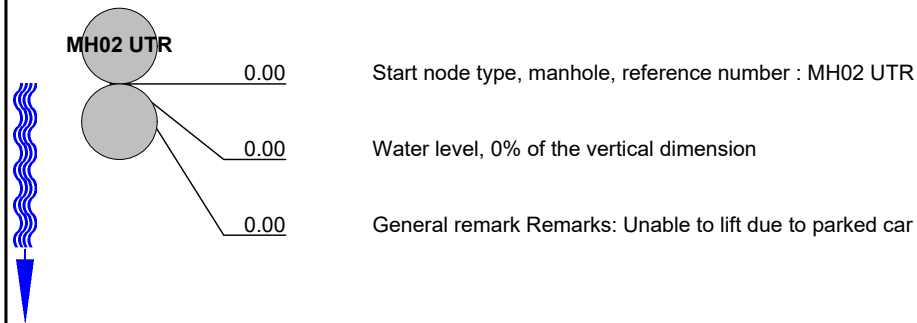
Inspection report

Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 4	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MH02 UTR (D/S)	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	MH02 UTR
Use: Year laid : Purpose : Total length :	Foul Routine inspection of condition 0.00 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 300 mm Vitrified clay		

Comment :

1:50 Position Observation



0 m



0 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade

Place :

Utilimap Ltd
Richmond House, Avonmouth Way
Avonmouth, BS11 8DE
Tel: 0844 335 1123
Fax:
Email: info@utilimap.co.uk

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
4

PLR Suffix :



Photo: 20250401_112422.jpg
0m, Start node type, manhole, reference number : MH02 UTR



Photo: 20250401_112426.jpg
0m, General remark

Inspection report

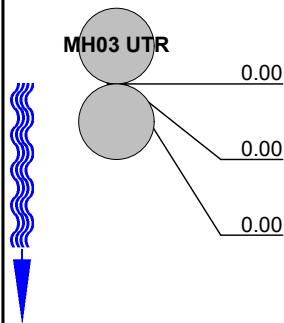
Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 5	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MH03 UTR (D/S)	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	MH03 UTR
Use: Year laid : Purpose : Total length :	Foul Routine inspection of condition 0.00 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 300 mm Vitrified clay		

Comment :

1:50 Position

Observation



Start node type, manhole, reference number : MH03 UTR

Water level, 0% of the vertical dimension

General remark Remarks: Unable to lift manhole due no key holes for lifters



0 m



0 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade

Place :

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Richmond House, Avonmouth Way
Avonmouth, BS11 8DE
Tel: 0844 335 1123
Fax:
Email: info@utilimap.co.uk

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
5

PLR Suffix :



Photo: 20250401_114610.jpg
0m, Start node type, manhole, reference number : MH03 UTR



Photo: 20250401_114614.jpg
0m, General remark

Inspection report

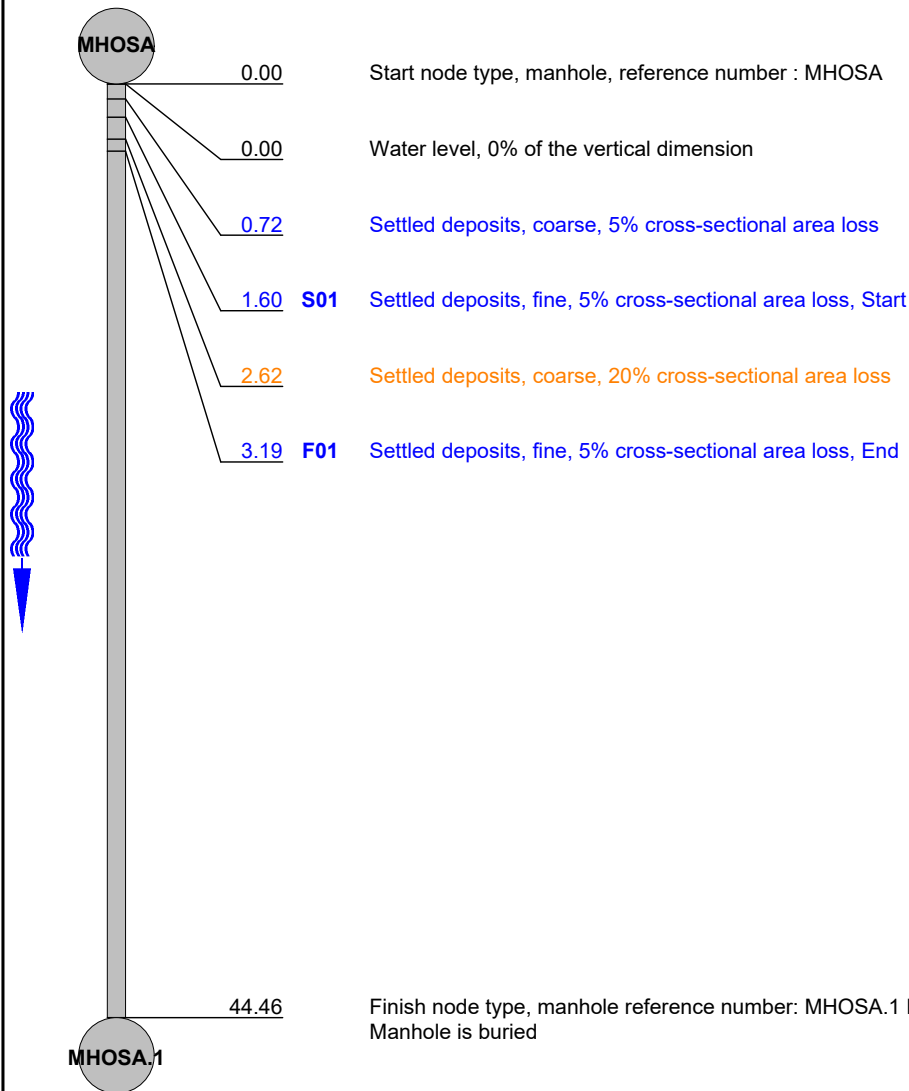
Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 6	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MHOSA (D/S) MHOSA.1	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	MHOSA 0.98 MHOSA.1
Use: Year laid : Purpose : Total length :	Surface water Routine inspection of condition 44.46 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	 150 mm Polyvinyl chloride		

Comment :

1:360 Position
Depth: 0.98

Observation



Remarks:
Manhole is buried

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	3	3	0.1	4.5	3

Place :

Utilimap Ltd
Richmond House, Avonmouth Way
Avonmouth, BS11 8DE
Tel: 0844 335 1123
Fax:
Email: info@utilimap.co.uk

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

Section number :
6

PLR Suffix :



Photo: 7_7_142_A.jpg, 00:00:06
2.62m, Settled deposits, coarse, 20% cross-sectional area loss

