

**GWK STRUCTURAL SOLUTIONS LTD**  
**CONSULTING ENGINEERS**

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

**PROJECT REFERENCE:**

- **Project No:** GK2020
- **Project Location:** 2 Cambridge Road, Heaton Chapel, Stockport, SK4 4QN
- **Project Title:** 2 Cambridge Road
- **Client:** Mr J Beadle

				<b>APPROVALS</b>	
<b>Issue</b>	<b>Date</b>	<b>Pages</b>	<b>Issue Description</b>	<b>By</b>	<b>Check</b>
A	10.12.20		Issued to discharge planning condition	PG	GWK
B	10.03.21		Updated with extra detail as requested by LLFA	PG	GWK
<input checked="" type="checkbox"/> Entire Report Issued this Revision			Report Issued for:		
<input type="checkbox"/> Revised Pages Only Issued this Revision			<input type="checkbox"/> In-house Review	<input type="checkbox"/> Purchase	<input type="checkbox"/> Construction
			<input type="checkbox"/> Client Approval	<input type="checkbox"/> Construction	<input checked="" type="checkbox"/> Planning
			<input type="checkbox"/> Inquiry	<input checked="" type="checkbox"/> Planning	

## **TABLE OF CONTENTS**

<b>1.0</b>	<b>Introduction</b>	<b>3</b>
<b>2.0</b>	<b>Drainage Strategy</b>	<b>4</b>
2.1	Existing Drainage	4
2.2	Existing Geology	4
2.3	SuDS Hierarchal Approach	4
2.4	Surface Water Drainage Strategy	5
2.5	Maintenance	5
<b>3.0</b>	<b>Drainage Related Planning Condition and Responses</b>	<b>6</b>
3.1	Planning Conditions	6
3.2	GWK Response to Discharge Planning Conditions	6
	<b>Appendix A - GWK Design Drawings</b>	<b>7</b>
	<b>Appendix B - GWK Drainage Calculations</b>	<b>8</b>
	<b>Appendix C – UU Connection Approval</b>	<b>9</b>
	<b>Appendix D – Soakaway Test</b>	<b>10</b>
	<b>Appendix E – Watercourse Records</b>	<b>11</b>

## **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  $8.20 \times 10^{-6}$  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 for 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 of 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

