

Appendix B

Architects Layout

Appendix C

Sewer Asset Map

National One Call Plan To Dig
Mill Place
1 Mill Road Industrial Estate
WEST LOTHIAN
EH49 7TL

Search address supplied Amethyst Lane
Reading
RG30 2EZ

Your reference NOC/NKVQS361

Our reference ALS/ALS Standard/2022_4735244

Search date 17 October 2022

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540

Search address supplied: Amethyst Lane, Reading, RG30 2EZ

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.



For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 469471,172649
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6401	57.84	56.13
6502	58.99	n/a
6550	58.98	n/a
651C	n/a	n/a
651B	n/a	n/a
651A	n/a	n/a
6501	57.66	54.64
561A	57.65	56.2
561C	57.45	56.173
561B	57.385	55.9
661A	57.355	55.8
6650	57.37	55.85
661C	57.2	55.902
661B	57.4	54.911
6602	57.48	54.98
5617	57.43	56.23
5606	57.46	55.7
5616	57.46	56.13
5605	57.51	55.43
6659	57.39	56.03
6658	n/a	56.08
6657	57.44	55.31
6656	n/a	55.15
6601	57.72	55.3
6751	57.85	56.43
6702	57.82	56.01
571A	n/a	n/a
571B	n/a	n/a
6703	n/a	n/a
6701	59.19	57.12
6750	59.15	57.79
581A	n/a	n/a
581B	n/a	n/a
3504	58.59	56.19
3552	58.6	57.1
3554	58.71	57.42
4401	56.64	53.14
4451	59.55	54.66
4403	n/a	n/a
4402	59.29	53.33
541A	n/a	n/a
541B	n/a	n/a
541C	n/a	n/a
6402	59.26	n/a
3802	60.57	59.33
3851	60.11	58.07
38NC	n/a	n/a
38MN	n/a	n/a
3801	59.64	57.7
3850	59.6	58.24
38MM	n/a	n/a
481D	n/a	n/a
481C	n/a	n/a
48NF	n/a	n/a
48ND	n/a	n/a
481B	n/a	n/a
48NC	n/a	n/a
48MN	n/a	n/a
48ML	n/a	n/a
48MK	n/a	n/a
48MM	n/a	n/a
4801	59.36	58.23
361H	n/a	n/a
361B	n/a	n/a
361C	n/a	n/a
3750	60.38	57.98
3702	60.27	57.15
3751	60.14	58.03
361G	n/a	n/a
37NE	n/a	n/a
3650	58.99	57.46
37NF	n/a	n/a
37NH	n/a	n/a
3604	58.98	56.09
3605	58.98	56.25
361A	n/a	n/a
471A	n/a	n/a
471B	n/a	n/a
5716	57.77	56.77
5705	57.73	56.71
5715	57.73	56.71
5704	57.75	56.57
5714	57.58	56.59
5703	57.67	56.45
5701	57.53	56.26
5712	57.5	56.46
5609	57.49	56.04
5608	57.52	55.95
5618	57.47	56.28
5607	57.49	55.79
261A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
361K	n/a	n/a
3510	58.12	56.98
361J	n/a	n/a
361I	n/a	n/a
3502	58.63	57
3550	58.34	57.35
3508	n/a	n/a
3509	58.19	56.7
3501	58.35	56.73
361D	n/a	n/a
361E	n/a	n/a
361F	n/a	n/a
361L	n/a	n/a
361M	n/a	n/a
361N	n/a	n/a
3603	58.33	56.42
3553	58.85	57.62
361P	n/a	n/a
361O	n/a	n/a
3505	58.69	57.61
3506	58.68	55.96
3551	58.78	57.12
3503	58.74	55.7
3507	58.78	55.8
4550	58.9	57.04
4503	58.82	n/a
4551	58.45	57.17
4501	58.99	55.41
4505	58.45	55.9
4601	n/a	n/a
3451	59.12	54.27
3452	n/a	n/a
341B	n/a	n/a
3453	58.82	56.53
341C	n/a	n/a
3454	58.71	56.68
341A	n/a	n/a
3401	58.63	57.15
3402	58.56	56.49
3455	58.52	56.91
2501	58.61	57.11
4850	59.35	58.65
4802	59.4	58.29
4803	59.2	58.51
481A	n/a	n/a
5802	60.01	n/a
5851	60.27	58.99
5850	60.51	58.86
5801	60.13	57.84
68NK	n/a	n/a
68NJ	n/a	n/a
68NH	n/a	n/a
6801	n/a	n/a
7801	60.28	56.68
7850	60.31	57.56
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer		Culverted Watercourse
	Proposed		Decommissioned Sewer
	Content of this drainage network is currently unknown		Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

Ducts or Crossings

	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 469471, 172649.