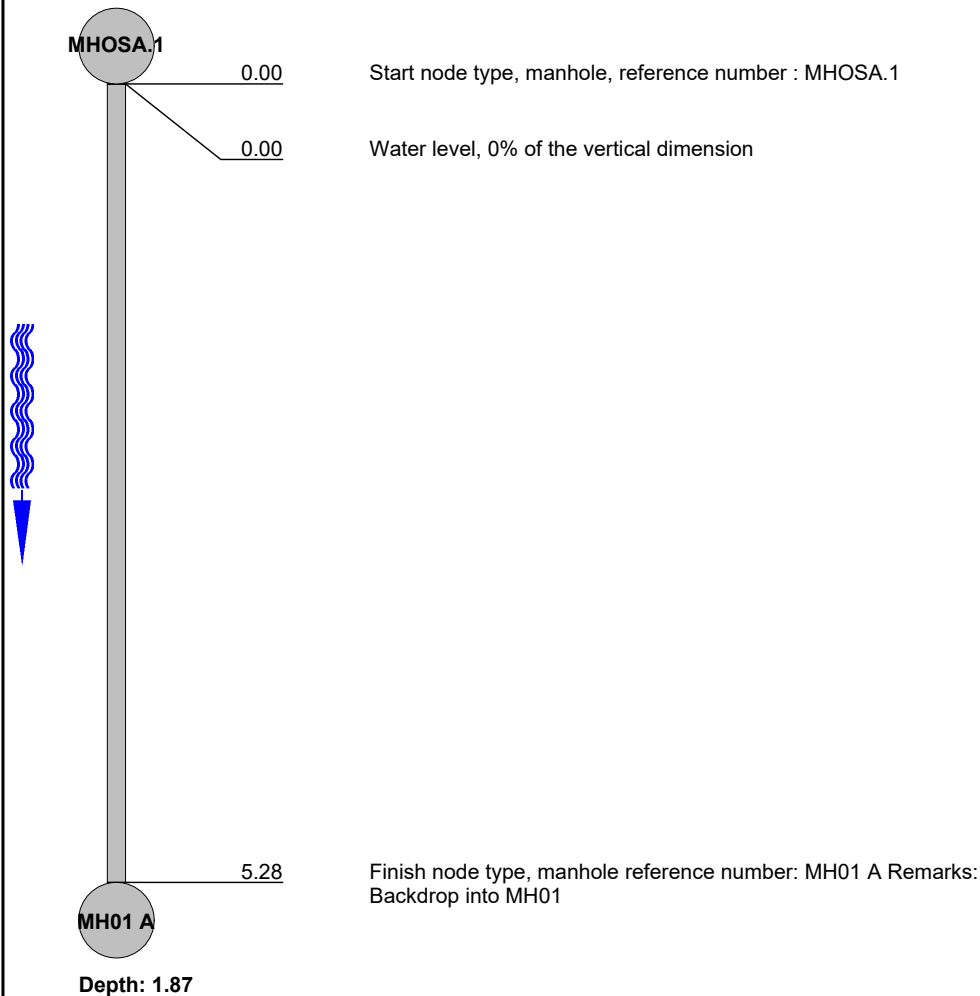
Inspection report

Date : 02/04/2025	Job number :	Section Type :	Operator : MM	Section number : 7	PLR SUFFIX:
Weather no rain or snow	Vehicle :	Camera :	Preset :	Cleaned : no	Type of Drain : Gravity drain/sewer

Place : Road : Location Inspection	Newport Coverack Road Property with buildings MHOSA.1 (D/S) MH01 A	Location details: Catchment: Pipe Shape : Pipe Length	Circular	U/S MH : U/S Depth : D/S MH : D/S Depth :	MHOSA.1 MH01 A 1.87
Use: Year laid : Purpose : Total length :	Surface water Routine inspection of condition 5.28 m	Pipe Width : Pipe Diameter : Pipe material : Lining :	150 mm Polyvinyl chloride		

Comment :

1:50 Position Observation



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Place :

Utilimap Ltd
Richmond House, Avonmouth Way
Avonmouth, BS11 8DE
Tel: 0844 335 1123
Fax:
Email: info@utilimap.co.uk

Inspection pictures

Place :
Newport

Road :
Coverack Road

Date :
02/04/2025

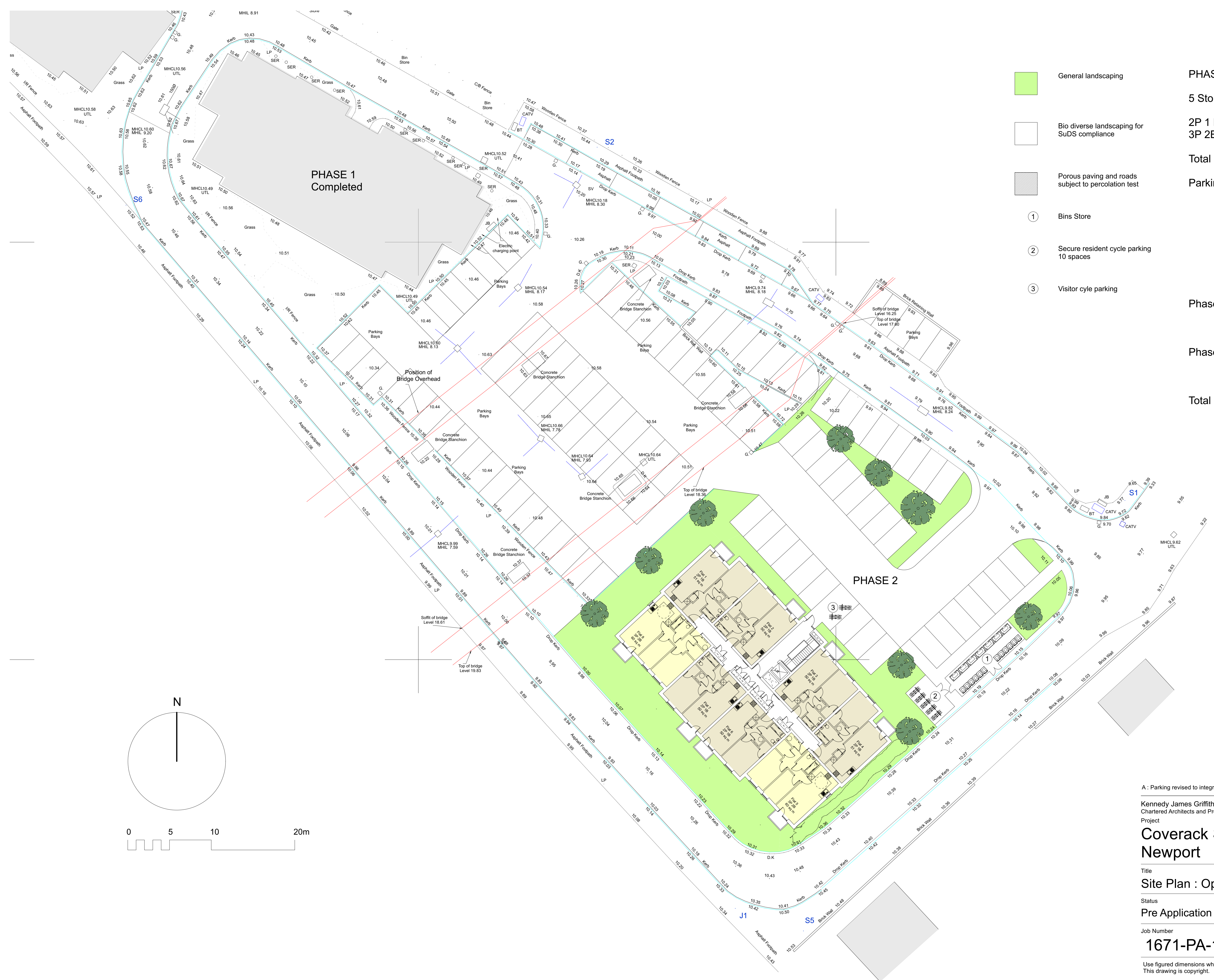
Section number :
7

PLR Suffix :



Photo: 8_8_147_A.jpg, 00:01:14
5.28m, Finish node type, manhole reference number: MH01 A

APPENDIX 6 – PROPOSED SITE LAYOUT



- General landscaping
- Bio diverse landscaping for SuDS compliance
- Porous paving and roads subject to percolation test
- ① Bins Store
- ② Secure resident cycle parking 10 spaces
- ③ Visitor cycle parking

PHASE 2

5 Storey Development

2P 1 Bed : 30 No.

3P 2Bed : 10 No.

Total : 40 No.

Parking : 32 spaces

Phase 1 : 75 Flats

77 Parking Spaces

Phase 2 : 40 Flats

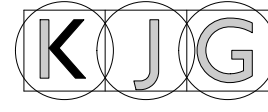
32 Parking Spaces

Total : 115 Flats

109 Parking Spaces

A : Parking revised to integrate with Phase 1 : 14 12 23

Kennedy James Griffiths
Chartered Architects and Project Managers
Project



T 02920 545100
10 Victoria Park Court
516 Cowbridge Road East
Cardiff
CF5 1DB

Coverack Street Newport

Title
Site Plan : Option 1

Date
31 07 2023

Status
Pre Application Consultation

Scale
1:200@ A1
1:400@ A3

Job Number

Revision

Drawn by

1671-PA-1-02 A

DJ

Use figured dimensions where possible. Do not scale for construction purposes.
This drawing is copyright.

APPENDIX 7 – CONFIRMED DISCHARGE RATES WITH SAB

Joss Holloway

From: [REDACTED]
Sent: 23 January 2024 15:06
To: [REDACTED]
Subject: RE: Coverack Phase 2 Development

You don't often get email from [REDACTED]

Hi Joss,

Provided that the infrastructure in place can support unrestricted flows, without causing flooding, then this will be acceptable – this assumes that the Usk is tidal at this point.

We will need to see the full modelled scheme, using FEH data, and up to and including the 1 in 100 year + 40% climate change event. No flooding for the 1 in 30 year event, and 'safe' above ground flooding for the 1 in 100 year events.

Regardless of unrestricted discharge, the other statutory standards need to be adhered to, paying attention to interception, water quality and bio-diversity.

Hopefully this helps.

Kind regards,

NCC SAB

From: Joss Holloway [REDACTED]
Sent: Tuesday, January 23, 2024 2:18 PM
To: NCC [REDACTED]
Subject: Coverack Phase 2 Development

Good Afternoon.

We are currently working on plans for a development at Coverack Road (NR Reference - ST320877)
And wondering if I could seek some advice.

