Weetwood

Development • Planning • Environment

HOLCOMBE MILL, RAMSBOTTOM

DRAINAGE ASSESSMENT

Final Report v1.3

January 2022

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Report Title	**Holcombe Mill, Ramsbottom** Drainage Assessment Final Report v1.3
Client	Eccleston Homes
Date of issue	18 January 2022

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This document has been prepared solely as a Drainage Assessment for Eccleston Homes. This report is confidential to Eccleston Homes and Weetwood Services Ltd accepts no responsibility or liability for any use that is made of this document other than by Eccleston Homes for the purposes for which it was originally commissioned and prepared.

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1 INTRODUCTION

1.1 PURPOSE OF REPORT

Weetwood Services Ltd ('Weetwood') has been instructed by Eccleston Homes to prepare a Drainage Assessment (DA) report to accompany a planning application for the proposed redevelopment of Holcombe Mill, Ramsbottom.

The assessment has been undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) updated on 19 February 2019 and the National Planning Practice Guidance (NPPG) updated on 1 October 2019.

1.2 STRUCTURE OF THE REPORT

The report is structured as follows:

Section 1	Introduction and report structure
Section 2	Provides background information relating to the development site, the development proposals, ground conditions and existing site access arrangements
Section 3	Presents national and local drainage planning policy
Section 4	Addresses the effect of the proposed development on surface water runoff and presents an illustrative surface water drainage scheme to ensure that surface water runoff is sustainably managed and flood risk is not increased elsewhere
Section 5	Addresses the effect of the proposed development on the existing public foul drainage infrastructure and the receiving wastewater treatment works
Section 6	Presents a summary of key findings

1.3 RELEVANT DOCUMENTS

The assessment has been informed by the following documents:

- Bury Local Plan Topic Paper 6 Flood Risk, Bury Council, October 2018
- Bury Local Flood Risk Management Strategy, Bury Council, April 2018
- Surface Water Management Plan Stage 1 – A Strategic Assessment of Surface Water Flood Risk, Association of Greater Manchester Authorities (AGMA), January 2012
- Preliminary Flood Risk Assessment, Bury Council, May 2011
- Level 2 Strategic Flood Risk Assessment (SFRA), Bury, Rochdale and Oldham, November 2009
- Level 1 SFRA, Association of Greater Manchester Authorities, August 2008
- Bury Unitary Development Plan, Bury Council, August 1997

2 SITE DETAILS AND PROPOSED DEVELOPMENT

2.1 SITE LOCATION

The approximately 2.85 hectare (ha) site is located to the south of Bridge Street at the former Holcombe Mill, at Ordnance Survey National Grid Reference SD 793 167, as shown in **Figure 1**.

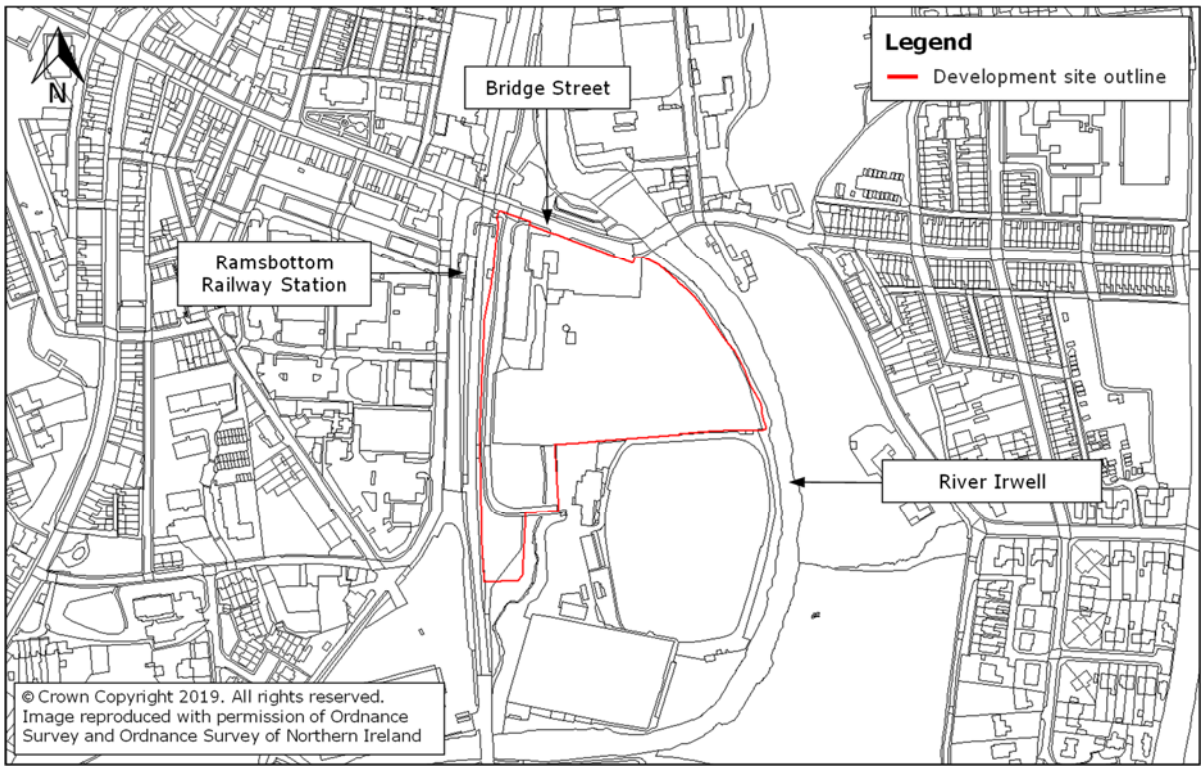


Figure 1: Site Location

2.2 EXISTING AND PROPOSED DEVELOPMENT

The existing site comprises derelict land previously occupied by the Mondi/Holcombe Paper Mill. The mill was demolished in 2012 and all that remains are 3 no. small buildings and the industrial chimney.

The development proposals are for the erection of 68 new residential dwellings, refurbishment of 2 existing buildings to provide 5 residential dwellings, retention of the chimney and demolition of final derelict building (**Appendix A**).

The NPPG classifies residential development as more vulnerable land use.

2.3 WATERBODIES IN THE VICINITY OF THE SITE

The River Irwell flows in a principally southerly direction in the vicinity of the site and flows directly around the eastern boundary of the site. The River Irwell is classified as a main river.

A mill-race previously flowed through the western portion of the site. The inlet to the mill race is understood to have been sealed and the mill race is therefore only expected to convey flows resulting from direct rainfall or floodwaters entering the site overland.

2.4 GROUND CONDITIONS

British Geological Survey (BGS) Surface Geology mapping[1] indicates that the bedrock underlying the site comprises mudstone and siltstone of the Marsden Formation, which is overlain by clay, silt, sand and gravel (alluvium).

The intrusive ground investigation undertaken by Betts Geo Environmental Ltd indicates that the site is underlain by made ground with deposits of clay, silt, sand and gravel generally encountered between 1.3 and 3.0 metres below ground level (m bgl).

Groundwater was encountered within a number of the exploratory holes between 2.6 and 4.0 m bgl.

DEFRA mapping classifies the bedrock and superficial deposits at the site as Secondary A aquifers. The site is not shown to be located within a designated Groundwater Source Protection Zone.

2.5 SITE LEVELS

A topographic survey of the site has been undertaken by Urban Contours Ltd and is provided in **Appendix B**.

Site levels are generally shown to fall from west to east with levels ranging between approximately 127.8 and 124.7 metres Above Ordnance Datum (m AOD).

Two large material stockpiles appear to be present in the south-west corner of the site with crest levels ranging between 130.2 and 129.1 m AOD.

2.6 ACCESS AND EGRESS

Vehicular access to the site is provided along its northern boundary via Bridge Street.

[1] http://mapapps.bgs.ac.uk/geologyofbritain/home.html

3 PLANNING POLICY AND GUIDANCE

3.1 NATIONAL PLANNING POLICY AND GUIDANCE

NPPF Paragraph 163 states that development should only be allowed in areas at risk of flooding if it incorporates sustainable drainage systems unless there is clear evidence that this would be inappropriate whilst NPPF Paragraph 165 states that applications for major developments should incorporate sustainable drainage systems to appropriate operational standards and with maintenance arrangements in place unless there is clear evidence that this would be inappropriate.

Non-statutory technical standards for sustainable drainage published by DEFRA in March 2015 set out how surface water runoff generated during the present day 1 in 30 and 1 in 100 AEP rainfall events and for events exceeding the present day 1 in 100 AEP event should be managed, how peak runoff rates should be restricted and how runoff volumes should be controlled.

3.2 LOCAL PLANNING POLICY AND GUIDANCE

3.2.1 Adopted Bury Unitary Development Plan, 1997

The Bury Unitary Development Plan (UDP) was adopted by Bury Metropolitan Borough Council (MBC) on 29 August 1997. Bury MBC is now working to replace the adopted UDP with a new document called the Bury Local Plan. Until the new Local Plan is produced the UDP will continue be used to make planning decisions.

The following policies are relevant in respect of drainage:

EN5/1 - New Development and Flood Risk

The Council will not permit new development, including the raising of land and the intensification of development, where such development would be at risk from flooding, would be likely to increase the risk of flooding elsewhere, or would adversely affect river flood defences. When assessing proposals against this policy, the following criteria will apply:

- *the impact on the floodplain;*
- *the increase in surface water run-off as a result of the proposal;*
- *the impact on fluvial flood defences;*
- *the incorporation of mitigating works.*

EN7/5 - Waste Water Management

In seeking to limit surface water pollution the Council will not permit development which:

- *does not have satisfactory arrangements for the disposal of foul sewage, trade effluent and contaminated surface water;*
- *will exacerbate existing problems, such as premature or increased frequency of discharges through storm sewer overflows due to inadequate infrastructure or lack of sewer capacity;*
- *would present an unacceptable risk of spillage or leakage of stored oil/chemicals or other potentially polluting substances.*

3.2.2 Bury Local Plan

Bury MBC has commenced preparation of a new Local Plan. The Local Plan will set out a range of planning policies that will seek to support or restrict development up to 2035 and will zone land for specific uses. Once adopted, it will replace the Bury UDP.

3.3 ENVIRONMENTAL PERMITTING AND LAND DRAINAGE CONSENT

Under the Environmental Permitting (England and Wales) Regulations 2016 an Environmental Permit for Flood Risk Activities[2] is required from the Environment Agency for any permanent or temporary works:

- In, over or under a designated main river
- Within 8 m of the top of bank of a designated main river or of the landward toe of a flood defence (16 m if it is a tidal main river).

In addition, any permanent or temporary works within the floodplain of a designated main river may also require an Environmental Permit for Flood Risk Activities. A permit is separate to and in addition to any planning permission granted.

Land drainage consent may be required from the lead local flood authority or drainage board for work to an ordinary watercourse.

Undertaking activities controlled by local byelaws also requires the relevant consent.

[2] https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

4 SURFACE WATER MANAGEMENT

4.1 SURFACE WATER DRAINAGE AT THE EXISTING SITE

Gullies are present along the existing access road, indicating that approximately 0.187 ha of the existing site is served by a formal surface water drainage system. The drainage system is expected to outfall to the River Irwell south-east of the site.

An additional 2.087 ha of the site is shown to comprise areas of hardstanding and is believed to have been served by a formal surface water drainage system prior to demolition of the Mondi/Holcombe Paper Mill in 2012. Surface water runoff generated across the areas of hardstanding would now be expected to flow overland to the River Irwell.

The remaining 0.580 ha of the site comprises areas of short grass and woodland.

4.1.1 Existing Runoff Rates

The greenfield runoff rates for the undeveloped parts of the site have been calculated using the ICP SUDS method within MicroDrainage and from existing impermeable areas using the Modified Rational Method. The calculated runoff rates are presented in **Table 1** and details of the input parameters and the output results are provided in **Appendix C** and **Appendix D** respectively.

Table 1: Peak Runoff Rate - Existing Site

Annual probability of rainfall event	Permeable runoff rate 0.580 ha (l/s)	Impermeable runoff rate 2.274 ha (l/s)	Total (l/s)
1:1	5.6	203.5	209.1
1:30	11.0	497.8	508.8
1:100	13.4	640.3	653.7

4.2 SURFACE WATER DRAINAGE AT THE REDEVELOPED SITE

4.2.1 Disposal of Surface Water

In accordance with the NPPG[3], surface water runoff should be disposed of according to the following hierarchy: Into the ground (infiltration); To a surface water body; To a surface water sewer, highway drain, or another drainage system; To a combined sewer.

The disposal of surface water by infiltration is not considered to be feasible at the site given the presence of made ground and shallow groundwater. As such, it is proposed to discharge surface water to the existing mill race, which ultimately discharges to the River Irwell.

4.2.2 Post Development Impermeable Area

The area of impermeable surfaces at the redeveloped site has been estimated to be 1.302 ha based upon the proposed site layout. This is a 0.972 ha reduction in impermeable surfaces compared to the existing site and would result in a significant reduction in the volume of surface water being discharged from the developed site.

[3] Paragraph 080, Reference ID: 7-080-20150323

4.2.3 Peak Flow Control

It is proposed to restrict the maximum rate at which surface water is discharged from the developed site to 142.5 l/s, a 30% reduction in the existing peak runoff rate from impermeable surfaces during the 1:1 annual probability storm event.

The modelled surface water discharge rates from the redeveloped site for a range of annual probability events are presented in **Table 2**. The proposals reduce the maximum rate at which surface water leaves the site by a minimum of 52.5% in the 1:1 annual probability event and a maximum of 77.7% in the 1:100 annual probability event, even when considering a 40% increase in rainfall intensity in order to allow for climate change.

Table 2: Peak Discharge Rate - Redeveloped Site

Annual probability of rainfall event	Discharge Rate (l/s)	Reduction (%)
1:1	96.6	52.5
1:30	139.6	72.0
1:100 (+40% climate change)	142.5	77.7

4.2.4 Attenuation Storage

Attenuation storage will be provided within the proposed pipe network, as presented by the preliminary foul and surface water drainage layout provided in **Appendix E**.

The proposed surface water drainage network has been modelled using MicroDrainage and has been designed to manage the 1:100 annual probability rainfall event, including a 40% increase in rainfall intensity to allow for climate change[4], below ground (**Appendix F**).

4.2.5 Quality Treatment

Water quality treatment will be provided by discharging surface water to the existing mill race located at the site. The mill race will effectively function as a swale because it no longer receives flows from the River Irwell. Additional SuDS features, such as permeable paving may be incorporated into the surface water drainage strategy at the detailed design stage to provide additional water quality treatment.

4.2.6 Exceedance Routes

Flows resulting from rainfall in excess of the 1:100 annual probability rainfall plus climate change event will be managed in exceedance routes, as illustrated by **Appendix G**. Flood flows will be directed towards carriageways, with the site being profiled to ensure that flood flows are directed away from built development.

4.2.7 Adoption and Maintenance of SuDS

The pipe network, designed in accordance with the Water UK Design and Construction Guidance document (March 2020), may be adopted by the sewerage undertaker.

An indicative maintenance schedule is presented in **Table 3**.

[4] Flood Risk Assessments: climate change allowances (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances)

Table 3: Maintenance Requirements

Schedule	Required action	Frequency
Mill Race		
Regular maintenance	Remove litter and debris	Monthly, or as required
	Manage vegetation and remove nuisance plants	As required
	Inspect inlets and outlets for blockages, and clear if required	Monthly
Remedial actions	Repair erosion or other damage	As required
	Remove and dispose of oil or petrol residues using safe standard practices	As required
	Remove build-up of sediment	As required
Gullies, Manholes and Pipework		
Regular maintenance	Trapped gullies, manholes and catchpits to be inspected and cleared if necessary	Every three months for first year, bi-annually thereafter
	Inspect drainage runs and jet if necessary	Annually
Permeable Paving		
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies accumulation rates and establish appropriate removal frequencies	Annually
	Monitor inspection chambers	

5 FOUL WATER MANAGEMENT

5.1 EXISTING ASSETS

The United Utilities public sewer record (**Appendix H**) indicates that the following wastewater assets are present at the site:

- 900 / 1000 mm diameter combined water sewer located along the eastern boundary of the site, directly adjacent to the River Irwell
- 300 mm diameter combined water sewer located in the eastern corner of the site, connecting to the 900 / 1000 mm diameter sewer along the sites eastern boundary
- 1000 mm diameter combined water sewer crossing the southern half of the site.

A survey of the existing drainage infrastructure at the site (**Appendix I**) confirms that the site previously discharged to the 900 / 1000 mm diameter combined water sewer at manhole MH4702 via a 150 mm diameter pipe and MH4601 via the 300 mm diameter combined water sewer. It appears that surface water was discharged from the site to the 300 mm diameter combined water sewer via a 225 mm dimeter plastic pipe.

