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Geotechnical Engineering and Envrionmental Services across the UK

FLOOD RISK ASSESSMENT AND SUDS STRATEGY

24 Burgess Hill, London, NW2 2DA

JOMAS ASSOCIATES LTD

Unit 24 Sarum Complex, Salisbury Road, Uxbridge, UB8 2RZ

www.jomasassociates.com info@jomasassociates.com

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Prepared by: **JOMAS ASSOCIATES LTD** **For:** **Verve Concepts Limited**

Should you have any queries relating to this report, please contact

JOMAS ASSOCIATES LTD

www.jomasassociates.com

0843 289 2187

info@jomasassociates.com

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Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

This document must only be treated as a draft unless it has been signed by the originators and approved by a director.

Revision	*V01*
Date	13/09/2024
Prepared by	A Wallace
Checked by	A Alsop
Authorised by	A Wallace

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EXECUTIVE SUMMARY

This Drainage Assessment reviews the existing drainage arrangement at the application site and proposes a surface water drainage strategy in line with Local Authority and Lead Local Flood Authority (LLFA) guidance.

The site is located at 24 Burgess Hill, London NW2 2DA

The proposed development comprises the extension and refurbishment of the site to form a dwelling with basement and associated external works.

Surface Water Drainage

The proposed strategy presented in detail in this report aims to reduce surface water discharge from the site to no greater than 2l/s. Discharge will be to the sewer in the street via the existing connection if possible, or a new connection if this cannot be located. Discharge will be subject to Thames Water approval.

An additional 10% allowance for urban creep has been included in the sizing of surface water storage.

Maintenance/management of all onsite drainage infrastructure has been considered within a separate maintenance plan appended to this report. This will be updated through the development process.

Thames Water approval will be required for the sewer connections.

Overall, the proposals provide runoff reduction and flooding protection for the proposed development and are in accordance with all requirements of the Lead Local Flood Authority (LLFA).

Foul Drainage

It is proposed to discharge the foul drainage from the site into the existing Thames Water sewer in the street via a new or existing connection.

1 INTRODUCTION

1.1 Background

1.1.1 Jomas was commissioned to undertake a Drainage Assessment for the proposed development of land located at 24 Burgess Hill, London NW2 2DA

1.1.2 The proposed development comprises the extension and refurbishment of the site to form a dwelling with basement and associated external works.

1.1.3 This Flooding and Drainage Assessment has been produced in support of a planning application and should be read in conjunction with the other planning documents.

2 SITE DESCRIPTION

2.1.1 The site is approximately 417 square metres in size and is occupied by an existing building and associated external works.

2.1.2 Pre-development, the site is 68% impermeable (285 square metres). Post development, the impermeable area remains the same.

2.1.3 The site location information is as follows:

- Nearest Postcode: NW2 2DA

2.2 Topography

Site Topography

2.2.1 A survey of the site has been completed. The site has a gentle fall from rear to front. The survey is provided in Appendix A.

3 DESIGN PRINCIPLES AND POLICY REQUIREMENTS

3.1.1 Since April 2015, Lead Local Flood Authorities (LLFA's) have become a statutory consultee on surface water drainage for many planning applications. For this site, the following is considered to be the required level of detail required for planning approval:

3.1.2 Report to be prepared in accordance with the National Planning Policy Framework (NPPF), the accompanying Planning Practice Guidance (PPG), Local Authority and Lead Local Flood Authority (LLFA) guidance and Strategic Flood Risk Assessments.

3.2 General Principles for Flooding

3.2.1 The National Planning Policy Framework (NPPF) states that when determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where informed by a site-specific FRA. This assessment is required for:

3.2.2 "Proposals of 1 hectare (ha) or greater in Flood Zone 1, all new development (including minor development and change of use) in Flood Zones 2 and 3 and an area within Flood Zone 1, which has critical drainage problems as notified to the local planning authority by the Environment Agency (EA)."

3.2.3 In accordance with the Planning Practice Guidance (PPG), which supports the NPPF, the objectives of this FRA are to establish:

- *Whether a proposed development is likely to be affected by current or future flooding from any source;*
- *Whether it will increase flood risk elsewhere;*
- *Whether the measures proposed to deal with these effects and risks are appropriate.*

3.3 General Principles for Surface Water Drainage

3.3.1 The DEFRA Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March, 2015), the Local Authority Flood Risk Management Strategy, Level 2 Strategic Flood Risk Assessment and the Local Flood Risk Management Strategy require sustainable drainage systems in all development to reduce surface water runoff and provide water treatment on site. This includes but is not limited to addressing the following issues in order of preference:

- Store rainwater for later use.
- Use infiltration techniques, such as porous surfaces in non-clay areas.
- Attenuate rainwater in ponds or open water features for gradual release.
- Attenuate rainwater by storing in tanks or sealed water features for gradual release.

- Discharge rainwater direct to a watercourse.
- Discharge rainwater to a surface water sewer/drain.
- Discharge rainwater to the combined sewer.

3.3.2 Consideration must be given to the direction of water flow across the site and where this may be dispersed and incorporating any features that will help reduce surface water run-off. All developments should follow the drainage hierarchy and aim to achieve greenfield run off with at least a 50% reduction in surface water discharge and this needs to be demonstrated as part of the planning submission.

4 FLOODING INFORMATION

4.1 Flood Risk from Rivers (Fluvial)

4.1.1 As the site is within Flood Zone 1 there is a low risk of fluvial flooding to the site.

4.1.2 Based on the above, the risk of flooding from rivers is considered Low.

4.2 Coastal and Tidal Flood Risk

4.2.1 The site is located inland and is not near any tidally influenced watercourses; therefore, there is negligible risk of flooding from this source.

4.3 Geology and Hydrogeology (Groundwater)

4.3.1 The British Geological Survey (BGS) mapping available on line suggests that the area is underlain by:

Bedrock

London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period.

Superficial deposits

None recorded

4.3.2 No onsite ground water testing is available for the site at the time of producing this report.

4.3.3 Due to the likely presence of impermeable ground, groundwater is unlikely to rise above ground level, hence the risk of flooding from ground water is considered Low. This will be mitigated through basement dewatering and pumping to ensure the risk of flooding is minimised.

4.4 Surface Water Flood Risk (Overland Flows)

4.4.1 Surface water flooding occurs when the rainwater does not drain away through the normal drainage system or infiltrate the ground, but instead lies on or flows over the ground.

4.4.2 The EA produced a Risk of Flooding from Surface Water Map in December 2013. The maps were produced using 'direct rainfall' modelling. Although they consider local drainage capacity, non-surface water influences such as rivers, seas or groundwater are not considered. The map is based on LIDAR topographic data which is not suitable for site specific assessment and therefore, where available, topographic survey data should be used to provide a more accurate understanding of potential flow paths.

