Descriptive Report with Remarks and Observation Images

Section 19

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole G2	Image Provided - Ref: 18_0
00.00m	0:00:00	WL	Water level: 0% Height/Diameter	
00.50m	0:00:25	S1 DES	Settled deposits fine 0.5m - 1.8m: 20% Cross sectional area loss - Severity 3	Image Provided - Ref: 18_2
01.80m	0:00:25	F1 DES	Settled deposits fine Defect End: 20% Cross sectional area loss - Severity 3	
04.40m	0:01:23	REM	General remark general condition	Image Provided - Ref: 18_3

Total Defects for section

1 | 0 | 11 | 0 | 0

DRB Grade for Section

B

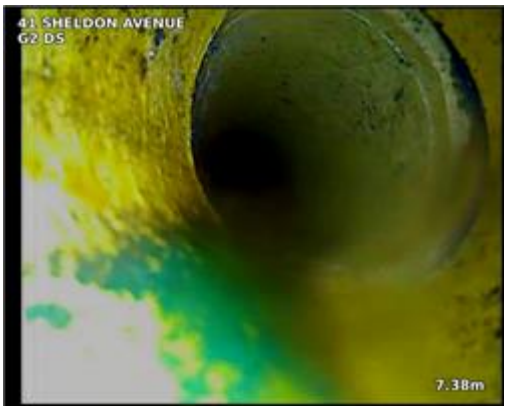
Pos	Video Ref	Code	Description	Image
06.20m	0:01:47	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_4
06.20m	0:01:47	LLH	Line of drain/sewer deviates left [half]	Image Provided - Ref: 18_5
06.80m	0:01:55	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_6

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
06.80m	0:01:55	LLH	Line of drain/sewer deviates left [half]	Image Provided - Ref: 18_7
07.40m	0:02:06	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_8 
07.40m	0:02:06	CC	Crack, circumferential from 10 o'clock to 04 o'clock - Severity 1	Image Provided - Ref: 18_9

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
07.40m	0:02:06	LLH	Line of drain/sewer deviates left [half]	Image Provided - Ref: 18_10
08.30m	0:02:18	REM	General remark general condition	Image Provided - Ref: 18_11
10.00m	0:02:54	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_12

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
10.30m	0:02:57	JN	Junction at 11 o'clock: 0mm Diameter	Image Provided - Ref: 18_13
11.20m	0:03:24	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_14
11.30m	0:03:25	LLH	Line of drain/sewer deviates left [half]	Image Provided - Ref: 18_15

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
12.20m	0:03:38	JN	Junction at 12 o'clock: 0mm Diameter	Image Provided - Ref: 18_16
12.50m	0:03:47	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_17
13.00m	0:03:50	JN	Junction at 09 o'clock: 0mm Diameter	Image Provided - Ref: 18_18

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
13.70m	0:03:59	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_19
15.00m	0:04:20	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_20
15.70m	0:04:39	JDM	Joint displaced medium - Severity 3	Image Provided - Ref: 18_21

Total Defects for section

1 | 0 | 11 | 0 | 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
15.90m	0:04:41	REM	General remark general condition	Image Provided - Ref: 18_22
19.00m	0:05:48	REM	General remark general condition	Image Provided - Ref: 18_23
22.40m	0:07:16	REM	General remark general condition	Image Provided - Ref: 18_24

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
22.90m		SA	Survey abandoned camera unable to continue	Image Provided - Ref: 18_9999

Total Defects for section

1 0 11 0 0

DRB Grade for Section

B

Site: 41 Sheldon Avenue, London

Section 20

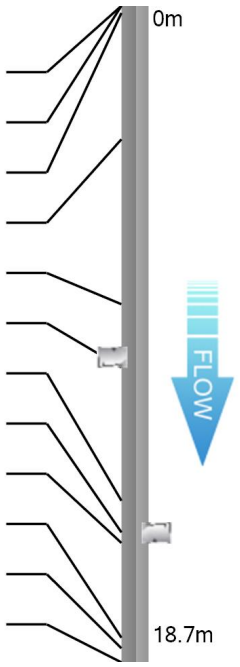
Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
	41 Sheldon Avenue	London			05/09/2023

Start Node Ref:	RWP 1	Finish Node Ref:	DS	Direction:	D	Height/Dia:	100
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	S	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	PVC	Cleaned	N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH				

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	18.7	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		19_0	
00.00m	WL	Water level 0%			0:00:00
00.20m	OB	Other obstacles 10%		19_2	0:00:03
03.80m	REM	General remark		19_3	0:00:21
08.50m	REM	General remark		19_4	0:00:38
10.30m	JN	Junction 02 : 0mm Diameter		19_5	0:00:46
14.10m	REM	General remark		19_6	0:01:02
15.00m	LRH	Line of drain/sewer deviates right [half]		19_7	0:01:06
15.30m	JN	Junction 09 : 0mm Diameter		19_8	0:01:14
18.00m	REM	General remark		19_9	0:01:38
18.30m	LRH	Line of drain/sewer deviates right [half]		19_1	0:01:41
18.70m	GYF	Finish node type Gully		19_9	



Total Defects for section

0	0	1	0	0

DRB Grade for Section

B

Descriptive Report with Remarks and Observation Images

Section 20

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole RWP 1	Image Provided - Ref: 19_0
00.00m	0:00:00	WL	Water level: 0% Height/Diameter	
00.20m	0:00:03	OB	Other obstacles: 10% Cross sectional area loss - Severity 3 screws	Image Provided - Ref: 19_2
03.80m	0:00:21	REM	General remark general condition	Image Provided - Ref: 19_3

Total Defects for section

0	0	1	0	0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
08.50m	0:00:38	REM	General remark general condition	Image Provided - Ref: 19_4
10.30m	0:00:46	JN	Junction at 02 o'clock: 0mm Diameter	Image Provided - Ref: 19_5
14.10m	0:01:02	REM	General remark general condition	Image Provided - Ref: 19_6

Total Defects for section

0 0 1 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
15.00m	0:01:06	LRH	Line of drain/sewer deviates right [half]	Image Provided - Ref: 19_7
15.30m	0:01:14	JN	Junction at 09 o'clock: 0mm Diameter	Image Provided - Ref: 19_8
18.00m	0:01:38	REM	General remark general condition	Image Provided - Ref: 19_9