QuadConsult Limited

Cardiff Head Office: Columbus House, Village Way, Greenmeadow Springs Business Park, Cardiff CF15 7NE
Gloucester Office: Southgate House, Southgate Street, Gloucester, GL1 1UB
Llandybie Office: Morgan Marine, Cilrychen Industrial Estate, Llandybie, Ammanford, SA18 3GY

QuadConsult Limited is Registered in England and Wales with Registration No. 06880193
Registered Office: Columbus House, Village Way, Greenmeadow Springs Business Park, Cardiff CF15 7NE

Working In Partnership with Corner Point Surveys Ltd



Mae'r Cyngor yn croesawu gohebiaeth yn Gymraeg, Saesneg neu yn y ddwy iaith. Byddwn yn cyfathrebu â chi yn ôl eich dewis. Ni fydd gohebu yn Gymraeg yn arwain at oedi.

The Council welcomes correspondence in English or Welsh or both, and will respond to you according to your preference. Corresponding in Welsh will not lead to delay.

Disclaimer/Ymwadiad

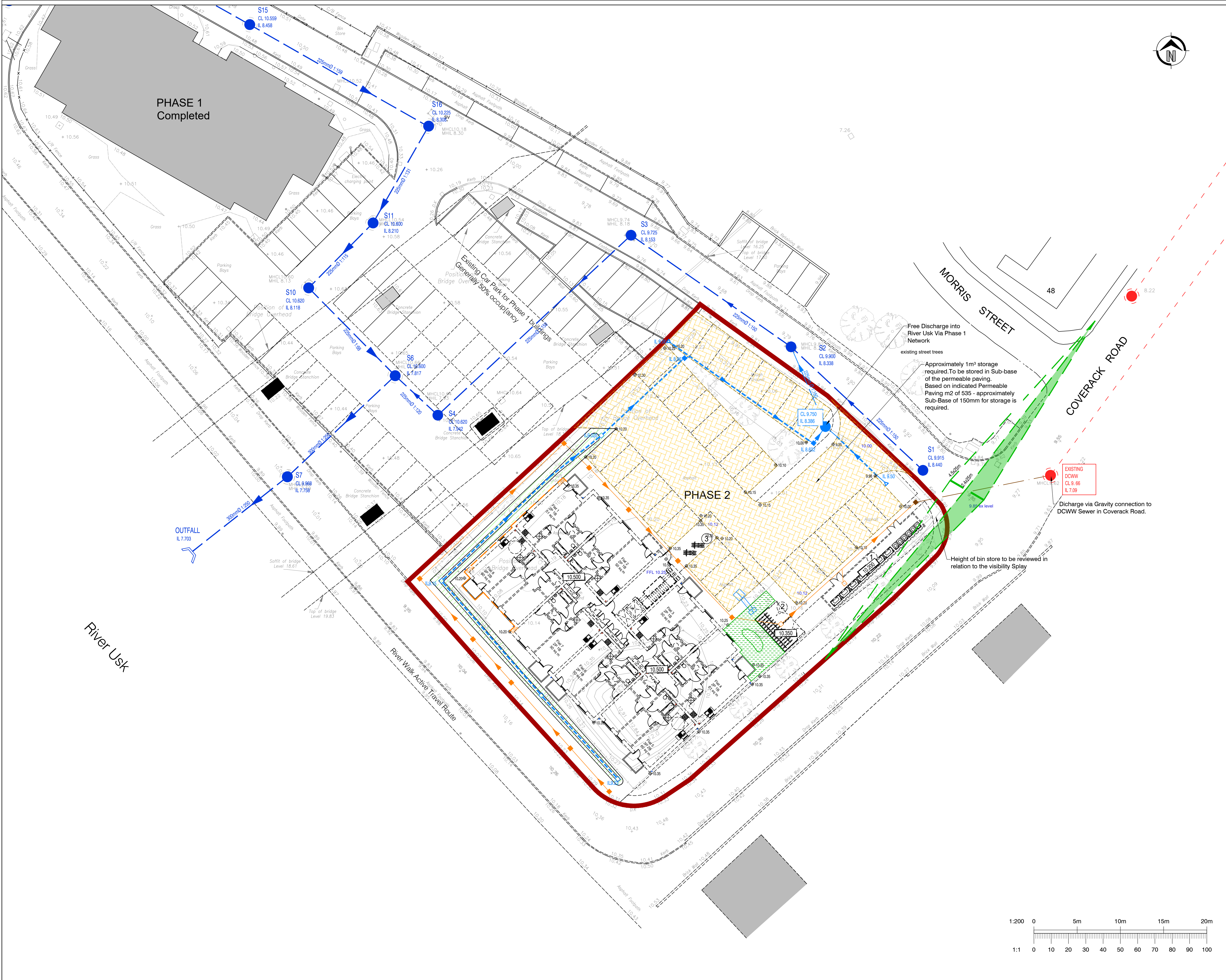
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When you email Newport City Council, you consent to the Council monitoring and reading any such emails for the purposes of security and legislative compliance. For the full disclaimer please access <http://www.newport.gov.uk/disclaimer>.

Mae'r e-bost hwn yn cynnwys gwybodaeth y bwriedir ar gyfer y derbynnydd yn unig a gall fod yn gyfrinachol, yn destun ragorfrant gyfreithiol neu broffesiynol, neu fel arall wedi'i diogelu rhag cael ei rhyddhau. Os nad chi yw derbynnydd bwriadedig y neges hon, a fydddech cystal â rhoi gwybod i'r anfonwr ar unwaith a pheidio â datgelu, dosbarthu neu gopïo'r e-bost i unrhyw barti arall. Mae'r e-bost hon ac unrhyw ffeiliau atodedig yn eiddo i Gyngor Dinas Casnewydd.

Pan fyddwch yn anfon e-bost at Gyngor Dinas Casnewydd, rydych yn cydsynio i'r Cyngor fonitro a darllen unrhyw e-byst o'r fath at ddibenion cydymffurfio â diogelwch ac â deddfwriaeth. I weld yr ymwadiad llawn ewch i <http://www.newport.gov.uk/ymwadiad>

APPENDIX 8 – PROPOSED DRAINAGE LAYOUT



GENERAL NOTES

- This drawing is to be read in conjunction with and checked against all other drawings, engineering details, specifications and any structural, geotechnical or other specialist document provided.
- Any discrepancies within all relevant drawings are to be reported to QuadConsult Ltd immediately.
- All dimensions and levels are in metres, U.N.O..
- Do not scale from this drawing - use figured dimensions only.
- This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.
- Surface water drainage subject to S104 / SAB approval where appropriate with the relevant authority.
- Foul Drainage subject to S104 approval with relevant water authority.
- All private drainage to be installed in accordance with Part H of building regulations and the developers warranty provider.
- The contractor is at risk if construction is progressed without relevant S104, S106, S278, S38, OWC etc agreement being in place with the relevant authorities.

KEY:

1:00.000	Slab Level
Ø0.000	Spot Level
Orange line	Underbuild
Red line	Site Boundary
Blue line	Existing Surface Water Network
Blue dashed line	Proposed Private Surface Water Network
Orange dashed line	Proposed Private Foul Network
Orange box	Proposed Private Pumping Station
Orange diamond	Foul Yard Gully
Green hatched box	Bio-retention Area
Green line	Bio-retention Trench
Yellow hatched box	Permeable Paving
Blue dashed line with arrow	Perforated Pipe
Blue diamond	Grated Catchpit Inspection Chamber
Blue diamond with dot	Catchpit Inspection chamber
Blue rectangle	Distribution Box - Permavoid or similar
Blue line with arrow	Rodding Eye
Green triangle	20mph Visibility Splays
Red circle	Existing DCWW Combined Sewer
Orange line	Adoptable Foul Sewer

- APPROVAL -

Rev	Date	Description	By

Dimensions to be verified on site.
This drawing should not be scaled. Use figured dimensions only.
Any discrepancies should be referred to the Engineer prior to work being put in hand.
This drawing is copyright.

