

GWK STRUCTURAL SOLUTIONS LTD CONSULTING ENGINEERS

Proposed Drainage Strategy to Discharge Planning Condition 19 of Application No. DC/074884

PROJECT REFERENCE:

- Project No:
- Project Location:
- Project Title:
- Client:

GK2020 2 Cambridge Road, Heaton Chapel, Stockport, SK4 4QN 2 Cambridge Road Mr J Beadle

						APPR	OVALS
Issue	Date	Pages		Issue Description	on	Ву	Check
А	10.12.20		Issue	d to discharge planning con	dition	PG	GWK
В	10.03.21		Upd	ated with extra detail as rec	PG	GWK	
V	Entire Report				Report Issued for	:	
	Issued this R	evision		In-house Review		Purchase	
	Revised Page	sed Pages Only		Client Approval		Construction	
	Issued this R	evision		Inquiry	\checkmark	Planning	



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1.0 Introduction

In 2020 a planning application was submitted to Stockport Borough Council for the demolition of existing single storey garage to side of number 2 Cambridge Road and erection of new detached dwelling house to land at side of 2 Cambridge Road, Heaton Chapel. No formal Flood Risk Assessment or Outline Drainage Strategy for the development was submitted with the application. Planning approval, ref DC/074884, was granted in 2020 subject to a number of planning conditions, including one condition relating to the drainage of the development.

This report has been prepared to remove this condition.



2.0 Drainage Strategy

2.1 Existing Drainage

Existing combined drains exist within 2 Cambridge Road. United Utilities have confirmed approval to connect to these drain for both foul and surface water drainage. Refer to Appendix C.

2.2 Existing Geology

An soakaway test has been carried out at the site has identified the underlying ground to comprise of sandy clay. A rate of 8.20×10^{-6} has been determined. This would therefore negate the option of infiltration as a viable option for draining the site. Refer to Appendix D for details.

2.3 SuDS Hierarchal Approach

Based on the existing drainage configuration, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in detail below:

Method	Suitability	Suitability for Development
Infiltration to Ground	No	A formal soakaway investigation has found the underlying ground to be sandy clay, with a rate not suitable for infiltration. Refer to Appendix D for full details
Connection to Watercourse	No	There is no watercourse in close proximity to the development site. Refer to Appendix E got details
Connection to Surface Water Sewer	No	No surface water sewers in close proximity. The closest is shown on the UU records to outfall to the combined sewer. Refer to Appendix F for details
Connection to Combined Water Sewer	Yes	Combined drain to be used within adjacent property

Figure 1: SuDS Hierarchal Approach



2.4 Surface Water Drainage Strategy

The general principal of the surface water drainage strategy is to collect the runoff from the roof configuration of the new residential property and direct it to a number of new RWPs that will drop down to a new surface water network on either side. This network will pass through a flow control chamber, limited the peak flow of 2l/s.

Prevention measures in the form or waterbutts and source control in the form of permeable paving to the driveway will be incorporated in the design.

2.5 Maintenance

The long-term maintenance of the new drainage infrastructure will be with the owner of the development in line with best practice guidance. Annual inspections will need to be carried out and clearing of gullies, channel drains and catch pits constructed.



3.0 Drainage Related Planning Condition and Responses

3.1 Planning Conditions

Condition 19

With the exception of demolition, prior to commencement of any development, a surface water drainage scheme, based on the hierarchy of drainage options in the National Planning Practice Guidance with evidence of an assessment of the site conditions shall be submitted to and approved in writing by the local planning authority.

The surface water drainage scheme must be in accordance with the Non Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards and unless otherwise agreed in writing by the local planning authority, no surface water shall discharge to the public sewerage system either directly or indirectly. The development shall be completed in accordance with the approved details.

3.2 GWK Response to Discharge Planning Conditions

Condition 19.

As described in section 2.0, ground conditions will preclude the use of infiltration as a means of draining the surface water. Additional options have also been discounted. As such the surface water is proposed to outfall to the local combined drain which has been approved by UU.

The SuDS hierarchal approach has been incorporated via prevention measures in the form or waterbutts and source control in the form of permeable paving to the driveway

The Outline drainage GA can be found in Appendix A with the calculations in Appendix B.