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.



Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

- Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

- Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
- Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0800 009 4540 quoting your invoice number starting CBA or ADS / OSS	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater.co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number	Made payable to ' Thames Water Utilities Ltd ' Write your Thames Water account number on the back. Send to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW or by DX to 151280 Slough 13

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Appendix D

Existing Drainage Layout



PUBLIC AND PRIVATE EXISTING/PROPOSED DRAINAGE

1500@1:100 EXISTING PUBLIC COMBINED SEWER

1500@1:100 EXISTING PRIVATE FOUL SEWER

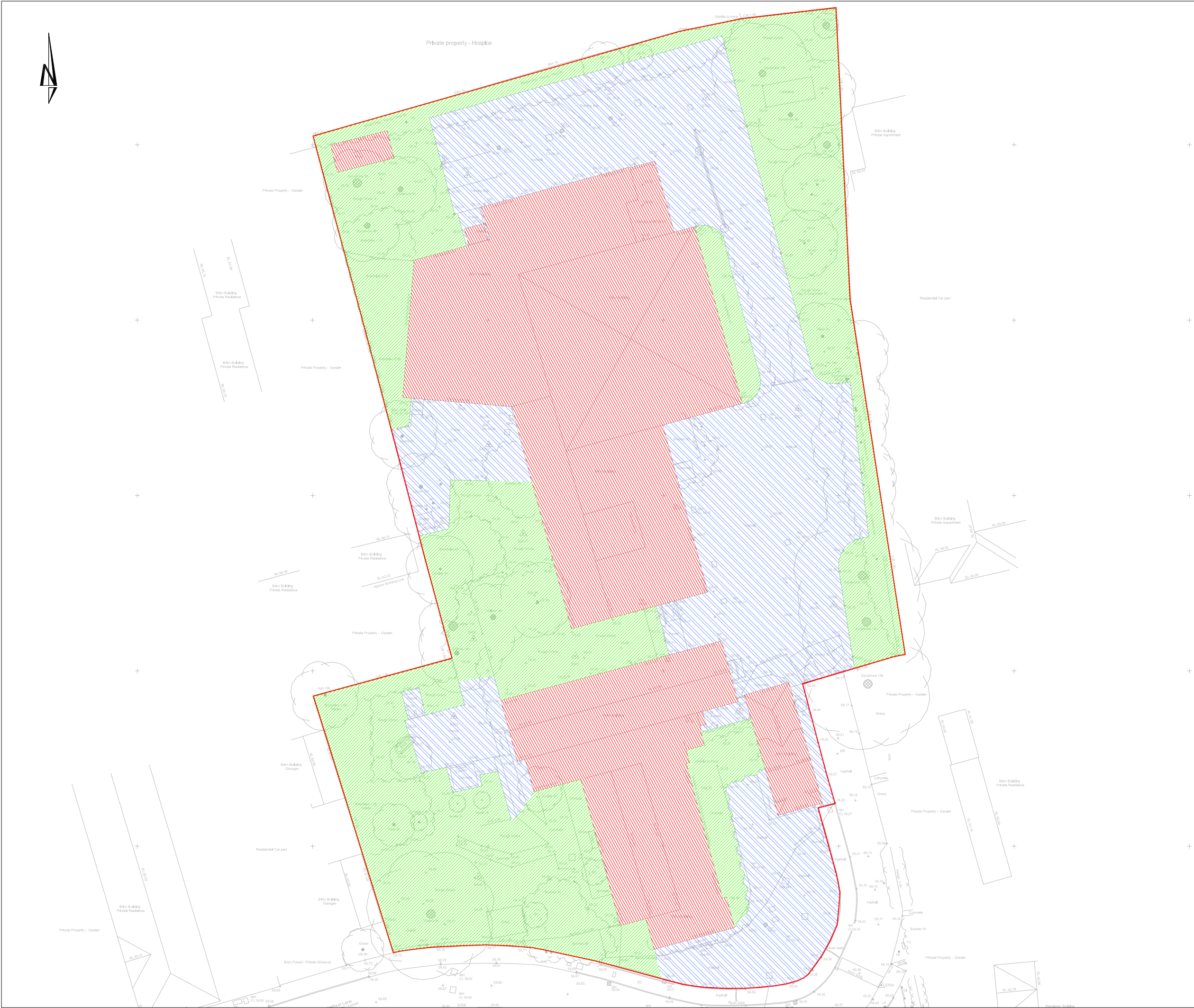
1500@1:100 EXISTING PRIVATE STORM SEWER

- KEY PLAN
- NOTES
- All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
 - The DWG file is issued for the purposes of coordination only and do not represent formal drawing issue and are not to be reprinted in any form. Formal issue of drawings is via DWF, Adobe PDF files and/or hard copies and their associated information issue sheets.
 - Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.
 - All levels are shown in metres above Ordnance Datum (m AOD).

PO2	UPDATED TO SUIT LATEST MASTERPLAN				
	D.WEBB	18/04/23	J.MAGEE	18/04/23	J.MAGEE
PO1	PRELIMINARY ISSUE				
	J.NEAL-LONG	22/02/23	J.MAGEE	22/02/23	J.MAGEE
REV	REVISION NOTES/COMMENTS				
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY
Hydrock Merchants' House North Wapping Road Bristol BS1 4RW t: +44 (0)117 945 9225 e: bristolcentral@hydrock.com					
CLIENT					
READING BOROUGH COUNCIL					
PROJECT					
AMETHYST LANE					
TITLE					
EXISTING DRAINAGE LAYOUT					
HYDROCK PROJECT NO. C-26887-C				SCALE @ A1 1:200	
STATUS DESCRIPTION PLANNING					STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 26887-HYD-00-ZZ-SK-C-7700					REVISION PO2

Appendix E

Pre / Post Development Catchments



KEY PLAN

- NOTES
1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