It is estimated that the foul discharge rate from the former Mondi/Holcombe Paper Mill was 4.6 l/s based upon the Water UK Design and Construction Guidance document. However, the total discharge to the combined sewer is expected to have been higher given the presence of additional surface water connections.

5.2 NEW CONNECTIONS

Under the Water Industry Act (1991), developers have a right to connect foul water flows from new developments to the public sewer network. The Act places a general duty on sewerage undertakers to provide the additional capacity that may be required to accommodate additional flows and loads arising from new domestic development.

United Utilities has advised by way of a Pre Development Enquiry email dated 10 June 2021 that foul flows from the site will be allowed to discharge to the public combined sewer at an unrestricted rate (**Appendix J**). The peak design flow rate from the site is calculated to be 3.4 l/s based upon the Water UK Design and Construction Guidance document.

It is noted that the lead local flood authority has raised concerns that the proposed foul discharge from the site may exacerbate existing flooding issues associated with the public combined sewer network.

United Utilities has advised that the foul flows emanating from the site may be expected to increase flood volumes associated with the combined sewer network by 14.9 m^3 (equivalent to a 0.2% increase in flood volumes). However, the propose foul drainage network (refer **Appendix E**) has been modelled using MicroDrainage and is shown to provide 44.4 m^3 of below ground storage (**Appendix K**).

Based upon the above, the proposed development would not be expected to increase the risk of flooding from the public combined sewer network. It should also be noted that the modelled increase in flood volumes ignores the discharges associated with the former Mondi/Holcombe Paper Mill.

6 SUMMARY

This report has been prepared on behalf of Eccleston Homes to accompany a planning application for the proposed redevelopment of Holcombe Mill, Ramsbottom.

The development proposals are for the erection of 68 new residential dwellings, refurbishment of 2 existing buildings to provide 5 residential dwellings, retention of the chimney and demolition of final derelict building.

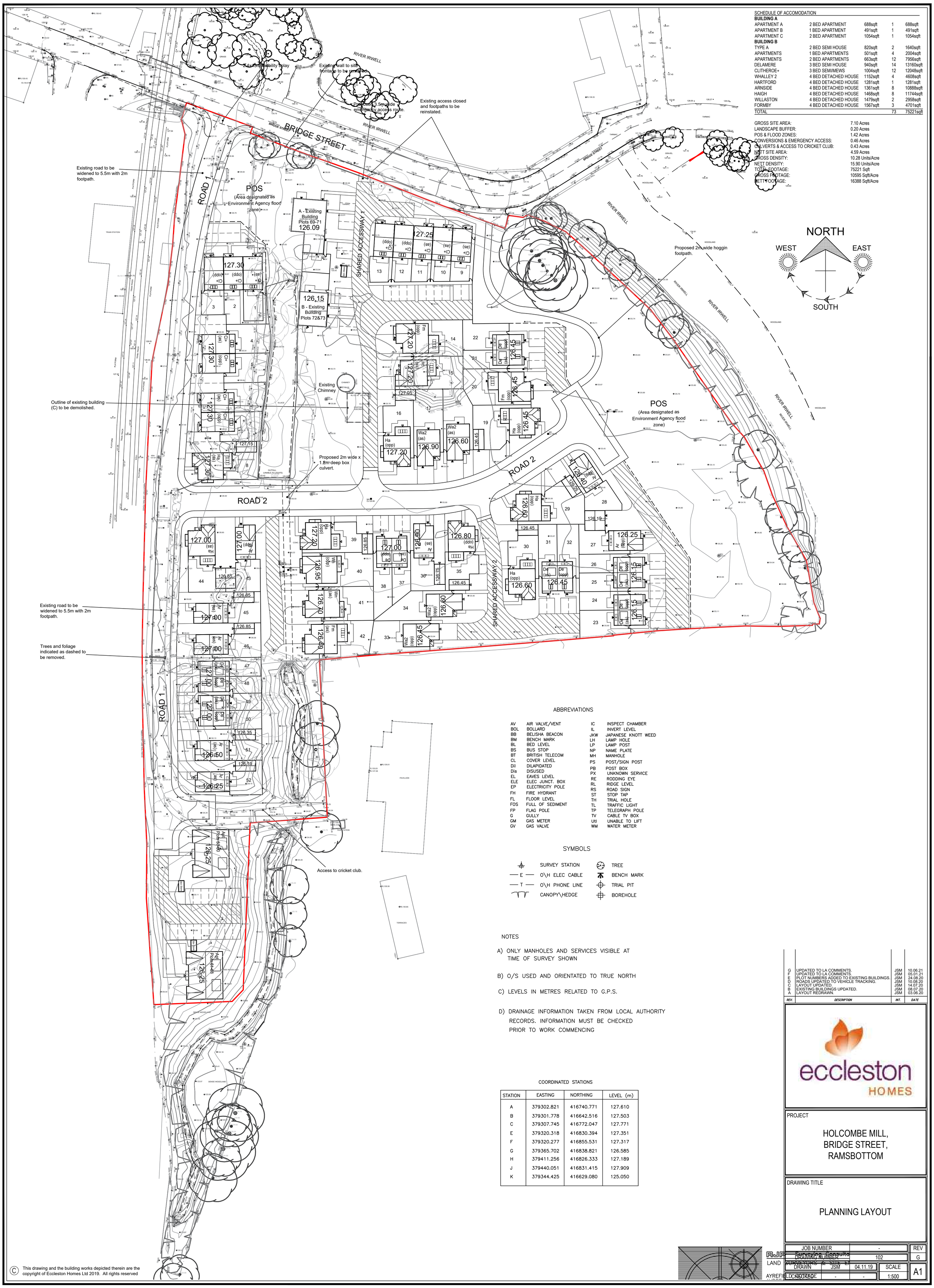
Surface water will be discharged to the existing mill race at the site, with the discharge rate restricted to a maximum of 70% of the existing 1:1 annual probability impermeable runoff rate. Attenuation storage will be provided within the proposed pipe network, with water quality treatment provided by the disused mill race, acting as a swale.

It is expected that the proposed drainage system will be offered for adoption by the sewerage undertaker and an indicative maintenance schedule is provided.

Based upon the above, surface water runoff from the developed site can be sustainably managed in accordance with planning policy and the proposals provide significant betterment when compared to the existing situation.

Foul water will be discharged to the existing public combined sewer located at the site and United Utilities has confirmed that foul flows can be discharged at an unrestricted rate.

APPENDIX A:	Development Proposals



SCHEDULE OF ACCOMODATION

BUILDING A				
APARTMENT A	2 BED APARTMENT	688sqft	1	688sqft
APARTMENT B	1 BED APARTMENT	491sqft	1	491sqft
APARTMENT C	2 BED APARTMENT	1054sqft	1	1054sqft
BUILDING B				
TYPE A	2 BED SEMI HOUSE	820sqft	2	1640sqft
APARTMENTS	1 BED APARTMENTS	501sqft	4	2004sqft
APARTMENTS	2 BED APARTMENTS	663sqft	12	7956sqft
DELAMERE	3 BED SEMI HOUSE	940sqft	14	13160sqft
CLITHEROE+	3 BED SEMI/MEWS	1004sqft	12	12048sqft
WHALLEY 2	4 BED DETACHED HOUSE	1152sqft	4	4608sqft
HARTFORD	4 BED DETACHED HOUSE	1281sqft	1	1281sqft
ARNSIDE	4 BED DETACHED HOUSE	1361sqft	8	10888sqft
HAIGH	4 BED DETACHED HOUSE	1468sqft	8	11744sqft
WILLASTON	4 BED DETACHED HOUSE	1479sqft	2	2958sqft
FORMBY	4 BED DETACHED HOUSE	1567sqft	3	4701sqft
TOTAL			73	75221sqft

GROSS SITE AREA:	7.10 Acres
LANDSCAPE BUFFER:	0.20 Acres
POS & FLOOD ZONES:	1.42 Acres
CONVERSIONS & EMERGENCY ACCESS:	0.46 Acres
CULVERTS & ACCESS TO CRICKET CLUB:	0.43 Acres
NETT SITE AREA:	4.59 Acres
GROSS DENSITY:	10.28 Units/Acre
NETT DENSITY:	15.90 Units/Acre
TOTAL FOOTAGE:	75221 Sqft
GROSS FOOTAGE:	10595 Sqft/Acre
NETT FOOTAGE:	16388 Sqft/Acre

ABBREVIATIONS

AV	AIR VALVE/VENT	IC	INSPECT CHAMBER
BOL	BOLLARD	IL	INVERT LEVEL
BB	BELISHA BEACON	JKW	JAPANESE KNOTT WEED
BM	BENCH MARK	LH	LAMP HOLE
BL	BED LEVEL	LP	LAMP POST
BS	BUS STOP	NP	NAME PLATE
BT	BRITISH TELECOM	MH	MANHOLE
CL	COVER LEVEL	PS	POST/SIGN POST
Dil	DILAPIDATED	PB	POST BOX
Dis	DISUSED	PX	UNKNOWN SERVICE
EL	EAVES LEVEL	RE	RODDING EYE
ELE	ELEC JUNCT. BOX	RL	RIDGE LEVEL
EP	ELECTRICITY POLE	RS	ROAD SIGN
FH	FIRE HYDRANT	ST	STOP TAP
FL	FLOOR LEVEL	TH	TRIAL HOLE
FOS	FULL OF SEDIMENT	TL	TRAFFIC LIGHT
FP	FLAG POLE	TP	TELEGRAPH POLE
G	GULLY	TV	CABLE TV BOX
GM	GAS METER	Util	UNABLE TO LIFT
GV	GAS VALVE	WM	WATER METER

SYMBOLS

	SURVEY STATION		TREE
— E —	O\H ELEC CABLE		BENCH MARK
— T —	O\H PHONE LINE		TRIAL PIT
	CANOPY\HEDGE		BOREHOLE

NOTES

A) ONLY MANHOLES AND SERVICES VISIBLE AT TIME OF SURVEY SHOWN

B) O/S USED AND ORIENTATED TO TRUE NORTH

C) LEVELS IN METRES RELATED TO G.P.S.

D) DRAINAGE INFORMATION TAKEN FROM LOCAL AUTHORITY RECORDS. INFORMATION MUST BE CHECKED PRIOR TO WORK COMMENCING

COORDINATED STATIONS

STATION	EASTING	NORTHING	LEVEL (m)
A	379302.821	416740.771	127.610
B	379301.778	416642.516	127.503
C	379307.745	416772.047	127.771
E	379320.318	416830.394	127.351
F	379320.277	416855.531	127.317
G	379365.702	416838.821	126.585
H	379411.256	416826.333	127.189
J	379440.051	416831.415	127.909
K	379344.425	416629.080	125.050

REV.	DESCRIPTION	INT.	DATE
G	UPDATED TO LA COMMENTS.	JSM	10.06.21
F	UPDATED TO LA COMMENTS.	JSM	05.01.21
E	PLOT NUMBERS ADDED TO EXISTING BUILDINGS.	JSM	24.08.20
D	ROADS UPDATED TO VEHICLE TRACKING.	JSM	10.08.20
C	LAYOUT UPDATED.	JSM	14.07.20
B	EXISTING BUILDINGS UPDATED.	JSM	08.07.20
A	LAYOUT REDRAWN.	JSM	03.06.20

eccleston HOMES

PROJECT

HOLCOMBE MILL,
BRIDGE STREET,
RAMSBOTTOM

DRAWING TITLE

PLANNING LAYOUT

RJP Surveying Consultants
LAND SURVEYORS & SITE ENGINEERS
AYREFIELD COURT

JOB NUMBER		-	REV
DRAWING NUMBER		102	G
DRAWN	JSM	04.11.19	SCALE
CHECKED	-	-	1:500

A1

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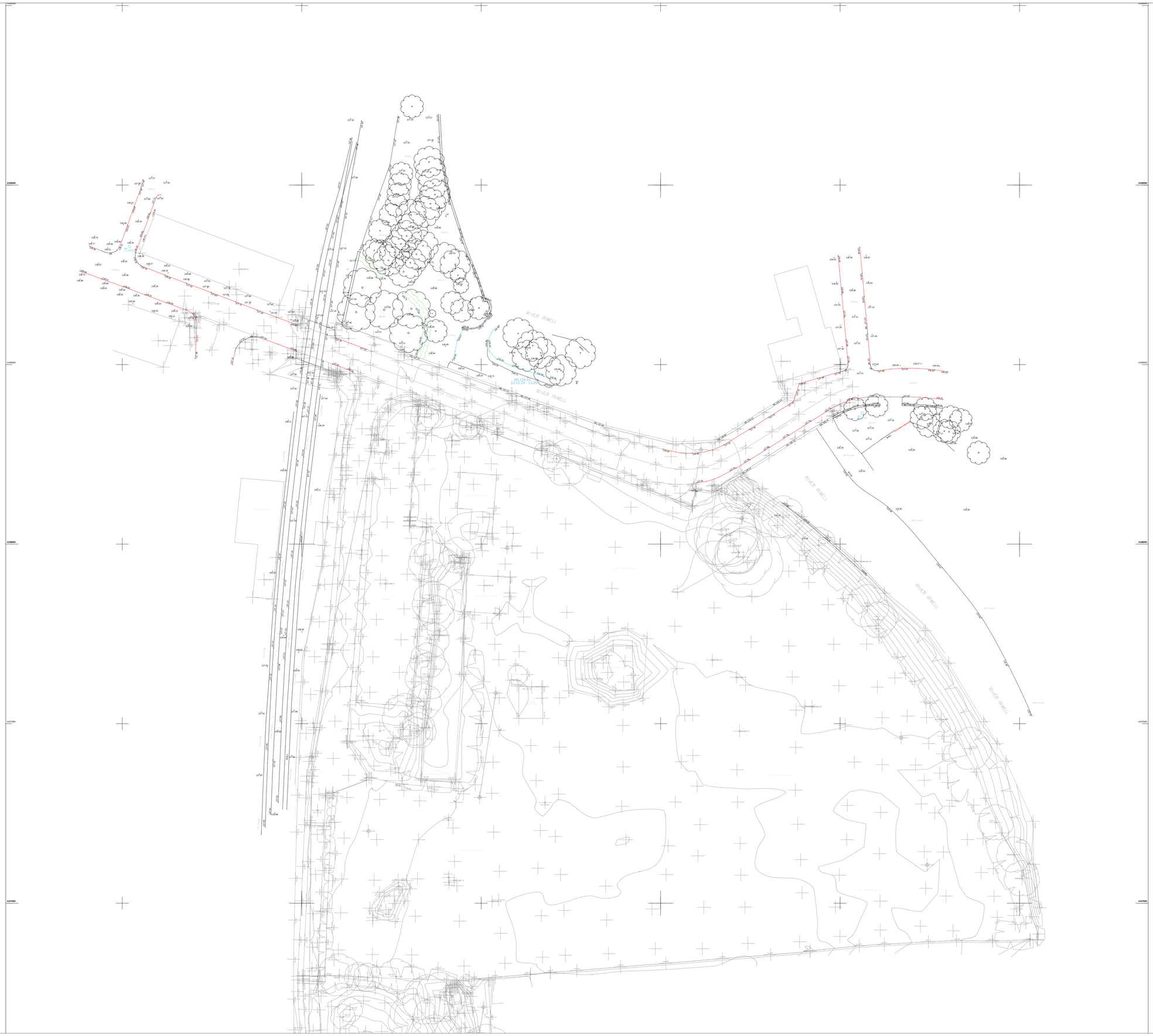
APPENDIX B:	Topographic Survey



urban contours

N
W E
S

Legend

	Walls		
	Kerb line	BS	Bus Stop
	Drip Line / Canopy	BT	British Telecom
	Top of Bank	FH	Fire Hydrant
	Bottom of Bank	WSV	Stop valve
	Fence	WST	Stop Tap
	Footpath	WO	Wash Out
	Hedge	AV	Air Valve
△STN	Control	MKR	Service Marker
	Tree	RE	Rodding eye
		CTV	Cable TV
	Vegetation	GP	Gate Post
		LP	Lamp Post
	Gate	SP	Sign Post
DRAINAGE ATRIBUTES		EP	Electricity Post
IC	Inspection chamber	TP	Telegraph Post
CL	Cover level	TL	Traffic light
IL	Invert level	RNP	Road Name Plate
P Inv Ø0.25	Pipe invert (diameter)	BOL	Bollard
GY	Gully	STAY	Cable Stay
KO	Kerb Outlet	EIC	Electric Inspection Cover
MH	Manhole	GAS	Gas Inspection Cover
BUILDING DATUM:		TOB	Top of Bank
RL	Ridge Line	BOB	Bottom of Bank
FFL	Finished Floor Level	ER	Earth rod
SOF	Soffit Level	DK	Drop Kerb
FENCE TYPES:		OHE	Overhead Electric Cable
CBF	Close Board	OHBT	Overhead BT Cable
PRF	Post and Rail	FTP	Footpath
PWF	Post and Wire	FWB	Flower Bed
BWF	Barbed Wire	TIPIT	Trial Pit
PLF	Post and lath	P	Pole
IR	Iron Railings		
CLF	Chain Linc		
PPF	Post and Panal		

Rev	Date	Description	Drawn

PROJECT
ECCLESTONE HOMES
RAMSBOTTOM
BL0 9AG

TITLE
TOPOGRAPGHICAL
SURVEY

SCALE	DATE	DRAWN	CHECKED BY
1: 500	22.11.2019	GY	

Level datum	OSBG 36(15)
Job number	RAMS-TOPO-001

Drawing No.	Rev.
RAMS-TOPO-001	

Notes:

This plan has been surveyed to the scale shown.
Caution should be exercised when enlargements are made.