QuadConsult Limited
Columbus House, Village Way
Gowermeadow Business Park
Cardiff
CF15 7NE

029 2077 9644
contactus@quadconsult.co.uk
www.quadconsult.co.uk

QuadConsult
ENGINEERS IN PARTNERSHIP

Consulting Civil & Structural Engineers

Offices in Cardiff, Gloucester and Llandybïlle

Client				
HEDYN				

Project				
Coverack Road PH2				

Title				
Engineering Layout				

Drawing Status				
APPROVAL				

Designed by	Drawn by	Checked by	Date	Scale @ A1 size
JH	JH	ML	APR 25	1:200

Drawing No				
23005-C-001-0				

1:200 0 5m 10m 15m 20m

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

File name: 23005-C-001-Engineering Layout.dwg

APPENDIX 9 – PROPOSED SURFACE WATER CALCULATIONS

QuadConsult Ltd		Page 1																																				
Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE																																						
Date 09/04/2024 12:44 File 23005-CA-750-Proposed Flows Plus Bas...	Designed by Victoria Walker Checked by																																					
Innovyze	Network 2020.1.3																																					
<u>STORM SEWER DESIGN by the Modified Rational Method</u> <u>Design Criteria for Storm</u> Pipe Sizes STANDARD Manhole Sizes STANDARD FSR Rainfall Model - England and Wales <table> <tr> <td>Return Period (years)</td> <td>2</td> <td>PIMP (%)</td> <td>100</td> </tr> <tr> <td>M5-60 (mm)</td> <td>20.000</td> <td>Add Flow / Climate Change (%)</td> <td>0</td> </tr> <tr> <td>Ratio R</td> <td>0.314</td> <td>Minimum Backdrop Height (m)</td> <td>0.200</td> </tr> <tr> <td>Maximum Rainfall (mm/hr)</td> <td>50</td> <td>Maximum Backdrop Height (m)</td> <td>1.500</td> </tr> <tr> <td>Maximum Time of Concentration (mins)</td> <td>30</td> <td>Min Design Depth for Optimisation (m)</td> <td>1.200</td> </tr> <tr> <td>Foul Sewage (l/s/ha)</td> <td>0.000</td> <td>Min Vel for Auto Design only (m/s)</td> <td>1.00</td> </tr> <tr> <td>Volumetric Runoff Coeff.</td> <td>0.750</td> <td>Min Slope for Optimisation (1:X)</td> <td>500</td> </tr> </table> Designed with Level Soffits <u>Time Area Diagram for Storm</u> <table> <thead> <tr> <th>Time (mins)</th> <th>Area (ha)</th> <th>Time (mins)</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr> <td>0-4</td> <td>0.262</td> <td>4-8</td> <td>0.251</td> </tr> </tbody> </table> Total Area Contributing (ha) = 0.513 Total Pipe Volume (m³) = 103.991 ©1982-2020 Innovyze			Return Period (years)	2	PIMP (%)	100	M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0	Ratio R	0.314	Minimum Backdrop Height (m)	0.200	Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500	Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200	Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00	Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500	Time (mins)	Area (ha)	Time (mins)	Area (ha)	0-4	0.262	4-8	0.251
Return Period (years)	2	PIMP (%)	100																																			
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0																																			
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Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00																																			
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500																																			
Time (mins)	Area (ha)	Time (mins)	Area (ha)																																			
0-4	0.262	4-8	0.251																																			



Micro
Drainage

Designed by Victoria Walker

Checked by

Network 2020.1.3

MH Name	MH	MH	MH	MH	Pipe Out			Pipes In			Backdrop (mm)	
	CL (m)	Depth (m)	Connection	Diam.,L*W (mm)	PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)		
SProposed Development	S1	9.915	1.475	Open Manhole	1200	S1.000	8.440	225				1336
		10.064	0.564	Open Manhole	3000	S2.000	9.500					
	S2	9.900	1.562	Open Manhole	3000	S1.001	8.338	225	S1.000	8.338	225	
									S2.000	9.335		
	S3	9.725	1.572	Open Manhole	1200	S1.002	8.153	225	S1.001	8.153	225	
	S4	10.620	2.678	Open Manhole	1200	S1.003	7.942	225	S1.002	7.942	225	
	S8	10.500	1.660	Open Manhole	1200	S3.000	8.840	225				
	S9	10.500	1.848	Open Manhole	1200	S3.001	8.652	225	S3.000	8.652	225	
	S12	10.206	1.311	Open Manhole	1200	S4.000	8.895	225				
	S13	10.488	1.703	Open Manhole	1200	S4.001	8.785	225	S4.000	8.785	225	
	S17	10.500	1.475	Open Manhole	1200	S5.000	9.025	225				
	S18	10.500	1.677	Open Manhole	1200	S5.001	8.823	225	S5.000	8.823	225	
	S19	10.535	1.782	Open Manhole	1200	S5.002	8.752	225	S5.001	8.752	225	
	S14	10.422	1.781	Open Manhole	1200	S4.002	8.640	225	S4.001	8.640	225	
									S5.002	8.640	225	
S15	10.559	2.101	Open Manhole	1200	S4.003	8.458	225	S4.002	8.458	225		

Designed by Victoria Walker
Checked by



Network 2020.1.3

Network 2020.1.3

Network 2020.1.3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SProposed Development	331999.278	187757.129	331999.278	187757.129	Required	
S2	332014.843	187776.387	332014.843	187776.387	Required	
S3	331993.103	187791.527	331993.103	187791.527	Required	
S4	331968.660	187771.149	331968.660	187771.149	Required	
S8	331929.255	187803.583	331929.255	187803.583	Required	
S9	331948.963	187792.289	331948.963	187792.289	Required	
S12	331894.058	187851.997	331894.058	187851.997	Required	



Micro
Drainage

Designed by Victoria Walker

Checked by

Network 2020.1.3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
------------	---------------------------	----------------------------	--------------------------------	---------------------------------	-------------------	-------------------

S13	331907.487	187842.293	331907.487	187842.293	Required
S17	331884.745	187834.942	331884.745	187834.942	Required
S18	331909.271	187816.424	331909.271	187816.424	Required
S19	331919.996	187819.875	331919.996	187819.875	Required
S14	331925.957	187829.406	331925.957	187829.406	Required
S15	331947.838	187817.107	331947.838	187817.107	Required
S16	331968.525	187805.364	331968.525	187805.364	Required



Micro
Drainage

Designed by Victoria Walker

Checked by

Network 2020.1.3

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S11	331962.100	187794.164	331962.100	187794.164	Required	
S10	331954.653	187786.650	331954.653	187786.650	Required	
S6	331963.812	187774.904	331963.812	187774.904	Required	
S7	331952.192	187764.794	331952.192	187764.794	Required	
SHeadwall 1	331941.220	187756.173			No Entry	



Micro
Drainage

Designed by Victoria Walker

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Network 2020.1.3

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	o	225	S8	10.500	8.840	1.435	Open Manhole	1200
S3.001	o	225	S9	10.500	8.652	1.623	Open Manhole	1200
S4.000	o	225	S12	10.206	8.895	1.086	Open Manhole	1200
S4.001	o	225	S13	10.488	8.785	1.478	Open Manhole	1200

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	22.715	120.8	S9	10.500	8.652	1.623	Open Manhole	1200
S3.001	8.011	15.0	S10	10.620	8.118	2.277	Open Manhole	1200
S4.000	16.568	150.9	S13	10.488	8.785	1.478	Open Manhole	1200
S4.001	22.522	155.3	S14	10.422	8.640	1.556	Open Manhole	1200

Designed by Victoria Walker
Checked by



Network 2020.1.3

Network 2020.1.3

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S4.005	o	225	S11	10.600	8.210	2.165	Open Manhole	1200
S3.002	o	225	S10	10.620	8.118	2.277	Open Manhole	1200
S1.004	o	300	S6	10.600	7.817	2.483	Open Manhole	1200
S1.005	o	300	S7	9.968	7.755	1.913	Open Manhole	1200

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S4.005	10.579	115.0	S10	10.620	8.118	2.277	Open Manhole	1200
S3.002	14.895	60.8	S6	10.600	7.873	2.502	Open Manhole	1200
S1.004	15.403	248.4	S7	9.968	7.755	1.913	Open Manhole	1200
S1.005	13.953	249.2	SHeadwall 1	9.930	7.699	1.931	Open Manhole	0