Total Defects for section

0 0 1 0 0

DRB Grade for Section

B

Pos	Video Ref	Code	Description	Image
18.30m	0:01:41	LRH	Line of drain/sewer deviates right [half]	Image Provided - Ref: 19_10
18.70m		GYF	Finish node type Gully DS	Image Provided - Ref: 19_9999

Total Defects for section

0 0 1 0 0

DRB Grade for Section

B

Conclusion

- The drainage serving the property is a private system. The drainage has been altered over the years with a seemingly original clay pipework system with alterations to the rear in newer plastic pipework. There are number of surface water connections into the foul drainage making it combined.
- MH 1 located on the patio at the rear of the house. The upstream pipe terminates with an open end under the patio. Branch BR1 connects a surface water gully which also connects the rainwater pipe on the conservatory. Another gully connects via a junction to branch BR1 which drains a channel gully in addition to foul connections from the utility room.
- MH2 is located under the patio upstream of MH2 BR2 and is not accessible. It serves a live RWP and gully. The upstream pipe has coarse settled deposits in the line.
- Downstream of MH1 the pipe connects to MH3 Branch BR1 which connects a rainwater pipe and gully via a junction. MH3 is located to the right hand side of the property this connects the kitchen via a gully (BR2), an soil vent pipe (SVP) (BR3) draining two 1st floor bathrooms and a 40mm waste pipe (BR4). A channel drain connects at high level to MH3 (BR5 HL).
- MH3 connects to MH5 located on the front drive near the boundary. This is the final chamber and has an interceptor trap present prior to connecting to the public sewer.
- A chamber MH4 is located on the left hand side of the property which connects an SVP and a channel drain in front of the garage. This connects to MH5 branch BR1. Branch BR2 connects the ground floor WC as well as the sink via a junction.
- A rainwater downpipe and gully (G1) to the front right hand side was not able to access beyond the gully trap.
- Using a 32mm flexible camera a gully ‘G2’ to the rear of the garage was able to be surveyed. This surface water run goes under the garage and turns, running under the drive to the right-hand side of the property. It was surveyed for 22m till the camera was unable to continue, due to multiple bends and feeding through the tight gully trap.
- There is a water meter chamber on the front drive partially in the shrubs.
- Two additional chambers in the rear garden are lighting.
- The drainage is in a serviceable condition. There are some medium displaced joints in the old clay ware pipes. Some minor cracks were observed; minor grade 1 crack MH1 to MH3 and MH5 BR2. The vent pipe to MH5 which is high level within the chamber is collapsed or has been removed beyond the start of the pipe.
- The line to the sewer has a crack and longitudinal fracture and root ingress just downstream of the interceptor trap.

Recommendations

- Clean the foul and surface water pipes to remove settled deposits with high pressure jetting as necessary. Clear large coarse deposits present in pipe MH2 upstream.
- Monitor grade 1 or 2 cracks and line if they deteriorate.
- Points of root ingress are to be sealed and repair any cracks/fractures pipe by lining, this is necessary downstream of the interceptor trap.
- Any critical drainage dimensions should be checked prior to any works.

APPENDIX C
THAMES WATER ASSET LOCATION MAP

Asset location search

Property Searches

Symmetrys Limited
Unit 6 The Courtyard Unit 6 The Courtyard

LONDON
N8 8SL

Search address supplied 41
Sheldon Avenue
London
N6 4JP

Your reference 23135 41 Sheldon Avenue

Our reference ALS/ALS Standard/2023_4873470

Search date 17 August 2023

Notification of Price Changes

From 1st April 2023 Thames water Property Searches will be increasing the prices of its CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches. Historically costs would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%.

Customers will be emailed with the new prices by January 1st 2023.

Any orders received with a higher payment prior to the 1st April 2023 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk

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

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

0800 009 4540

Asset location search

Property Searches

Search address supplied: 41, Sheldon Avenue, London, N6 4JP

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 searchprovides 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

Asset Location Search Sewer Map - ALS/ALS Standard/2023_4873470

The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 527540,188084

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
5102	99.15	96.74
5101	99.22	97.32
501A	n/a	n/a
5103	97.48	95.58
5001	97.54	94.95
5002	97.56	93.56
6103	95.7	92.09

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

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

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.
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.

Asset Location Search Water Map - ALS/ALS Standard/2023_4873470

The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 527540, 188084.

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: Indiates 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.

Payment 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 within 14 days of the 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. 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'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. 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 still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

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 0300 034 2222 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**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	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

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

APPENDIX D
GREENFIELD RUNOFF CALCULATIONS

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Stefany Rojas
Site name:	41 Sheldon Avenue
Site location:	London

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.57707° N
Longitude:	0.16061° W
Reference:	2872621486
Date:	Oct 11 2023 11:19

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.164

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible.