 2. The DWG file is issued for the purposes of coordination only and do not represent formal drawing issue and are not to be reprinted in any form. Formal issue of drawings is via DWF, Adobe PDF files and/or hard copies and their associated information issue sheets.
 3. Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.
 4. All levels are shown in metres above Ordnance Datum (m AOD).

LEGEND		
	BUILDING / ROOF	= 1803m²
	HARDSTANDING	= 1821m²
	SOFT LANDSCAPING	= 2033m²
TOTAL		= 5657m²

P01	PRELIMINARY ISSUE					
	J.NEAL-LONG	22/02/23	J.MAGEE	22/02/23	J.MAGEE	22/02/23
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
 Merchants' House North Wapping Road Bristol BS1 4BW t: +44 (0)117 945 9225 e: bristolcentral@hydrock.com						
CLIENT						
READING BOROUGH COUNCIL						
PROJECT						
AMETHYST LANE						
TITLE						
PRE-DEVELOPMENT CATCHMENT PLAN						
HYDROCK PROJECT NO.				SCALE @ A1		
C-26887-C				1:200		
STATUS DESCRIPTION						STATUS
PLANNING						S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)						REVISION
26887-HYD-00-ZZ-SK-C-7710						P01



KEY PLAN

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. The DWG file is issued for the purposes of coordination only and do not represent formal drawing issue and are not to be reprinted in any form. Formal issue of drawings is via DWF, Adobe PDF files and/or hard copies and their associated information issue sheets.

3. Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.

4. All levels are shown in metres above Ordnance Datum (m AOD).

CATCHMENT 1

	BUILDING / ROOF	= 1737m ²
	PERMEABLE PAVING	= 377m ²
	HARDSTANDING	= 2123m ²
TOTAL		= 4237m ²

OTHER

	SOFT LANDSCAPING	= 1661m ²
-------------	------------------	----------------------

TOTAL

= 5898m²

P04	UPDATED TO SUIT NEW SITE LAYOUT					
	D.WEBB	02/05/23	J.MAGEE	02/05/23	J.MAGEE	02/05/23
P03	UPDATED TO SUIT NEW SITE LAYOUT					
	D.WEBB	18/04/23	J.MAGEE	18/04/23	J.MAGEE	18/04/23
P02	UPDATED TO SUIT NEW SITE LAYOUT					
	J.SHIMMIN	27/03/23	J.MAGEE	27/03/23	J.MAGEE	27/03/23
P01	PRELIMINARY ISSUE					
	J.NEAL-LONG	22/02/23	J.MAGEE	22/02/23	J.MAGEE	22/02/23
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