QuadConsult Ltd				Page 11																																																																																																																																																												
Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE																																																																																																																																																																
Date 09/04/2024 12:44 File 23005-CA-750-Proposed Flows Plus Bas...		Designed by Victoria Walker Checked by																																																																																																																																																														
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Area Summary for Storm <table><thead><tr><th>Pipe Number</th><th>PIMP Type</th><th>PIMP Name</th><th>PIMP (%)</th><th>Gross Area (ha)</th><th>Imp. Area (ha)</th><th>Pipe Total (ha)</th></tr></thead><tbody><tr><td>1.000</td><td>-</td><td>-</td><td>100</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td>2.000</td><td>-</td><td>-</td><td>100</td><td>0.200</td><td>0.200</td><td>0.200</td></tr><tr><td>1.001</td><td>-</td><td>-</td><td>100</td><td>0.014</td><td>0.014</td><td>0.014</td></tr><tr><td>1.002</td><td>-</td><td>-</td><td>100</td><td>0.027</td><td>0.027</td><td>0.027</td></tr><tr><td>1.003</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>3.000</td><td>-</td><td>-</td><td>100</td><td>0.026</td><td>0.026</td><td>0.026</td></tr><tr><td>3.001</td><td>-</td><td>-</td><td>100</td><td>0.013</td><td>0.013</td><td>0.013</td></tr><tr><td>4.000</td><td>-</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>4.001</td><td>-</td><td>-</td><td>100</td><td>0.004</td><td>0.004</td><td>0.004</td></tr><tr><td>5.000</td><td>-</td><td>-</td><td>100</td><td>0.013</td><td>0.013</td><td>0.013</td></tr><tr><td>5.001</td><td>-</td><td>-</td><td>100</td><td>0.013</td><td>0.013</td><td>0.013</td></tr><tr><td>5.002</td><td>-</td><td>-</td><td>100</td><td>0.011</td><td>0.011</td><td>0.011</td></tr><tr><td>4.002</td><td>-</td><td>-</td><td>100</td><td>0.061</td><td>0.061</td><td>0.061</td></tr><tr><td>4.003</td><td>-</td><td>-</td><td>100</td><td>0.012</td><td>0.012</td><td>0.012</td></tr><tr><td>4.004</td><td>-</td><td>-</td><td>100</td><td>0.037</td><td>0.037</td><td>0.037</td></tr><tr><td>4.005</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>3.002</td><td>-</td><td>-</td><td>100</td><td>0.021</td><td>0.021</td><td>0.021</td></tr><tr><td>1.004</td><td>-</td><td>-</td><td>100</td><td>0.028</td><td>0.028</td><td>0.028</td></tr><tr><td>1.005</td><td>-</td><td>-</td><td>100</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td colspan="4"></td><td>Total</td><td>Total</td><td>Total</td></tr><tr><td colspan="4"></td><td>0.513</td><td>0.513</td><td>0.513</td></tr></tbody></table>							Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)	1.000	-	-	100	0.012	0.012	0.012	2.000	-	-	100	0.200	0.200	0.200	1.001	-	-	100	0.014	0.014	0.014	1.002	-	-	100	0.027	0.027	0.027	1.003	-	-	100	0.000	0.000	0.000	3.000	-	-	100	0.026	0.026	0.026	3.001	-	-	100	0.013	0.013	0.013	4.000	-	-	100	0.021	0.021	0.021	4.001	-	-	100	0.004	0.004	0.004	5.000	-	-	100	0.013	0.013	0.013	5.001	-	-	100	0.013	0.013	0.013	5.002	-	-	100	0.011	0.011	0.011	4.002	-	-	100	0.061	0.061	0.061	4.003	-	-	100	0.012	0.012	0.012	4.004	-	-	100	0.037	0.037	0.037	4.005	-	-	100	0.000	0.000	0.000	3.002	-	-	100	0.021	0.021	0.021	1.004	-	-	100	0.028	0.028	0.028	1.005	-	-	100	0.000	0.000	0.000					Total	Total	Total					0.513	0.513	0.513
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)																																																																																																																																																										
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4.005	-	-	100	0.000	0.000	0.000																																																																																																																																																										
3.002	-	-	100	0.021	0.021	0.021																																																																																																																																																										
1.004	-	-	100	0.028	0.028	0.028																																																																																																																																																										
1.005	-	-	100	0.000	0.000	0.000																																																																																																																																																										
				Total	Total	Total																																																																																																																																																										
				0.513	0.513	0.513																																																																																																																																																										
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QuadConsult Ltd		Page 12																																				
Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE																																						
Date 09/04/2024 12:44 File 23005-CA-750-Proposed Flows Plus Bas...	Designed by Victoria Walker Checked by																																					
Innovyze	Network 2020.1.3																																					
Storage Structures for Storm Porous Car Park Pipe: S2.000 <table><tr><td>Manning's N</td><td>0.036</td><td>Width (m)</td><td>21.5</td></tr><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Length (m)</td><td>24.8</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Slope (1:X)</td><td>150.1</td></tr><tr><td>Max Percolation (l/s)</td><td>147.9</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Porosity</td><td>0.30</td><td>Membrane Depth (mm)</td><td>0</td></tr><tr><td>Invert Level (m)</td><td>9.500</td><td></td><td></td></tr></table> Under Drain Details <table><tr><td>Depth above Invert Level (m)</td><td>0.000</td><td>Number of Pipes</td><td>1</td></tr><tr><td>Diameter (m)</td><td>0.150</td><td>Manning's N</td><td>0.036</td></tr></table>			Manning's N	0.036	Width (m)	21.5	Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	24.8	Membrane Percolation (mm/hr)	1000	Slope (1:X)	150.1	Max Percolation (l/s)	147.9	Depression Storage (mm)	5	Safety Factor	2.0	Evaporation (mm/day)	3	Porosity	0.30	Membrane Depth (mm)	0	Invert Level (m)	9.500			Depth above Invert Level (m)	0.000	Number of Pipes	1	Diameter (m)	0.150	Manning's N	0.036
Manning's N	0.036	Width (m)	21.5																																			
Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	24.8																																			
Membrane Percolation (mm/hr)	1000	Slope (1:X)	150.1																																			
Max Percolation (l/s)	147.9	Depression Storage (mm)	5																																			
Safety Factor	2.0	Evaporation (mm/day)	3																																			
Porosity	0.30	Membrane Depth (mm)	0																																			
Invert Level (m)	9.500																																					
Depth above Invert Level (m)	0.000	Number of Pipes	1																																			
Diameter (m)	0.150	Manning's N	0.036																																			
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Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	0	Number of Storage Structures	1	Number of Real Time Controls	0

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location GB 332002 187766 ST 32002 87766	Cv (Winter)	0.840	

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
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Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

									Water	Surcharged
PN	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth
	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
S1.000		S1 15	Winter	2	+0%	2/15	Summer		8.770	0.105
S2.000	SProposed Development	15	Winter	2	+0%				9.539	-0.525
S1.001		S2 15	Winter	2	+0%	2/15	Summer		8.768	0.206
S1.002		S3 15	Winter	2	+0%	2/15	Summer		8.701	0.323
S1.003		S4 15	Winter	2	+0%	2/15	Summer		8.620	0.453
S3.000		S8 15	Winter	2	+0%	100/15	Summer		8.885	-0.180
S3.001		S9 15	Winter	2	+0%	100/15	Summer		8.686	-0.192
S4.000		S12 15	Winter	2	+0%	30/15	Winter		8.939	-0.181
S4.001		S13 15	Winter	2	+0%	30/15	Summer		8.832	-0.179
S5.000		S17 15	Winter	2	+0%	100/15	Summer		9.057	-0.193
S5.001		S18 15	Winter	2	+0%	30/15	Summer		8.871	-0.177
S5.002		S19 15	Winter	2	+0%	30/15	Summer		8.802	-0.175
S4.002		S14 15	Winter	2	+0%	30/15	Summer		8.738	-0.127
S4.003		S15 30	Winter	2	+0%	2/15	Winter		8.700	0.017
S4.004		S16 30	Winter	2	+0%	2/15	Summer		8.669	0.136

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name		Flooded	Flow / Cap.	Half Drain	Pipe	Status	Level Exceeded
			Volume (m³)		Time (mins)	Flow (l/s)		
S1.000	SProposed Development	S1	0.000	0.04		1.6	SURCHARGED	
S2.000			0.000	0.02	6	28.9	OK	
S1.001		S2	0.000	0.55		22.1	SURCHARGED	
S1.002		S3	0.000	0.60		23.8	SURCHARGED	
S1.003		S4	0.000	0.43		23.8	SURCHARGED	
S3.000		S8	0.000	0.09		3.8	OK	
S3.001		S9	0.000	0.05		5.4	OK	
S4.000		S12	0.000	0.08		3.1	OK	
S4.001		S13	0.000	0.09		3.6	OK	
S5.000		S17	0.000	0.05		1.9	OK	
S5.001		S18	0.000	0.10		3.5	OK	
S5.002		S19	0.000	0.11		4.9	OK	
S4.002		S14	0.000	0.39		15.9	OK	
S4.003		S15	0.000	0.36		13.7	SURCHARGED	
S4.004		S16	0.000	0.44		17.2	SURCHARGED	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

									Water	Surcharged	Flooded		
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow / Overflow
PN	Name	Storm	Period	Change		Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap. (l/s)
S4.005	S11	30 Winter		2	+0%	2/15 Summer				8.640	0.205	0.000	0.43
S3.002	S10	30 Winter		2	+0%	2/15 Summer				8.616	0.273	0.000	0.39
S1.004	S6	30 Winter		2	+0%	2/15 Summer				8.572	0.455	0.000	0.81
S1.005	S7	30 Winter		2	+0%	2/15 Summer				8.486	0.431	0.000	0.82