All critical dimensions should be confirmed on site prior to the commencement of any works.

All dimensions have been measured or estimated from ground level.

Tree species shown should be treated with caution and expert identification is advised.

Pipe sizes are estimated from a surface inspection only, Due to Health and Safety requirements.

Every effort is made to identify all visible above ground features, however it should be bourne in mind that there may be items obscured at the time of the survey.

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APPENDIX C:	Greenfield Runoff Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.500
Area (ha)	0.580	Urban	0.000
SAAR (mm)	1276	Region Number	Region 10

Results	**l/s**
QBAR Rural	6.5
QBAR Urban	6.5
Q2 years	6.0
Q1 year	5.6
Q30 years	11.0
Q100 years	13.4

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APPENDIX D:	Modified Rational Method

The following parameters have been obtained from the maps in Volume 3 of the Wallingford Procedure:

M5-60 minute rainfall depth:	20 mm
Ratio of M5-60 to M5-2 day rainfall:	0.3
Average Annual Rainfall:	1276 mm
Winter Rain Acceptance Potential/ Soil Type :	5
The Urban Catchment Wetness Index (UCWI) value:	133.8

A time of concentration of 15 minutes has been used.

A rainfall estimation calculation has been carried out to convert the M5-60 minute rainfall to the 15-minute duration rainfall for the 1:1, 1:30 and 1:100 annual probability rainfall events. The calculated rainfall intensities for these events are 28.9, 70.7 and 90.9 mm/hr respectively.

The flow rate as given by the Modified Rational Method is:

$Q=2.78 \times C_v \times C_r \times$ rainfall intensity x impermeable area

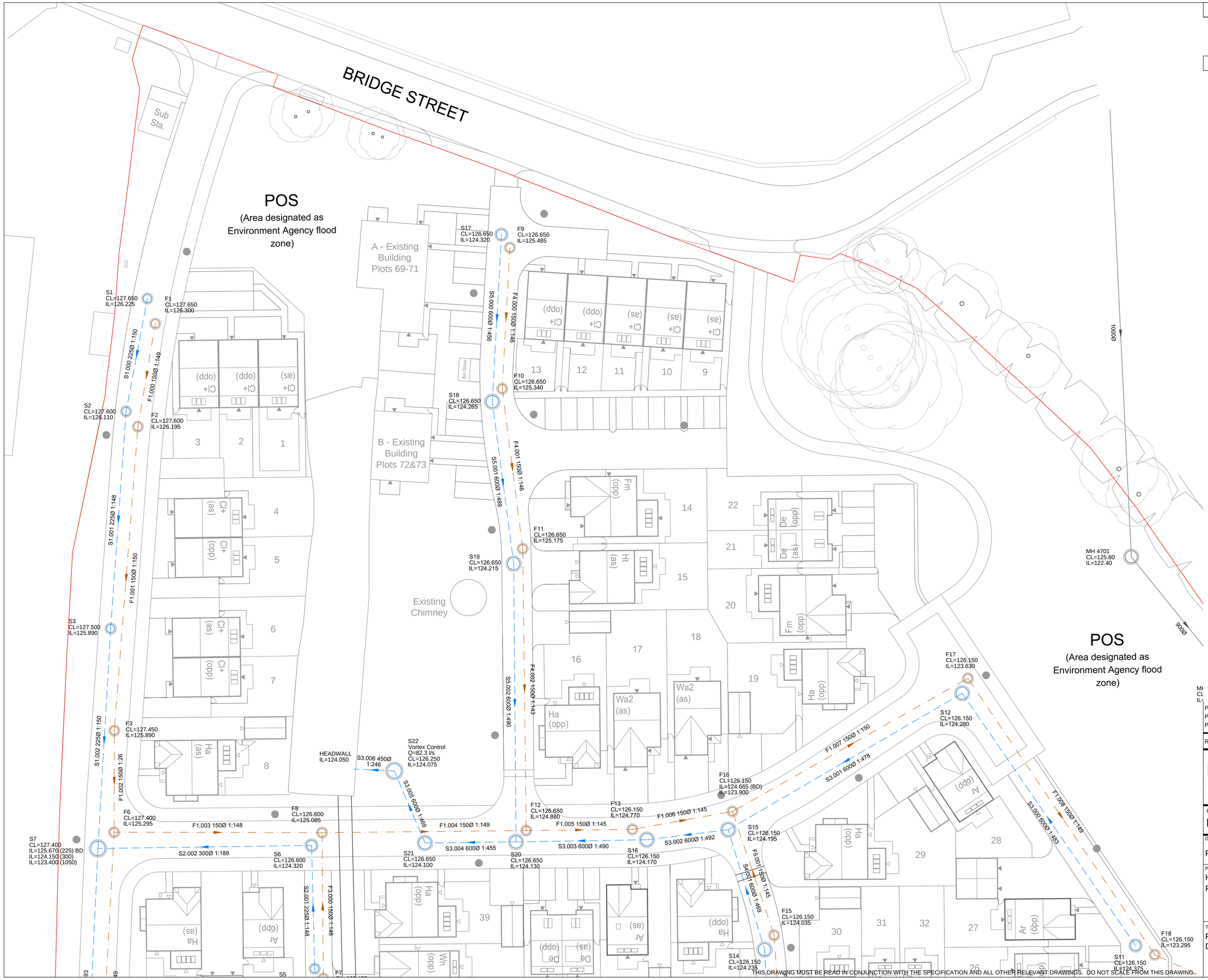
where:

C_v is the volumetric runoff coefficient = P_r/PIMP = 0.86
where P_r is Percentage Runoff and PIMP is Percentage Impermeable Area
C_r is the routing coefficient = 1.3
Impermeable Area = 2.274 ha

The peak discharges of surface runoff from impermeable areas of the existing site are shown in the table below:

Annual probability of rainfall event	Peak runoff rate (l/s)
1:1	203.5
1:30	497.8
1:100	640.3

APPENDIX E:	Preliminary Foul and Surface Water Drainage Layout



NOTES

1. This drawing to be read in conjunction with all relevant Weetwood drawings.

LEGEND

- Site boundary
- Proposed surface water pipe
- Proposed surface water manhole
- Proposed foul water pipe
- Proposed foul water manhole
- Existing combined water pipe
- Existing combined water manhole

Rev	Date	Description	Drawn	Check
P3	17/01/22	FOUL NETWORK UPDATED	JA	
P2	17/12/21	FOUL NETWORK INCLUDED	JA	TB
P1	06/08/20	INITIAL ISSUE	JA	KT

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Client
ECCLESTON HOMES

Drawing Status
PLANNING

Date
AUG 2020

Scale (A1)
1:250

Project
HOLCOMBE MILL
RAMSBOTTOM

Drawn
JA

Checked
KT

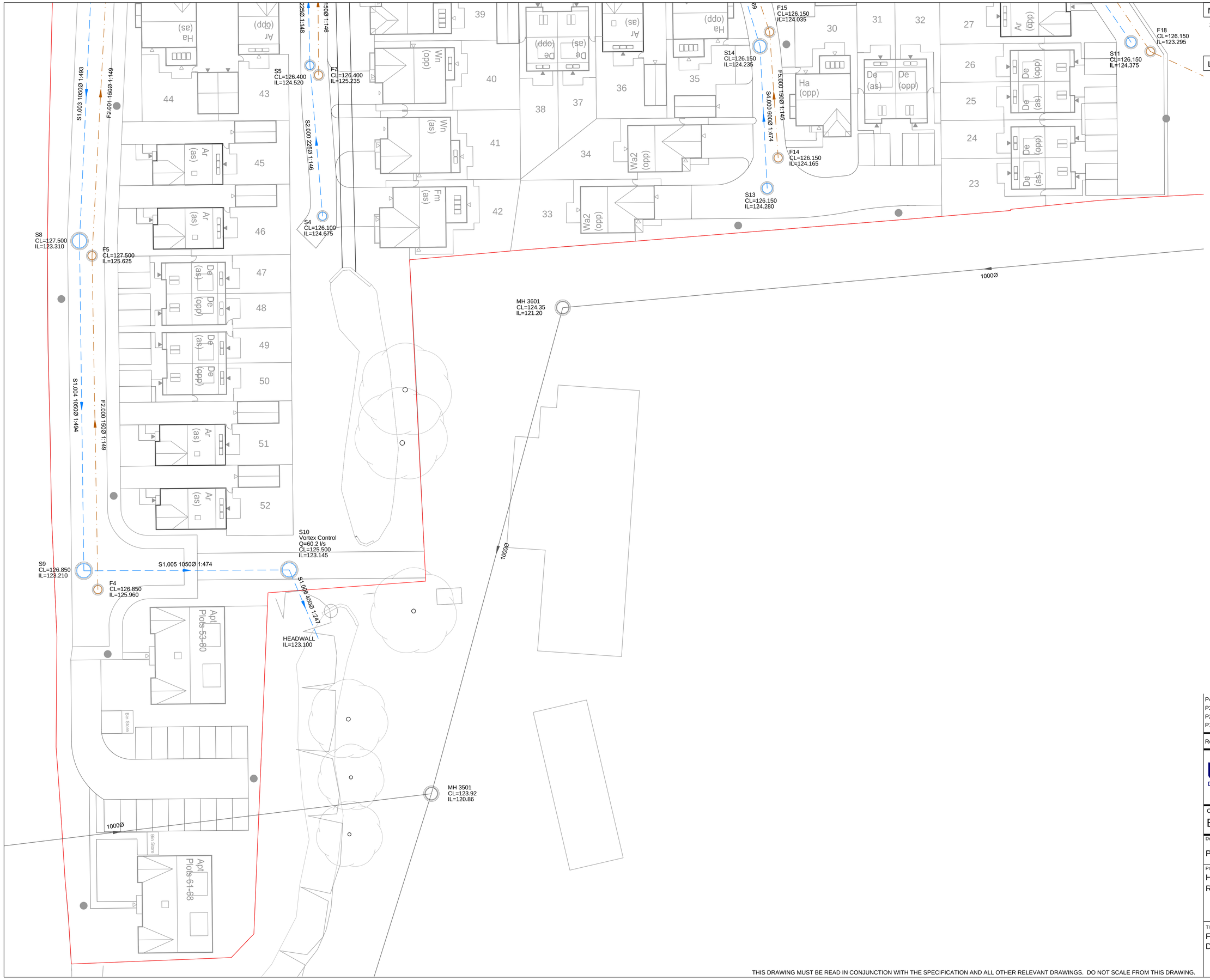
Project No
4714

Title
FOUL AND SURFACE WATER DRAINAGE LAYOUT

Drawing No
C100

Revision
P3

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.



NOTES

1. This drawing to be read in conjunction with all relevant Weetwood drawings.

LEGEND

- Site boundary
- Proposed surface water pipe (S1.000 150Ø 1:150)
- Proposed surface water manhole
- Proposed foul water pipe (F1.000 150Ø 1:150)
- Proposed foul water manhole
- Existing combined water pipe (150ø)
- Existing combined water manhole

Rev	Date	Description	Drawn	Check
P4	17/01/22	FOUL NETWORK UPDATED	JA	
P3	12/01/22	COVER LEVELS UPDATED	JA	
P2	17/12/21	FOUL NETWORK INCLUDED	JA	TB
P1	06/08/20	INITIAL ISSUE	JA	KT

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Date
AUG 2020

Scale (A1)
1:250

Project
HOLCOMBE MILL
RAMSBOTTOM

Drawn
JA

Checked
KT

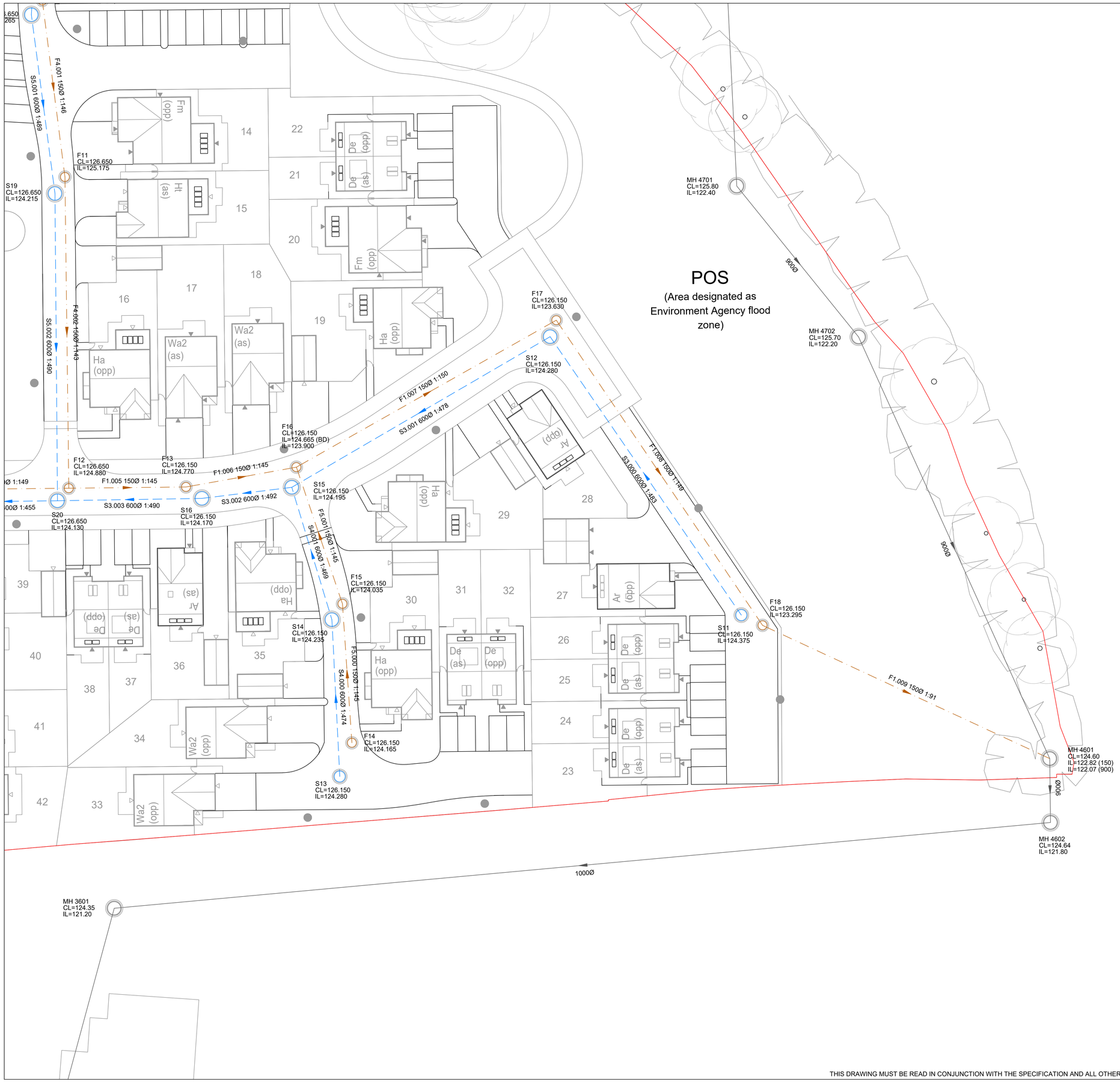
Project No
4714

Title
FOUL AND SURFACE WATER DRAINAGE LAYOUT

Drawing No
C101

Revision
P4

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.