SAAR (mm):	678	678
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

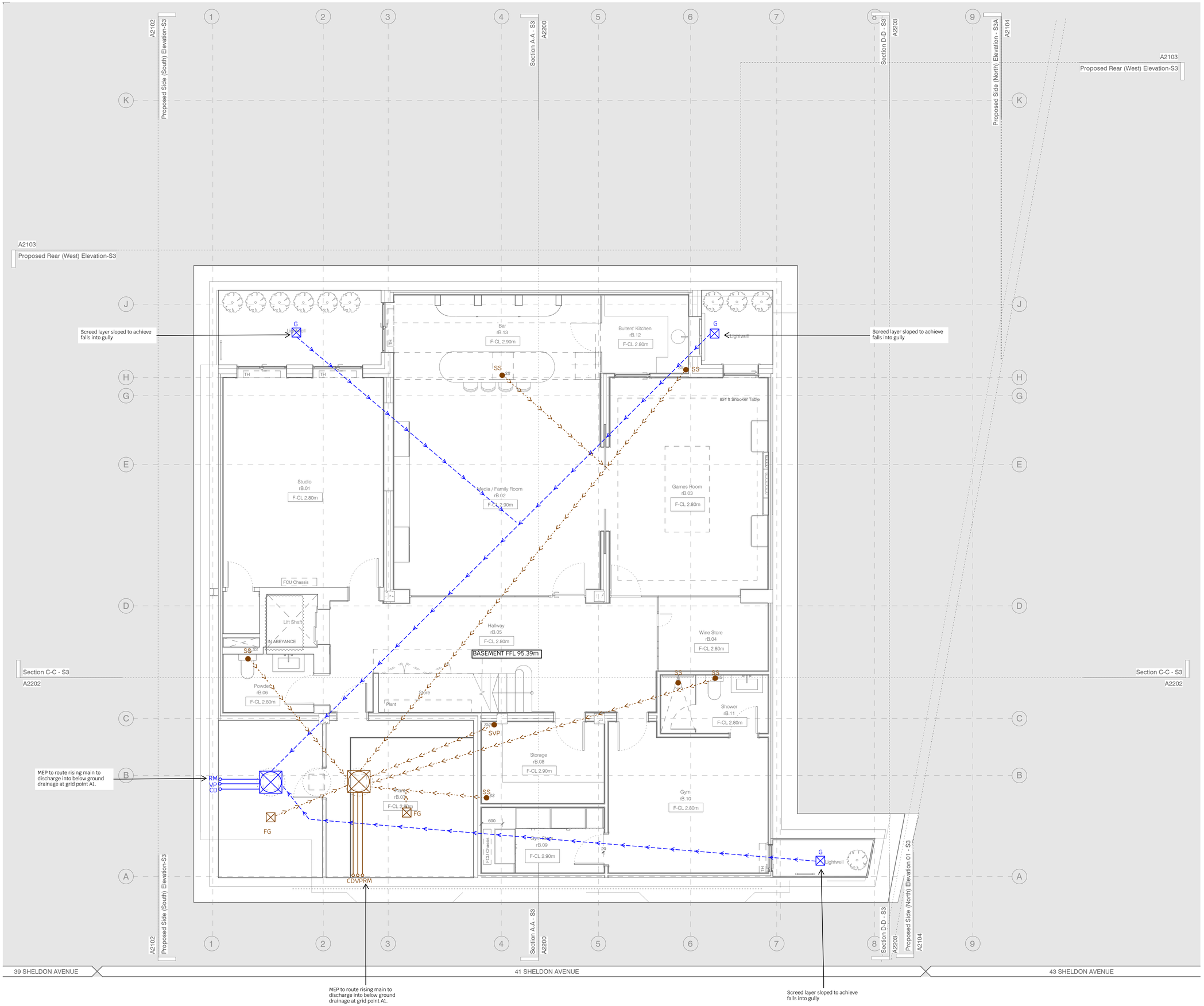
Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	0.76	0.76
1 in 1 year (l/s):	0.65	0.65
1 in 30 years (l/s):	1.75	1.75
1 in 100 year (l/s):	2.43	2.43
1 in 200 years (l/s):	2.85	2.85

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

APPENDIX E
PROPOSED BELOW GROUND DRAINAGE STRATEGY SKETCH



Stage 3a Design Notes

1. Drainage points shown indicatively pending finalised above ground drainage layout from MEP.

Notes

1. The Architectural Layout is based on the Proposed Basement Floor Plan , drawing no. SHA-MWA-A-B1-DR-A-A1999, received by Symmetrys on 27/02/2024.

Key

- SVP/SS — Soil vent pipe/stub stack by MEP
- G — Surface water gully with integrated non return valve
- FG — Foul water gully with integrated non return valve
- Foul pump by Specialist
- Surface water pump by Specialist
- CD VP RM — Cable duct, vent pipe, rising main by Others
- Surface water pipe 100mm dia. @ 1:80 UNO
- Foul water pipe 100mm dia. @ 1:40 UNO

STAGE 3 FOR INFORMATION

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

23135-SYM-XX-XX-SK-C-0300-REV P3
Below Ground Drainage Strategy
Basement
41 Sheldon Avenue, London, N6 4JP
By: SR/RF
P3 Date: 29/02/2024 1:50 @ A1

Drainage Notes

1. Greenfield runoff rate Qbar = 0.8 l/s. Feasible outflow discharge rate is 1.0 l/s.

2. 9.0mx6.5m 1.0m deep attenuation tank 95% porosity to provide 55.5m³ storage for the 1 in 100 year storm + 40% climate change allowance.

3. CCTV Survey by the Drainage Lab shows combined outfall connection to Thames Water sewer. Assumed to be connected to the foul sewer. Connection to be reused and made into foul connection only. Refer to Drainage Survey Report for recommended remedial works.

4. Soakaway to be used in lieu of/in conjunction with attenuation tank. Pending results of soakaway test.

5. Connection from foul SVPs into below ground drainage to be confirmed by MEP.

6. All RWPs to have above ground access.

7. New connection into Thames Water surface water sewer subject to S106 approval.

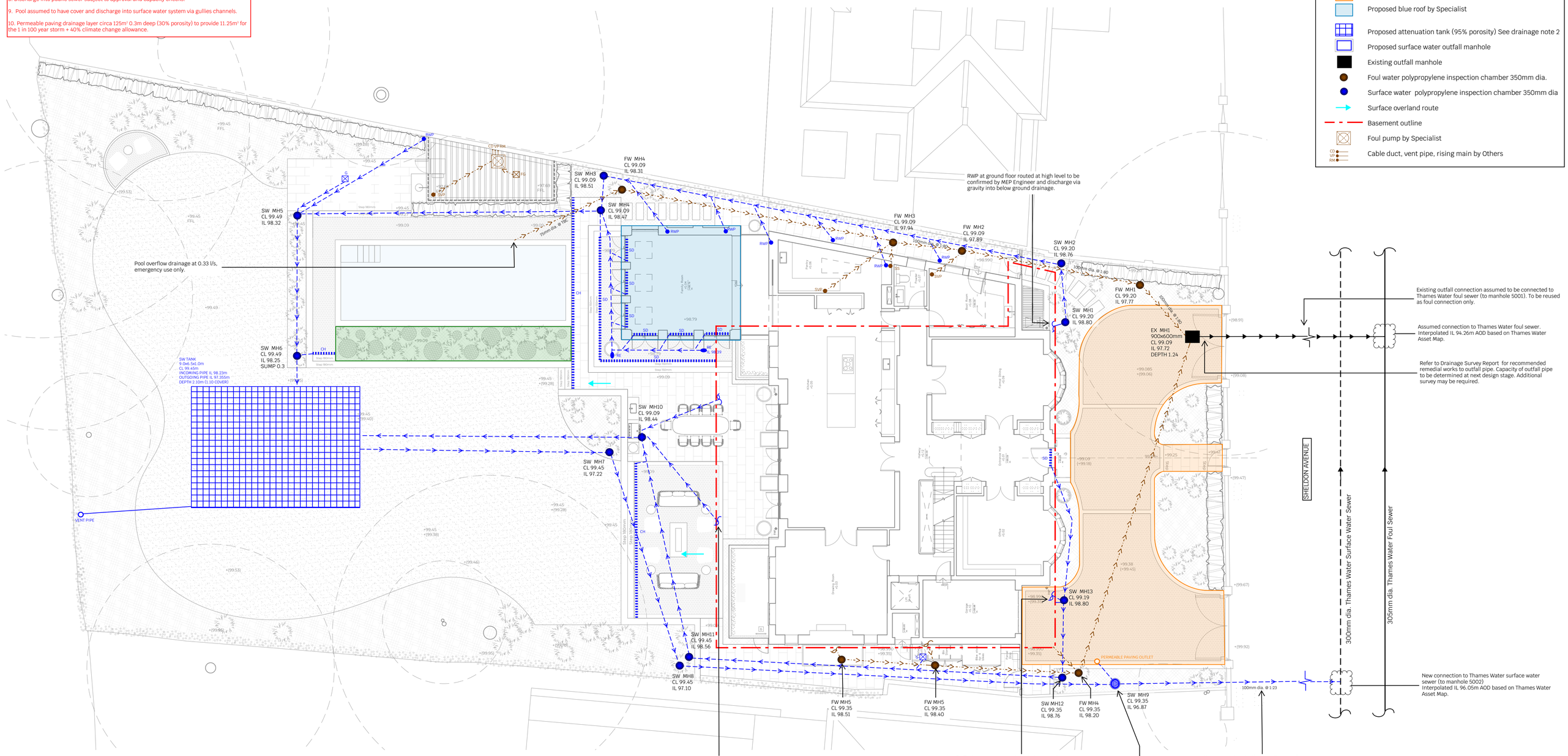
8. Discharge into public sewer subject to approval and capacity checks.