PN	US/MH	Half Drain	Pipe	Status	Level Exceeded
	Name	Time (mins)	Flow (l/s)		
S4.005	S11		17.4	SURCHARGED	
S3.002	S10		22.8	SURCHARGED	
S1.004	S6		48.1	SURCHARGED	
S1.005	S7		47.9	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name		Flooded	Half Drain	Pipe	Status	Level Exceeded
			Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)		
S1.000	SProposed Development	S1	0.000	0.10		3.6	SURCHARGED
S2.000			0.000	0.04	6	62.3	OK
S1.001		S2	0.000	1.17		46.9	SURCHARGED
S1.002		S3	0.000	1.22		48.5	SURCHARGED
S1.003		S4	0.000	0.89		48.7	SURCHARGED
S3.000		S8	0.000	0.19		8.2	OK
S3.001		S9	0.000	0.09		8.9	OK
S4.000		S12	0.000	0.13		4.8	SURCHARGED
S4.001		S13	0.000	0.14		5.4	SURCHARGED
S5.000		S17	0.000	0.08		3.3	OK
S5.001		S18	0.000	0.19		6.7	SURCHARGED
S5.002		S19	0.000	0.20		8.7	SURCHARGED
S4.002		S14	0.000	0.48		19.6	SURCHARGED
S4.003		S15	0.000	0.57		21.4	SURCHARGED
S4.004		S16	0.000	0.70		27.5	SURCHARGED

APPENDIX 10 – EXISTING SURFACE WATER NETWORK CALCULATIONS

QuadConsult Ltd		Page 1																												
Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE																														
Date 09/04/2024 12:48 File Phase 1 Drainage Calcs.MDX	Designed by Victoria Walker Checked by																													
Innovyze	Network 2020.1.3																													
<u>STORM SEWER DESIGN by the Modified Rational Method</u> <u>Design Criteria for Storm</u> Pipe Sizes STANDARD Manhole Sizes STANDARD FSR Rainfall Model - England and Wales <table> <tr> <td>Return Period (years)</td> <td>2</td> <td>PIMP (%)</td> <td>100</td> </tr> <tr> <td>M5-60 (mm)</td> <td>20.000</td> <td>Add Flow / Climate Change (%)</td> <td>0</td> </tr> <tr> <td>Ratio R</td> <td>0.314</td> <td>Minimum Backdrop Height (m)</td> <td>0.200</td> </tr> <tr> <td>Maximum Rainfall (mm/hr)</td> <td>50</td> <td>Maximum Backdrop Height (m)</td> <td>1.500</td> </tr> <tr> <td>Maximum Time of Concentration (mins)</td> <td>30</td> <td>Min Design Depth for Optimisation (m)</td> <td>1.200</td> </tr> <tr> <td>Foul Sewage (l/s/ha)</td> <td>0.000</td> <td>Min Vel for Auto Design only (m/s)</td> <td>1.00</td> </tr> <tr> <td>Volumetric Runoff Coeff.</td> <td>0.750</td> <td>Min Slope for Optimisation (1:X)</td> <td>500</td> </tr> </table> Designed with Level Soffits			Return Period (years)	2	PIMP (%)	100	M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0	Ratio R	0.314	Minimum Backdrop Height (m)	0.200	Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500	Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200	Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00	Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500
Return Period (years)	2	PIMP (%)	100																											
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0																											
Ratio R	0.314	Minimum Backdrop Height (m)	0.200																											
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500																											
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200																											
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00																											
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500																											
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MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S1	9.915	1.475	Open Manhole	1200	S1.000	8.440	225				
S2	9.900	1.562	Open Manhole	1200	S1.001	8.338	225	S1.000	8.338	225	
S3	9.725	1.572	Open Manhole	1200	S1.002	8.153	225	S1.001	8.153	225	
S4	10.620	2.678	Open Manhole	1200	S1.003	7.942	225	S1.002	7.942	225	
S8	10.500	1.660	Open Manhole	1200	S2.000	8.840	225				
S9	10.500	1.848	Open Manhole	1200	S2.001	8.652	225	S2.000	8.652	225	
S12	10.206	1.311	Open Manhole	1200	S3.000	8.895	225				
S13	10.488	1.703	Open Manhole	1200	S3.001	8.785	225	S3.000	8.785	225	
S17	10.500	1.475	Open Manhole	1200	S4.000	9.025	225				
S18	10.500	1.677	Open Manhole	1200	S4.001	8.823	225	S4.000	8.823	225	
S19	10.535	1.782	Open Manhole	1200	S4.002	8.752	225	S4.001	8.752	225	
S14	10.422	1.781	Open Manhole	1200	S3.002	8.640	225	S3.001	8.640	225	
								S4.002	8.640	225	
S15	10.559	2.101	Open Manhole	1200	S3.003	8.458	225	S3.002	8.458	225	
S16	10.225	1.917	Open Manhole	1200	S3.004	8.308	225	S3.003	8.308	225	
S11	10.600	2.390	Open Manhole	1200	S3.005	8.210	225	S3.004	8.210	225	

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Cardiff, CF15 7NE

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S10	10.620	2.502	Open Manhole	1200	S2.002	8.118	225	S2.001	8.118	225	56
								S3.005	8.118	225	
S6	10.600	2.809	Open Manhole	1200	S1.004	7.817	300	S1.003	7.791	225	
								S2.002	7.873	225	
S7	9.968	2.213	Open Manhole	1200	S1.005	7.755	300	S1.004	7.755	300	
SHeadwall 1	9.930	2.231	Open Manhole	0		OUTFALL		S1.005	7.699	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	332025.704	187765.547	332025.704	187765.547	Required	
S2	332014.843	187776.387	332014.843	187776.387	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
------------	---------------------------	----------------------------	--------------------------------	---------------------------------	-------------------	-------------------

The diagram illustrates the growth of a network over time. It starts with a single node (grey circle) at the bottom. As time progresses, new nodes are added, and the connections between them (yellow lines) become more complex, showing a transition from a simple linear structure to a more interconnected, branching network.



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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
------------	---------------------------	----------------------------	--------------------------------	---------------------------------	-------------------	-------------------

S18	331909.271	187816.424	331909.271	187816.424	Required
S19	331919.996	187819.875	331919.996	187819.875	Required
S14	331925.957	187829.406	331925.957	187829.406	Required
S15	331947.838	187817.107	331947.838	187817.107	Required
S16	331968.525	187805.364	331968.525	187805.364	Required
S11	331962.100	187794.164	331962.100	187794.164	Required
S10	331954.653	187786.650	331954.653	187786.650	Required

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
------------	---------------------------	----------------------------	--------------------------------	---------------------------------	-------------------	-------------------

No Entry



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Upstream Manhole

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.004	15.403	248.4	S7	9.968	7.755	1.913	Open Manhole	1200
S1.005	13.953	249.2	SHeadwall 1	9.930	7.699	1.931	Open Manhole	0

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Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.012	0.012	0.012
1.001	-	-	100	0.014	0.014	0.014
1.002	-	-	100	0.027	0.027	0.027
1.003	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.026	0.026	0.026
2.001	-	-	100	0.013	0.013	0.013
3.000	-	-	100	0.021	0.021	0.021
3.001	-	-	100	0.004	0.004	0.004
4.000	-	-	100	0.013	0.013	0.013
4.001	-	-	100	0.013	0.013	0.013
4.002	-	-	100	0.011	0.011	0.011
3.002	-	-	100	0.061	0.061	0.061
3.003	-	-	100	0.012	0.012	0.012
3.004	-	-	100	0.037	0.037	0.037
3.005	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.021	0.021	0.021
1.004	-	-	100	0.028	0.028	0.028
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.313	0.313	0.313