Appendix A - GWK Design Drawings



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RWP	PROPOSED 3000 MINI PPIC (MAX 600 DP) RAINWATER PIPE
SVP	SOIL VENT PIPE
RG YG	ROAD GULLY YARD GULLY
RE	RODDING EYE
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Appendix B - GWK Drainage Calculations

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cro Draina					Network	c 2018.	1		
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		Page 3
	Cambridge Road	
	SW Network	
		Mirro
Date 13/12/2020 09:56	Designed by SHD20	Drainage
File Camnbridge Road - SW Ca	Checked by	Diamage
Micro Drainage	Network 2018.1	

Online Controls for Storm

Orifice Manhole: s3, DS/PN: 1.002, Volume (m³): 0.2

Diameter (m) 0.034 Discharge Coefficient 0.600 Invert Level (m) 47.200

Cambridge Road Micro Date 13/12/2020 09:56 Designed by SHD20 File Camnbridge Road - SW Ca Checked by	
Date 13/12/2020 09:56 Designed by SHD20	
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	Jr
Micro Drainage Network 2018.1	
<u>1 year Return Period Summary of Critical Results by Maximum Level (Rank</u> <u>for Storm</u>	1)
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 Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (1/per/day) 0.000 Foul Sewage per hectare (1/s) 0.000	
Number of Input Hydrographs 0 Number of Storage Structures 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0	
Synthetic Rainfall Details Rainfall Model FSR Ratio R 0.364 Region England and Wales Cv (Summer) 0.750 M5-60 (mm) 18.000 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 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 0, 40	
(1) (1) (1) (2) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3) (3)	
Wate US/MH Return Climate First (X) First (Y) First (Z) Overflow Leve PN Name Storm Period Change Surcharge Flood Overflow Act. (m)	el
1.000 s1 15 Winter 1 +0% 30/15 Summer 47.33 1.001 s2 15 Winter 1 +0% 30/15 Summer 47.23 1.002 s3 15 Winter 1 +0% 30/15 Summer 47.23	76
Surcharged Flooded Pipe US/MH Depth Volume Flow / Overflow Flow Level PN Name (m) (m ³) Cap. (l/s) (l/s) Status Exceeded	
1.000s1-0.0820.0000.070.4OK1.001s2-0.0740.0000.110.6OK1.002s3-0.0320.0000.140.5OK	
©1982-2018 Innovyze	

								Pag	e 5
			(Cambrid	lge Roa	ıd			
			()	SW Netw	ork			Mi	
ate 13/12/2	020 09:5	6	I	Designe	ed by S	SHD20			
ile Camnbri	dge Road	– SW	Ca (Checked	l by			Dic	inag
icro Draina	ge		1	Network	2018.	1			
Manhole H	Areal Red Hot Sta eadloss C wage per Number of Number of Number of	uction F Start (rt Level oeff (G] hectare Input : of Onli: of Offli:	<u>Simu</u> actor 1. (mins) . (mm) .obal) 0. (1/s) 0. Hydrograp ne Contro ne Contro <u>Synthet</u>	for St alation 0 000 A 0 500 Flo 000 bhs 0 Nu bls 1 Nu	Orm Criteria ddition MADD w per Po umber of umber of umber of	al Flow Factor I: erson pe Storage Time/Ar Real Ti ails	- % of Tota * 10m³/ha S nlet Coeffi r Day (1/pe : Structure ea Diagram me Control	al Flow 0. Storage 2. .ecient 0. er/day) 0. s 0 s 0 s 0	000 000 800
Mai	Rair rgin for 1	M5-60 (1	ion Engl. mm)	1	Wales C	v (Summe	er) 0.364 er) 0.750 er) 0.840	300.0	
		An	DTS	Status Status	2.5 Sec	ond Incr	rement (Ext	ended) OFF ON ON	
Retu	rn Period		ns) rs)	15, 30,	60, 120	, 180, 2	1,		
US/MH			Climate				First (Z)		Water Level
PN Name	Storm	Period	Change	Surcha	arge	Flood	Overflow	Act.	(m)
	15 Winter			30/15 S					47.448
	15 Winter 15 Winter			30/15 S ⁻ 30/15 S ⁻					47.444
		50							
	S111	charged	Flooded			Pipe			
		Depth		Flow /	Overflo	-		Level	
PN	Name	(m)	(m³)	Cap.	(1/s)	(l/s)	Status	Exceeded	
1.000	s1	0.048	0.000	0.14		0.8	SURCHARGED)	
1.001	s2	0.094	0.000	0.22		1.2	SURCHARGED)	
1.002	s3	0.137	0.000	0.29		1.1	SURCHARGED)	