9. Pool assumed to have cover and discharge into surface water system via gullies channels.

10. Permeable paving drainage layer circa 125m² 0.3m deep (30% porosity) to provide 11.25m³ for the 1 in 100 year storm + 40% climate change allowance.

Key

- Thames Water Foul 305mm dia. Sewer
- Thames Water Surface Water 300mm dia. Sewer
- Existing 100mm dia. combined outfall connection
- Proposed surface water (SW) 100mm dia. pipe @ 1:100 UNO
- Proposed foul water (FW) 100mm dia. pipe @ 1:40 UNO
- Proposed raingarden by Specialist TBC
- Permeable paving (30% porosity) See drainage note 10
- Proposed blue roof by Specialist
- Proposed attenuation tank (95% porosity) See drainage note 2
- Proposed surface water outfall manhole
- Existing outfall manhole
- Foul water polypropylene inspection chamber 350mm dia.
- Surface water polypropylene inspection chamber 350mm dia
- Surface overland route
- Basement outline
- Foul pump by Specialist
- CD / VP / RM — Cable duct, vent pipe, rising main by Others



STAGE 3 FOR INFORMATION

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

23135-SYM-XX-XX-SK-C-0301-REV P5
Below Ground Drainage Strategy
Ground Floor
41 Sheldon Avenue, London, N6 4JP
By: SR/RF
P5 Date: 29/02/2024 1:100 @ A1

APPENDIX F
MICRODRAINAGE HYDRAULIC MODELLING CALCULATIONS

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	5	PIMP (%)	100
M5-60 (mm)	21.000	Add Flow / Climate Change (%)	0
Ratio R	0.440	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	5.000	0.050	100.0	0.077	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	10.000	0.100	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	5.204	0.052	100.1	0.013	2.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	5.000	0.085	58.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.08	98.250	0.077	0.0	0.0	0.0	1.00	17.8	10.4
1.001	50.00	5.25	97.355	0.077	0.0	0.0	0.0	1.00	17.8	10.4
2.000	50.00	2.11	98.960	0.013	0.0	0.0	0.0	0.77	6.0	1.8
1.002	50.00	5.31	96.870	0.090	0.0	0.0	0.0	1.31	23.2	12.2

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Bac (m
Catchment	99.450	1.200	Open Manhole	500	1.000	98.250	150				
Tank	99.450	2.095	Open Manhole	300	1.001	97.355	150	1.000	98.200	150	
CBPP	99.380	0.420	Open Manhole	300	2.000	98.960	100				
Flow Control	99.450	2.580	Open Manhole	500	1.002	96.870	150	1.001	97.255	150	
								2.000	98.908	100	
	99.380	2.595	Open Manhole	0		OUTFALL		1.002	96.785	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CBPP	371.784	172.319	371.784	172.319	Required	

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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)
1.000	o	150	Catchment	99.450	98.250	1.050	Open Manhole	500
1.001	o	150	Tank	99.450	97.355	1.945	Open Manhole	300
2.000	o	100	CBPP	99.380	98.960	0.320	Open Manhole	300
1.002	o	150	Flow Control	99.450	96.870	2.430	Open Manhole	500

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)
1.000	5.000	100.0	Tank	99.450	98.200	1.100	Open Manhole	300
1.001	10.000	100.0	Flow Control	99.450	97.255	2.045	Open Manhole	500
2.000	5.204	100.1	Flow Control	99.450	98.908	0.442	Open Manhole	500
1.002	5.000	58.8		99.380	96.785	2.445	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	-	-	100	0.077	0.077	0.077
1.001	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.013	0.013	0.013
1.002	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.090	0.090	0.090

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002		99.380	96.785	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.440		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: Flow Control, DS/PN: 1.002, Volume (m³): 0.7

Unit Reference	MD-SHE-0039-7000-1000-7000
Design Head (m)	1.000
Design Flow (l/s)	0.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	39
Invert Level (m)	97.155
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	0.7
Flush-Flo™	0.172	0.5
Kick-Flo®	0.345	0.4
Mean Flow over Head Range	-	0.5

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	0.5	1.200	0.8	3.000	1.1	7.000	1.7
0.200	0.5	1.400	0.8	3.500	1.2	7.500	1.7
0.300	0.5	1.600	0.9	4.000	1.3	8.000	1.8
0.400	0.5	1.800	0.9	4.500	1.4	8.500	1.8
0.500	0.5	2.000	1.0	5.000	1.4	9.000	1.9
0.600	0.6	2.200	1.0	5.500	1.5	9.500	1.9
0.800	0.6	2.400	1.0	6.000	1.6		
1.000	0.7	2.600	1.1	6.500	1.6		