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Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE		
Date 09/04/2024 12:48 File Phase 1 Drainage Calcs.MDX	Designed by Victoria Walker Checked by	
Innovyze	Network 2020.1.3	
<u>Simulation Criteria for Storm</u> Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000 Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000 Hot Start (mins) 0 Inlet Coefficient 0.800 Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000 Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 60 Foul Sewage per hectare (l/s) 0.000 Output Interval (mins) 1 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750 Return Period (years) 2 Ratio R 0.314 Cv (Winter) 0.840 Region England and Wales Profile Type Summer Storm Duration (mins) 30		
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Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE																																																											
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Innovyze	Network 2020.1.3																																																										
Manhole Headloss for Storm <table><thead><tr><th>PN</th><th>US/MH Name</th><th>US/MH Headloss</th></tr></thead><tbody><tr><td>S1.000</td><td>S1</td><td>0.500</td></tr><tr><td>S1.001</td><td>S2</td><td>0.500</td></tr><tr><td>S1.002</td><td>S3</td><td>0.500</td></tr><tr><td>S1.003</td><td>S4</td><td>0.500</td></tr><tr><td>S2.000</td><td>S8</td><td>0.500</td></tr><tr><td>S2.001</td><td>S9</td><td>0.500</td></tr><tr><td>S3.000</td><td>S12</td><td>0.500</td></tr><tr><td>S3.001</td><td>S13</td><td>0.500</td></tr><tr><td>S4.000</td><td>S17</td><td>0.500</td></tr><tr><td>S4.001</td><td>S18</td><td>0.500</td></tr><tr><td>S4.002</td><td>S19</td><td>0.500</td></tr><tr><td>S3.002</td><td>S14</td><td>0.500</td></tr><tr><td>S3.003</td><td>S15</td><td>0.500</td></tr><tr><td>S3.004</td><td>S16</td><td>0.500</td></tr><tr><td>S3.005</td><td>S11</td><td>0.500</td></tr><tr><td>S2.002</td><td>S10</td><td>0.500</td></tr><tr><td>S1.004</td><td>S6</td><td>0.500</td></tr><tr><td>S1.005</td><td>S7</td><td>0.500</td></tr></tbody></table>			PN	US/MH Name	US/MH Headloss	S1.000	S1	0.500	S1.001	S2	0.500	S1.002	S3	0.500	S1.003	S4	0.500	S2.000	S8	0.500	S2.001	S9	0.500	S3.000	S12	0.500	S3.001	S13	0.500	S4.000	S17	0.500	S4.001	S18	0.500	S4.002	S19	0.500	S3.002	S14	0.500	S3.003	S15	0.500	S3.004	S16	0.500	S3.005	S11	0.500	S2.002	S10	0.500	S1.004	S6	0.500	S1.005	S7	0.500
PN	US/MH Name	US/MH Headloss																																																									
S1.000	S1	0.500																																																									
S1.001	S2	0.500																																																									
S1.002	S3	0.500																																																									
S1.003	S4	0.500																																																									
S2.000	S8	0.500																																																									
S2.001	S9	0.500																																																									
S3.000	S12	0.500																																																									
S3.001	S13	0.500																																																									
S4.000	S17	0.500																																																									
S4.001	S18	0.500																																																									
S4.002	S19	0.500																																																									
S3.002	S14	0.500																																																									
S3.003	S15	0.500																																																									
S3.004	S16	0.500																																																									
S3.005	S11	0.500																																																									
S2.002	S10	0.500																																																									
S1.004	S6	0.500																																																									
S1.005	S7	0.500																																																									
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QuadConsult Ltd		Page 14
Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE		
Date 09/04/2024 12:48 File Phase 1 Drainage Calcs.MDX	Designed by Victoria Walker Checked by	
Innovyze	Network 2020.1.3	
30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FEH Data Type Point FEH Rainfall Version 2013 Cv (Summer) 0.750 Site Location GB 332002 187766 ST 32002 87766 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter		
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Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE					
Date 09/04/2024 12:48 File Phase 1 Drainage Calcs.MDX		Designed by Victoria Walker Checked by			
Innovyze		Network 2020.1.3			
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>					
			Half Drain	Pipe	
	US/MH	Overflow	Time	Flow	Level
PN	Name	(l/s)	(mins)	(l/s)	Status Exceeded
S1.000	S1			3.7	OK
S1.001	S2			7.7	SURCHARGED
S1.002	S3			14.5	SURCHARGED
S1.003	S4			14.8	SURCHARGED
S2.000	S8			8.2	OK
S2.001	S9			12.8	OK
S3.000	S12			5.9	OK
S3.001	S13			6.5	SURCHARGED
S4.000	S17			4.0	OK
S4.001	S18			7.9	SURCHARGED
S4.002	S19			10.1	SURCHARGED
S3.002	S14			24.5	SURCHARGED
S3.003	S15			26.4	SURCHARGED
S3.004	S16			32.1	SURCHARGED
S3.005	S11			32.6	SURCHARGED
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Columbus House Greenmeadow Springs Business Park Cardiff, CF15 7NE		
Date 09/04/2024 12:48 File Phase 1 Drainage Calcs.MDX	Designed by Victoria Walker Checked by	
Innovyze	Network 2020.1.3	
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u> <u>Simulation Criteria</u> Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FEH Data Type Point FEH Rainfall Version 2013 Cv (Summer) 0.750 Site Location GB 332002 187766 ST 32002 87766 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 Analysis Timestep 2.5 Second Increment (Extended) DTS Status OFF DVD Status ON Inertia Status ON Profile(s) Summer and Winter		
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Network 2020.1.3

Innovyze

			Half Drain		Pipe			
			US/MH	Overflow	Time			Flow
PN	Name	(l/s)	(mins)	(l/s)	Status	Level Exceeded		
S1.000	S1			5.4	SURCHARGED			
S1.001	S2			10.8	SURCHARGED			
S1.002	S3			22.5	SURCHARGED			
S1.003	S4			21.8	SURCHARGED			
S2.000	S8			12.2	SURCHARGED			
S2.001	S9			15.1	SURCHARGED			
S3.000	S12			7.5	SURCHARGED			
S3.001	S13			9.8	SURCHARGED			
S4.000	S17			5.0	SURCHARGED			
S4.001	S18			11.6	SURCHARGED			
S4.002	S19			14.7	SURCHARGED			
S3.002	S14			36.4	SURCHARGED			
S3.003	S15			40.2	SURCHARGED			
S3.004	S16			49.7	SURCHARGED			
S3.005	S11			50.7	SURCHARGED			

Designed by Victoria Walker
Checked by



Network 2020.1.3

Checked by

Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

									Water	Surcharged	Flooded		
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)
S2.002	S10 15	Winter	100	+30%	30/15	Summer			9.132	0.789	0.000	1.22	
S1.004	S6 15	Winter	100	+30%	30/15	Summer			8.764	0.647	0.000	1.73	
S1.005	S7 15	Winter	100	+30%	30/15	Summer			8.575	0.520	0.000	1.75	

PN	Half Drain		Pipe	Status	Level Exceeded
	US/MH	Time	Flow		
	Name	(mins)	(l/s)		
S2.002	S10		71.4	SURCHARGED	
S1.004	S6		102.3	SURCHARGED	
S1.005	S7		101.8	SURCHARGED	

APPENDIX 11 – DCWW FOUL WATER CAPACITY

Joss Holloway

From: Phillip Little [REDACTED]
Sent: 21 March 2024 14:49
To: Joss Holloway
Subject: RE: Coverack Road Ph2

Hi Joss,

My colleague Chris has passed your query over to me as I am currently covering Newport.

I can confirm that there is sufficient capacity to discharge foul flows at or downstream of manhole ST32870702 which is the manhole which is the manhole you have proposed a connection to in your drainage strategy marked as option 1.

Any further questions, please do not hesitate to get in touch.

Kind regards,



Phillip Little

Development Planning Officer | Developer Services
Dŵr Cymru Welsh Water



W: dwrcymru.com



A: PO Box 3146, Cardiff, CF30 0EH



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If we've gone the extra mile to provide you with excellent service, let us know. You can nominate an individual or team for a Diolch award through our [website](#).

From: Joss Holloway [REDACTED]
Sent: Friday, March 8, 2024 7:48 AM
To: Chris Scourfield [REDACTED]
Cc: Joshua Guy [REDACTED]
Subject: Covera [REDACTED]

***** External Mail *****

Hi Chris

I hope you're having a good week

we are currently beginning design on a development in On Coverack Road as shown below
ST 32001 87759
332001, 187759



We have been discussing potential Foul water Discharge locations - Please see attached Plans

Our preference of discharge location is a gravity connection to one of the 2 DCWW Sewers within Coverack road (Option 1)

Would you be able to confirm if there is capacity in this sewer at the proposed discharge location point.