NOTES

1. This drawing to be read in conjunction with all relevant Weetwood drawings.

LEGEND

- Site boundary
- Proposed surface water pipe
- Proposed surface water manhole
- Proposed foul water pipe
- Proposed foul water manhole
- Existing combined water pipe
- Existing combined water manhole

Rev	Date	Description	Drawn	Check
P1	17/12/21	INITIAL ISSUE	JA	TB

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Drawing Status
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Date
DEC 2021

Scale (A1)
1:250

Project
HOLCOMBE MILL
RAMSBOTTOM

Drawn
JA

Checked
TB

Project No
4714

Title
FOUL AND SURFACE WATER DRAINAGE LAYOUT

Drawing No
C102

Revision
P1

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

APPENDIX F:	Surface Water Attenuation - Storage Volume Calculation

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	127.650	1.425	Open Manhole	1200	S1.000	126.225	225				
S2	127.600	1.490	Open Manhole	1200	S1.001	126.110	225	S1.000	126.110	225	
S3	127.500	1.610	Open Manhole	1200	S1.002	125.890	225	S1.001	125.890	225	
S4	126.100	1.425	Open Manhole	1200	S2.000	124.675	225				
S5	126.400	1.880	Open Manhole	1200	S2.001	124.520	225	S2.000	124.520	225	
S6	126.600	2.280	Open Manhole	1500	S2.002	124.320	300	S2.001	124.395	225	
S7	127.400	4.000	Open Manhole	2100	S1.003	123.400	1050	S1.002	125.670	225	1445
								S2.002	124.150	300	
S8	127.500	4.190	Open Manhole	2100	S1.004	123.310	1050	S1.003	123.310	1050	
S9	126.850	3.640	Open Manhole	2100	S1.005	123.210	1050	S1.004	123.210	1050	
S10	125.500	2.355	Open Manhole	2100	S1.006	123.145	450	S1.005	123.145	1050	
S	125.250	2.150	Open Manhole	0		OUTFALL		S1.006	123.100	450	
S11	126.150	1.775	Open Manhole	1500	S3.000	124.375	600				
S12	126.150	1.870	Open Manhole	1800	S3.001	124.280	600	S3.000	124.280	600	
S13	126.150	1.870	Open Manhole	1500	S4.000	124.280	600				
S14	126.150	1.915	Open Manhole	1800	S4.001	124.235	600	S4.000	124.235	600	
S15	126.150	1.955	Open Manhole	1800	S3.002	124.195	600	S3.001	124.195	600	
								S4.001	124.195	600	
S16	126.150	1.980	Open Manhole	1800	S3.003	124.170	600	S3.002	124.170	600	
S17	126.650	2.330	Open Manhole	1500	S5.000	124.320	600				
S18	126.650	2.385	Open Manhole	1800	S5.001	124.265	600	S5.000	124.265	600	
S19	126.650	2.435	Open Manhole	1800	S5.002	124.215	600	S5.001	124.215	600	
S20	126.650	2.520	Open Manhole	1800	S3.004	124.130	600	S3.003	124.130	600	
								S5.002	124.130	600	
S21	126.650	2.550	Open Manhole	1800	S3.005	124.100	600	S3.004	124.100	600	
S22	126.250	2.175	Open Manhole	2100	S3.006	124.075	450	S3.005	124.075	600	
S	126.150	2.100	Open Manhole	0		OUTFALL		S3.006	124.050	450	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	379312.017	416808.264	379312.017	416808.264	Required	
S2	379308.825	416791.352	379308.825	416791.352	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S3	379306.513	416758.817	379306.513	416758.817	Required	
S4	379338.973	416685.280	379338.973	416685.280	Required	
S5	379337.085	416707.865	379337.085	416707.865	Required	
S6	379336.626	416726.341	379336.626	416726.341	Required	
S7	379304.605	416725.888	379304.605	416725.888	Required	
S8	379302.558	416681.566	379302.558	416681.566	Required	
S9	379303.203	416632.175	379303.203	416632.175	Required	
S10	379333.994	416632.300	379333.994	416632.300	Required	
S	379338.316	416622.048			No Entry	
S11	379460.105	416711.352	379460.105	416711.352	Required	
S12	379434.141	416749.137	379434.141	416749.137	Required	
S13	379405.584	416689.465	379405.584	416689.465	Required	
S14	379404.513	416710.748	379404.513	416710.748	Required	
S15	379399.070	416728.699	379399.070	416728.699	Required	
S16	379386.869	416727.195	379386.869	416727.195	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S17	379365.083	416817.855	379365.083	416817.855	Required	
S18	379363.713	416792.812	379363.713	416792.812	Required	
S19	379366.918	416768.554	379366.918	416768.554	Required	
S20	379367.259	416726.877	379367.259	416726.877	Required	
S21	379353.618	416726.717	379353.618	416726.717	Required	
S22	379349.024	416737.499	379349.024	416737.499	Required	
S	379342.889	416737.792			No Entry	

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PIPELINE SCHEDULES for Storm

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)
S1.000	o	225	S1	127.650	126.225	1.200	Open Manhole	1200
S1.001	o	225	S2	127.600	126.110	1.265	Open Manhole	1200
S1.002	o	225	S3	127.500	125.890	1.385	Open Manhole	1200
S2.000	o	225	S4	126.100	124.675	1.200	Open Manhole	1200
S2.001	o	225	S5	126.400	124.520	1.655	Open Manhole	1200
S2.002	o	300	S6	126.600	124.320	1.980	Open Manhole	1500
S1.003	o	1050	S7	127.400	123.400	2.950	Open Manhole	2100
S1.004	o	1050	S8	127.500	123.310	3.140	Open Manhole	2100
S1.005	o	1050	S9	126.850	123.210	2.590	Open Manhole	2100
S1.006	o	450	S10	125.500	123.145	1.905	Open Manhole	2100
S3.000	o	600	S11	126.150	124.375	1.175	Open Manhole	1500
S3.001	o	600	S12	126.150	124.280	1.270	Open Manhole	1800
S4.000	o	600	S13	126.150	124.280	1.270	Open Manhole	1500
S4.001	o	600	S14	126.150	124.235	1.315	Open Manhole	1800
S3.002	o	600	S15	126.150	124.195	1.355	Open Manhole	1800

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)
S1.000	17.211	149.7	S2	127.600	126.110	1.265	Open Manhole	1200
S1.001	32.617	148.3	S3	127.500	125.890	1.385	Open Manhole	1200
S1.002	32.985	149.9	S7	127.400	125.670	1.505	Open Manhole	2100
S2.000	22.664	146.2	S5	126.400	124.520	1.655	Open Manhole	1200
S2.001	18.482	147.9	S6	126.600	124.395	1.980	Open Manhole	1500
S2.002	32.023	188.4	S7	127.400	124.150	2.950	Open Manhole	2100
S1.003	44.369	493.0	S8	127.500	123.310	3.140	Open Manhole	2100
S1.004	49.395	494.0	S9	126.850	123.210	2.590	Open Manhole	2100
S1.005	30.791	473.7	S10	125.500	123.145	1.305	Open Manhole	2100
S1.006	11.126	247.2	S	125.250	123.100	1.700	Open Manhole	0
S3.000	45.845	482.6	S12	126.150	124.280	1.270	Open Manhole	1800
S3.001	40.592	477.6	S15	126.150	124.195	1.355	Open Manhole	1800
S4.000	21.309	473.5	S14	126.150	124.235	1.315	Open Manhole	1800
S4.001	18.759	469.0	S15	126.150	124.195	1.355	Open Manhole	1800
S3.002	12.293	491.7	S16	126.150	124.170	1.380	Open Manhole	1800

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PIPELINE SCHEDULES for Storm

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)
S3.003	o	600	S16	126.150	124.170	1.380	Open Manhole	1800
S5.000	o	600	S17	126.650	124.320	1.730	Open Manhole	1500
S5.001	o	600	S18	126.650	124.265	1.785	Open Manhole	1800
S5.002	o	600	S19	126.650	124.215	1.835	Open Manhole	1800
S3.004	o	600	S20	126.650	124.130	1.920	Open Manhole	1800
S3.005	o	600	S21	126.650	124.100	1.950	Open Manhole	1800
S3.006	o	450	S22	126.250	124.075	1.725	Open Manhole	2100

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)
S3.003	19.613	490.3	S20	126.650	124.130	1.920	Open Manhole	1800
S5.000	25.080	456.0	S18	126.650	124.265	1.785	Open Manhole	1800
S5.001	24.469	489.4	S19	126.650	124.215	1.835	Open Manhole	1800
S5.002	41.678	490.3	S20	126.650	124.130	1.920	Open Manhole	1800
S3.004	13.642	454.7	S21	126.650	124.100	1.950	Open Manhole	1800
S3.005	11.720	468.8	S22	126.250	124.075	1.575	Open Manhole	2100
S3.006	6.143	245.7	S	126.150	124.050	1.650	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.081	0.081	0.081
1.001	User	-	100	0.053	0.053	0.053
1.002	User	-	100	0.062	0.062	0.062
2.000	User	-	100	0.043	0.043	0.043
2.001	User	-	100	0.026	0.026	0.026
2.002	User	-	100	0.060	0.060	0.060
1.003	User	-	100	0.084	0.084	0.084
1.004	User	-	100	0.051	0.051	0.051
	User	-	100	0.056	0.056	0.107
1.005	User	-	100	0.071	0.071	0.071
	User	-	100	0.016	0.016	0.087
	User	-	100	0.016	0.016	0.103
1.006	User	-	100	0.014	0.014	0.014
3.000	User	-	100	0.026	0.026	0.026
	User	-	100	0.059	0.059	0.085
3.001	User	-	100	0.013	0.013	0.013
	User	-	100	0.111	0.111	0.124
	User	-	100	0.010	0.010	0.134
	User	-	100	0.010	0.010	0.145
4.000	User	-	100	0.063	0.063	0.063
	User	-	100	0.010	0.010	0.073
	User	-	100	0.013	0.013	0.086
4.001	User	-	100	0.010	0.010	0.010
	User	-	100	0.015	0.015	0.025
3.002	User	-	100	0.042	0.042	0.042
3.003	User	-	100	0.029	0.029	0.029
	User	-	100	0.007	0.007	0.035
5.000	User	-	100	0.039	0.039	0.039
	User	-	100	0.052	0.052	0.091
	User	-	100	0.016	0.016	0.107
5.001	User	-	100	0.035	0.035	0.035
	User	-	100	0.010	0.010	0.045
5.002	User	-	100	0.036	0.036	0.036
3.004	User	-	100	0.007	0.007	0.007
	User	-	100	0.018	0.018	0.024
	User	-	100	0.010	0.010	0.035
3.005	User	-	100	0.018	0.018	0.018
	User	-	100	0.010	0.010	0.029
3.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.302	1.302	1.302

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)
S1.006	S	125.250	123.100	0.000	0	0

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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)
S3.006	S	126.150	124.050	0.000	0	0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S10, DS/PN: S1.006, Volume (m³): 33.0

Unit Reference	MD-SHE-0302-6000-2255-6000
Design Head (m)	2.255
Design Flow (l/s)	60.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	302
Invert Level (m)	123.145
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.255	60.0
Flush-Flo™	0.679	59.9
Kick-Flo®	1.480	49.0
Mean Flow over Head Range	-	51.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.2	1.200	56.4	3.000	68.9	7.000	104.0
0.200	31.0	1.400	52.0	3.500	74.2	7.500	107.5
0.300	52.8	1.600	50.8	4.000	79.2	8.000	110.9
0.400	57.2	1.800	53.8	4.500	83.8	8.500	114.3
0.500	59.0	2.000	56.6	5.000	88.2	9.000	117.5
0.600	59.8	2.200	59.3	5.500	92.4	9.500	120.7
0.800	59.7	2.400	61.8	6.000	96.4		
1.000	58.5	2.600	64.3	6.500	100.3		

Hydro-Brake® Optimum Manhole: S22, DS/PN: S3.006, Volume (m³): 10.3

Unit Reference	MD-SHE-0351-8200-1975-8200
Design Head (m)	1.975
Design Flow (l/s)	82.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	351
Invert Level (m)	124.075
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

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Hydro-Brake® Optimum Manhole: S22, DS/PN: S3.006, Volume (m³): 10.3

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.975	82.0
Flush-Flo™	0.641	81.9
Kick-Flo®	1.378	68.9
Mean Flow over Head Range	-	69.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.2	1.200	76.0	3.000	100.4	7.000	151.8
0.200	35.5	1.400	69.4	3.500	108.3	7.500	157.0
0.300	65.3	1.600	74.0	4.000	115.5	8.000	162.1
0.400	78.9	1.800	78.4	4.500	122.4	8.500	166.9
0.500	81.0	2.000	82.5	5.000	128.8	9.000	171.7
0.600	81.8	2.200	86.4	5.500	134.9	9.500	176.3
0.800	81.2	2.400	90.1	6.000	140.8		
1.000	79.4	2.600	93.7	6.500	146.4		

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Total Volume (m³)
S1.000	S1	1.612	0.684	2.296
S1.001	S2	1.685	1.297	2.982
S1.002	S3	1.821	1.312	3.132
S2.000	S4	1.612	0.901	2.513
S2.001	S5	2.126	0.735	2.861
S2.002	S6	4.029	2.264	6.293
S1.003	S7	13.854	38.419	52.274
S1.004	S8	14.513	42.771	57.284
S1.005	S9	12.608	26.662	39.269
S1.006	S10	8.157	1.770	9.926
S3.000	S11	3.137	12.962	16.099
S3.001	S12	4.759	11.477	16.236
S4.000	S13	3.305	6.025	9.330
S4.001	S14	4.873	5.304	10.177
S3.002	S15	4.975	3.476	8.451
S3.003	S16	5.038	5.545	10.584
S5.000	S17	4.117	7.091	11.209
S5.001	S18	6.069	6.918	12.988
S5.002	S19	6.196	11.784	17.980
S3.004	S20	6.413	3.857	10.270
S3.005	S21	6.489	3.314	9.803
S3.006	S22	7.533	0.977	8.510

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Volume Summary (Static)

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Total Volume (m³)
Total		124.920	195.545	320.465

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1 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 Storage Structures 0
Number of Online Controls 2 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 0.300
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 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
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S1.000	S1	15 minute 1 year Winter I+0%	127.650	126.305	-0.145	0.000	0.27
S1.001	S2	15 minute 1 year Winter I+0%	127.600	126.209	-0.126	0.000	0.39
S1.002	S3	15 minute 1 year Winter I+0%	127.500	126.010	-0.105	0.000	0.55
S2.000	S4	15 minute 1 year Winter I+0%	126.100	124.731	-0.169	0.000	0.13
S2.001	S5	15 minute 1 year Winter I+0%	126.400	124.590	-0.155	0.000	0.21
S2.002	S6	15 minute 1 year Winter I+0%	126.600	124.410	-0.210	0.000	0.20
S1.003	S7	15 minute 1 year Winter I+0%	127.400	123.567	-0.883	0.000	0.04
S1.004	S8	15 minute 1 year Winter I+0%	127.500	123.502	-0.858	0.000	0.05
S1.005	S9	15 minute 1 year Winter I+0%	126.850	123.451	-0.809	0.000	0.05
S1.006	S10	15 minute 1 year Winter I+0%	125.500	123.433	-0.162	0.000	0.34
S3.000	S11	15 minute 1 year Winter I+0%	126.150	124.474	-0.501	0.000	0.04
S3.001	S12	15 minute 1 year Winter I+0%	126.150	124.434	-0.446	0.000	0.08
S4.000	S13	30 minute 1 year Winter I+0%	126.150	124.413	-0.467	0.000	0.04
S4.001	S14	30 minute 1 year Winter I+0%	126.150	124.410	-0.425	0.000	0.04
S3.002	S15	30 minute 1 year Winter I+0%	126.150	124.408	-0.387	0.000	0.18
S3.003	S16	30 minute 1 year Winter I+0%	126.150	124.392	-0.378	0.000	0.15
S5.000	S17	15 minute 1 year Winter I+0%	126.650	124.430	-0.490	0.000	0.05
S5.001	S18	30 minute 1 year Winter I+0%	126.650	124.398	-0.467	0.000	0.06

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

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Pipe Flow (l/s)	Status
S1.000	S1			10.1	OK
S1.001	S2			15.7	OK
S1.002	S3			22.0	OK
S2.000	S4			5.3	OK
S2.001	S5			8.1	OK
S2.002	S6			14.5	OK
S1.003	S7			44.2	OK
S1.004	S8			50.5	OK
S1.005	S9			51.4	OK
S1.006	S10			50.0	OK
S3.000	S11			10.3	OK
S3.001	S12			21.8	OK
S4.000	S13			8.4	OK
S4.001	S14			8.9	OK
S3.002	S15			29.0	OK
S3.003	S16			30.8	OK
S5.000	S17			13.1	OK
S5.001	S18			14.0	OK

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S5.002	S19	30 minute 1 year Winter I+0%	126.650	124.385	-0.430	0.000	0.06
S3.004	S20	30 minute 1 year Winter I+0%	126.650	124.376	-0.354	0.000	0.25
S3.005	S21	30 minute 1 year Winter I+0%	126.650	124.354	-0.346	0.000	0.28
S3.006	S22	30 minute 1 year Winter I+0%	126.250	124.333	-0.192	0.000	0.37

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Pipe Flow (l/s)	Status
S5.002	S19			15.3	OK
S3.004	S20			45.1	OK
S3.005	S21			46.6	OK
S3.006	S22			46.5	OK