4.4.3 The map shows the entire country within four different risk categories, defined below in Table 1.

Table 1: EA Surface Water Flood Risk Categories

Risk Category	Definition
High	Each year, there is a chance of flooding of greater than 1 in 30 (3.3%)
Medium	Each year, there is a chance of flooding of between 1 in 30 (3.3%) and 1 in 100 (1%)
Low	Each year, there is a chance of flooding of between 1 in 100 (1%) and 1 in 1000 (0.1%)
Very Low	Each year, there is a chance of flooding of less than 1 in 1000 (0.1%)

1.1.1 An extract of the map, provided below, shows that the area is generally at Low risk of surface water flooding.

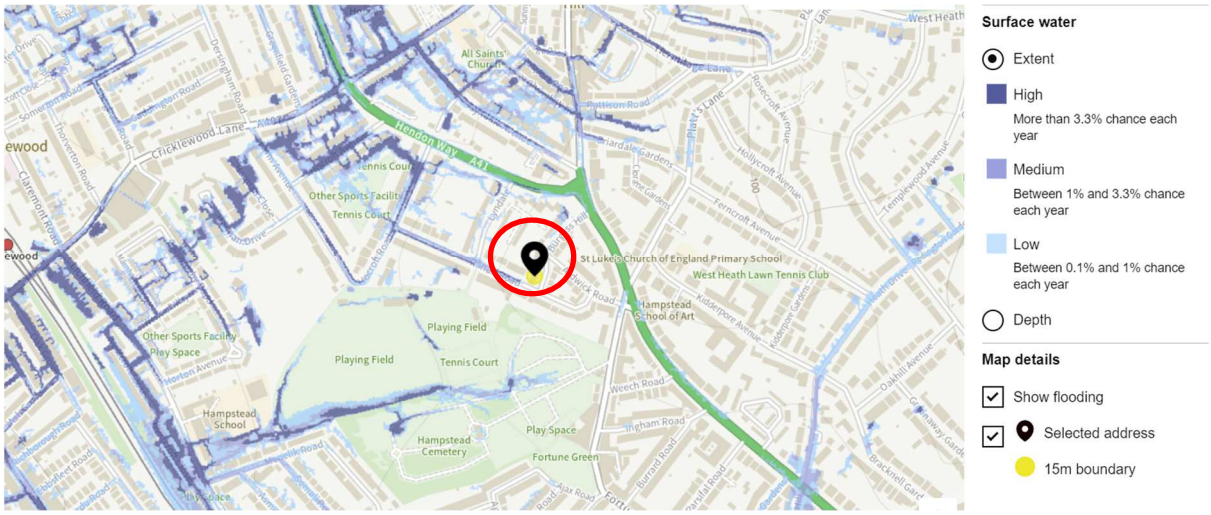


Figure 1: EA Flood Risk from Surface Water Map

4.4.4 Based on the EA's mapping, the local SFRA, historical data and local topography, the risk of surface water flooding to the site is considered to be Low. This will be further mitigated through pumps within the basement.

4.5 Sewer/Drainage Flood Risk

4.5.1 Sewer flooding is often caused by excess surface water entering the drainage system when there is insufficient sewer capacity to cope with this excess water, but also due to 'one off' events such as blockages.

4.5.2 Thames Water is the statutory undertaker for the local public sewer network. The nearest TW sewers are located within the street

4.5.3 As the natural topography of the site falls away towards the west, this indicates that the site is at low risk of sewer flooding.

4.5.4 There are no records within any local flooding and drainage documents of sewer flooding in the area.

4.5.5 Pumps are also proposed for the basement development further reducing the risk of flooding

4.5.6 On the basis there is considered to be a low risk of sewer flooding to the site.

4.6 Reservoir Flood Risk

4.6.1 The EA has produced a Reservoir Flood Map that shows that the site is at risk from reservoir flooding. This map indicates very low risk of reservoir flooding at this site.

4.6.2 It should be emphasised that the risk of flooding from reservoir breach is very small since the EA is the enforcement authority for the Reservoirs Act (1975) and all large raised reservoirs are inspected and supervised by reservoir panel engineers.

4.6.3 On the basis there is considered to be a negligible risk of reservoir flooding to the site.

4.7 Summary of Risk Levels

4.7.1 Pre-development, the risk of flooding is summarised below.

Table 2: Flood Risk Categories

Source	Risk Category
Fluvial (Rivers and Sea)	Low
Coastal and tidal	Negligible
Groundwater	Low
Surface water	Low
Sewers	Low
Reservoirs	Negligible

5 SITE DRAINAGE INFORMATION

5.1.1 The DEFRA Sustainable Drainage Systems Non-Statutory Technical Standards for Sustainable Drainage Systems (March, 2015) states that the following options must be considered for disposal of surface water runoff in order of preference:

- Discharge to ground
- Discharge to a surface water body
- Discharge to a surface water sewer
- Discharge to a combined sewer

5.1 Discharge to Ground

5.1.1 The potential for surface water to discharge to ground has been assessed through a review of the likely ground conditions and possible infiltration structures.

5.1.2 As the existing ground conditions are London clay, they are not suitable for infiltration. Borehole samples have been taken (See Appendix B) which confirms that the ground is impermeable.

5.2 Discharge to Surface Water Body

5.2.1 There nearest watercourse is too far from the site to be used for discharge of surface water.

5.3 Discharge to Surface Water Sewer/Combined Sewer

5.3.1 Discharge to the public sewer network should only be considered once all other options for draining surface water from the site have been exhausted.

5.3.2 As there is an existing combined water sewer running through road at the site frontage, surface water will discharge into this sewer.

5.4 Sustainable Drainage Systems (SuDS)

5.4.1 To maximise the potential use of SuDS at the site, a review has been undertaken as shown in Table 3 in accordance with the SuDS Hierarchy. This review highlights the components referenced in the SuDS Hierarchy and provides recommendations on whether the components could be incorporated into the development.