Hydrock

Merchants' House North
Wapping Road
Bristol
BS1 4RW
t: +44 (0)117 945 9225
e: bristolcentral@hydrock.com

CLIENT

READING BOROUGH COUNCIL

PROJECT

AMETHYST LANE

TITLE

POST-DEVELOPMENT CATCHMENT PLAN

HYDROCK PROJECT NO.
C-26887-C

SCALE @ A1
1:200

STATUS DESCRIPTION
PLANNING

STATUS
S2

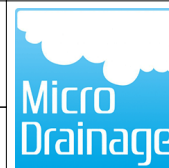
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)
26887-HYD-00-ZZ-SK-C-7720

REVISION
P04

Appendix F

Calculations

-
-
-



Designed by DanWebb

Checked by

Source Control 2020.1.3

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ (l/s)	Max Outflow (l/s)	Max Volume (m ³)	Status
----------------	---------------------	---------------------	------------------------------	----------------------------------	-------------------------	------------------------------------	--------

30 min Winter	57.249	0.824	0.0	5.0	5.0	161.1	O K
60 min Winter	57.366	0.941	0.0	5.0	5.0	196.0	O K
120 min Winter	57.464	1.039	0.0	5.0	5.0	225.0	O K
180 min Winter	57.500	1.075	0.0	5.0	5.0	235.9	O K
240 min Winter	57.510	1.085	0.0	5.0	5.0	239.0	O K
360 min Winter	57.494	1.069	0.0	5.0	5.0	234.1	O K
480 min Winter	57.461	1.036	0.0	5.0	5.0	224.2	O K
600 min Winter	57.427	1.002	0.0	5.0	5.0	214.0	O K
720 min Winter	57.402	0.977	0.0	5.0	5.0	206.6	O K
960 min Winter	57.351	0.926	0.0	5.0	5.0	191.5	O K
1440 min Winter	57.246	0.821	0.0	5.0	5.0	160.1	O K
2160 min Winter	57.036	0.611	0.0	5.0	5.0	113.2	O K
2880 min Winter	56.752	0.327	0.0	5.0	5.0	60.7	O K
4320 min Winter	56.458	0.033	0.0	4.9	4.9	6.1	O K
5760 min Winter	56.425	0.000	0.0	4.2	4.2	0.0	O K
7200 min Winter	56.425	0.000	0.0	3.5	3.5	0.0	O K
8640 min Winter	56.425	0.000	0.0	3.0	3.0	0.0	O K
10080 min Winter	56.425	0.000	0.0	2.7	2.7	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
30 min Winter	83.871	0.0	170.1	33
60 min Winter	52.595	0.0	213.1	62
120 min Winter	31.922	0.0	258.7	120
180 min Winter	23.544	0.0	286.3	178
240 min Winter	18.869	0.0	306.2	234
360 min Winter	13.701	0.0	333.2	346
480 min Winter	10.923	0.0	354.6	450
600 min Winter	9.157	0.0	371.5	488
720 min Winter	7.925	0.0	385.6	562
960 min Winter	6.304	0.0	409.1	714
1440 min Winter	4.560	0.0	443.9	1022
2160 min Winter	3.293	0.0	480.2	1468
2880 min Winter	2.611	0.0	508.1	1788
4320 min Winter	1.880	0.0	549.0	2336
5760 min Winter	1.488	0.0	579.4	0
7200 min Winter	1.240	0.0	603.8	0
8640 min Winter	1.069	0.0	624.2	0
10080 min Winter	0.942	0.0	641.9	0

Hydrock Consultants Ltd		Page 3																																	
. . .																																			
Date 02/05/2023 16:42	Designed by DanWebb																																		
File ATTENUATION @ 5LS (19.0...	Checked by																																		
Innovyze		Source Control 2020.1.3																																	
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.950</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.950</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.600</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.400</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.427 <table> <tr> <th colspan="2">Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>(ha)</th> </tr> <tr> <td>0</td> <td>4</td> <td>0.427</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.950	Region	England and Wales	Cv (Winter)	0.950	M5-60 (mm)	18.600	Shortest Storm (mins)	15	Ratio R	0.400	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)		Area	From:	To:	(ha)	0	4	0.427
Rainfall Model	FSR	Winter Storms	Yes																																
Return Period (years)	100	Cv (Summer)	0.950																																
Region	England and Wales	Cv (Winter)	0.950																																
M5-60 (mm)	18.600	Shortest Storm (mins)	15																																
Ratio R	0.400	Longest Storm (mins)	10080																																
Summer Storms	Yes	Climate Change %	+40																																
Time (mins)		Area																																	
From:	To:	(ha)																																	
0	4	0.427																																	
©1982-2020 Innovyze																																			