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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 Storage Structures	0
Number of Online Controls	2	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	0.300
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	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
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S1.000	S1	15 minute 30 year Winter I+0%	127.650	126.513	0.063	0.000	0.59
S1.001	S2	15 minute 30 year Winter I+0%	127.600	126.442	0.107	0.000	0.89
S1.002	S3	15 minute 30 year Winter I+0%	127.500	126.258	0.143	0.000	1.29
S2.000	S4	15 minute 30 year Winter I+0%	126.100	124.765	-0.135	0.000	0.33
S2.001	S5	15 minute 30 year Winter I+0%	126.400	124.641	-0.104	0.000	0.55
S2.002	S6	15 minute 30 year Winter I+0%	126.600	124.480	-0.140	0.000	0.54
S1.003	S7	30 minute 30 year Winter I+0%	127.400	123.873	-0.577	0.000	0.09
S1.004	S8	30 minute 30 year Winter I+0%	127.500	123.847	-0.513	0.000	0.09
S1.005	S9	30 minute 30 year Winter I+0%	126.850	123.815	-0.445	0.000	0.08
S1.006	S10	30 minute 30 year Winter I+0%	125.500	123.792	0.197	0.000	0.41
S3.000	S11	30 minute 30 year Winter I+0%	126.150	124.656	-0.319	0.000	0.08
S3.001	S12	30 minute 30 year Winter I+0%	126.150	124.650	-0.230	0.000	0.17
S4.000	S13	30 minute 30 year Winter I+0%	126.150	124.626	-0.254	0.000	0.09
S4.001	S14	30 minute 30 year Winter I+0%	126.150	124.620	-0.215	0.000	0.10
S3.002	S15	30 minute 30 year Winter I+0%	126.150	124.613	-0.182	0.000	0.38
S3.003	S16	30 minute 30 year Winter I+0%	126.150	124.602	-0.168	0.000	0.31
S5.000	S17	30 minute 30 year Winter I+0%	126.650	124.647	-0.273	0.000	0.10
S5.001	S18	30 minute 30 year Winter I+0%	126.650	124.636	-0.229	0.000	0.12

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

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Pipe Flow (l/s)	Status
S1.000	S1			22.3	SURCHARGED
S1.001	S2			35.7	SURCHARGED
S1.002	S3			51.5	SURCHARGED
S2.000	S4			13.0	OK
S2.001	S5			21.1	OK
S2.002	S6			40.1	OK
S1.003	S7			95.7	OK
S1.004	S8			95.4	OK
S1.005	S9			81.5	OK
S1.006	S10			59.7	SURCHARGED
S3.000	S11			20.5	OK
S3.001	S12			46.4	OK
S4.000	S13			20.3	OK
S4.001	S14			20.1	OK
S3.002	S15			60.6	OK
S3.003	S16			63.9	OK
S5.000	S17			25.4	OK
S5.001	S18			28.9	OK

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S5.002	S19	30 minute 30 year Winter I+0%	126.650	124.618	-0.197	0.000	0.11
S3.004	S20	30 minute 30 year Winter I+0%	126.650	124.578	-0.152	0.000	0.45
S3.005	S21	30 minute 30 year Winter I+0%	126.650	124.561	-0.139	0.000	0.50
S3.006	S22	30 minute 30 year Winter I+0%	126.250	124.547	0.022	0.000	0.64

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Pipe Flow (l/s)	Status
S5.002	S19			28.5	OK
S3.004	S20			81.5	OK
S3.005	S21			83.0	OK
S3.006	S22			79.9	SURCHARGED

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100 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 Storage Structures	0
Number of Online Controls	2	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	0.300
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	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
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S1.000	S1	15 minute 100 year Winter I+40%	127.650	127.548	1.098	0.000	1.02
S1.001	S2	15 minute 100 year Winter I+40%	127.600	127.434	1.099	0.000	1.49
S1.002	S3	15 minute 100 year Winter I+40%	127.500	126.933	0.818	0.000	2.16
S2.000	S4	60 minute 100 year Winter I+40%	126.100	125.474	0.574	0.000	0.35
S2.001	S5	60 minute 100 year Winter I+40%	126.400	125.465	0.720	0.000	0.58
S2.002	S6	60 minute 100 year Winter I+40%	126.600	125.453	0.833	0.000	0.57
S1.003	S7	60 minute 100 year Winter I+40%	127.400	125.439	0.989	0.000	0.12
S1.004	S8	60 minute 100 year Winter I+40%	127.500	125.437	1.077	0.000	0.10
S1.005	S9	60 minute 100 year Winter I+40%	126.850	125.433	1.173	0.000	0.09
S1.006	S10	60 minute 100 year Winter I+40%	125.500	125.430	1.835	0.000	0.41
S3.000	S11	30 minute 100 year Winter I+40%	126.150	126.080	1.105	0.000	0.12
S3.001	S12	30 minute 100 year Winter I+40%	126.150	126.077	1.197	0.000	0.25
S4.000	S13	30 minute 100 year Winter I+40%	126.150	126.075	1.195	0.000	0.15
S4.001	S14	30 minute 100 year Winter I+40%	126.150	126.073	1.238	0.000	0.15
S3.002	S15	30 minute 100 year Winter I+40%	126.150	126.070	1.275	0.000	0.56
S3.003	S16	30 minute 100 year Winter I+40%	126.150	126.063	1.293	0.000	0.43
S5.000	S17	30 minute 100 year Winter I+40%	126.650	126.066	1.146	0.000	0.17
S5.001	S18	30 minute 100 year Winter I+40%	126.650	126.063	1.198	0.000	0.20

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

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Pipe Flow (l/s)	Status
S1.000	S1			38.5	FLOOD RISK
S1.001	S2			59.6	FLOOD RISK
S1.002	S3			85.9	SURCHARGED
S2.000	S4			13.8	SURCHARGED
S2.001	S5			22.3	SURCHARGED
S2.002	S6			41.8	SURCHARGED
S1.003	S7			122.4	SURCHARGED
S1.004	S8			104.7	SURCHARGED
S1.005	S9			86.1	SURCHARGED
S1.006	S10			60.3	FLOOD RISK
S3.000	S11			33.5	FLOOD RISK
S3.001	S12			66.6	FLOOD RISK
S4.000	S13			34.2	FLOOD RISK
S4.001	S14			32.4	FLOOD RISK
S3.002	S15			89.5	FLOOD RISK
S3.003	S16			89.0	FLOOD RISK
S5.000	S17			43.5	SURCHARGED
S5.001	S18			48.4	SURCHARGED

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
S5.002	S19	30 minute 100 year Winter I+40%	126.650	126.059	1.244	0.000	0.16
S3.004	S20	30 minute 100 year Winter I+40%	126.650	126.053	1.323	0.000	0.63
S3.005	S21	30 minute 100 year Winter I+40%	126.650	126.040	1.340	0.000	0.63
S3.006	S22	30 minute 100 year Winter I+40%	126.250	126.028	1.503	0.000	0.66

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Pipe Flow (l/s)	Status
S5.002	S19			43.4	SURCHARGED
S3.004	S20			112.6	SURCHARGED
S3.005	S21			104.5	SURCHARGED
S3.006	S22			82.2	FLOOD RISK

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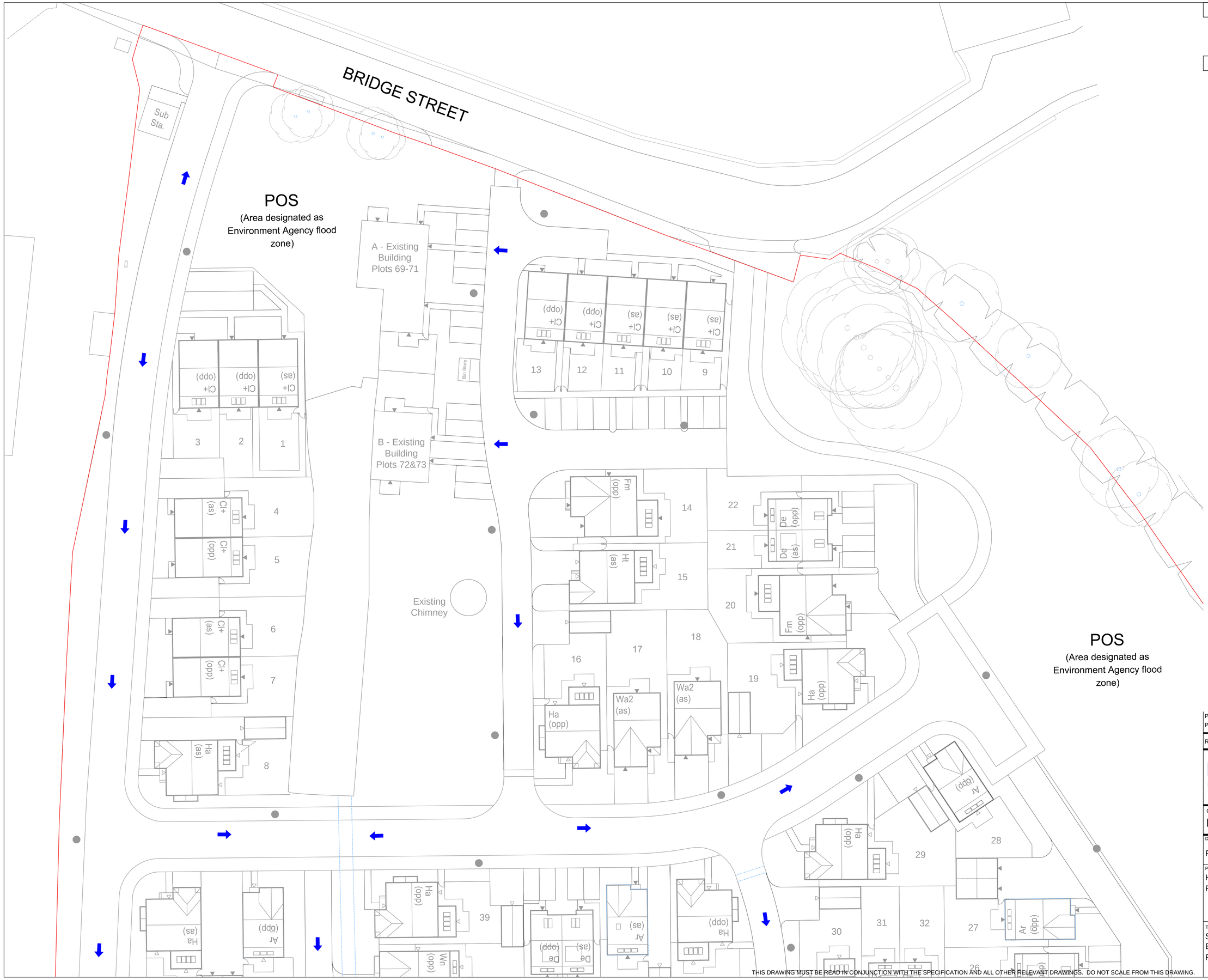
APPENDIX G:	Exceedance Flow Plan



NOTES

1. This drawing to be read in conjunction with all relevant Weetwood drawings.

LEGEND

Site boundary

Direction of surface water exceedance flows

Rev	Date	Description	Drawn	Check
P2	17/12/21	SITE LAYOUT UPDATED	JA	TB
P1	17/06/21	INITIAL ISSUE	JA	KT

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Drawing Status
PLANNING

Date
JUNE 2021

Scale (A1)
1:250

Project
HOLCOMBE MILL
RAMSBOTTOM

Drawn
JA

Checked
KT

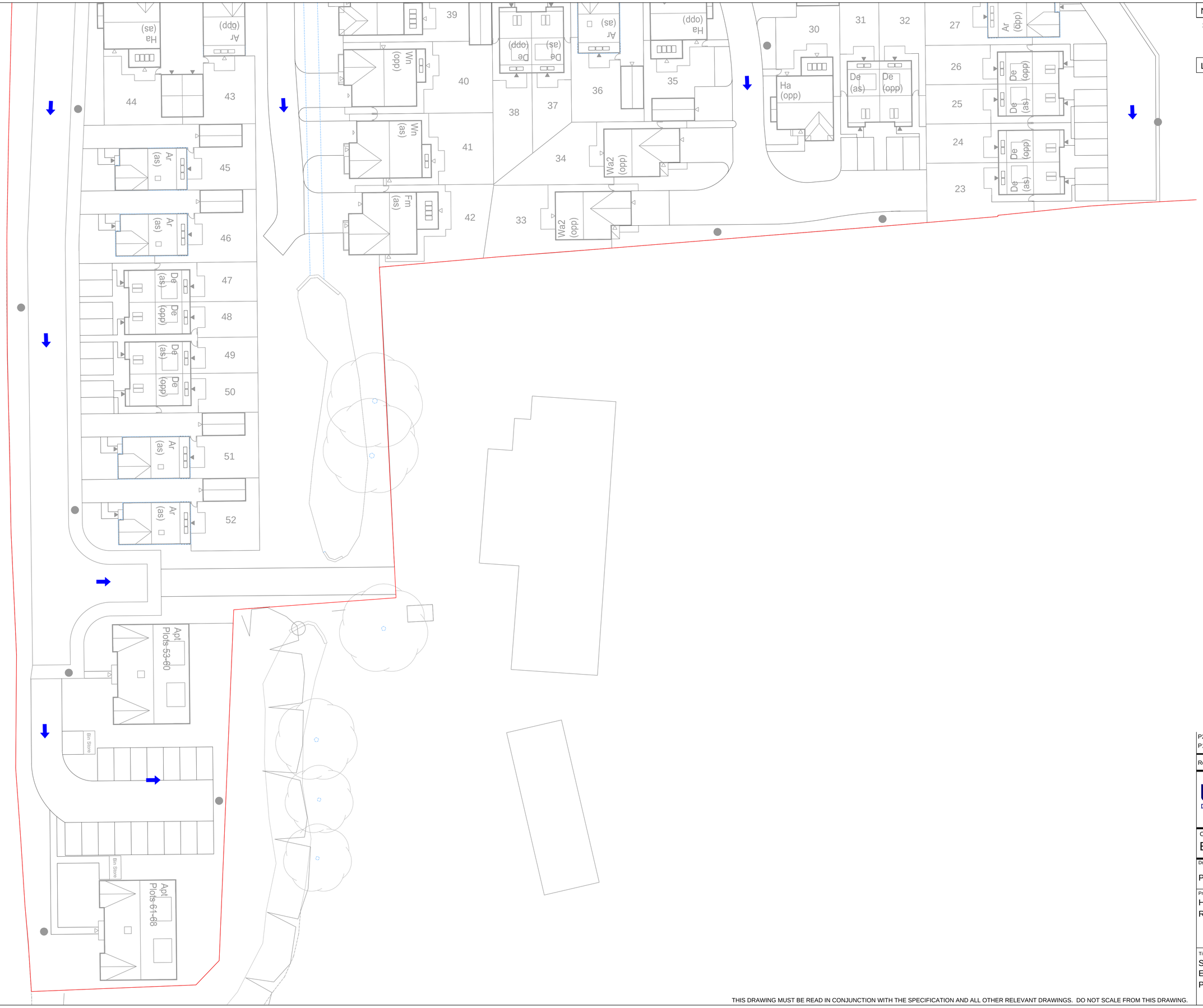
Project No
4714

Title
SURFACE WATER EXCEEDANCE FLOW PLAN

Drawing No
C150

Revision
P2

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.