Table 3: SuDS Selection Based on the SuDS Hierarchy

Component	Recommendation
Green/Blue roofs	Whilst the use of green and blue roofs provides additional environmental benefits such as enhanced aesthetics and ecology, its exposure to wind and orientation must be considered. Access to undertake the construction and maintenance easily and safely is also a high priority. If feasible, depending on the roof design, a green/blue roof will provide water quality, biodiversity and aesthetic benefits to the site. Additionally, the green/blue roof/s will offer some attenuation for run-off, reducing volumes of run-off and in higher frequency events (i.e. 1in2 year storms) will result in no run-off for the building. The lightweight and pitched roofs are not suitable for green or blue roofs.
Basins and Ponds	Ponds and attenuation basins can provide overland storage of surface water whilst also providing additional biodiversity and aesthetic/amenity value. There are no open areas on the site which are suitable for basins or ponds.
Filter Strips and Swales	Swales are linear vegetated drainage features, which provide overland conveyance and storage of surface water whilst trapping sediments and hydrocarbons within run-off. They also create biodiverse areas for planting and habitat. Swales are not considered suitable for this site due to the urban setting restricting the availability of space.
Infiltration Devices	Infiltration devices are likely to be suitable for the main drainage system due to the permeable nature of the existing ground. Infiltration is not possible for this site.
Permeable Paving	Whilst incorporating attenuation storage, permeable paving also provides treatment through filtration of silt (and attached pollutants), settlement and retention of solids, adsorption of pollutants and biodegradation of organic pollutants, including petrol and diesel. Tanked permeable paving is proposed for the site frontage.
Tanked Systems	This is the least sustainable option in terms of the SuDS Hierarchy. However, the use of tanked systems would still be of benefit compared to traditional drainage systems as it does allow run-off to be slowed down to an acceptable discharge rate. There are no tanks proposed.

6 SURFACE WATER DRAINAGE DESIGN

6.1 Site Areas

6.1.1 The development area currently comprises an existing dwelling and hardstanding. The existing and proposed areas are summarised below.

Table 4: Site Areas

Parameter	Existing (m2)	Existing (%)	Proposed (m2)	Proposed (%)
Impermeable area	285	68	285	68
Permeable area	132	32	132	32
Total area	417	100	417	100

6.1.2 It is assumed that the surface water runoff from the site currently discharges into the TW sewer in the street.

6.2 Design Considerations

6.2.1 Consideration has been given to the following when calculating the proposed impermeable areas.

- The 2013 EA 'Rainfall Run-off Management for Developments' Report (SC030219) states that urban creep, the process of gradually increasing impermeable area within an urban area (through paving soft landscaped surfaces and constructed outbuildings etc), is an acknowledged issue. To include an allowance for urban creep, the impermeable area used in the drainage calculations has been increased by 10% in accordance with the recommendation made in SC030219.

6.2.2 The climate change allowance used in the Drainage Strategy is in line with updated EA guidance values published in February 2016 for increased rainfall intensities by 2115.

6.3 Greenfield Run-Off Rates

6.3.1 The existing run-off rates for a variety of return periods have been calculated using the Wallingford method.

6.3.2 The greenfield run-off rates are based on the parameters provided below in Table 5 and rates are below in table 6.

Table 5: Rural Run-off Calculator Parameters

Parameter	Value
Area (ha)	**0.0417**
SAAR (mm)	**650**

Soil Type	**4**

6.4 Existing Site Runoff Rates

6.4.1 The existing total site area is 417 square metres and is 68% impermeable. Taking conservative peak 1 year, 30 year and 100 year rainfall rates of 50mm/hr, 125mm/hr and 185mm/hr respectively, the maximum existing peak discharge rates have been calculated as follows.

Contributing Area (ha) x 1 yr Rainfall (mm/hr) x 2.78

285/10000 x 50 x 2.78 = **4.0 l/s**

Contributing Area (ha) x 30 yr Rainfall (mm/hr) x 2.78

285/10000 x 125 x 2.78 = **9.9 l/s**

Contributing Area (ha) x 100yr Rainfall (mm/hr) x 2.78

285/10000 x 185 x 2.78 = **14.7 l/s**

6.4.2 The discharge rates for the existing and proposed site are summarised below.

Table 6: Existing Run-off Rates

Parameter	Greenfield Discharge (l/s)	Existing Discharge (l/s)	Proposed Discharge (l/s)
QBAR	0.18	NA	NA
1 year	0.16	4.0	1.8
30 year	0.41	9.9	1.8
100 year	0.59	14.7	1.8
100 year +40%	NA	NA	1.9

6.5 Drainage Design

6.5.1 As infiltration is not possible on this site and greenfield rates are low, it is proposed to restrict discharge to 2l/s or less. Reducing the post development run-off discharge rate to the existing rate less than 2l/s is achieved through attenuation.

6.5.2 By controlling run-off rates and providing attenuation for all storm events up to and including a 1 in 100-year storm plus 40% climate change allowance, the risk of downstream flooding will be minimised.

6.5.3 Details of the drainage system and attenuation structures are presented in the design drawings and calculations in Appendix B.

6.5.4 The calculations include an assessment of the attenuation for the 100-year storm +40% climate change. A total volume of 9 cubic metres is proposed within the permeable paving subbase.

6.5.5 A basement dewatering system should also be investigated and included in the basement design.

6.6 Consents, Offsite Works and Diversions

6.6.1 The proposed surface water drainage strategy is accommodated entirely on site.

6.6.2 Consent will be required for the discharge to the Thames Water sewer.

6.7 Maintenance

6.7.1 A SuDS maintenance plan has been prepared to outline the management of the potential SuDS features. The maintenance plan is provided in Appendix C.

6.8 Exceedance Flooding and Overland Flow

6.8.1 The drainage system has been designed to cater for the 1 in 100 year + 40% climate change storm. ie in this storm event all surface water will be collected on site and slowly released. Thus, the overland flow route for the site drainage will only be in use in the event of drainage network failure, storms in excess of the 1 in 100 year + 40% climate change storm or flows from offsite flowing through the site. See Appendix C for overland flow plan.

6.9 Foul Drainage

6.9.1 Thames Water are the foul sewerage suppliers for the area.

6.9.2 The identified point of connection from the site is into the existing Combined sewer in the street.

7 DRAINAGE DURING CONSTRUCTION

7.1 Construction Run-off Management

7.1.1 Installing the surface water and foul drainage system, whilst managing temporary run-off, are key aspects of the construction works involved in any development. The information provided below is in accordance with the 'C698 Site handbook for the construction of SUDS' (CIRIA, 2007).

7.1.2 Please note that the measures recommended below are recommendations only and need to be confirmed at the construction stage by the client and the contractor.

7.2 Management of Construction (Including Drainage)

7.2.1 Drainage is typically an early activity in the construction stage of a development, taking form during the earthworks phase. However, final construction i.e. piped drainage system connections to the SuDS devices, should not take place until the end of site development work, unless a robust strategy for silt-removal is implemented prior to occupation of the site.