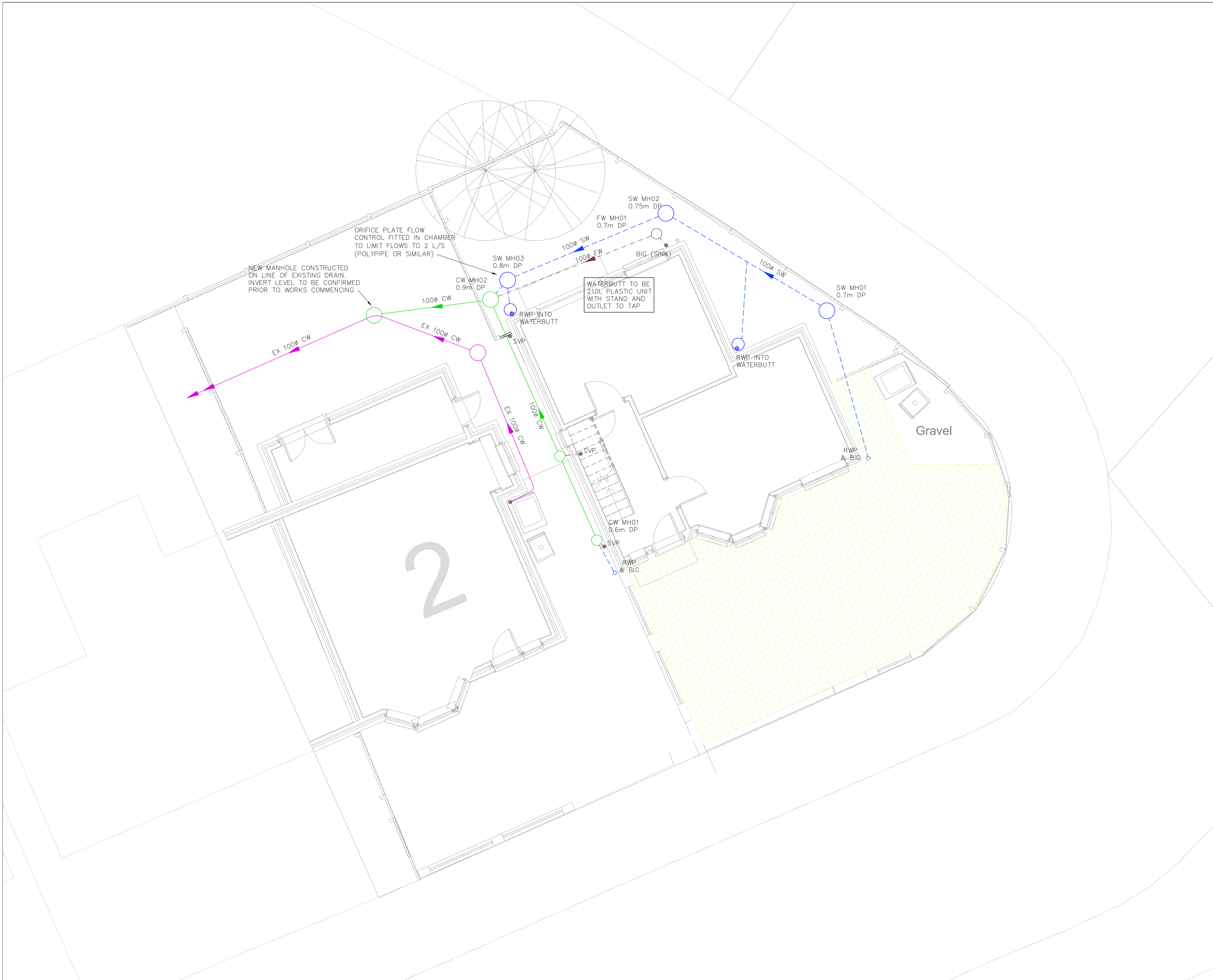
NOTES

NOTES:-

1. ALL LEVELS ARE IN METRES.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF ALL DIMENSIONS AND LEVELS AND FOR THE CORRECT SETTING OUT OF THE WORK ON SITE UNLESS NOTED OTHERWISE.
4. THE CONTRACTOR SHALL ENSURE ALL NECESSARY PRECAUTIONS ARE TAKEN TO PROTECT EXISTING SERVICES DURING THE WORKS.

KEY

-  EXISTING COMBINED WATER DRAINAGE
-  PROPOSED FOUL WATER DRAINAGE
-  PROPOSED SURFACE WATER DRAINAGE
-  PROPOSED COMBINED WATER DRAINAGE
-  PROPOSED PERMEABLE PAVING
-  PROPOSED 450Ø PPIC
-  PROPOSED 300Ø MINI PPIC (MAX 600 DP)
- RWP RAINWATER PIPE
- SVP SOIL VENT PIPE
- RG ROAD GULLY
- YG YARD GULLY
- RE RODDING EYE



C	11.12.20	PG	GWK	DRAINAGE LAYOUT UPDATED
B	10.12.20	PG	GWK	DRAINAGE LAYOUT UPDATED
A	09.11.20	PG	GWK	PRELIMINARY ISSUE
No	DATE	DRAWN	REV'D ENG.	AMENDMENT



**GWK STRUCTURAL SOLUTIONS LTD**  
 CONSULTING CIVIL & STRUCTURAL ENGINEERS  
 3 MILTON DRIVE, POYNTON STOCKPORT SK12 1EZ  
 Email: gareth.kimber@gwkstructuralsolutions.co.uk  
 Web: gwkstructuralsolutions.co.uk