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Storage Structures for Storm

Cellular Storage Manhole: Tank, DS/PN: 1.001

Invert Level (m) 97.355 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	58.5	58.5	1.001	0.0	89.1
1.000	58.5	89.1			

Porous Car Park Manhole: CBPP, DS/PN: 2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.2
Membrane Percolation (mm/hr)	1000	Length (m)	11.2
Max Percolation (l/s)	34.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	98.960	Membrane Depth (mm)	120

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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 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.441
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 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, 240, 360, 480, 960, 1440
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.
1.000	Catchment	15 minute 1 year Winter I+0%	99.450	98.356	-0.044	0.000	0.83
1.001	Tank	240 minute 1 year Winter I+0%	99.450	97.507	0.002	0.000	0.05
2.000	CBPP	120 minute 1 year Winter I+0%	99.380	98.975	-0.085	0.000	0.06
1.002	Flow Control	240 minute 1 year Winter I+0%	99.450	97.512	0.492	0.000	0.03

PN	US/MH Name	Overflow (l/s)	Overflow Vol (m³)	Total Overflow Vol(m³)	Maximum Vol (m³)	Discharge Vol (m³)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	Catchment				0.020	5.447		11.6
1.001	Tank				8.446	12.848	169	0.8
2.000	CBPP				0.576	1.172	59	0.3
1.002	Flow Control				0.292	14.335		0.5

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

PN	US/MH Name	Status
1.000	Catchment	OK
1.001	Tank	SURCHARGED
2.000	CBPP	OK
1.002	Flow Control	SURCHARGED

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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 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.441
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 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, 240, 360, 480, 960, 1440
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)
1.000	Catchment	15 minute 30 year Winter I+0%	99.450	98.558	0.158	0.000
1.001	Tank	240 minute 30 year Winter I+0%	99.450	97.813	0.308	0.000
2.000	CBPP	30 minute 30 year Winter I+0%	99.380	98.996	-0.064	0.000
1.002	Flow Control	240 minute 30 year Winter I+0%	99.450	97.830	0.810	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Overflow Vol (m³)	Total Overflow Vol(m³)	Maximum Vol (m³)	Discharge Vol (m³)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	Catchment	2.02				0.059	13.379		28.3
1.001	Tank	0.05				25.488	28.815	417	0.7
2.000	CBPP	0.29				1.375	1.850	22	1.5
1.002	Flow Control	0.03				0.357	32.997		0.6

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

PN	US/MH Name	Status
1.000	Catchment	SURCHARGED
1.001	Tank	SURCHARGED
2.000	CBPP	OK
1.002	Flow Control	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 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.441
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 21.000 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, 240, 360, 480, 960, 1440
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)
1.000	Catchment	15 minute 100 year Winter I+40%	99.450	99.031	0.631	0.000
1.001	Tank	360 minute 100 year Winter I+40%	99.450	98.300	0.795	0.000
2.000	CBPP	30 minute 100 year Winter I+40%	99.380	99.024	-0.036	0.000
1.002	Flow Control	360 minute 100 year Winter I+40%	99.450	98.323	1.303	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Overflow Vol (m³)	Total Overflow Vol(m³)	Maximum Vol (m³)	Discharge Vol (m³)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	Catchment	3.66				0.152	24.380		51.2
1.001	Tank	0.05				52.630	56.808	681	0.8
2.000	CBPP	0.74				2.421	4.207	16	3.9
1.002	Flow Control	0.04				0.454	65.717		0.7

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

PN	US/MH Name	Status
1.000	Catchment	SURCHARGED
1.001	Tank	SURCHARGED
2.000	CBPP	OK
1.002	Flow Control	SURCHARGED

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APPENDIX G
SUDS PROFORMA

GREATER**LONDON**AUTHORITY

1. Project & Site Details	
Project / Site Name (including sub-catchment / stage / phase where appropriate)	41 Sheldon Avenue
Address & post code	41 Sheldon Avenue, London, N6 4JP
OS Grid ref. (Easting, Northing)	E 527558
	N 188073
LPA reference (if applicable)	
Brief description of proposed work	The demolition and rebuild of the existing dwelling, with the exception of the front façade which is to be retained, to create a new detached residential dwelling with basement works, new pool and pool house.
Total site Area	1600 m^2
Total existing impervious area	580 m^2
Total proposed impervious area	765 m^2
Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	Not in a Critical Drainage Area but subject to 'Medium' risk surface water flooding.
Existing drainage connection type and location	Via gravity to Thames Water 305mm dia. foul sewer along Sheldon Avenue
Designer Name	Stefany Rojas
Designer Position	Civil Engineer
Designer Company	Symmetrys Ltd

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	N/A
Bedrock geology classification	Claygate Member
Site infiltration rate	TBC m/s
Depth to groundwater level	Circa 19.55m m below ground level
Is infiltration feasible?	No

2b. Drainage Hierarchy

	Feasible (Y/N)	*Proposed (Y/N)*
1 store rainwater for later use	Y	Y
2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
3 attenuate rainwater in ponds or open water features for gradual release	Y	Y
4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
5 discharge rainwater direct to a watercourse	N	N
6 discharge rainwater to a surface water sewer/drain	Y	Y
7 discharge rainwater to the combined sewer.	N	N

2c. Proposed Discharge Details

Proposed discharge location	To Thames Water 300mm dia. surface water sewer along Sheldon Avenue.
Has the owner/regulator of the discharge location been consulted?	Yes

3. Drainage Strategy

3a. Discharge Rates & Required Storage				
	Greenfield (GF) runoff rate (l/s)	*Existing discharge rate (l/s)*	*Required storage for GF rate (m^3)*	*Proposed discharge rate (l/s)*
Qbar	0.76			
1 in 1	0.65	5.43	7.5	0.6
1 in 30	1.75	13.33	23.9	0.8
1 in 100	2.43	17.35	33.4	0.9
1 in 100 + CC			50.7	0.9
Climate change allowance used		40%		
3b. Principal Method of Flow Control		SUDS		