7.2.2 A plan for the management of construction (including phasing of works, details of any offsite works etc.) cannot be provided at this early stage, as construction work plans are not yet known. However, the following key points are general construction issues associated with SuDS which will be addressed when these plans are complete:

- Silt-laden waters from construction sites represent a common form of waterborne pollution;
- These silt-laden waters cannot enter SUDS drainage systems unless specifically designed to accept this as it can clog the systems and pollute receiving waters. Therefore, piped drainage systems should not be connected to the attenuation SuDS devices until the late stages of construction.
- Any gullies and piped systems should be capped off during construction and fully jetted and cleaned prior to connection to the attenuation SuDS devices.

7.3 Temporary Drainage During Construction

7.3.1 The three principal aspects of drainage control during construction are trapping sediment, conveying run-off, and controlling run-off.

7.3.2 Sediment traps and barriers can include basin traps and sediment fences (with any necessary boundary controls). The principal basins are to be installed after the construction site is accessed. Sediment fences and barriers will then be installed as needed during grading.

7.3.3 Conveyance of run-off can be achieved through small ditches/stream, storm drains, channels and sloped drains with sufficient inlet/outlet protection.

7.3.4 Slope stability needs to be considered when using any channels to convey run-off across the site into any basins etc.

7.3.5 Run-off control measures will need to be implemented in order not overwhelm the temporary system and cause flooding issues. Run-off rates from the site will be managed so they are no greater than pre-development or in keeping with the best practice guidance to minimise risk of blockage. Any additional conveyance measures are to be installed as needed during grading.

7.3.6 Run-off control to include provision of perimeter ditches or appropriate levels grading to direct any water from the construction site to remain on site.

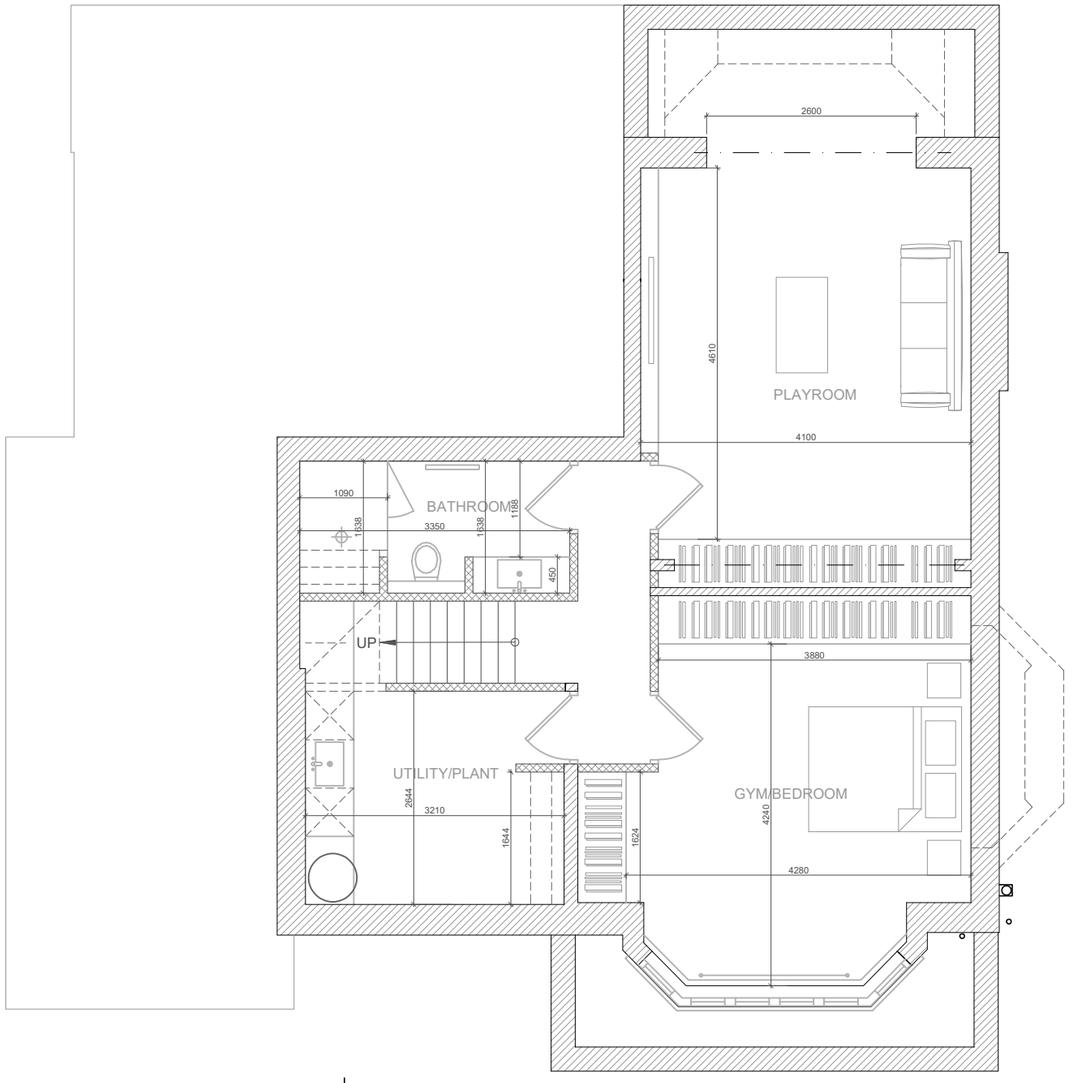
7.3.7 Any necessary surface stabilisation measures are to be applied immediately on all disturbed areas where construction work is either delayed or incomplete.

7.3.8 Maintenance inspections are to be performed weekly, and maintenance repairs to be made immediately after periods of rainfall.

7.4 Protection of Drainage Infrastructure during Construction

7.4.1 All drainage infrastructure should be protected from damage by construction traffic and heavy machinery through the implementation of measures such as protective barriers, and storing construction materials away from the drainage infrastructure.

APPENDIX A: PROPOSED DEVELOPMENT DETAILS



12 E PROPOSED LGF PLAN

NOT TO SCALE

CLIENT ISSUE

All shown dimensions to be used in preference to scaled dimensions.
Verify all dimenions on site prior to commencement of work.
All work shall conform to British Standards, Planning Approvals and Building Regulations.