CLIENT	MR J BEADLE		
PROJECT	2 CAMBRIDGE ROAD HEATON CHAPEL		
DRAFTER	PG	ENGINEER	GWK
TITLE	DRAINAGE GA		
SCALE	DRAWING No	DATE	AMDT
1:50	GK2020-C-001	09.11.20	C



## Appendix B - GWK Drainage Calculations

Cambridge Road  
SW NetworkDate 13/12/2020 09:56  
File Camnbridge Road - SW Ca...Designed by SHD20  
Checked by

Micro Drainage

Network 2018.1

STORM SEWER DESIGN by the Modified Rational MethodDesign Criteria for Storm

Pipe Sizes Pipe Manhole Sizes Manhole

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.364	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

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.005	4-8	0.000

Total Area Contributing (ha) = 0.005

Total Pipe Volume (m<sup>3</sup>) = 0.094Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	5.000	0.050	100.0	0.003	4.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	5.000	0.050	100.0	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.11	47.300	0.003	0.0	0.0	0.0	0.77	6.0	0.4
1.001	50.00	4.22	47.250	0.005	0.0	0.0	0.0	0.77	6.0	0.7
1.002	50.00	4.26	47.200	0.005	0.0	0.0	0.0	0.77	6.0	0.7

Cambridge Road  
SW NetworkDate 13/12/2020 09:56  
File Camnbridge Road - SW Ca...Designed by SHD20  
Checked by

Micro Drainage

Network 2018.1

PIPELINE SCHEDULES for StormUpstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	o	100	s1	48.000	47.300	0.600	Open Manhole		450
1.001	o	100	s2	48.000	47.250	0.650	Open Manhole		450
1.002	o	100	s3	48.000	47.200	0.700	Open Manhole		450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., (mm)	L*W
1.000	5.000	100.0	s2	48.000	47.250	0.650	Open Manhole		450
1.001	5.000	100.0	s3	48.000	47.200	0.700	Open Manhole		450
1.002	2.000	100.0	ex drain	48.000	47.180	0.720	Open Manhole		0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	ex drain	48.000	47.180	47.000	0	0


Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /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 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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.364		

		Page 3
	Cambridge Road SW Network	
Date 13/12/2020 09:56 File Camnbridge Road - SW Ca...	Designed by SHD20 Checked by	
Micro Drainage	Network 2018.1	