NOTES

1. This drawing to be read in conjunction with all relevant Weetwood drawings.

LEGEND

Site boundary

Direction of surface water exceedance flows

Rev	Date	Description	Drawn	Check
P2	17/12/21	SITE LAYOUT UPDATED	JA	TB
P1	17/06/21	INITIAL ISSUE	JA	KT

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Drawing Status
PLANNING

Date
JUNE 2021

Scale (A1)
1:250

Project
HOLCOMBE MILL
RAMSBOTTOM

Drawn
JA

Checked
KT

Project No
4714

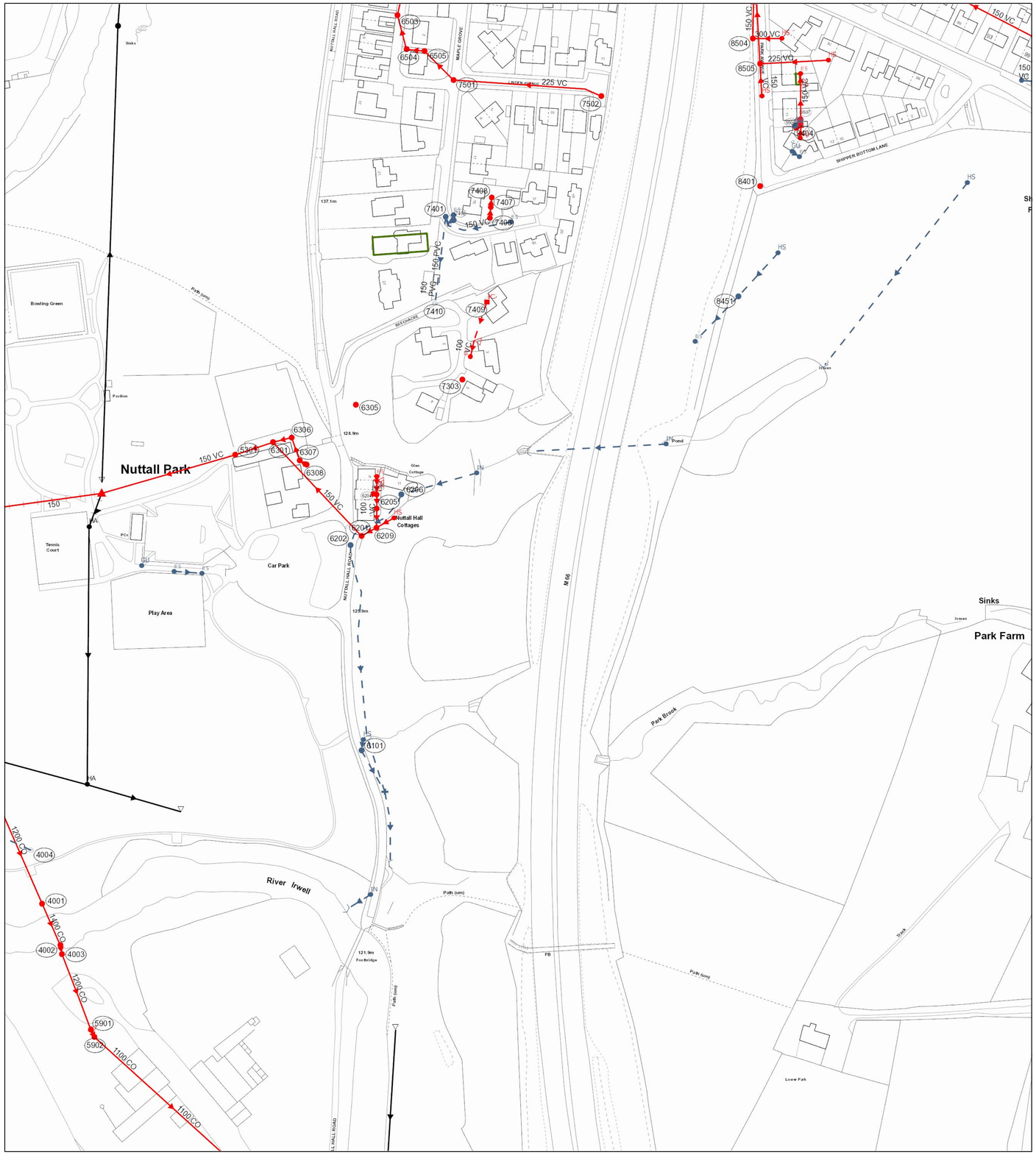
Title
SURFACE WATER
EXCEEDANCE FLOW
PLAN

Drawing No
C151

Revision
P2

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

APPENDIX H:	United Utilities Public Sewer Record



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
5902	121.32	CO	118.55	1100			CO	116.1034	1 in 464
5902	121.32	CO	118.55	1100			CO	116.1034	1 in 464
7501	146.76	CO	143.73	225			VC	22.62742	1 in 45
7501	146.76	CO	143.73	225			VC	22.62742	1 in 45
6504	145.19	CO	142.84	225			VC	19.64688	1 in 116
6504	145.19	CO	142.84	225			VC	19.64688	1 in 116
6505	145.64	CO	143.24	225			VC	10.04988	1 in 25
6505	145.64	CO	143.24	225			VC	10.04988	1 in 25
7502	152.35	CO	149.23	225			VC	83.01989	1 in 15
7502	152.35	CO	149.23	225			VC	83.01989	1 in 15
5301	123.41	CO	122.74	150			VC	77.06306	1 in 23
4002		CO	0	1200			CO	5.09902	
4002		CO	0	1200			CO	5.09902	
7407		CO		150			VC	5.344016	
7407		CO		150			VC	5.344016	
8451		SW		0				34.65545	
6503	145.3	CO	142.56	225			VC	18.43909	1 in 123
6503	145.3	CO	142.56	225			VC	18.43909	1 in 123
4003	121.12	CO	0	1200			CO	44.94478	
4003	121.12	CO	0	1200			CO	44.94478	
7406		CO		150			VC	5.988619	
7406		CO		150			VC	5.988619	
8504	160.31	CO	158.3	150			VC	41.01219	
8504	160.31	CO	158.3	150			VC	41.01219	
4001		CO	0	1400			CO	25.07987	
4001		CO	0	1400			CO	25.07987	
8505	160.3	CO	158.4	225			VC	55.08176	1 in 197
8505	160.3	CO	158.4	225			VC	55.08176	1 in 197
4101	120.87	CO	119.28	1200			CO	60.00833	
9506		CO		150			VC	2.3465	
9506		CO		150			VC	2.3465	
6101	123.53	SW	122.25	0				26.41969	
5901	120.85	CO	0	1200			CO	2.236068	
5901	120.85	CO	0	1200			CO	2.236068	
6205		CO		100			VC	10.53236	
7401		SW		150			PVC	48.35646	
7401		SW		150			PVC	48.35646	
6202	126.96	SW		0				139.7645	
6209		CO	0	150			VC	9.620207	
6306		CO		150			VC	10.67357	
7402		SW		100			VC	3.610298	
7402		SW		100			VC	3.610298	
6307		CO		150			VC	13.53013	
6206		SW		0				41.57977	
6201	127.26	CO	125.87	150			VC	71.44928	1 in 21
6301	123.57	CO	122.48	150			VC	22.13594	1 in 85
6308		CO		150			VC	4.429853	

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

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

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LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

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

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforecd Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

Address or Site Reference:

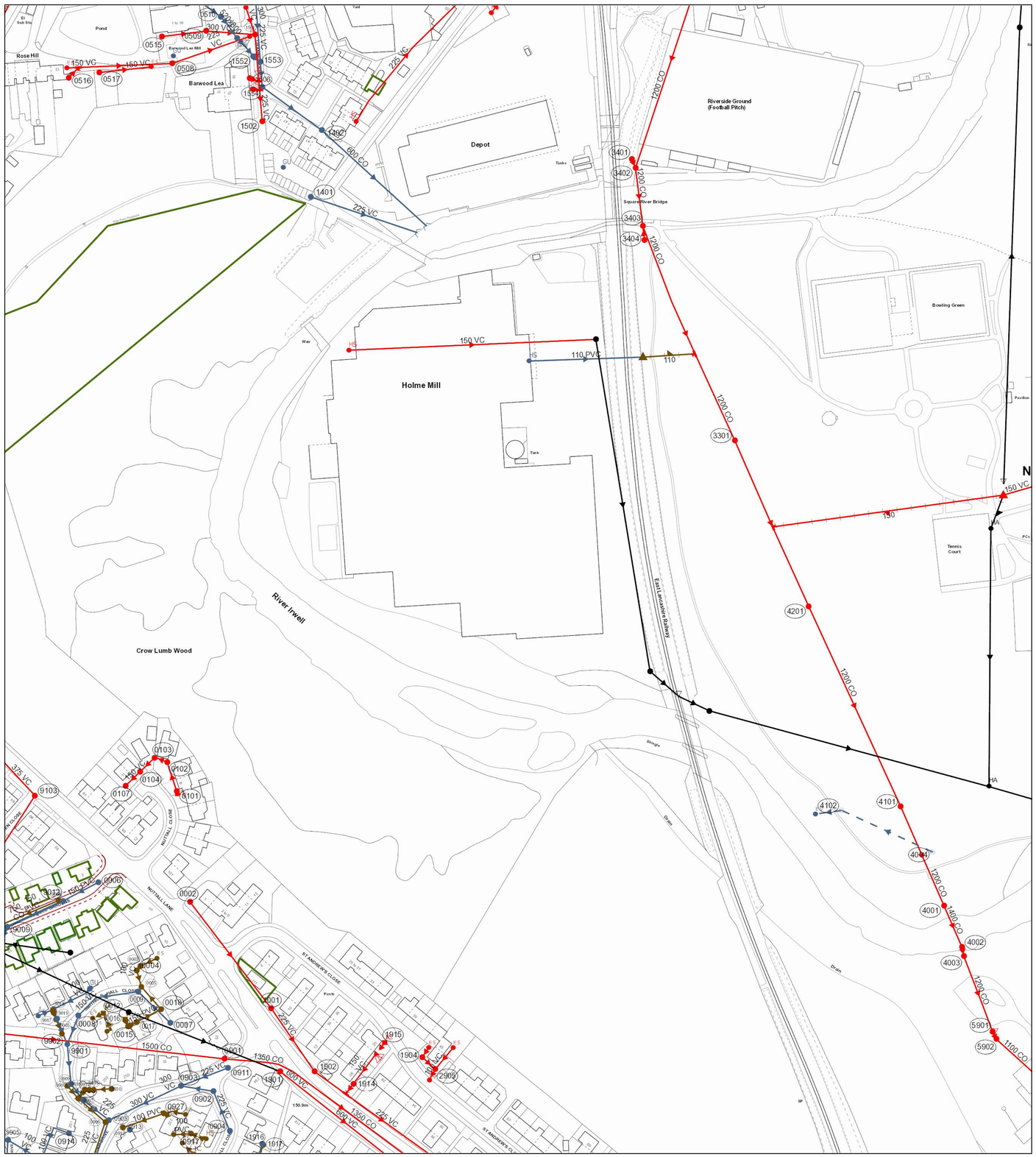
Holcombe Mill,

OS sheet Number: SD7916SE
Scale: 1:1250 **Date:** 24/05/2019
Nodes: 47
Sheet: 1 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly



Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
0018		FO		150			VC	16.50521	
9103	156.61	CO	153.55	375			VC	92.27214	
0903	153.45	SW	151.7	300			VC	44.28318	1 in 193
0906	153.78	FO	151.95	225			VC	62.29767	1 in 135
1554	132.71	SW	129.86	600			CO	40.80441	1 in 23
1554	132.71	SW	129.86	600			CO	40.80441	1 in 23
2905		CO		100			VC	6.792109	
9012	155.38	FO	153.75	150			PVC	36.75269	1 in 25
4001		CO	0	1400			CO	25.07987	
4001		CO	0	1400			CO	25.07987	
0509	135.32	CO	0	300			VC	27.07397	
0509	135.32	CO	0	300			VC	27.07397	
9009	154.27	SW	151.2	750			CO	9.099101	1 in 57
0015		FO		150			PVC	5.225512	
1914		CO		150			VC	7.015839	
0516		CO		150			VC	8.000196	
0516		CO		150			VC	8.000196	
1551	133.5	SW	130.65	225			VC	39.11557	1 in 87
9901		SW		150			VC	22.19627	
5902	121.32	CO	118.55	1100			CO	116.1034	1 in 464
5902	121.32	CO	118.55	1100			CO	116.1034	1 in 464
9019		SW		100			PVC	5.605523	
5301	123.41	CO	122.74	150			VC	77.06306	1 in 23
0101		CO		150			VC	16.93866	
9008	155.44	SW	151.47	750			CO	34.0066	1 in 126
3501	123.92	CO	120.86	1200			CO	127.4402	1 in 1593
0004		FO		100			VC	9.399326	
0508		CO	0	225			VC	45.67829	
0508		CO	0	225			VC	45.67829	
0506	135.42	SW	133.37	750			RPM	8.602325	1 in 19
0902	153.19	SW	151.94	225			VC	18.24629	1 in 261
0009		SW		150			VC	37.60827	
0517		CO		150			VC	28.8585	
0517		CO		150			VC	28.8585	
0904	153.35	SW	152.14	225			VC	23.76973	1 in 132
1553	133.05	SW	130.2	600			CO	14.03567	1 in 47
1553	133.05	SW	130.2	600			CO	14.03567	1 in 47
0510	134.38	SW	132.47	520			RPM	7.81025	1 in 0
0510	134.38	SW	132.47	520			RPM	7.81025	1 in 0
5901	120.85	CO	0	1200			CO	2.236068	
5901	120.85	CO	0	1200			CO	2.236068	
0908	153.62	FO	152.21	150			VC	19.84943	1 in 110
1902	151.72	CO	148.42	225			VC	92.41753	1 in 20
0104		CO		150			VC	11.24031	
0515		CO	0	300			VC	24.72511	
0515		CO	0	300			VC	24.72511	
0003		FO		100			VC	3.272722	
0007		SW		150			VC	24.80543	
0907	153.62	SW	151.81	225			VC	17.80449	1 in 81
0905	153.77	SW	151.39	375			CO	62.62587	1 in 133
0917		FO		100			PVC	9.69412	
0911	153	SW	151.91	225			VC	27.85678	1 in 348
0017		FO		150			PVC	15.35069	
0512		SW	0	390			RPM	7.071068	
0512		SW	0	390			RPM	7.071068	
0103		CO		150			VC	10.99224	
0927		FO		100			PVC	23.97465	
1506		CO		0			VC	5.433882	
1506		CO		0			VC	5.433882	
4003	121.12	CO	0	1200			CO	44.94478	
4003	121.12	CO	0	1200			CO	44.94478	
0919	153.53	SW	151.88	300			VC	11.40175	1 in 228
0901	153.29	CO	142.76	1350			CO	146.311	1 in 697
0017		SW		100			PVC	15.30615	
0914		SW		100			VC	27.98328	
3301	122.57	CO	120.12	1200			CO	100.7249	1 in 305
1904		CO		100			VC	9.774369	
1901		CO	0	600			VC	90.42677	
1552	133.06	SW	131.46	600			CO	5	1 in 9
1552	133.06	SW	131.46	600			CO	5	1 in 9
9003		FO		100			PVC	8.44977	
4002		CO	0	1200			CO	5.09902	
4002		CO	0	1200			CO	5.09902	
1001	153.3	CO	151.31	225			VC	42.43819	1 in 30
0006	155.8	SW	154.16	150			PVC	22.23611	1 in 8
3402	123.3	CO	120.55	1200			CO	32.24903	1 in 461
3402	123.3	CO	120.55	1200			CO	32.24903	1 in 461
1501	133.26	CO	131.01	300			VC	24.08319	1 in 30
1501	133.26	CO	131.01	300			VC	24.08319	1 in 30
0008		SW		150			VC	17.03442	
0102		CO		150			VC	7.684664	
9018		FO		100			PVC	5.35411	
3404	124.22	CO	123.02	1200			CO	8.062258	
3404	124.22	CO	123.02	1200			CO	8.062258	
3401	123.24	CO	0	1200			CO	5.385165	
3401	123.24	CO	0	1200			CO	5.385165	
4101	120.87	CO	119.28	1200			CO	60.00833	
9905	152.66	SW	151.1	225			VC	36.05551	1 in 113
0002	154.9	CO	152.7	225			VC	74.20242	1 in 53
4201	122.22	CO	119.77	1200			CO	122.1556	1 in 509
0909	153.52	FO	152.29	150			VC	9.219544	1 in 154
1402	130.58	SW	127.99	600			CO	78.78506	1 in 14
1402	130.58	SW	127.99	600			CO	78.78506	1 in 14
0932		FO		150			VC	2.35681	
0931		FO		150			VC	6.080112	
3403	124.23	CO	120.45	1200			CO	129.5264	1 in 463
3403	124.23	CO	120.45	1200			CO	129.5264	1 in 463
0915		FO		150			VC	2.589786	
0930		FO		150			VC	9.895969	
1401	130.19	SW	128.31	225			VC	62.32987	1 in 12
1401	130.19	SW	128.31	225			VC	62.32987	1 in 12

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

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
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- Sludge Main
- Overflow
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All point assets follow the standard colour convention:
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- Extent of Survey
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- Discharge Point
- Vortex
- Penstock
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- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

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

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
PE	Polyethylene
RP	Reinforced Plastic Matrix
CO	Concrete
CSB	Concrete Segment Bolted
CSU	Concrete Segment Unbolted
CC	Concrete Box Culverted
PSC	Plastic / Steel Composite
GRC	Glass Reinforecd Plastic
DI	Ductile Iron
PVC	Polyvinyl Chloride
CI	Cast Iron
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
PP	Polypropylene
PF	Pitch Fibre
MAC	Masonry, Coursed
MAR	Masonry, Random
U	Unspecified

Address or Site Reference:

Holcombe Mill,

OS sheet Number: SD7916SW
Scale: 1:1250 **Date:** 24/05/2019
Nodes: 101
Sheet: 2 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
9701	166.22	CO	164.29	300			VC	16.27582	1 in 10
9811		CO		100			VC	5.312928	
7504		CO		100			VC	15.80236	
9801		SW		100				38.0526	
7502	152.35	CO	149.23	225			VC	83.01989	1 in 15
7502	152.35	CO	149.23	225			VC	83.01989	1 in 15
6701	150.1	CO	148.3	225			VC	26	1 in 8
7002		CO		0			VC	6.912111	
6503	145.3	CO	142.56	225			VC	18.43909	1 in 123
6503	145.3	CO	142.56	225			VC	18.43909	1 in 123
7604	149.89	CO	148.31	225			VC	30.36445	
4602	124.64	CO	121.75	1000			CO	124.6796	1 in 277
4602	124.64	CO	121.75	1000			CO	124.6796	1 in 277
9903	172.18	CO	169.43	300			VC	13.0384	1 in 130
4601		CO	0	1000			CO	8	
4601		CO	0	1000			CO	8	
7702	152.27	CO	151.45	300			VC	30.59395	
8504	160.31	CO	158.3	150			VC	41.01219	
8504	160.31	CO	158.3	150			VC	41.01219	
6607		CO		150			VC	6.381382	
4702	124.99	CO	122.25	900			CO	30.08322	1 in 0
4702	124.99	CO	122.25	900			CO	30.08322	1 in 0
5704		CO		225			VC	5.833005	
6703	144.1	CO	141.52	300			VC	33.24154	
7004		CO		150			VC	5.893934	
8605	155.13	SW	153.49	225			VC	41.15298	
9513		CO		150			VC	11.15201	
9902	172.24	CO	169.66	300			VC	8.062258	1 in 35
6813		CO		100			VC	8.232013	
5804	133.24	CO	130.96	300			VC	41.01219	1 in 16
6603	145.92	CO	143.44	300			VC	2	1 in 2
7803	154.21	CO	150.89	450			VC	65.06919	1 in 16
6801	149.42	CO	147.92	225			VC	31.01612	1 in 38
6504	145.19	CO	142.84	225			VC	19.64688	1 in 116
6504	145.19	CO	142.84	225			VC	19.64688	1 in 116
6705	150.63	CO	146.92	750			CO	26.01922	
6505	145.64	CO	143.24	225			VC	10.04988	1 in 25
6505	145.64	CO	143.24	225			VC	10.04988	1 in 25
8702	160.81	CO	157.54	500			CO	34.0147	1 in 56
6010		CO		150			VC	45.54116	
9904		SW		150				35.01428	
9804	171.45	CO	168.25	450			VC	78.85429	1 in 12
8902	165.28	CO	163.93	300			VC	40.04997	1 in 87
7407		CO		150			VC	5.344016	
7407		CO		150			VC	5.344016	
6905		CO		100			VC	23.03594	
6807	149.06	CO	146.24	450			VC	58.13777	
8705	159.95	CO	156.93	500			CO	97.32934	
7701	154.41	CO	152.51	300			VC	65.06919	1 in 15
8001	161.62	SW	160.58	150			VC	111.4495	1 in 248
6803	144.36	CO	142.22	400			VC	27.16615	
8801	165.13	CO	163.46	300			VC	40.11234	1 in 41
6014		CO		150			VC	21.75007	
8602	160.06	CO	157.74	300			VC	20.39608	1 in 136
9802	170.93	CO	168.93	300			VC	49.36598	1 in 85
6601	140.51	CO	138.32	300			VC	121.2023	1 in 16
9506		CO		150			VC	2.3465	
9506		CO		150			VC	2.3465	
5705		CO		225			VC	12.87769	
0902		CO	0	150			VC	51.93959	
6702	146.87	CO	144.88	225			VC	28	1 in 18
5706		CO		225			VC	10.93215	
6002		CO		150			VC	17.67035	
7802	157.8	CO	154.45	300			VC	57.03508	1 in 19
6701	150.1	CO	148.3	300			VC	14.14214	1 in 13
5802	139.12	CO	135.27	225			VC	15.13275	1 in 41
7003		CO		150			VC	19.35801	
8804	158.06	CO	154.94	450			VC	66.06815	1 in 19
9803	176.07	CO	0	225			VC	26.4764	
6911		CO		225			VC	4.444551	
9907		CO		225			VC	49.64421	
9901		CO	0	300			VC	45.81722	
5803	130.96	CO	128.41	600			CO	68	1 in 16
5803	130.96	CO	128.41	600			CO	68	1 in 16
8501	160.48	CO	158.12	225			VC	18.24829	1 in 70
0701		CO	0	150			VC	26.07681	
6502	145.86	CO	142.37	225			VC	34.0147	1 in 32
6802	143.05	CO	141.55	225			VC	33.13608	1 in 8
8505	160.3	CO	158.4	225			VC	55.08176	1 in 197
8505	160.3	CO	158.4	225			VC	55.08176	1 in 197
9001		CO	0	300			VC	78.29053	
7602	151.41	SW	147.81	750			CO	47.29694	1 in 86
6804	147.49	CO	143.79	300			VC	31.06445	1 in 19
8901	165.32	CO	164.12	225			VC	5.09902	1 in 57
8802	165.08	CO	162.47	300			VC	31.01612	1 in 48
6805	149.28	CO	147.14	375			VC	29.01724	1 in 38
7710		CO		100			VC	5.21034	
4701	124.87	CO	121.9	1000			CO	12.72792	
8601	160.48	CO	157.58	300			CO	18.02776	1 in 90
7501	146.76	CO	143.73	225			VC	22.62742	1 in 45
7501	146.76	CO	143.73	225			VC	22.62742	1 in 45
0906		CO		150			VC	2.966682	
6722		CO		150			VC	4.662682	
0802		CO	0	225			VC	23.02173	
9905	172.13	CO	169.29	300			VC	32.38827	1 in 90
8701	163.38	CO	161.12	500			CO	48	1 in 13
6704	146.86	CO	144.68	300			VC	47.80167	1 in 17
7906		CO		100			VC	8.353653	
7903		CO	0	150			VC	6.013857	
6910		CO		150			VC	10.74578	
7703	152.17	CO	147.26	750			CO	42.42641	1 in 129
0702		CO	0	150			VC	16.12452	
8603	160.44	CO	158.65	225			VC	3	1 in 3
5801	135.62	CO	132.3	225			VC	29.68164	1 in 9
7800	151.37	CO	0	300			VC	38.11824	
6713		CO		150			VC	14.51412	
6806	142.36	CO	0	450			VC	45.27692	
7406		CO		150			VC	5.988619	
7406		CO		150			VC	5.988619	
7612		CO	0	750			CO	63.3877	
5806		SW		450				90.48242	
6501	143.38	CO	141.32	225			VC	40.31129	
6904		SW		450			MAC	103.1213	
7801	153.79	CO	151.28	300			VC	30.01666	
8803	164.45	CO	161.72	450			VC	15.13275	1 in 49
7906		CO		100			VC	16.74927	
6706	150.79	CO	147.27	225			VC	55.57877	1 in 23
7605		CO	0	300			VC	63.07139	
6602	145.89	CO	140.91	300			VC	90.44335	1 in 35
0801		CO	0	225			VC	38.83298	
7401		SW		150			PVC	48.35646	
7401		SW		150			PVC	48.35646	
9909		CO		100			VC	11.27305	
7402		SW		100			VC	3.610298	
7402		SW		100			VC	3.610298	
9816		CO		100			VC	5.222969	
5707		CO		225			VC	9.498874	

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

LEGEND

Abandoned	Foul	Surface Water	Combined	
				Public Sewer
				Private Sewer
				Section 104
				Rising Main
				Sludge Main
				Overflow
				Water Course
				Highway Drain

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

- Manhole
- Head of System
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- Rodding Eye
- Inlet
- Discharge Point
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- Soakaway
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- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
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- CI Circular
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- OV Oval
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- UN Unspecified

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforecd Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

Address or Site Reference:

Holcombe Mill,

OS sheet Number: SD7916NE
Scale: 1:1250 **Date:** 24/05/2019
Nodes: 127
Sheet: 3 of 4

Printed by: Property Searches

SEWER RECORDS

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Refno	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
0803	139.28	CO	136.82	225			VC	16.12452	
2701	127.11	CO	122.43	900			CO	81.00617	1 in 245
2901	126.5	CO	123.42	450			VC	24.33105	1 in 487
0002	138.41	CO	137.19	225			VC	46.2277	1 in 7
4804	127.4	CO	122.85	750			CO	15.0333	1 in 72
4602	124.64	CO	121.75	1000			CO	124.6796	1 in 277
4602	124.64	CO	121.75	1000			CO	124.6796	1 in 277
2801	128.36	CO	122.84	900			CO	31.01612	
4601		CO	0	1000			CO	8	
4601		CO	0	1000			CO	8	
0901	138.19	CO	136.2	450			VC	13.41641	1 in 4
1902	133.59	CO	131.46	300			VC	25.05993	
1012	129.22	CO	126.77	225			VC	24.46871	1 in 63
2802	129.22	FO	127.25	375			VC	18.02776	1 in 37
1009	129.13	CO	126.99	225			VC	8.959467	1 in 64
0703	137.83	CO	135.73	375			VC	26.68333	1 in 9
4801	126.29	CO	122.88	825			CO	32.01562	1 in 1067
2804	128.57	FO	126.42	300			VC	11.40175	
4807	126.94	CO	122.28	300			ST	56.32051	1 in 97
2601	126.53	CO	124.8	150			VC	2	1 in 20
4953	125.66	SW	123.88	525			CO	4	
0903		CO	0	450			CO	35.77709	
3002	126.33	CO	124.68	225			VC	44.01136	1 in 191
3501	123.92	CO	120.86	1200			CO	127.4402	1 in 1593
4851	126.19	SW	123.49	750			CO	46.09772	
0506	135.42	SW	133.37	750			RPM	6.602325	1 in 19
0951	135.43	SW	134.28	150			VC	3.162278	
2852	127.9	SW	125.65	225			VC	11.18034	
4001	126.12	CO	124.19	600			VC	27.07397	
4901	125.66	CO	123.34	750			CO	54.00926	1 in 146
0515		CO	0	300			VC	24.72511	
0515		CO	0	300			VC	24.72511	
0001		CO	0	300			VC	109.9172	
0752	132.33	SW	131.45	225			VC	27.07397	1 in 104
5803	130.96	CO	128.41	600			CO	68	1 in 16
5803	130.96	CO	128.41	600			CO	68	1 in 16
1905	132.5	CO	129.93	450			CO	66.12866	1 in 20
2602	126.64	CO	122.06	900			CO	31.06445	
1506		CO		0			VC	5.433882	
1506		CO		0			VC	5.433882	
9906		CO		0			VC	4.560554	
0003		CO		150			VC	30.19428	
2502	126.46	CO	121.96	1000			CO	7.615773	1 in 32
1709		CO	125.96	375			VC	4.10278	1 in 9
0902	132.51	CO	129.94	560			BR	38.32754	
1907		SW		225			VC	20.24339	
2902	125.91	CO	123.16	900			CO	77.3575	1 in 455
1007	127.38	CO	125.98	300			VC	16.95098	
4951		SW	0	375			VC	34.23449	
1601	132.21	FO	130.15	225			VC	40.49691	1 in 49
1701	132.24	CO	129.9	600			BR	24.18677	1 in 35
2002	126.28	CO	124.94	375			VC	31.257	
1052		CO	0	300			VC	37.66256	
0603		CO		225			VC	8.764597	
5806		SW		450				90.46242	
0601	146.19	CO	142.94	450			VC	120.1871	1 in 22
1010	129.1	CO	126.84	225			VC	17.96289	1 in 257
4952	125.86	SW	0	375			VC	23.08679	
0805	138.69	CO	0	225			VC	15.0333	
2951	125.83	CO	123.52	225			VC	4	
4805	127.63	CO	122.64	1000			CO	4.123106	1 in 69
0653	132.2	SW	130.92	225			VC	43.28972	1 in 160
4806	127.63	CO	122.58	1000			CO	9.486833	1 in 68
3001	125.61	CO	123.94	300			CO	24.18677	1 in 46
1554	132.71	SW	129.86	600			CO	40.80441	1 in 23
1554	132.71	SW	129.86	600			CO	40.80441	1 in 23
2003	125.52	CO	123.41	900			CO	54.97115	
0806	138.61	CO	135.31	450			VC	36.01389	1 in 78
0702	141.08	CO	137.43	450			VC	56.02105	1 in 45
4954	125.8	SW	124.45	450			VC	21.2132	1 in 37
0914		CO		100			VC	4.581688	
4702	124.99	CO	122.25	900			CO	30.08322	1 in 0
4702	124.99	CO	122.25	900			CO	30.08322	1 in 0
0509	135.32	CO	0	300			VC	27.07397	
0509	135.32	CO	0	300			VC	27.07397	
0904	139.13	CO	0	225			VC	48.04165	
9604	147.21	CO	144.25	375			VC	18.38478	1 in 29
4003	126.37	CO	123.71	750			CO	74.02702	1 in 206
2803	128.34	CO	122.96	900			CO	24.18677	
0501	138.31	CO	136.98	300			VC	101	1 in 133
5804	133.24	CO	130.96	300			VC	41.01219	1 in 16
2004	127.21	CO	0	375			VC	19.10497	
4803		CO	0	150			VC	41.4367	
0516		CO		150			VC	8.000196	
0516		CO		150			VC	8.000196	
1551	133.5	SW	130.65	225			VC	39.11557	1 in 87
1752	127.84	SW	126.54	300			VC	16.03122	1 in 28
1702	131.54	CO	128.62	670			BR	87.65842	1 in 89
1801	130.55	FO	127.92	375			VC	17.26703	1 in 281
1703	131.77	CO	129.17	600			BR	9.433981	1 in 30
2503	125.94	CO	121.74	1000			CO	117.2295	1 in 189
4807	126.94	CO	122.48	1000			CO	56.80708	1 in 77
0709		CO		100			VC	10.10155	
0508		CO	0	225			VC	45.67829	
0508		CO	0	225			VC	45.67829	
0813		CO	0	300			VC	31.73777	
0517		CO		150			VC	28.8585	
0517		CO		150			VC	28.8585	
1804	129.54	FO	127.39	450			VC	67.35725	1 in 74
9602	142.81	CO	140.9	225			VC	16.03122	1 in 6
1553	133.05	SW	130.2	600			CO	14.03567	1 in 47
1553	133.05	SW	130.2	600			CO	14.03567	1 in 47
1005	126.01	CO	123.6	900			CO	94.04786	1 in 495
0510	134.38	SW	132.47	520			RPM	7.81025	1 in 0
0510	134.38	SW	132.47	520			RPM	7.81025	1 in 0
0652	131.91	SW	131.31	225			VC	21.09502	1 in 54
2952	127.69	SW	126.12	225			VC	38.63936	
3601	124.35	CO	121.25	1000			CO	75.69016	1 in 445
9701	148.45	CO	144.56	300			VC	10.77033	
0512		SW	0	390			RPM	7.071068	
0512		SW	0	390			RPM	7.071068	
0808	133.62	CO	131.22	1000			CO	27.51363	1 in 41
2505	125.68	CO	122.44	225			VC	15.81139	
2811		CO	123.16	900			CO	24.51006	1 in 144
1802	130.21	FO	127.83	375			VC	36.40055	1 in 63
4002	126.1	CO	124.27	600			VC	44.28318	1 in 103
0801	138.21	CO	134.39	700			BR	24.18677	
0905		CO		150			VC	18.64742	
0802	135.93	CO	133.49	1000			CO	64.28841	1 in 28
2851	128.34	SW	127.04	0				102.8834	
4701	124.87	CO	121.9	1000			CO	12.72792	
1751	130.6	SW	128.09	300			VC	35.69314	1 in 23
1903	134.56	CO	132.13	300			VC	22.82542	1 in 34
1552	133.06	SW	131.46	600			CO	5	1 in 9
1552	133.06	SW	131.46	600			CO	5	1 in 9
0702	141.08	CO	138.36	300			VC	13	1 in 9
1803	130.09	FO		300			VC	18.97367	
0952	135.38	SW	133.67	400			BR	17.46425	
3402	123.3	CO	120.55	1200			CO	32.24903	1 in 461
3402	123.3	CO	120.55	1200			CO	32.24903	1 in 461
0705	138.52	CO	136.22	300			VC	57.00877	1 in 116
1501	133.26	CO	131.01	300			VC	24.08319	1 in 30
1501	133.26	CO	131.01	300			VC	24.08319	1 in 30
5801	135.62	CO	132.3	225			VC	29.68164	1 in 9
4902	125.6	CO	123.5	525			CO	26.1725	1 in 187
0804	139.17	CO	137.09	300			VC	13	
3404	124.22	CO	123.02	1200			CO	8.062258	
3404	124.22	CO	123.02	1200			CO	8.062258	
3401	123.24	CO	0	1200			CO	5.385165	
3401	123.24	CO	0	1200			CO	5.385165	
1651	132.09	SW	131.19	225			VC	34.23449	
1602	132.03	FO	129.95	225			VC	26	
1008	129.59	CO	127.99	300			VC	28.79027	1 in 14
1753	127.29	CO	125.49	375			VC	38.0526	1 in 115
9901	138.96	CO	136.46	375			VC	31.90611	1 in 123
0816		CO		150			VC	5.976882	
4808		CO		100			VC	22.02728	
0815		CO		150			VC	5.646144	
1402	130.58	SW	127.99	600			CO	78.78506	1 in 14
1402	130.58	SW	127.99	600			CO	78.78506	1 in 14
1851	128.87	SW	126.51	375			VC	47.75982	
1904	129.47	CO	127.71	225			VC	41.48494	
2509	126.66	CO	0	825			CO	16.32455	
9601	156.29	CO	153.32	300			VC	23.08679	1 in 7
2823		SW		150			VC	1.964025	
4802	125.39	CO	123.56	225			VC	22.46728	1 in 75
3403	124.23	CO	120.45	1200			CO	129.5264	1 in 463
3403	124.23	CO	120.45	1200			CO	129.5264	1 in 463
1401	130.19	SW	128.31	225			VC	62.32987	1 in 12
1401	130.19	SW	128.31	225			VC	62.32987	1 in 12
1901	127.79	CO	123.84	375			VC	23.37756	
2820		CO		375			VC	9.675877	
2504	126.27	CO	125.29	225			VC	15.26434	

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

LEGEND

Abandoned | Foul | Surface Water | Combined

- Public Sewer
- Private Sewer
- Section 104
- Rising Main
- Sludge Main
- Overflow
- Water Course
- Highway Drain

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

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

SEWER SHAPE

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

SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforecd Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

Address or Site Reference:

Holcombe Mill,

OS sheet Number: SD7916NW

Scale: 1:1250 **Date:** 24/05/2019

Nodes: 163

Sheet: 4 of 4

Printed by: Property Searches

SEWER RECORDS

United Utilities — helping life flow smoothly

APPENDIX I:	Drainage Survey

Mondi Mill – On Site Combined Sewer Investigation – October 2021

Survey carried out to identify the existing UU public combined sewer and confirm existing connections to it from the site.