Hydrock Consultants Ltd		Page 4
. . .		
Date 02/05/2023 16:42	Designed by DanWebb	
File ATTENUATION @ 5LS (19.0...	Checked by	
Innovyze		Source Control 2020.1.3

Model Details

Storage is Online Cover Level (m) 58.050

Complex Structure

Cellular Storage

Invert Level (m) 56.425 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	195.0	0.0	1.126	0.0	0.0
1.125	195.0	0.0			

Cellular Storage

Invert Level (m) 57.175 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	377.0	0.0	0.451	0.0	0.0
0.450	377.0	0.0			

Swale

Infiltration Coefficient Base (m/hr) 0.00000 Length (m) 19.8
 Infiltration Coefficient Side (m/hr) 0.00000 Side Slope (1:X) 4.0
 Safety Factor 2.0 Slope (1:X) 0.0
 Porosity 1.00 Cap Volume Depth (m) 0.000
 Invert Level (m) 57.860 Cap Infiltration Depth (m) 0.000
 Base Width (m) 1.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0099-5000-1455-5000
 Design Head (m) 1.455
 Design Flow (l/s) 5.0
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 99
 Invert Level (m) 56.095
 Minimum Outlet Pipe Diameter (mm) 150
 Suggested Manhole Diameter (mm) 1200

©1982-2020 Innovyze

Hydrock Consultants Ltd		Page 5																																																																																							
																																																																																									
Date 02/05/2023 16:42	Designed by DanWebb																																																																																								
File ATTENUATION @ 5LS (19.0...	Checked by																																																																																								
Innovyze	Source Control 2020.1.3																																																																																								
Hydro-Brake® Optimum Outflow Control <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.455</td><td>5.0</td></tr><tr><td>Flush-Flo™</td><td>0.430</td><td>5.0</td></tr><tr><td>Kick-Flo®</td><td>0.881</td><td>4.0</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>4.4</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>3.2</td><td>1.200</td><td>4.6</td><td>3.000</td><td>7.0</td><td>7.000</td><td>10.5</td></tr><tr><td>0.200</td><td>4.5</td><td>1.400</td><td>4.9</td><td>3.500</td><td>7.5</td><td>7.500</td><td>10.8</td></tr><tr><td>0.300</td><td>4.9</td><td>1.600</td><td>5.2</td><td>4.000</td><td>8.0</td><td>8.000</td><td>11.1</td></tr><tr><td>0.400</td><td>5.0</td><td>1.800</td><td>5.5</td><td>4.500</td><td>8.5</td><td>8.500</td><td>11.5</td></tr><tr><td>0.500</td><td>5.0</td><td>2.000</td><td>5.8</td><td>5.000</td><td>8.9</td><td>9.000</td><td>11.8</td></tr><tr><td>0.600</td><td>4.9</td><td>2.200</td><td>6.1</td><td>5.500</td><td>9.3</td><td>9.500</td><td>12.1</td></tr><tr><td>0.800</td><td>4.4</td><td>2.400</td><td>6.3</td><td>6.000</td><td>9.7</td><td></td><td></td></tr><tr><td>1.000</td><td>4.2</td><td>2.600</td><td>6.5</td><td>6.500</td><td>10.1</td><td></td><td></td></tr></table>			Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.455	5.0	Flush-Flo™	0.430	5.0	Kick-Flo®	0.881	4.0	Mean Flow over Head Range	-	4.4	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	3.2	1.200	4.6	3.000	7.0	7.000	10.5	0.200	4.5	1.400	4.9	3.500	7.5	7.500	10.8	0.300	4.9	1.600	5.2	4.000	8.0	8.000	11.1	0.400	5.0	1.800	5.5	4.500	8.5	8.500	11.5	0.500	5.0	2.000	5.8	5.000	8.9	9.000	11.8	0.600	4.9	2.200	6.1	5.500	9.3	9.500	12.1	0.800	4.4	2.400	6.3	6.000	9.7			1.000	4.2	2.600	6.5	6.500	10.1		
Control Points	Head (m)	Flow (l/s)																																																																																							
Design Point (Calculated)	1.455	5.0																																																																																							
Flush-Flo™	0.430	5.0																																																																																							
Kick-Flo®	0.881	4.0																																																																																							
Mean Flow over Head Range	-	4.4																																																																																							
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)																																																																																		
0.100	3.2	1.200	4.6	3.000	7.0	7.000	10.5																																																																																		
0.200	4.5	1.400	4.9	3.500	7.5	7.500	10.8																																																																																		
0.300	4.9	1.600	5.2	4.000	8.0	8.000	11.1																																																																																		
0.400	5.0	1.800	5.5	4.500	8.5	8.500	11.5																																																																																		
0.500	5.0	2.000	5.8	5.000	8.9	9.000	11.8																																																																																		
0.600	4.9	2.200	6.1	5.500	9.3	9.500	12.1																																																																																		
0.800	4.4	2.400	6.3	6.000	9.7																																																																																				
1.000	4.2	2.600	6.5	6.500	10.1																																																																																				
©1982-2020 Innovyze																																																																																									