3c. Proposed SuDS Measures			
	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	24		TBC
Infiltration systems	0		0
Green roofs	0	0	0
Blue roofs	33	33	1.3
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	125	125	11.25
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	765		51.3
Total	**947**	**158**	**63.85**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	23135-SYM-XX-XX-RP-C-0001 Flood Risk Assessment Section 4.4
Drainage hierarchy (2b)	23135-SYM-XX-XX-RP-C-0002 SUDS Strategy Report Section 7.2
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	23135-SYM-XX-XX-RP-C-0002 SUDS Strategy Report Section 7.0
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	SUDS Strategy Report Appendix F
Proposed SuDS measures & specifications (3b)	SUDS Strategy Report Section 7.0

4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Appendix A
Detailed drainage design drawings, including exceedance flow routes	Appendix E
Detailed landscaping plans	Appendix E
Maintenance strategy	Section 9.0
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Section 7.0
b) biodiversity?	Appendix E
c) amenity?	Appendix E

APPENDIX H
BLUE ROOF PRELIMINARY DESIGN

BLUE ROOF ATTENUATION AND OUTFLOW SUMMARY

PRIVATE & CONFIDENTIAL - NOT FOR DISTRIBUTION

abg creative geosynthetic engineering

Project Name:	41 Sheldon Avenue, N6 4JP		
Prepared for:	Symmetrys		
Date:	03/11/2023		
ABG Project ID:	41SA	Calculator version:	1.34
Prepared by:	Matt Gledhill, matthew.gledhill@abgltd.com		
Notes/description:	Mix of green roof, soft and hard landscaping - TBC. Potential for free-standing/ballasted, PV panels, lighter-weight plant units or planters to be installed on top of the 'blue roof' system (recommended). Appropriate support for larger plant units TBC with ABG, and structural and M&E engineers. Maintenance or pedestrian/amenity access only - TBC. Warm/inverted roof/un-insulated podium, construction, with zero falls - TBC.		
Document/Drawing references:			

Blue Roof Estimate

Input Parameters - Rainfall Information (Flood Studies Report 1975)			
Return period:	100	years	*As supplied by Client*
Allowance for Climate Change:	40	%	*As supplied by Client*
Location selected for FSR data:	London (N)		

Input Parameters - Roof Information			
Total catchment area:	33	m^2	*As supplied by Client*
Attenuation area:	33	m^2	*As supplied by Client*
Maximum allowable runoff:	0.5	l/s	*As supplied by Client*

Output - Rainfall Calculation

Duration	Time to Empty	Restricted Outflow (l/s)
15 mins	0 hours and 50 minutes	0.5
30 mins	0 hours and 50 minutes	0.5
1 hour	0 hours and 50 minutes	0.4
2 hours	0 hours and 30 minutes	0.3
4 hours	0 hours and 0 minutes	0.1
6 hours	0 hours and 0 minutes	0.0
10 hours	0 hours and 0 minutes	0.0
24 hours	0 hours and 0 minutes	0.0
48 hours	0 hours and 0 minutes	0.0

Total attenuation required: 1.3 m^3

Half empty time: The critical storm does not result in the storage reaching half full

Output - Recommended Blue Roof System	
System Name:	ABG blueroof VF HD 108mm
Description:	Blue roof depth of 108mm. No. of control positions TBC by design team, and also cross-referenced with the structural engineer's long-term deflection analysis. Additional 'tell-tale' parapet overflow outlets, may also be added by the architect.
Total attenuation capacity:	3.2 m^3
Number of Blue Roof outlets:	2

Notes:

1. This document contains an estimate which has been prepared by ABG Ltd and is illustrative only and not a detailed design.
2. Further details on the theories used in this estimate are available upon request from ABG. The values given for the performance of the system relate to testing, modelling and analysis of our systems obtained from laboratories and testing institutes. In line with our policy of continuous improvement the right is reserved to make changes to our systems without notice at any time.
3. The estimate given in this report is based on the stated parameters as per the brief. If these parameters are not correct or have changed, ABG should be contacted to provide a revised estimate.
4. This estimate is specific to the characteristics of ABG products/systems and is not applicable to other competitor products. The substitution of the whole or any component of this design for a material supplied from another source renders this estimate invalid.
5. Final determination of the suitability of any information is the sole responsibility of the user. ABG will be pleased to discuss the use of this or any other product but responsibility for selection of a material and its application in any specific project remains with the user.

abg ltd. E7 Meltham Mills Rd, Meltham, West Yorkshire, HD9 4DS
UK t 01484 852096 **e** geo@abgltd.com **Export t** +44(0)1484 852250 **e** export@abgltd.com
www.abgltd.com

1. DEFINITIONS

'Consultant' means ABG Geosynthetics Ltd and its legal successors. 'Client' means the person, firm, company or organisation for whom the Consultant is performing the Services. 'Agreement' means the contract referred to in Clause 2. 'Services' means the services to be performed by the Consultant in accordance with the proposal from the Consultant. 'Project' means the project or works for which the Client has commissioned the Services.

2. GENERAL

Unless and until a formal agreement is entered into, the Client's acceptance of the proposal for Services from the Consultant or a request for some or all the Services to be performed by the Consultant, shall constitute a binding
contract between the Client and the Consultant which contract will be subject to any terms and conditions contained or referred to in the aforementioned proposal and these terms and conditions. In the event of any conflict, the terms and conditions in the proposal shall prevail over these terms and conditions. The Agreement so formed shall supersede all previous understandings, commitments or agreements whether written or oral between the Client and the Consultant relating to the subject matter hereof. No person or entity shall have any rights in relation to this Agreement, whether as third parties or otherwise, save the parties to this Agreement. Should any term or condition of this Agreement be held to be unenforceable or invalid by the courts of any jurisdiction to which it is subject then such term or condition shall be disregarded and the remaining terms and conditions shall remain in full force and effect.

3. PERFORMANCE OF SERVICES AND SCOPE

The Consultant shall perform the Services using the degree of skill care and diligence to be expected from a consultant experienced in the provision of services of similar scope size and complexity. The Consultant shall use reasonable endeavours to complete the Services within the time or programme agreed but shall not be responsible for any delay beyond the reasonable control of the Consultant. The fee contained in the proposal is for the scope of services as defined therein. If not already contained in the proposal the Consultant and the Client shall agree as an initial activity an integrated project services programme to
include the activities of all the parties to the Project relevant to the Services to be supplied by the Consultant. The
aforesaid programme shall show the key dates for final information and the delivery of such to the Consultant so as to enable the Consultant to carry out the services in an efficient once through manner to achieve the programme delivery dates for the Services.
The Consultant provides various services including Design and Product use advice which is distinct from a Design Service. The Design Service may or may not attract a fee.
Where the Consultant's services are of an advisory nature and dependent upon the degree of information and release thereof by the Client then the Client agrees that any reliance placed on the services by the Client shall take due account of such constraints.