					Page	e 6
		Cambridge R	oad			
		SW Network			Mio	
ate 13/12/2020 09:56		Designed by	SHD20			
ile Camnbridge Road	- SW Ca	Checked by			Dic	inago
licro Drainage		Network 201	8.1			
100 year Return Peri	<u>1</u>) for Storm	<u>L</u>	by Maximu	um Level	(Rank
Hot S	tion Factor 1 Start (mins) Level (mm) Eff (Global) 0	0 MA 0 .500 Flow per	onal Flow DD Factor I	* 10m³/ha S nlet Coeffi	torage 2. ecient 0.	000 800
Number o	Input Hydrogra f Online Contr Offline Contr	ols 1 Number	of Time/Ar	ea Diagram	s 0	
	all Model	land and Wales	Ratio	er) 0.750		
Margin for Fl	DTS	ing (mm) Timestep 2.5 S S Status D Status A Status	econd Incr	ement (Exte	300.0 ended) OFF ON ON	
Duration (Return Period(s	rofile(s) s) (mins)) (years) hange (%)	15, 30, 60, 1	20, 180, 2	720, 90 1,		
•	Return Climate Period Change		First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000 s1 15 Winter 1.001 s2 15 Winter 1.002 s3 15 Winter	100 +40%	30/15 Summer 30/15 Summer 30/15 Summer				47.801 47.795 47.785
Sura	harged Flooded	1	Pipe			
	-	Flow / Overf	-		Level	
PN Name	(m ³)	Cap. (1/	s) (l/s)	Status	Exceeded	
1.000 s1	0.401 0.000	0.23	1.2	FLOOD RISK		
1.001 s2	0.445 0.000			FLOOD RISK		
1.002 s3	0.485 0.000	0.46	1.8	FLOOD RISK		