Appendix G

Overland Flow Routes



KEY PLAN

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. The DWG file is issued for the purposes of coordination only and do not represent formal drawing issue and are not to be reprinted in any form. Formal issue of drawings is via DWF, Adobe PDF files and/or hard copies and their associated information issue sheets.

3. Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.

4. All levels are shown in metres above Ordnance Datum (m AOD).

LEGEND

→ →

OVERLAND FLOW ROUTE

PO2	AMENDED TO SUIT SITE LAYOUT UPDATES					
	D. WEBB	02/05/23	J.MAGEE	02/05/23	J.MAGEE	02/05/23
PO1	PRELIMINARY ISSUE					
	O.LAINEHURRY	27/03/23	J.MAGEE	27/03/23	J.MAGEE	27/03/23
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

Hydrock

Merchants' House North

Wapping Road

Bristol

BS1 4RW

t: +44 (0)117 945 9225

e: bristolcentral@hydrock.com

CLIENT

READING BOROUGH COUNCIL

PROJECT

AMETHYST LANE

TITLE

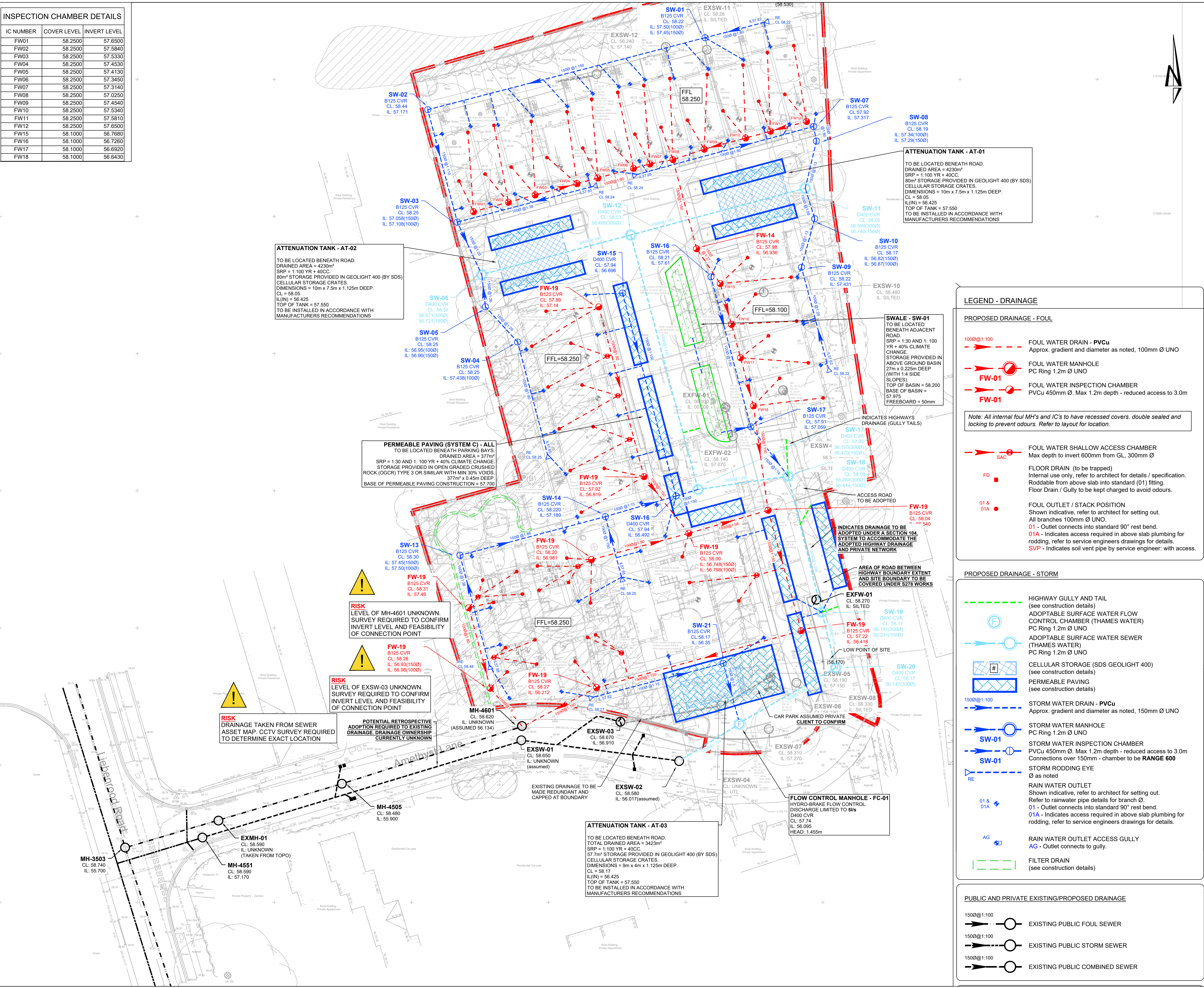
OVERLAND FLOW ROUTES

HYDROCK PROJECT NO.		SCALE @ A1
C-26887-C		1:200
STATUS DESCRIPTION		STATUS
PLANNING		S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)		REVISION
26887-HYD-00-ZZ-SK-C-7730		P02

Appendix H

Drainage Strategy Layout

INSPECTION CHAMBER DETAILS		
IC NUMBER	COVER LEVEL	INVERT LEVEL
FW01	58.2500	57.6500