Online Controls for Storm

Orifice Manhole: s3, DS/PN: 1.002, Volume (m<sup>3</sup>): 0.2

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







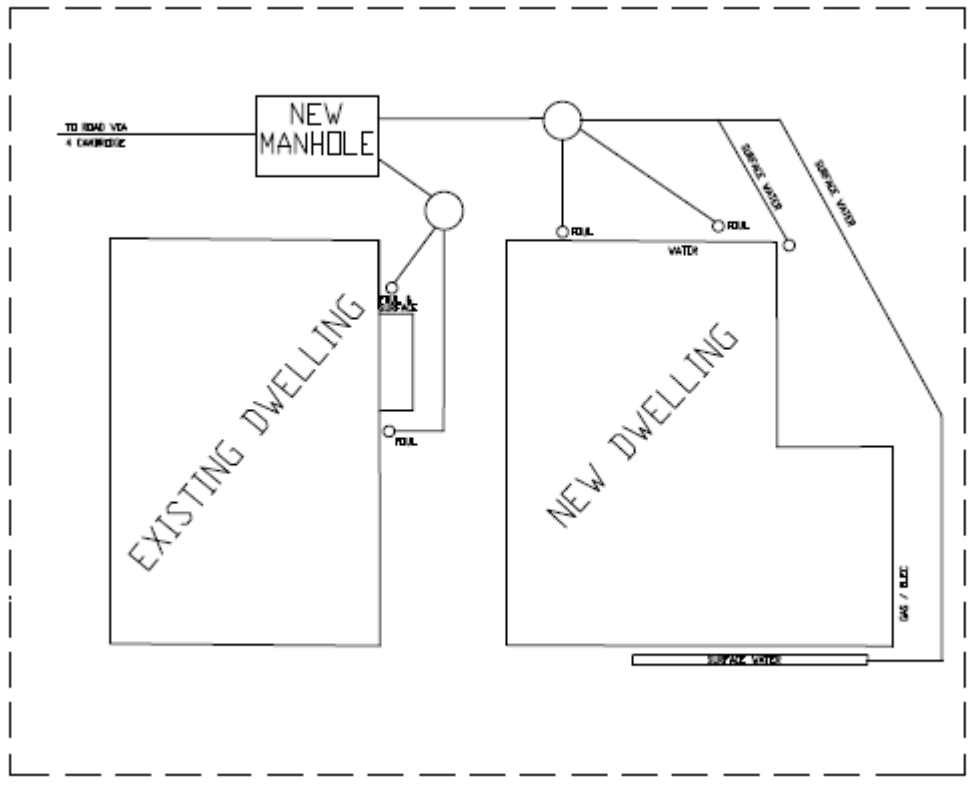
## Appendix C – UU Connection Approval



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



						SC5258	
<b>Applicant details</b>							
Applicant name		Mr James Beadle					
Applicant address <i>(including postcode)</i>		2 Cambridge Road Heaton Chapel Stockport SK4 4QN					
Applicant email		wjbeadle@hotmail.co.uk					
<b>Site details:</b> The site / property which is proposed for connection to the public sewer							
		2 Cambridge Road, Heaton Chapel, Stockport, SK4 4QN					
<h2>APPROVED</h2>							
<b>Your application for connection to the public sewer has been approved, to be made via a new connection:</b>							
<b>To a private drain</b>		<input checked="" type="checkbox"/>		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.			
<b>Direct to the public sewer</b>		<input type="checkbox"/>		<b><u>Further action required</u></b> You may now appoint an appropriately qualified contractor. Your appointed contractor is responsible for obtaining authorisation to work on a public sewer. (The S106 Part 2 application form ' <b>Request for permission to work on a public sewer</b> ' is available on our website; unitedutilities.com).			
Mode of connection approved		Other - please see comments box					
Sewer connection type		Foul   <input type="checkbox"/>		Surface water   <input type="checkbox"/>		Combined   <input checked="" type="checkbox"/>	
<p>This approval is valid for 12 months from the date below.</p> <p>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.</p>							
<b>Comments</b>							
<p>Approval for the combined connection via the utilisation of an existing private drain in the rear of number 2 Cambridge Road Which communicates to the public combined sewer in Cambridge Road</p> <p>Please note, if you are proposing to connect to an existing, unchartered drain or sewer then it is the developers responsibility to confirm that it communicates with the Public Sewer Connections may be made to private lateral drains or to existing neighbouring drain. A part 1 approval does not give permission to access third party land. The applicant must seek permission from the relevant land owner.</p>							



Development Support Technician	Lynne Berry
Contact number	07881 034558
Date	26/10/2020