ISSUE	DATE	AMENDMENT	ISSUE	DATE	AMENDMENT
A	10/11/2023	CLIENT ISSUE			
B	20/11/2023	CLIENT ISSUE			
C	23/11/2023	CLIENT ISSUE			
D	23/11/2023	CLIENT ISSUE			
E	23/01/2024	CLIENT ISSUE			

PROJECT
PROPOSED ALTERATIONS AND ADDITIONS

ADDRESS
24 Burgess Hill, London NW2 2DA

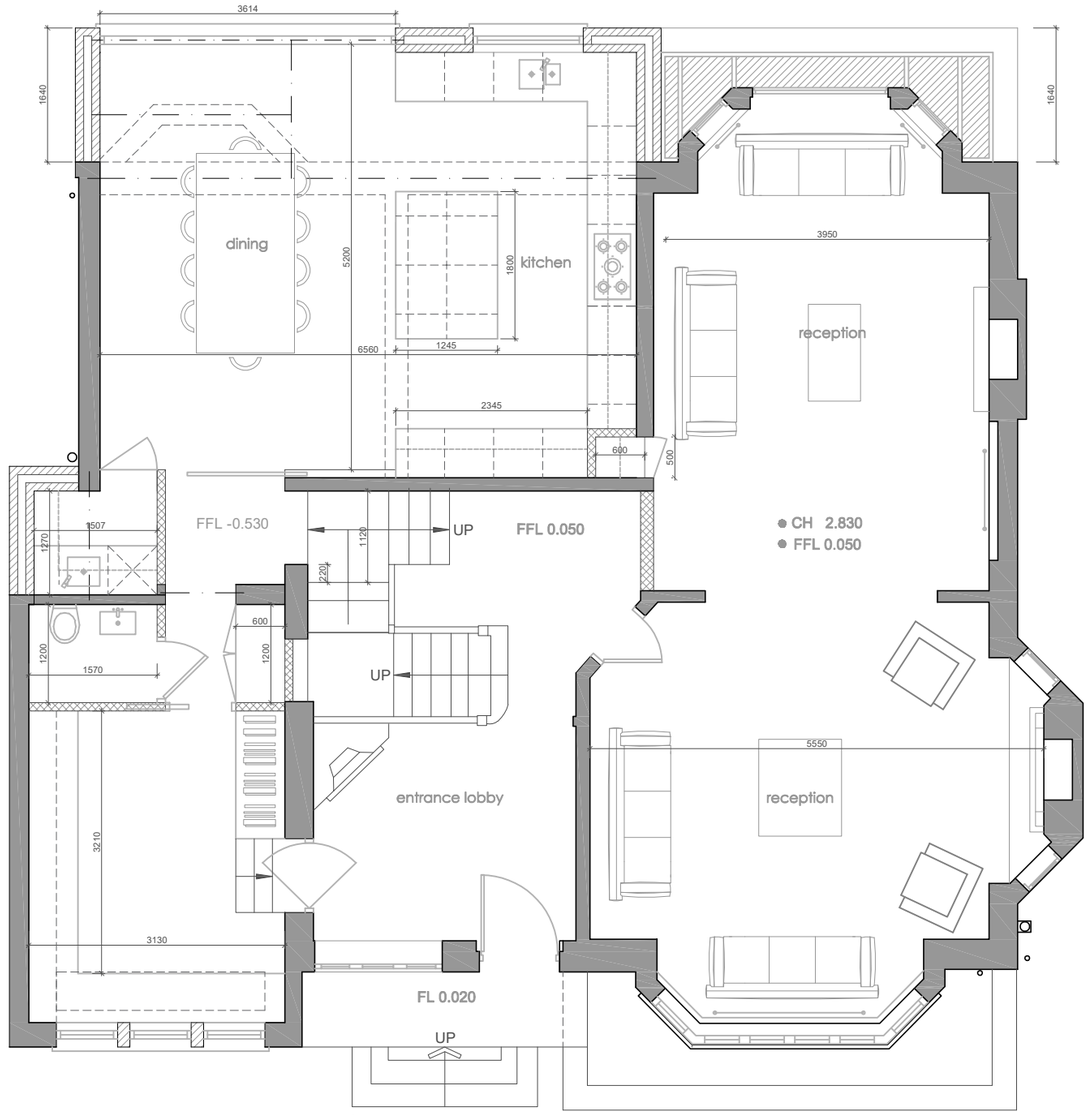
CLIENT
Mr.& Mrs.A. Durrani

VERVE CONCEPTS
VERVECONCEPTS.CO.UK
Verve Concepts Limited
Highway Farm, Cobham, Surrey, KT113JZ
INDUSTRY PARTNER
FOLLOW OUR PROJECTS

DRAWING
12 PROPOSED LGF PLAN

SCALE	DATE	DWN BY	PROJECT	DWG NO.
NTS	OCT 2023	RH	1033	12

E



13 H PROPOSED GF PLAN

NOT TO SCALE

CLIENT ISSUE

All shown dimensions to be used in preference to scaled dimensions.
Verify all dimenions on site prior to commencement of work.
All work shall conform to British Standards, Planning Approvals and Building Regulations.

ISSUE	DATE	AMENDMENT	ISSUE	DATE	AMENDMENT
A	03/11/2023	CLIENT ISSUE	F	23/11/2023	CLIENT ISSUE
B	10/11/2023	CLIENT ISSUE	G	23/01/2024	CLIENT ISSUE
C	20/11/2023	CLIENT ISSUE	H	08/02/2024	CLIENT ISSUE
D	20/11/2023	CLIENT ISSUE			
E	23/11/2023	CLIENT ISSUE			

PROJECT
PROPOSED ALTERATIONS AND ADDITIONS

ADDRESS
24 Burgess Hill, London NW2 2DA

CLIENT
Mr.& Mrs.A. Durrani

VERVE CONCEPTS
VERVECONCEPTS.CO.UK
Verve Concepts Limited
Highway Farm, Cobham, Surrey, KT113JZ
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13 PROPOSED GF PLAN

SCALE	DATE	DWN BY	PROJECT	DWG NO.
NTS	OCT 2023	RH	1033	13

H

APPENDIX B: DRAINAGE DRAWINGS AND CALCULATIONS

Asset Location Search

Thames Water Property Searches

andrew wallace
22Park Rise
HARPENDEN
AL5 3AL

Search address supplied 24
Burgess Hill
London
NW2 2DA

Your reference Burgess

Our reference ALS/ALS Standard/2024_5044213

Search date 3 September 2024

Notification of Price Changes

From 1st April 2024 Thames Water Property Searches will be increasing the prices of its CON29DW Residential and Commercial searches along with the Asset Location Search. Costs will rise in line with RPI as per previous years, which is sat at 6%.

Customers will be emailed with the new prices by February 28th 2024.