Kind Regards

Joss Holloway
Bsc

Graduate Civil Engineer

Tel: [REDACTED]
Web: [REDACTED]

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QuadConsult Limited

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Tel: [REDACTED]
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APPENDIX 12 – LANDSCAPE LAYOUT (to be included once complete)



Site Boundary

Proposed Tree

Proposed Ornamental Hedge Planting
Topsoil Depth: 450mm
Mulch: 75mm Depth Bark Mulch

Proposed Amenity Grass
Product: Medallion Premium Lawn Seed or Similar Approver
Supplier: Rolawn
Topsoil Depth: 150mm

Proposed Meadow Grass
Product: EM4 Meadow Mixture for Clay Soils
Supplier: Emorsgate Seeds
Sowing rate: 4g/m² Topsoil Depth: 150mm

Proposed Ornamental Shrub Planting
Topsoil Depth: 450mm
Mulch: 75mm Depth Bark Mulch

Proposed Marginal/Aquatic Planting to Bio-retention Basin

This drawing is to be read in conjunction with all other drawings and specifications within the package. These drawings have been prepared for design development and costing purposes only. All dimensions in millimeters unless otherwise specified. Do not scale off this drawing, written dimensions to be taken only. All base plans used are provided by the client and architect, except where otherwise expressly agreed in writing. EDP shall have no responsibility or liability for any loss direct or consequential. This drawing must not be copied in whole or part without prior written consent from EDP.

purpose of issue PLANNING			
a	Amendments to layout and additional planting introduced.	12/12/2024	JHa
	- Original	26/03/2024	TYC
rev	description	date	by
client			
Newport City Homes			
project title			
Galliford's Yard, Coverack Road, Newport - Phase 2			
drawing title			
Detailed Soft Landscape Plan			
Sheet 1 of 2			
date	12 DECEMBER 2024	drawn by TYC	
drawing number	edp8348_d003a	checked JHa	
scale	1:200 @ A2	QA GYo	

APPENDIX 13 – RAINWATER HARVESTING VIABILITY STATEMENT

Rainwater Harvesting Viability Assessment

The developer has confirmed there is no requirement for rainwater harvesting for the proposed development from the point of construction or throughout the design life of the development.

The proposed site is currently within easy connectivity to the Welsh Water potable water network. Newport is not currently or likely to be in the future classed as in danger of suffering regular drought water rationing. Welsh Water draft Drought Plan 2020 also states the unlikelihood of any water rationing being realised within the next 30. Welsh Water highlight 2018 as being a very hot year with increased demand on their network but like other parts of the UK did not have to introduce any restriction in the form of hosepipe bans or limited access to the potable water supply.

APPENDIX 14 – PROPOSED POLLUTION REMOVAL CALCULATIONS

POLLUTION REMOVAL & WATER QUALITY MANAGEMENT SCHEDULE

CIRIA 753 The SuDS Manual Chapter 26, provides design advice to meet water quality standards by adopting the SuDS train treatment mechanism and thereby reduce the risk of pollution by evaluating potential pollution hazards at the outset.

As the proposed drainage strategy proposes to discharge runoff to ground, Chapter 26.3 'Protecting Groundwater' is particularly relevant.

Runoff from residential roofing and pedestrian areas is viewed as low risk (Table 4.3) and the proposed site layout provides the opportunity to introduce SuDS into the scheme to reduce potential contaminant risk still further. For example, the use of porous paving reduces flow velocities and increase retention times promoting a level of absorption into the upper soils (intergranular flow) prior to discharge to ground (fracture flow).

We propose to apply a simple qualitative method to assess the risk (Simple Index Approach) and proposed mitigation measures as defined in Table 26.1 CIRIA SuDS Manual.

Total SuDS Mitigation Index = Mitigation Index₁ + 0.5 Mitigation Index₂

Plot Discharge - Assuming a roof/hard surface split of 70/30 and using a weighted mean:

Residential Roof 0.5 (70%)	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
	(Very Low)	(0.2)	(0.2)	(0.05)
Weighted value		0.14	0.14	0.035
Individual Property Driveways & Homezones (30%)	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
	(Low)	(0.5)	(0.4)	(0.4)
Weighted value		0.15	0.12	0.12
Total hazard Index		0.29	0.26	0.155

Development Highway only - using a weighted mean:

Weighted value		0.00	0.00	0.00
Private Drive / Highway (100%)	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
	(Low)	(0.5)	(0.4)	(0.4)
Weighted value		0.5	0.4	0.4
Total hazard Index		0.5	0.4	0.4

Comparing against the mitigation indices shown below.

SuDS Individual Component Mitigation Indices

	Suspended Solids	Metals	Hydrocarbons
Bioretention Planter	0.8	0.8	0.8
Rain Garden (Swale)	0.5	0.6	0.6
Pervious Pavement	0.7	0.6	0.7

However, within the outline drainage scheme a multi staged treatment is proposed for the majority of the site where practical, creating a Suds Management Train improving treatment locally and further reducing risk with the best and worst case outlined within Table 4.

Table 4 – Total SuDS Mitigation Index

Total SuDS Mitigation Index = Mitigation Index₁ + 0.5 Mitigation Index₂

	Suspended Solids	Metals	Hydrocarbons
SCENARIO 1 (Roof Runoff) Bioretention – Pervious Paving	1.15	1.10	1.15
SCENARIO 2 (Roof Runoff) Rain Garden – Pervious Paving	0.85	0.9	0.65
SCENARIO 3 (Driveway Runoff) Pervious Paving	0.7	0.6	0.7
SCENARIO 4 (Shared Drive / Highway) Basin	0.5	0.5	0.6
Comparison with Hazard Index	ALL PASS >0.29-0.5	ALL PASS >0.26-0.4	ALL PASS >0.155-0.4

APPENDIX 15 – SURFACE WATER MAINTENANCE SCHEDULE

Maintenance Plan for the surface water system.

To ensure the surface water systems to function as intended it is important appropriate maintenance arrangements are in place.

The surface water from the proposed development will be maintained in accordance to CIRIA C753 Chapter 32.

Storm Water Maintenance Management Schedule (CIRIA C753 – The SuDS Manual)

Operation and maintenance activity	SuDS component												
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/trees	Filter strip	Green roofs	Proprietary treatment systems
Regular maintenance													
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■		□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■		
Weed and invasive plant control	□	□	□	□		□	□		□		□	■	
Shrub management (including pruning)	□	□	□	□					□	□	□		
Shoreline vegetation management	■	■	□										
Aquatic vegetation management	■	■	□										
Occasional maintenance													
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■		■
Vegetation replacement	□	□	□	□						□	□	■	
Vacuum sweeping and brushing									■				
Remedial maintenance													
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□	
Infiltration surface reconditioning				□	□	□	□		□	□	□		

Key

- will be required
- may be required

Notes

- 1 Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

Proposed Site SuDS Features

1. Pervious Surfacing
2. Bio Retention Planter / Rain Garden
3. Piped Network Elements
4. Wetland

The maintenance management will be highlighted in 3 categories: -

Regular Maintenance

Regular maintenance comprises tasks that are likely to be required regularly to maintain and observe the drainage system typically on a monthly programme.

- Inspection - (Elements - 1, 2, 3, 4)
- Litter and Debris Removal - (Elements - 1, 2, 3,)
- Grass Cutting - (Elements – 2,4)
- Shrub Management - (Elements – 2,4)

Occasional Maintenance

Occasional maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the regular tasks, typically annually.

- Sediment management - (Elements - 1, 2, 3)
- Catchpit / Silt trap cleaning - (Elements - 3)
- Pipe jetting if required - (Elements – 1, 3)
- Vegetation Replacement - (Elements – 2)
- Vacuum Sweeping and Brushing - (Elements - 1)

Remedial Maintenance

Remedial maintenance describes the intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design, construction and regular maintenance activities. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and so timings are difficult to predict.

- Structure Rehabilitation / Repair - (Elements - 1, 2, 3)

Site Specific Maintenance Plan

1. Permeable Surfacing

Maintenance to be carried in accordance with Ciria Suds Manual (Chapter 20 & Table 20.1.5) and to include but not limited to the following actions: -

- Annual visual inspections to be undertaken of the pervious system with litter and debris removed.
- Brush / Vacuum, replacing any lost jointing material every year. Sediment management to be undertaken at the same time. Upstream chamber of discharge pipe to be inspected and cleaned yearly.
- Remedial maintenance will be undertaken intermittently following the outcome of monthly inspections if required. This may consist of the following items –
 - Weed control
 - Replacement of damaged blocks
 - Repair any rutting
 - Cleaning for aesthetics of the paving blocks
 - De-icing during winter months
 - Inspection of ponding during or following heavy rainfall

2. Bioretention Planting / Rain Gardens

Site specific method statement

Maintenance to be carried in accordance with Ciria Suds Manual (Chapter 18 & Table 18.3) and to include but not limited to the following actions: -

- Quarterly visual inspections to be undertaken along with litter and debris removed. planting inspection to be undertaken at the same time but will be less frequent during winter months.
- Remedial maintenance will be undertaken intermittently following the outcome of quarterly inspections if required. This may consist of the following items –
 - Weed control
 - Replacement of damaged planting
 - Structure Rehabilitation / Repair
 - Surface Reconditioning

3. Piped Network

- Gully / catchpit / channel drain cleaning and pipe jetting to be undertaken typically every year. If a blockage is present and flooding occurs, cleaning and clearing the blockage should be undertaken immediately. If item is defective, this should also be repaired or replaced.