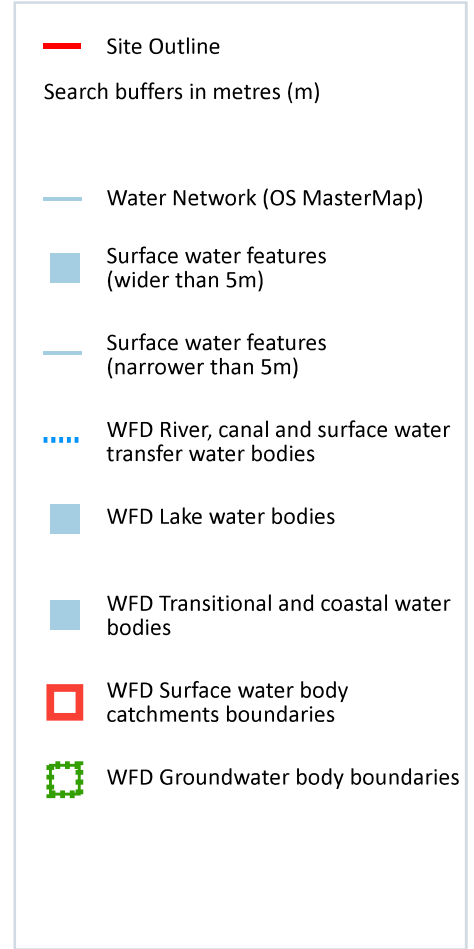
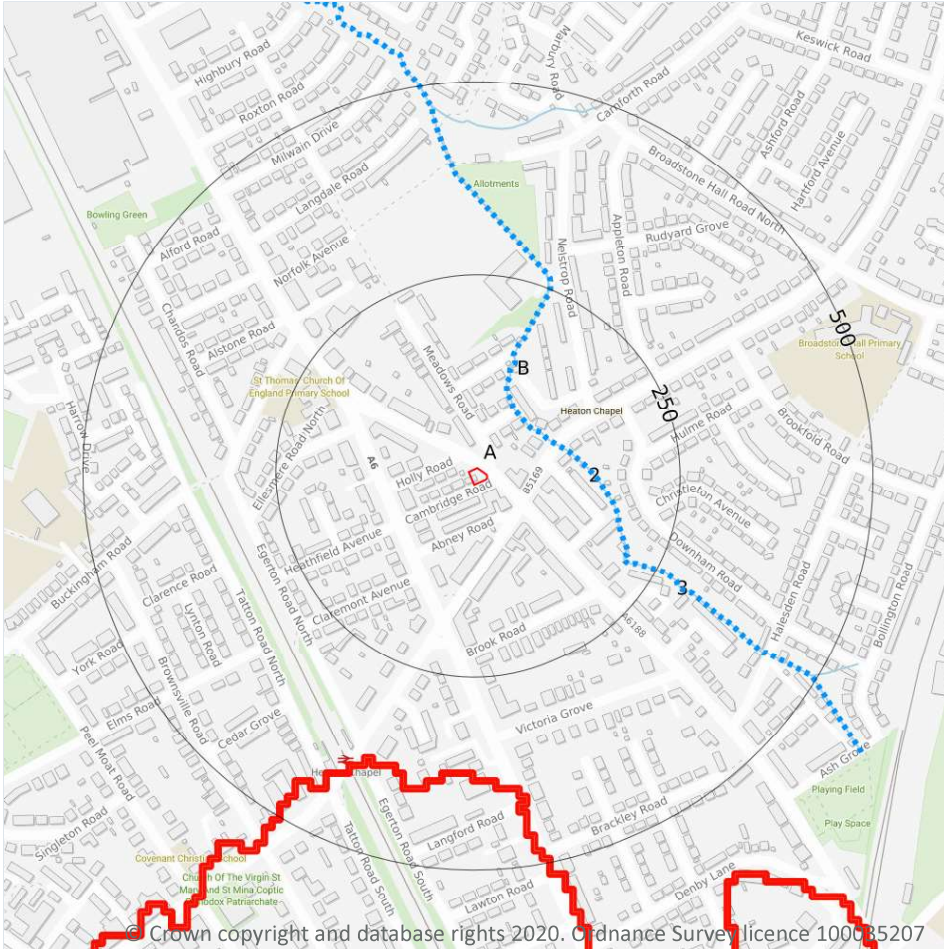
## Appendix D – Soakaway Test





## Appendix E – Watercourse Records

## 7 Hydrology



### 7.1 Water Network (OS MasterMap)

**Records within 250m** **3**

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
B	82m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Black Brook