Any orders received with a higher payment prior to the 1st April 2024 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: 24, Burgess Hill, London, NW2 2DA

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

Asset Location Search

Thames Water Property Searches

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

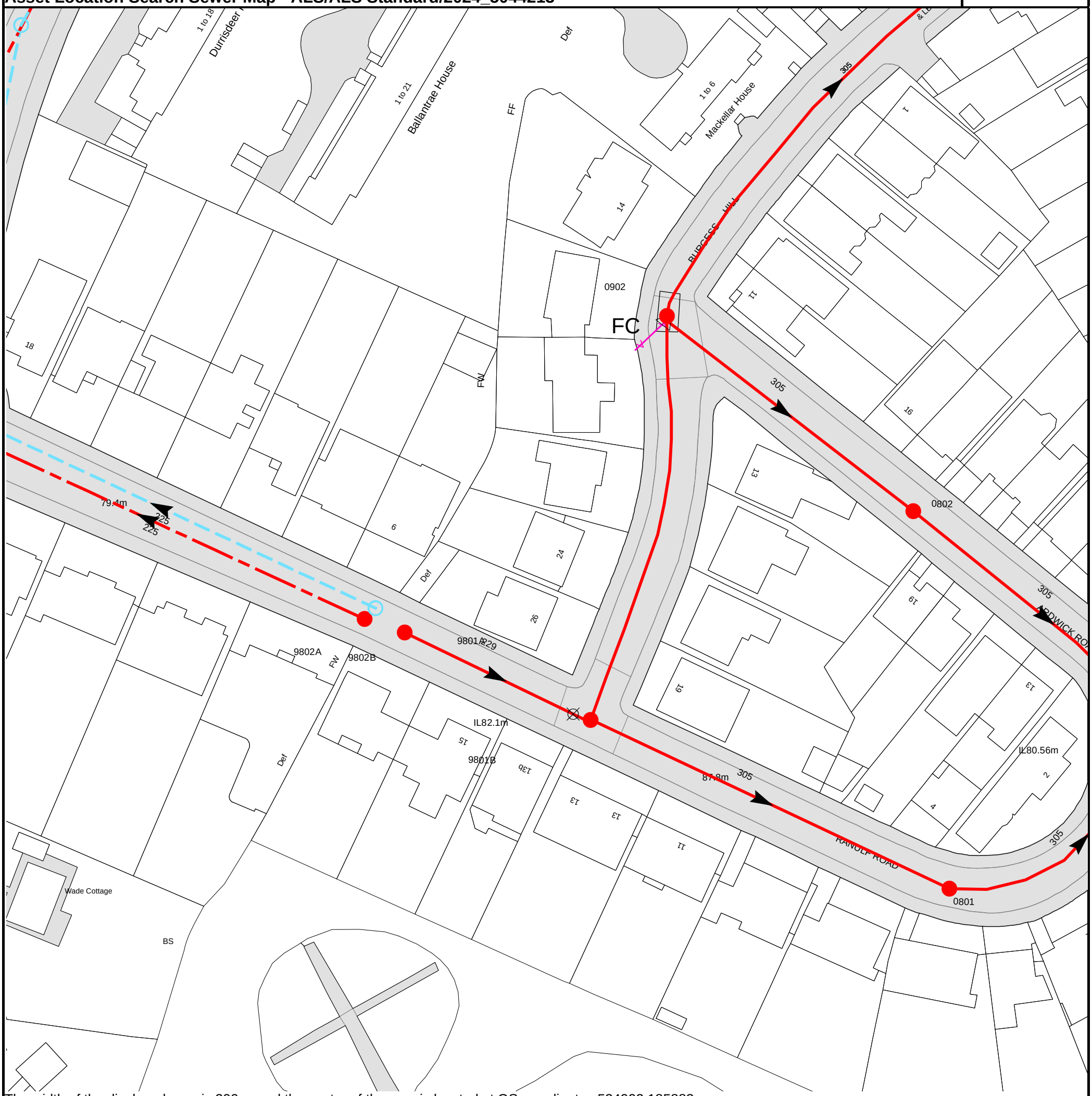
Clean Water queries

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/2024_5044213



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 524992,185883

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
8905	76.66	74.21
0801	88.37	81.2
9801B	86.51	82.02
9802A	84.26	82.44
9801A	83.61	81.3
9802B	83.6	81.9
0802	89.08	82.08
0902	86.08	n/a

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

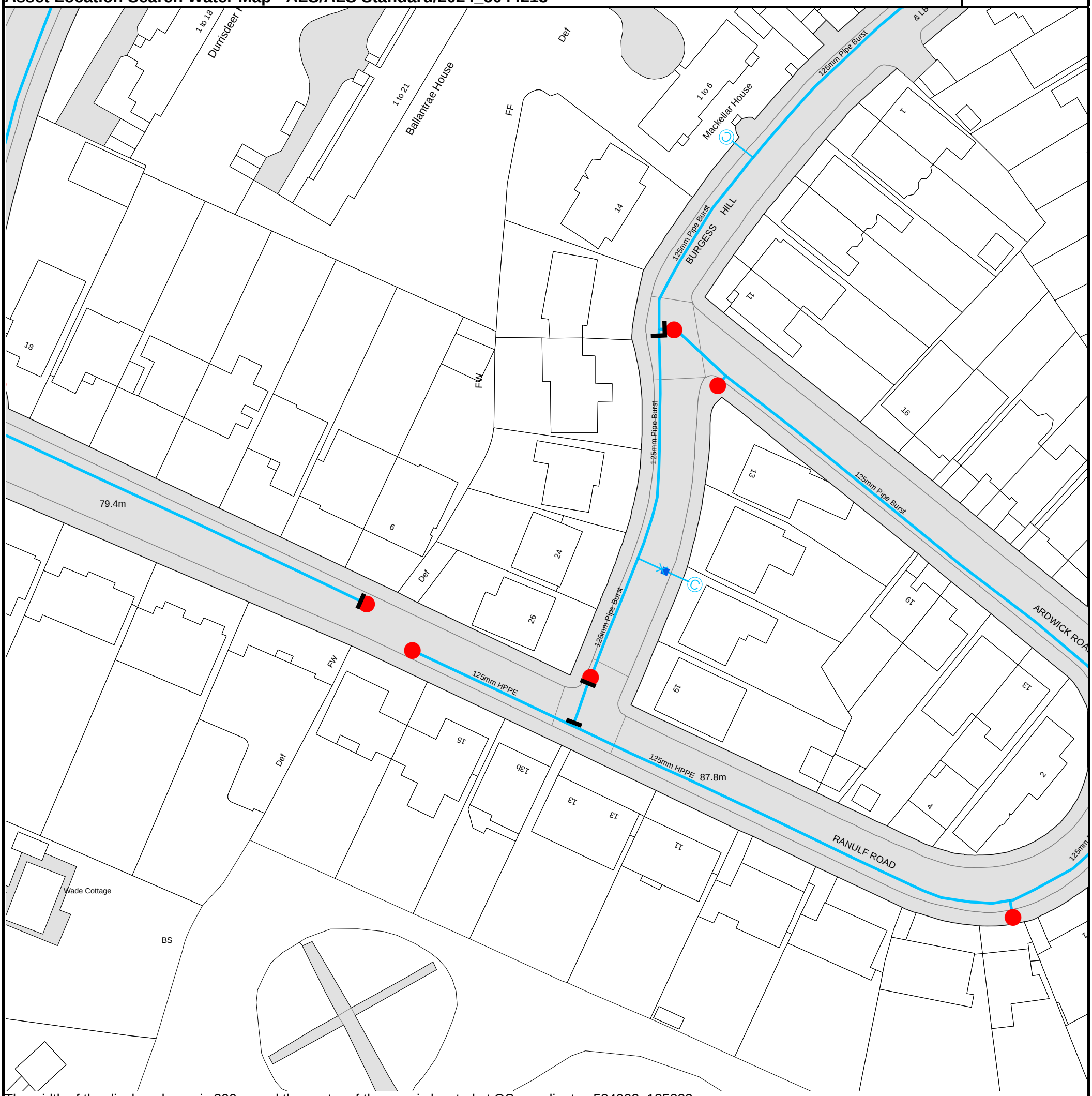
Ducts may contain high voltage cables. Please check with Thames Water.