4. CONFIDENTIALITY AND INTELLECTUAL PROPERTY RIGHTS

i. The Consultant and the Client shall keep confidential all information pertaining to the Services.
ii. Copyright for all reports, documents and the like produced by the Consultant in the performance of the Services
shall remain vested with the Consultant but the Consultant shall grant an irrevocable royalty free license to the Client to use such reports, documents and the like for any purpose in connection with the Project.

5. LIABILITY

i. The Consultant shall be liable to pay compensation to the Client arising out of or in connection with this
Agreement only if a breach of the duty of care in Clause 3 is established against the Consultant.
ii. Notwithstanding any other term to the contrary in this Agreement or any related document and whether the cause of action for any claim arises under or in connection with the Agreement in contract or in tort, in negligence or for breach of statutory duty or otherwise the Consultant shall have no liability to the Client in respect of any claim for loss or damage arising from acts of war or terrorism or arising from flooding, burst water mains or failed drainage or arising from any incidence of toxic mould or asbestos but otherwise in relation to any cause of action as aforesaid the total liability of the Consultant in the aggregate for all claims shall be limited to a sum equivalent to ten (10) times the fee payable under this Agreement or £50,000, whichever is the lesser, or such other sum as may be expressly stated in the Consultant's proposal, and further but without prejudice to the aforesaid limit of liability any such liability of the Consultant shall be limited to such sum or sums as it would be just and equitable for the Consultant to pay having regard to the Consultant's responsibility for the same and on the basis that all other parties appointed or to be appointed by the Client to perform related services in connection with the Project shall be deemed to have provided undertakings on terms no less onerous than this Agreement and shall be deemed to have paid to the Client such contribution as it would be just and equitable for them to pay having regard to their responsibility for any loss or damage and providing that it shall be deemed that such other parties have not limited or excluded their liability to the Client for such loss or damage in any way which may be prejudicial to the Consultant's liability under this clause. Nothing in this clause shall operate to exclude or limit the Consultant's liability for death or personal injury.
iii. The Client shall indemnify and keep indemnified the Consultant from and against all claims, demands,
proceedings, damages, costs and expenses arising out of or in connection with this Agreement or the Project
arising from acts of terrorism or arising otherwise in excess of the liability of the Consultant under this
Agreement or which may be made in respect of events occurring after the expiry of the period of liability stated
in this Agreement.
iv. No action or proceedings under or in connection with this Agreement shall be commenced against the Consultant after the expiry of one year from completion of the Services.
v. ABG Geosynthetics Ltd is not responsible for consequential, indirect or incidental losses.

6. INSURANCE

The Consultant shall arrange Professional Indemnity Insurance cover for the amount stated in Clause 5(ii). The Consultant will use all reasonable endeavours to maintain Professional Indemnity Insurance cover for the period stated in 5(iv) above, providing such insurance remains available to the Consultant at commercially reasonable rates.

7. CLIENT'S OBLIGATIONS

The Client shall supply, without charge and in such time so as not to delay or disrupt the performance of the Consultant in carrying out the Services, all necessary and relevant information, in his possession or available to him from his other agents or consultants and all necessary approvals or consents. Any deviation on any information from the proposal shall be confirmed in writing and any attendant consequential fees will be forwarded for approval by the Client before any changes are made. The Consultant shall not be liable for any consequential delays on site. Every reasonable effort will be made to mitigate against delays, however no liability for losses and costs will be accepted. The approval or consent by the Client to the Services shall not relieve the Consultant from any liability under this Agreement. All work undertaken by the Consultant must be ratified and signed off by the Client.

8. PAYMENT

i. The Client shall pay the Consultant for the Services in accordance with the proposal and this Agreement. If the Consultant performs any additional services or if the Services are delayed or disrupted for reasons beyond the
reasonable control of the Consultant then the Consultant shall be entitled to such additional fees as are fair and
reasonable in the circumstances. The Consultant may render an invoice at monthly intervals for services properly
performed. The agreed invoice, or in the event of a dispute the undisputed element, shall be paid within 28 days of receipt of the invoice by the Client. Any invoice paid after this period will attract interest at 3% above the base
rate of the central bank of the country of the currency of payment along with any collection costs which may occur.
ii. The Client shall not withhold any payment of any sum or part of a sum due to the Consultant under this
Agreement by reason of claims or alleged claims against the Consultant unless the amount to be withheld has
been agreed between the Client and the Consultant as due to the Client or such sum arises from an award in
adjudication, arbitration or litigation in favour of the Client and arises under or in connection with the Agreement.
Save as aforesaid all rights of set off at common law, in equity or otherwise which the Client may otherwise be
entitled to exercise are hereby expressly excluded.

9. TERMINATION

If a party is in breach of a material term of this Agreement and despite written notice from the other party fails to
remedy such breach within 30 days or such other period as may be agreed between the parties, then the other party shall be entitled to terminate this Agreement forthwith. The Consultant may seek to recoup costs incurred for works completed prior to termination.