Sewer Record Extract

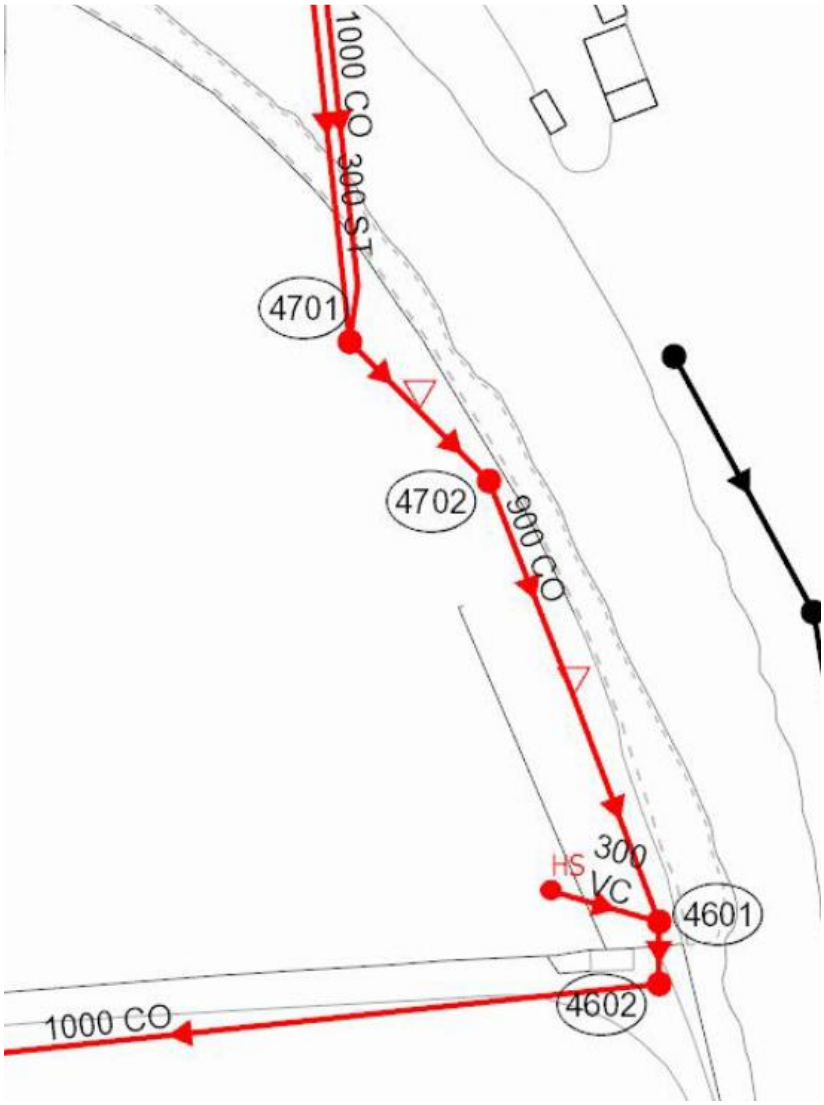

Photo of MH 4601 – located in southeast corner of site adjacent the boundary with Cricket Club and river.

Photo of MH 4601 – showing 900 dia through channel flowing right to left and 300mm dia combined connection from site.

Photo taken from MH 4601 into site towards MH labelled as HS on sewer records.

Photo taken from HS (actual MH) towards MH 4601 (top centre) showing evidence of 225mm dia plastic SW pipe connection and then 300mm dia combined pipe towards sewer.

Photo of MH 4702 looking downstream

Photo of MH 4702 with evidence of 150mm dia plastic pipe former site connection on far side of channel. Flow going right to left.

Photo of MH 4701 flows from top to bottom. Mh located within concrete slab area, flow from top to bottom.

Summary

The findings of the investigation confirmed that the sewer records for the sewers running through the site are correct. In addition to the existing 300mm dia combined sewer connection from the site from MH ref HS to MH ref 4601, another 150mm dia connection from the site to MH 4702 was identified.

The existing connection reference HS to MH 4601 will be maintained and used to drain foul only drainage for the majority of the new development. This will take the form of a new 150mm dia FW pipe and new MH on the existing 300mm dia sewer. Foul drainage from the south west of the development will connect to the combined sewer network further downstream near to the existing cricket club access, with another 150mm dia foul connection.

APPENDIX J:	United Utilities Correspondence

Stephen Parker

From: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Sent: 10 June 2021 13:08
To: Stephen Parker; Wastewater Developer Services
Subject: PDE 4200040413 Mondi Mill Ramsbottom BL0 0BS

Good afternoon Stephen,

Pre Development Enquiry for: Mondi Mill Ramsbottom BL0 0BS UU Reference Number : 4200040413

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 3723223 or refer to the link below:

https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 1000mm diameter public combined sewer located on-site at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The North West SuDS Pro-Forma provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

It is understood that there are made ground and shallow groundwater alongside a mixed geologic profile which appears to preclude the use of infiltration based drainage. Further clarification on this point should be discussed with the Lead Local Flood Authority.

Waterbody

You have indicated that you intend to drain surface water emanating from the proposed site into the on-site mill race leading to the River Irwell. We recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge and rates to this system and where this is not feasible a direct connection to the River Irwell should be sought.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In this instance, given the proximity of watercourses on and immediately adjacent to the site

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

We would recommend that all property finish floor levels and proposed cover levels are set a minimum of 300mm above the cover level on the receiving sewer network in order to provide some mitigation against surcharged flows.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances.

Sewer Adoptions

You have indicated on your application form that you intend to put the sewers forward for adoption (including any SuDS components that can come within the meaning of a sewer).

United Utilities assess adoption applications based on the current Design & Construction Guidance and local practices which have now replaced 'Sewers For Adoption 6th Edition'.

We recommend that you submit a pre design assessment to the sewer adoption mailbox (SewerAdoptions@uuplc.co.uk) stating pre design assessment in the title

Please refer to links below to obtain further guidance:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-adoptions/

Site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

If you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements set out in the Design & Construction Guidance. The proposed design should give consideration to long term operability and give United Utilities a safe and cost effective proposal for the lifetime of the assets. In these cases, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 application, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Codes For Adoption

The new Codes for Adoption are outlined on the Water UK Website. The link below takes you to their webpage:

https://www.water.org.uk/technical-guidance/developers-services/codes-for-adoption/

A free copy of the new Design & Construction Guidance can be downloaded via the link below which identifies that SuDS should be design in accordance with the CIRIA SuDS manual (C753):

Design and Construction Guidance

Sustainable Drainage Systems (SuDS)

If you need advice on any site proposals which incorporate open SuDS features either that are to be offered for adoption or that interact with a traditional adoptable piped network you can complete the form below and we will be in touch within 2 weeks to discuss the proposals further.

Pre Design Enquiry

Existing Wastewater Assets Crossing the Site

We have significant assets crossing this site that cannot simply be diverted. We would ask that you obtain a copy of our asset data records from your provider and plan your development around them ensuring that all legal easements are observed. If any work is required that may impart vibration into the ground we would ask that you contact us for further advice.

We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

United Utilities
Water for the North West

Robert Brenton
Developer Engineer
Developer Services & Metering
Customer Services
M: 07880299827
unitedutilities.com

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Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry https://www.unitedutilities.com/builders-developers/ or you can email us at developerserviceswater@uuplc.co.uk

APPENDIX K:	Foul Water Attenuation

Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
F1	127.650	1.350	Open Manhole	1200	F1.000	126.300	150				
F2	127.600	1.405	Open Manhole	1200	F1.001	126.195	150	F1.000	126.195	150	
F3	127.450	1.560	Open Manhole	1200	F1.002	125.890	150	F1.001	125.890	150	
F4	126.850	0.890	Open Manhole	1200	F2.000	125.960	150				
F5	127.500	1.875	Open Manhole	1200	F2.001	125.625	150	F2.000	125.625	150	
F6	127.400	2.105	Open Manhole	1200	F1.003	125.295	150	F1.002	125.295	150	
								F2.001	125.295	150	
F7	126.400	1.165	Open Manhole	1200	F3.000	125.235	150				
F8	126.600	1.515	Open Manhole	1200	F1.004	125.085	150	F1.003	125.085	150	
								F3.000	125.085	150	
F9	126.650	1.165	Open Manhole	1200	F4.000	125.485	150				
F10	126.650	1.310	Open Manhole	1200	F4.001	125.340	150	F4.000	125.340	150	
F11	126.650	1.475	Open Manhole	1200	F4.002	125.175	150	F4.001	125.175	150	
F12	126.650	1.770	Open Manhole	1200	F1.005	124.880	150	F1.004	124.880	150	
								F4.002	124.880	150	
F13	126.150	1.380	Open Manhole	1200	F1.006	124.770	150	F1.005	124.770	150	
F14	126.150	1.985	Open Manhole	1200	F5.000	124.165	150				
F15	126.150	2.115	Open Manhole	1200	F5.001	124.035	150	F5.000	124.035	150	
F16	126.150	2.250	Open Manhole	1200	F1.007	123.900	150	F1.006	124.665	150	765
								F5.001	123.900	150	
F17	126.150	2.520	Open Manhole	1200	F1.008	123.630	150	F1.007	123.630	150	
F18	126.150	2.855	Open Manhole	1200	F1.009	123.295	150	F1.008	123.295	150	
F	124.600	1.780	Open Manhole	0		OUTFALL		F1.009	122.820	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F1	379313.208	416804.497	379313.208	416804.497	Required	
F2	379310.597	416789.093	379310.597	416789.093	Required	
F3	379307.061	416743.541	379307.061	416743.541	Required	
F4	379305.307	416629.352	379305.307	416629.352	Required	

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Manhole Schedules for Foul - Main

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F5	379304.437	416679.369	379304.437	416679.369	Required	
F6	379307.029	416728.322	379307.029	416728.322	Required	
F7	379338.387	416706.421	379338.387	416706.421	Required	
F8	379338.197	416728.255	379338.197	416728.255	Required	
F9	379366.352	416815.888	379366.352	416815.888	Required	
F10	379365.199	416794.756	379365.199	416794.756	Required	
F11	379368.271	416770.797	379368.271	416770.797	Required	
F12	379368.794	416728.577	379368.794	416728.577	Required	
F13	379384.714	416728.744	379384.714	416728.744	Required	
F14	379407.232	416694.028	379407.232	416694.028	Required	
F15	379405.946	416712.888	379405.946	416712.888	Required	
F16	379399.700	416731.431	379399.700	416731.431	Required	
F17	379434.978	416751.377	379434.978	416751.377	Required	
F18	379462.988	416709.967	379462.988	416709.967	Required	
F	379501.970	416691.895			No Entry	

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PIPELINE SCHEDULES for Foul - Main

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)
F1.000	o	150	F1	127.650	126.300	1.200	Open Manhole	1200
F1.001	o	150	F2	127.600	126.195	1.255	Open Manhole	1200
F1.002	o	150	F3	127.450	125.890	1.410	Open Manhole	1200
F2.000	o	150	F4	126.850	125.960	0.740	Open Manhole	1200
F2.001	o	150	F5	127.500	125.625	1.725	Open Manhole	1200
F1.003	o	150	F6	127.400	125.295	1.955	Open Manhole	1200
F3.000	o	150	F7	126.400	125.235	1.015	Open Manhole	1200
F1.004	o	150	F8	126.600	125.085	1.365	Open Manhole	1200
F4.000	o	150	F9	126.650	125.485	1.015	Open Manhole	1200
F4.001	o	150	F10	126.650	125.340	1.160	Open Manhole	1200
F4.002	o	150	F11	126.650	125.175	1.325	Open Manhole	1200
F1.005	o	150	F12	126.650	124.880	1.620	Open Manhole	1200
F1.006	o	150	F13	126.150	124.770	1.230	Open Manhole	1200

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)
F1.000	15.624	148.8	F2	127.600	126.195	1.255	Open Manhole	1200
F1.001	45.689	149.8	F3	127.450	125.890	1.410	Open Manhole	1200
F1.002	15.219	25.6	F6	127.400	125.295	1.955	Open Manhole	1200
F2.000	50.025	149.3	F5	127.500	125.625	1.725	Open Manhole	1200
F2.001	49.021	148.5	F6	127.400	125.295	1.955	Open Manhole	1200
F1.003	31.168	148.4	F8	126.600	125.085	1.365	Open Manhole	1200
F3.000	21.835	145.6	F8	126.600	125.085	1.365	Open Manhole	1200
F1.004	30.599	149.3	F12	126.650	124.880	1.620	Open Manhole	1200
F4.000	21.164	146.0	F10	126.650	125.340	1.160	Open Manhole	1200
F4.001	24.155	146.4	F11	126.650	125.175	1.325	Open Manhole	1200
F4.002	42.224	143.1	F12	126.650	124.880	1.620	Open Manhole	1200
F1.005	15.920	144.7	F13	126.150	124.770	1.230	Open Manhole	1200
F1.006	15.225	145.0	F16	126.150	124.665	1.335	Open Manhole	1200

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PIPELINE SCHEDULES for Foul - Main

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)
F5.000	o	150	F14	126.150	124.165	1.835	Open Manhole	1200
F5.001	o	150	F15	126.150	124.035	1.965	Open Manhole	1200
F1.007	o	150	F16	126.150	123.900	2.100	Open Manhole	1200
F1.008	o	150	F17	126.150	123.630	2.370	Open Manhole	1200
F1.009	o	150	F18	126.150	123.295	2.705	Open Manhole	1200

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)
F5.000	18.903	145.4	F15	126.150	124.035	1.965	Open Manhole	1200
F5.001	19.567	144.9	F16	126.150	123.900	2.100	Open Manhole	1200
F1.007	40.527	150.1	F17	126.150	123.630	2.370	Open Manhole	1200
F1.008	49.994	149.2	F18	126.150	123.295	2.705	Open Manhole	1200
F1.009	42.967	90.5	F	124.600	122.820	1.630	Open Manhole	0

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.009	F	124.600	122.820	0.000	0	0

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Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Total Volume (m³)
F1.000	F1	1.527	0.276	1.803
F1.001	F2	1.589	0.807	2.396
F1.002	F3	1.764	0.269	2.033
F2.000	F4	1.007	0.884	1.891
F2.001	F5	2.121	0.866	2.987
F1.003	F6	2.381	0.551	2.931
F3.000	F7	1.318	0.386	1.703
F1.004	F8	1.713	0.541	2.254
F4.000	F9	1.318	0.374	1.692
F4.001	F10	1.482	0.427	1.908
F4.002	F11	1.668	0.746	2.414
F1.005	F12	2.002	0.281	2.283
F1.006	F13	1.561	0.269	1.830
F5.000	F14	2.245	0.334	2.579
F5.001	F15	2.392	0.346	2.738
F1.007	F16	2.545	0.716	3.261
F1.008	F17	2.850	0.883	3.734
F1.009	F18	3.229	0.759	3.988
Total		34.710	9.716	44.426

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