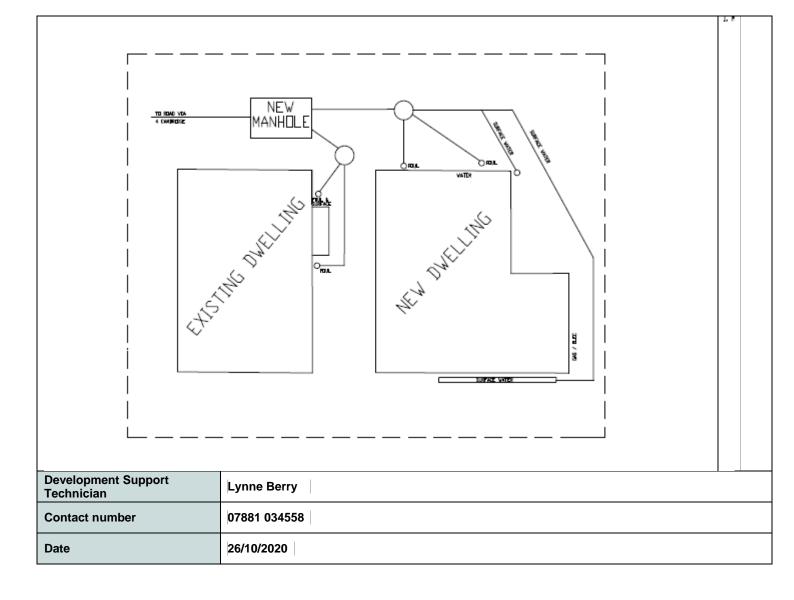


Appendix C – UU Connection Approval

S106 Part 1 'Application to connect to a public sewer' Approval Notice



		SC5258								
Applicant details										
Applicant name	Mr James I	Mr James Beadle								
Applicant address (including postcode)										
Applicant email	wjbeadle@	hotmail.co	o.uk							
Site details: The site / property	which is prop	osed for co	onnection to	the public sewer						
	- 2 Cambrid	dge Road,	Heaton Cha	apel, Stockport, SK4 4	QN					
Your application for	r connection			OVED as been approved, to	be made vi	a a new connection:				
To a private drain		You may appoint your contractor and advise your appointed building control body (who should inspect the work). United Utilities should be advised when this work is complete.								
Direct to the public sewer		You may responsib (The S10	ole for obtain 6 Part 2 app	red t an appropriately qualifi ing authorisation to wor lication form 'Request f ubsite; unitedutilities.com	k on a publi f or permiss	c sewer.				
Mode of connection approved	Other - pl	ease see o	comments b	oox						
Sewer connection type	Foul			Surface water		Combined				
This approval is valid for 12 months from the date below. This approval does not grant access to third party land, permission should be sought if required between applicant and land owner If the new connection renders access unsafe or is otherwise detrimental to the manhole or sewer, a new/upgraded manhole will be requested.										
Comments										
Approval for the combined con Which communicates to the pub					ar of numbe	er 2 Cambridge Road				
Please note, if you are proposin that it communicates with the Pu Connections may be made to pu access third party land. The app	ublic Sewer ivate lateral c	trains or to	existing neig	ghbouring drain. A part ²						





Appendix D – Soakaway Test

SOIL INFILTRATION RATE TEST

In accordance with BRE Digest 365 (1991 with amendments in 2003 and 2007)

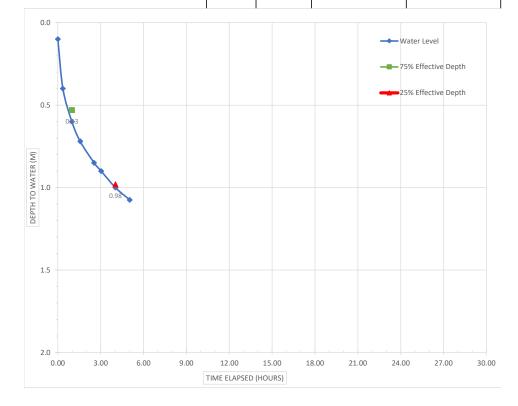
) ade	
Test Pit No.:	1
Gravel void ratio:	N/A
Time to fill pit:	18 mins

Pit Dimensions			
Length (m):	1.40		
Width (m):	0.30		
Depth (m):	1.20		
Invert (mbgl):	0.30		
Effective Depth (ED) (m):	0.90		
75% ED (mbgl):	0.53		
25% ED (mbgl):	0.98		

Elapsed Time		Depth recorded on dip meter	Water Level
GMT	Hours	(m)	(mbgl)
09:58:00	0.00	N/A	0.10
10:19:00	0.35		0.40
10:57:00	0.98		0.60
11:32:00	1.57		0.72
12:30:00	2.53		0.85
13:00:00	3.03		0.90
14:00:00	4.03		1.00
15:00:00	5.03		1.08
16:00:00	6.03		1.10

Monitored Level Interval				
Depth to water	<u>(mbgl)</u>	<u>%ED</u>		
From:	0.53	74%		
To:	0.98	24%		

Soil Infitration Rate (f)			
Test filling 1 (m/s):	8.20E-06		
Test filling 2 (m/s):			
Test filling 3 (m/s):			



Project/ Location: 2 Cambridge Road, SK4 4QN James Beadle Client: Project Ref/No.: A201003 Start Date: 04/12/2020 End Date: 04/12/2020 Start Time: 09:58:00 End Time: 16:00:00 Duration: 6 hr Water IBC with hose Source:



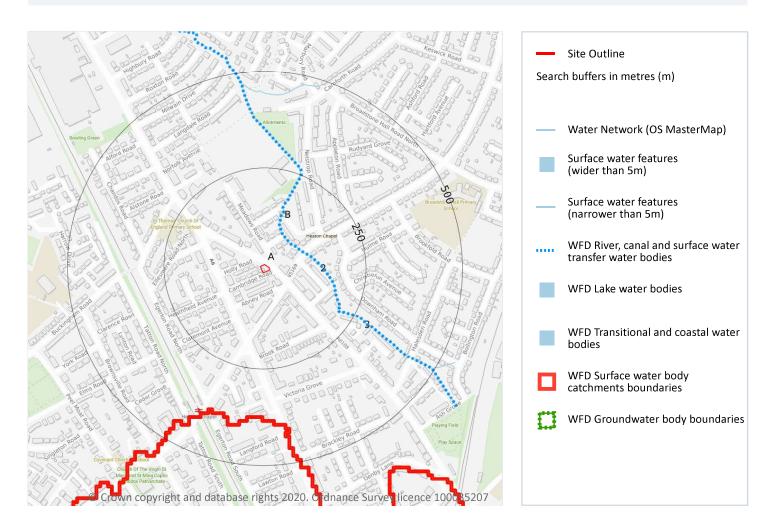


Appendix E – Watercourse Records



2, CAMBRIDGE ROAD, HEATON CHAPEL, STOCKPORT, SK4 4QN Ref: GS-7134227 Your ref: 2_Cambridge_Road Grid ref: 388386 392456

7 Hydrology



7.1 Water Network (OS MasterMap)

Records within 250m

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on page 46

ID	Location	Type of water feature	Ground level	Permanence	Name
В	82m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Black Brook





3



ID	Location	Type of water feature	Ground level	Permanence	Name
2	93m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Black Brook
3	166m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Black Brook

This data is sourced from the Ordnance Survey.

7.2 Surface water features

Records within 250m	1

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on page 46

This data is sourced from the Ordnance Survey.

7.3 WFD Surface water body catchments

Records on site

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on page 46

ID	Location	Туре	Water body catchment	Water body ID	Operational catchment	Management catchment
Α	On site	River WB catchment	Fallowfield Brook	GB112069061410	Bollin, Dean, Upper Mersey	Upper Mersey

This data is sourced from the Environment Agency and Natural Resources Wales.





1



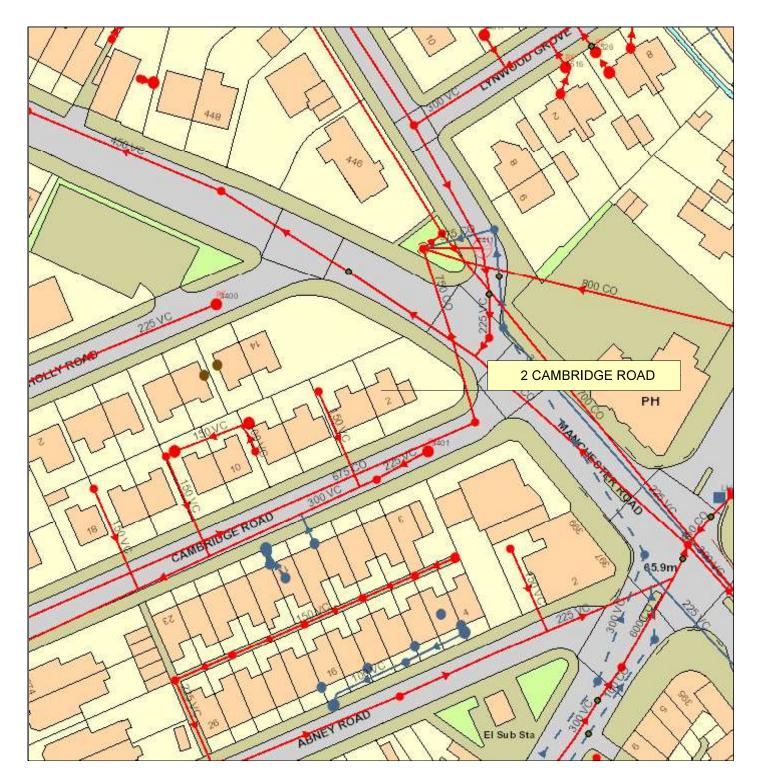
Appendix F – UU Sewer Records





SEWER RECORD

2 CAMBRIDGE ROAD STOCKPORT SK4 4QN



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

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