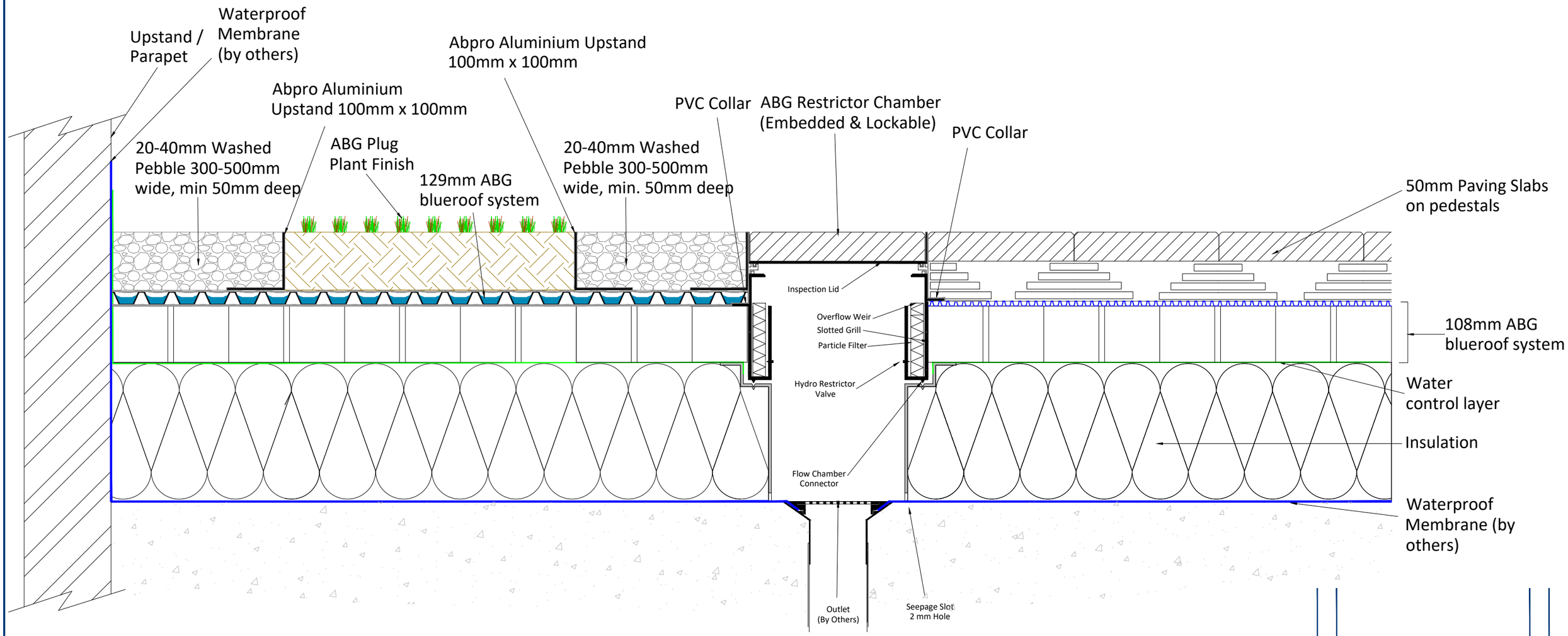
10. DISPUTE RESOLUTION

Any dispute between the parties that cannot be settled by mutual agreement shall be referred for final settlement to the arbitration of a person agreed between the parties or failing such agreement appointed upon the application of either party by the President of the Chartered Institute of Arbitrators and the said arbitration shall be carried out in accordance with the Construction Industry Model Arbitration Rules 1998 or such other version current at the time of the referral under this clause. Where the Agreement is subject to a governing law other than that of England and Wales then any dispute between the parties that cannot be settled by mutual agreement shall be finally settled by arbitration in accordance with the UNCITRAL Arbitration Rules by one arbitrator appointed in compliance with the said Rules. In either case such rules as appropriate are deemed to be incorporated into this Agreement by reference.

11. COMPLIANCE WITH LAWS

This Agreement shall be governed by and construed in accordance with the law of England and Wales unless stated
otherwise in the proposal for services from the Consultant.

Changes to the above terms and conditions will only be considered if agreed in writing as
part of the appointment process prior to ABG Geosynthetics commencing work.



Rev:	Comments:	By:	Date:

Project: Blue Roof - Inverted

Title: Restrictor Chamber & Green Roof / Paved Details

Drawn by:	Date:	
RH	07/07/23	
Scale: NTS	Drawing Ref: BRST02	Rev: 1.04

abg creative geosynthetic engineering

ABG Ltd | E7 | Meltham Mills Road | Meltham | HD9 4DS | West Yorkshire | UK |
Tel:+44(0)1484 852096 | Fax:+44(0)1484 851562 | Email: geo@abgltd.com
www.abgltd.com

Retaining Walls | Erosion Control | Landfill
Tunnels | Green Roofs | Landscaping | Highways

SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

APPENDIX I
THAMES WATER PRE-PLANNING ENQUIRY

Miss Stefany Rojas
Symmetrys Ltd
Unit 6 The Courtyard
Lynton Road
London
N8 8SL

Wastewater pre-planning
Our ref **DS6110670**

10 January 2024

Pre-planning enquiry: Confirmation of sufficient capacity

Site: 41 Sheldon Avenue, LONDON, N6 4JP

Dear Miss Rojas,

Thank you for Pre-planning application for the construction of 1 residential dwelling with 1no. swimming pool.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul and surface water sewer network to serve your development.

Foul Water

Proposed foul water to discharge via gravity flow into an existing 305mm foul water sewer upstream from existing manhole TQ2788 5001 located within the highway of Sheldon Avenue.

Surface Water

Proposed surface water to discharge via gravity flow into an existing 300mm surface water sewer upstream from existing manhole TQ2788 5103 located within the highway of Sheldon Avenue.

When developing a site, policy 5.13 of the London Plan and Policy 3.4 of the Supplementary Planning Guidance (Sustainable Design And Construction) states that every attempt should be made to use flow attenuation and SuDS/Storage to reduce the surface water discharge from the site as much as possible.

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable.
Before we can consider your surface water needs, you'll need written approval from the LLFA (Lead Local Flood Authority) that you have followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

1. store rainwater for later use.
2. use infiltration techniques where possible.
3. attenuate rainwater in ponds or open water features for gradual release.
4. attenuate rainwater by storing in tanks or sealed water features for gradual release.
5. discharge rainwater direct to a watercourse.
6. discharge rainwater to a surface water sewer/drain.
7. discharge rainwater to the combined sewer.
8. discharge rainwater to the foul sewer

Where connection to the public sewerage network is still required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

If the above surface water hierarchy has been followed and if the flows are restricted to a total of **1.0 litres/sec** for all storm events up to and including 1:100yr+40%CC, then Thames Water would not have any objections to the proposal.

Please see the attached 'Planning your wastewater' leaflet for additional information.

Diversion

From our records we don't anticipate that any wastewater assets need to be diverted to accommodate your proposals.

What happens next?

Please make sure you submit your **S106 Connection Application**, giving us at least 21 days' notice of the date you wish to make your new connection(s).

If you've any further questions, please do not hesitate to contact me.
Yours sincerely,

Colins Akemche
Clean & Waste Pre-Planning Engineer
Adoption Team - Service Delivery

CONTINUE THE CONVERSATION

TO DISCUSS YOUR PROJECT WITH US
PLEASE GET IN TOUCH ON 020 8340 4041
OR EMAIL US AT INFO@SYMMETRYS.COM