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**

**1**

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**

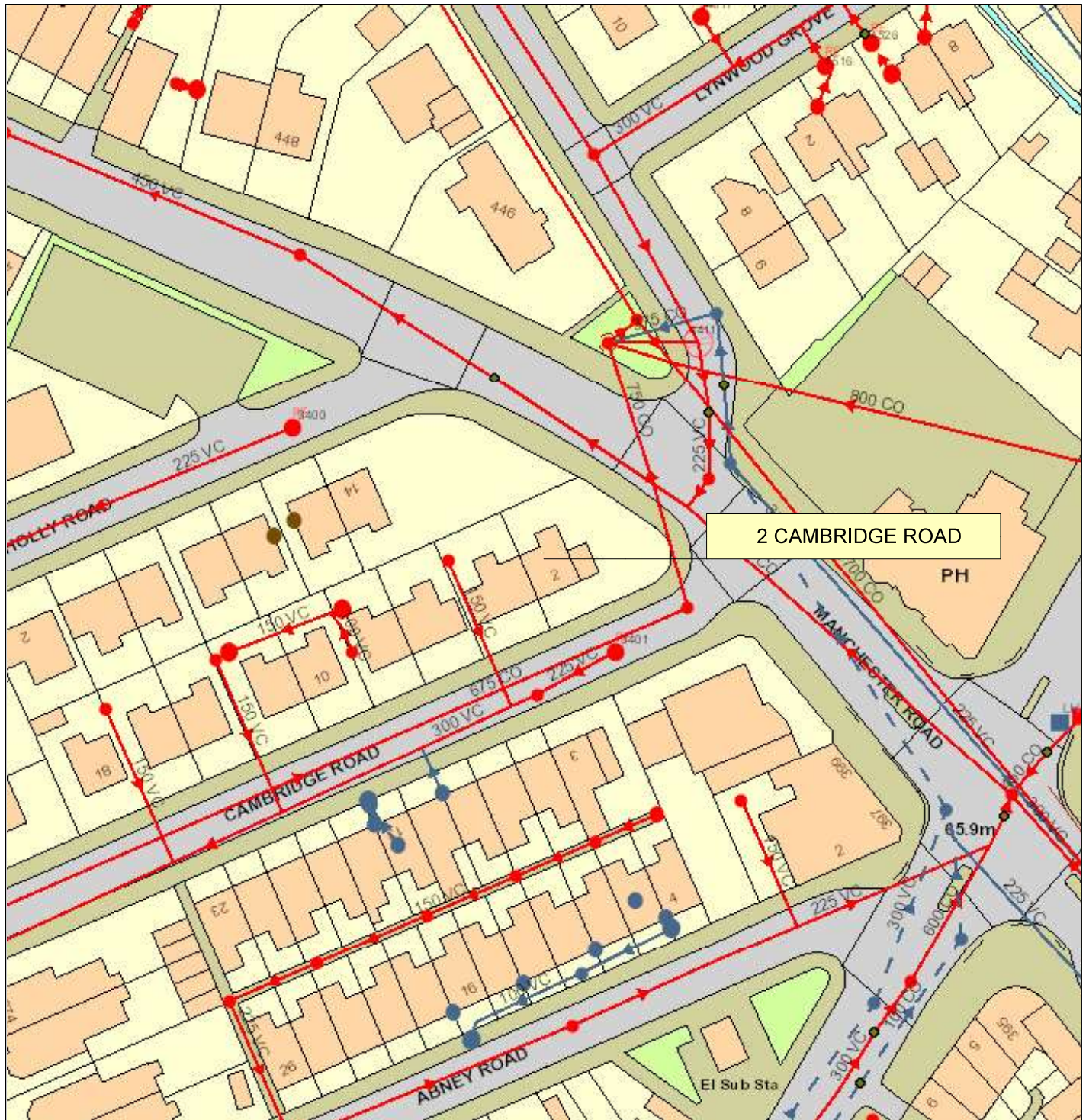
ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River WB catchment	Fallowfield Brook	GB112069061410	Bollin, Dean, Upper Mersey	Upper Mersey

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





## 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.***

*© United Utilities Water Limited 2014. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office. Crown copyright 100019326 and United Utilities Water Limited copyrights are reserved. Unauthorised reproduction will infringe these copyrights.*