FW02	58.2500	57.5840
FW03	58.2500	57.5330
FW04	58.2500	57.4530
FW05	58.2500	57.4130
FW06	58.2500	57.3450
FW07	58.2500	57.3140
FW08	58.2500	57.0250
FW09	58.2500	57.4540
FW10	58.2500	57.5340
FW11	58.2500	57.5810
FW12	58.2500	57.6500
FW15	58.1000	56.7680
FW16	58.1000	56.7260
FW17	58.1000	56.6920
FW18	58.1000	56.6430



LEGEND - DRAINAGE

PROPOSED DRAINAGE - FOUL

- 1000@1:100 Foul water drain - PVCu. Approx. gradient and diameter as noted, 100mm Ø UNO
- FW-01 Foul water manhole. PC Ring 1.2m Ø UNO
- FW-01 Foul water inspection chamber. PVCu 450mm Ø. Max 1.2m depth - reduced access to 3.0m
- Note: All internal foul MH's and IC's to have recessed covers. double sealed and locking to prevent odours. Refer to layout for location.
- SAC Foul water shallow access chamber. Max depth to invert 600mm from GL, 300mm Ø
- FD Floor drain. (to be trapped). Internal use only, refer to architect for details / specification. Roddable from above slab into standard (Ø1) fitting. Floor Drain / Gully to be kept charged to avoid odours.
- FOUL OUTLET / STACK POSITION. Shown indicative, refer to architect for setting out. All branches 100mm Ø UNO. 01A - Outlet connects into standard 90° rest bend. 01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details. SVP - Indicates soil vent pipe by service engineer. with access.

PROPOSED DRAINAGE - STORM

- HIGHWAY GULLY AND TAIL (see construction details)
- ADOPTABLE SURFACE WATER FLOW CONTROL CHAMBER (THAMES WATER) PC Ring 1.2m Ø UNO
- ADOPTABLE SURFACE WATER SEWER (THAMES WATER) PC Ring 1.2m Ø UNO
- CELLULAR STORAGE (SDS GEOLIGHT 400) (see construction details)
- PERMEABLE PAVING (see construction details)
- 1500@1:100 Storm water drain - PVCu. Approx. gradient and diameter as noted, 150mm Ø UNO
- Storm water manhole. PC Ring 1.2m Ø UNO
- Storm water inspection chamber. PVCu 450mm Ø. Max 1.2m depth - reduced access to 3.0m. Connections over 150mm - chamber to be RANGE 600
- Storm rodding eye. Ø as noted
- Rain water outlet. Shown indicative, refer to architect for setting out. Refer to rainwater pipe details for branch Ø. 01 - Outlet connects into standard 90° rest bend. 01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details.
- Rain water outlet access gully. AG - Outlet connects to gully.
- Filter drain (see construction details)

PUBLIC AND PRIVATE EXISTING/PROPOSED DRAINAGE

- 1500@1:100 Existing public foul sewer
- 1500@1:100 Existing public storm sewer
- 1500@1:100 Existing public combined sewer

KEY PLAN

NOTES

- All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
- The DWG file is issued for the purposes of coordination only and do not represent formal drawing issue and are not to be reprinted in any form. Formal issue of drawings is via DWF, Adobe PDF files and/or hard copies and their associated information issue sheets.
- Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.
- Levels shown in metres above Ordnance Datum (mAOD).
- All private drainage to comply with current Building Regulations, BS EN-752 Drain and Sewer systems outside Buildings and other relevant British Standards and Codes of Practices.
- All external drainage within trafficked areas with less than 1.2m cover to have type Z concrete bed and surround. All external drainage within landscaped areas with cover less than 0.8m to have type Z concrete bed and surround. All drainage with greater cover than the minimum required to have type S bed and surround.
- All drainage to be laid soffit to soffit unless otherwise shown.
- The Contractor is to verify the line, level and diameter of existing sewers before commencing drainage works.
- All foul drainage to be minimum 100mm diameter, all surface water drainage to be minimum 150mm diameter unless otherwise shown.
- Cover levels shown on this drawing refer to approximate surface levels. It is the contractors responsibility to ensure that access covers and frames are set at the final surface levels.
- Where possible the contractor is to orientate manhole biscuits and covers to locate them parallel to kerbs and paving.
- The Contractor should comply with hs(g) 47 "Avoiding Danger from Underground Services" when excavating around existing services.
- It is the contractors responsibility to determine the location and depth of all existing services, mains and cables prior to construction.
- Contractor to provide temporary screens in each of the down stream manholes during the construction period of the development in accordance with SFA 2.9.10 and the local sewerage undertakers requirements.
- All in-situ concrete and precast concrete components to be manufactured using Sulphate Resisting Portland Cement, (SRPC) to BS 4027, if required, subject to soil conditions. Manhole components to be to BS EN 1917:2002.
- All ironwork to be kite marked by BSI or certified by equal inspection authority.
- All redundant connections to be capped off and grouted from the down stream manhole.
- All new drainage pipes to be jetted, CCTV surveyed with DVD recording and any defects highlighted to the supervising officer. Following the rectification of any defects, the drain is to be re-surveyed with CCTV and the recordings made available to the project manager/engineer.
- Prior to commencing the works the contractor is to confirm details of the existing drainage system as noted on the drawing.
- Prior to commencing the works the contractor is to undertake the drainage investigation work as noted on the drawing.

NOTE A

Prior to commencement of remediation/overlay works the contractor is to undertake a full service/utilities scan to establish details of existing utilities in the vicinity of the works. The contractor is responsible for the co-ordination/alterations of such utilities with the proposed works.

DRAWING AMENDED TO SUIT LANDSCAPE ARCHITECT COMMENTS				
PO3	D.WEBB	02.05.23	J.MAGEE	02.05.23
PRELIMINARY ISSUE				
PO2	D.WEBB	18.04.23	J.MAGEE	18.04.23
REVISION NOTES/COMMENTS				
REV	DRAWN BY	DATE	CHECKED BY	DATE
			APPROVED BY	DATE

Merchants' House North
Wapping Road
Bristol
BS1 4RW
t: +44 (0)117 945 9225
e: bristolcentral@hydrock.com

CLIENT

READING BOROUGH COUNCIL

PROJECT

AMETHYST LANE

TITLE

DRAINAGE LAYOUT

HYDROCK PROJECT NO. C-26887-C	SCALE @ A1 1:250	STATUS S3
STATUS DESCRIPTION SUITBLE FOR STAGE 3		
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 26887-HYD-00-ZZ-DR-C-7010		REVISION P03