- 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/2024_5044213



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 524992, 185883.

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 - Water Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

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.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

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 980 8800.

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

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	andrew wallace
Site name:	Burgess
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:	51.55837° N
Longitude:	0.19781° W
Reference:	3210850046
Date:	Sep 04 2024 14:15

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): .0417

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
SAAR (mm):	650	650
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

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. 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):	0.18	0.18
1 in 1 year (l/s):	0.16	0.16
1 in 30 years (l/s):	0.42	0.42
1 in 100 year (l/s):	0.59	0.59
1 in 200 years (l/s):	0.69	0.69

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WE LISTEN, WE PLAN, WE DELIVER

Geotechnical Engineering and Environmental Services across the UK

PRELIMINARY EXPLORATORY HOLE LOGS

FOR THE SITE AT

24 BURGESS HILL,
LONDON,
NW2 2DA

JOMAS ASSOCIATES LTD
Unit 24 Sarum Complex, Salisbury Road, Uxbridge Ub8 2RZ
www.jomasassociates.com 0333-305-9054 info@jomasassociates.com
Jomas Associates Ltd Registered in England and Wales No. 7095350

NOTE:

The attached logs are “preliminary” and are based on the observations made during the drilling and visual inspection of the samples.

All logs are subject to alteration or change on receipt of the laboratory testing.

Any comments relating to strength or relative density are based purely on in-situ testing.

PROJECT NAME	24 Burgess Hill, London, NW2 2DA	**CLIENT**	Verve Concepts Limited
TITLE	Completed Exploratory Hole Plan	**PROJECT NO.**	P5943J3029
DATE	August 2024	**FIGURE NO.**	-

JOMAS ENGINEERING ENVIRONMENTAL LAND REMEDIATION

WINDOWLESS SAMPLER RECORD

Borehole Number **WS1**

Project Name: 24 Burgess Hill	Client: Verve Concepts Limited	Date: 07/08/2024
Location: 24 Burgess Hill, London, NW2 2DA	Logged by: RAY	Co-ords: E525002.22 N185883.95
Project No. : P5943J3029	Crew Name: MD	Drilling Equipment: Windowless sampler

Log Status	Hole Type	Level	Approved By	Scale	Page Number
PRELIM	WS	84.07m AoD	JLW	1:30	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.10	83.97		Granite paving slabs. (MADE GROUND)
					0.25	83.82		Concrete. (MADE GROUND)
		0.35	ES					Brown sandy gravelly clay with occasional rootlets. Sand is fine to coarse. Gravel consists of fine to coarse, sub-angular to sub-rounded flint, with occasional brick. (MADE GROUND)
		0.50	D					
		0.50	ES					
		0.75	ES					
					0.80	83.27		Soft becoming stiff consistency** light orangish brown mottled brown CLAY. (LONDON CLAY FORMATION)
		1.00	ES					1
		1.20	SPT	N=7 (1,1/1,2,2,2)				
		1.50	D					
		2.00	SPT	N=11 (2,2/2,3,3,3)				2
		2.50	D					
		3.00	SPT	N=13 (2,2/3,3,3,4)				3
		3.50	D					
		3.50	ES					
		4.00	SPT	N=14 (2,3/3,3,4,4)				4
		4.50	D					
		5.00	SPT	N=17 (3,3/3,4,5,5)				5
		5.50	D					
		6.00	SPT	N=24 (3,4/5,6,6,7)				6

Remarks:

*Field description.

**Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.

Key:
ES - Environmental Sample
D - Small Disturbed Sample
B - Bulk Disturbed Sample
PID - Photo-ionisation Detector Reading

JOMAS ASSOCIATES LTD
Unit 24 Sarum Complex, Salisbury Road, Uxbridge UB8 2RZ
www.jomasassociates.com 0333-305-9054 info@jomasassociates.com

JOMAS ENGINEERING ENVIRONMENTAL LAND REMEDIATION

WINDOWLESS SAMPLER RECORD

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Log Status	Hole Type	Level	Approved By	Scale	Page Number
PRELIM	WS	84.07m AoD	JLW	1:30	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		6.50	D					Soft becoming stiff consistency** light orangish brown mottled brown CLAY. (LONDON CLAY FORMATION)
					6.70	77.37		
		7.00	SPT	N=24 (3,4/5,6,6,7)				Stiff consistency** grey CLAY. (LONDON CLAY FORMATION)
		7.50	D					
		7.50	ES					
		8.00	SPT	N=30 (5,6/6,7,8,9)	8.00	76.07		End of Borehole at 8.00m

7 8 9 10 11 12

Remarks:

*Field description.

**Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.

Key:
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JOMAS ENGINEERING ENVIRONMENTAL LAND REMEDIATION

WINDOWLESS SAMPLER RECORD

Borehole Number **WS2**

Project Name: 24 Burgess Hill	Client: Verve Concepts Limited	Date: 07/08/2024
Location: 24 Burgess Hill, London, NW2 2DA	Logged by: RAY	Co-ords: E525002.50 N185879.54
Project No. : P5943J3029	Crew Name: MD	Drilling Equipment: Windowless sampler

Log Status	Hole Type	Level	Approved By	Scale	Page Number
PRELIM	WS	84.08m AoD	JLW	1:30	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	83.98		Granite paving blocks. (MADE GROUND)
					0.25	83.83		Concrete. (MADE GROUND)
		0.30	ES					Light brown gravelly sand. Sand is fine to coarse. Gravel consists of fine to coarse, angular to sub-rounded flint and brick. (MADE GROUND)
		0.50	D					
		0.50	ES		0.60	83.48		
		0.75	ES					Orangish brown sandy gravelly clay with occasional rootlets. Sand is fine to coarse. Gravel consists of fine to coarse, sub-angular to sub-rounded flint, with occasional brick. (MADE GROUND)
					0.90	83.18		
		1.00	ES					Soft becoming firm consistency** light orangish brown mottled brown CLAY. (LONDON CLAY FORMATION)
		1.20	SPT	N=5 (1,1/1,1,1,2)				
		2.00	D					
		2.00	SPT	N=10 (2,2/2,2,3,3)				
		3.00	D					
		3.00	SPT	N=14 (2,3/3,3,4,4)				
		4.00	D					
		4.00	ES					
		4.00	SPT	N=15 (2,3/4,3,4,4)				
		5.00	D					
		5.00	SPT	N=16 (3,3/4,4,4,4)				
		6.00	D		6.00	78.08		

Remarks:

*Field description.

**Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.

Key:
ES - Environmental Sample
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Log Status	Hole Type	Level	Approved By	Scale	Page Number
PRELIM	WS	84.08m AoD	JLW	1:30	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		6.00	SPT	N=21 (3,3/4,5,6,6)				Stiff consistency** dark grey CLAY. (LONDON CLAY FORMATION)
		7.00	D					
		7.00	ES					
		7.00	SPT	N=22 (2,4/4,5,6,7)				
		7.90	D					
		8.00	SPT	N=24 (3,5/5,6,6,7)	8.00	76.08		End of Borehole at 8.00m

Remarks:

*Field description.

**Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.

Key:
ES - Environmental Sample
D - Small Disturbed Sample
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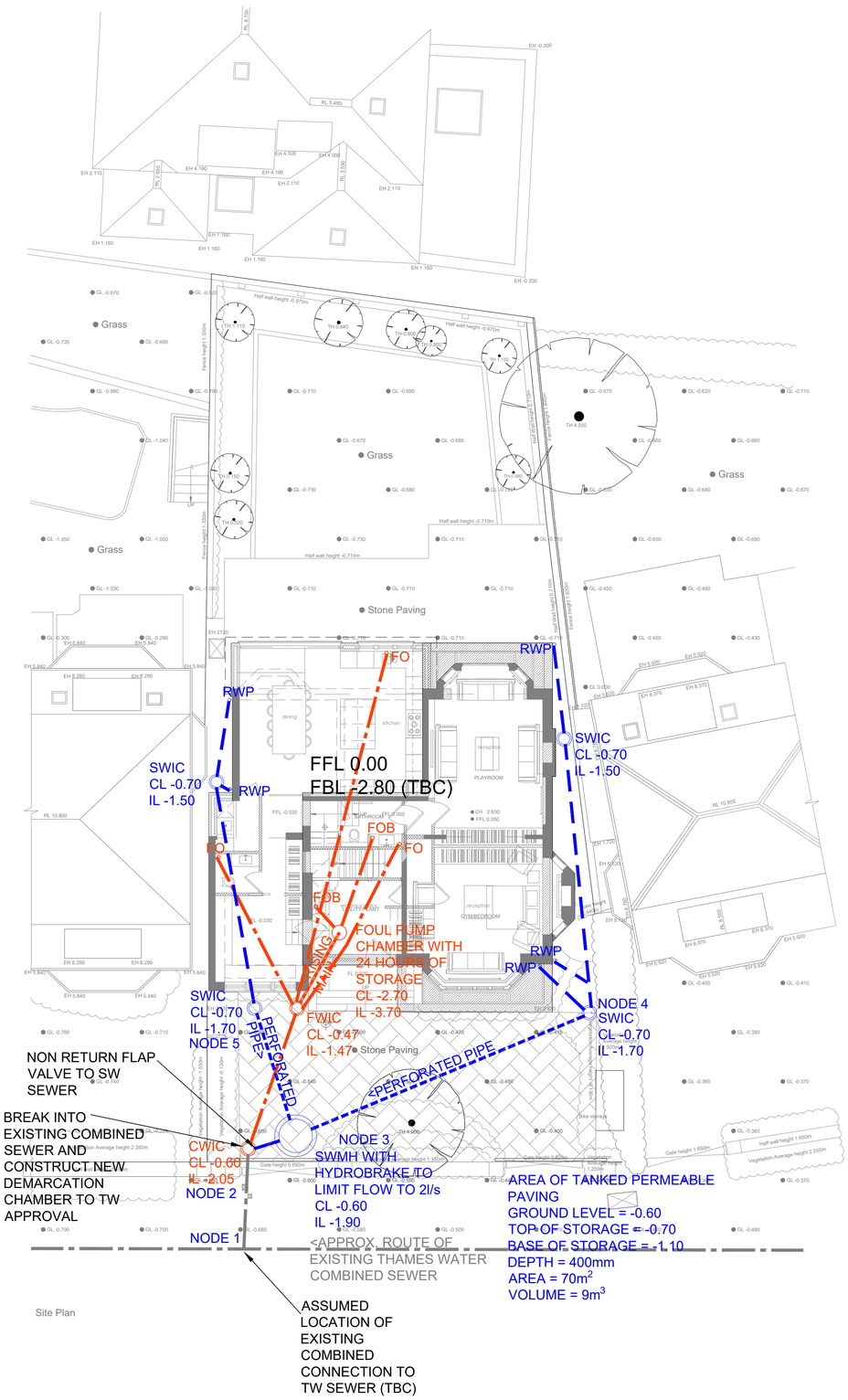
DRAINAGE KEY

Ø100@1:100>	Stormwater Pipe - Diameter and fall
Ø100@1:100>	Perforated Pipe - Diameter and fall
SMH Ø1200 CL 80.90 IL 80.00	Manhole type - SMH Surface Water Diameter Cover Level Invert Level
SWIC Ø450	Surface Water Polypropylene Inspection Chamber (PPIC)
RWP	Rain Water Pipe
Ø100@1:80>	Foul Pipe - Diameter and fall
FMH Ø1200 CL 80.90 IL 80.00	Manhole type - FMH Foul Water Diameter Cover Level Invert Level
FWIC Ø450	Foul Polypropylene Inspection Chamber (PPIC)
FO	Sewer Vent Pipe/Sub Stack/Foul Outlet
FOB	Basement Sewer Vent Pipe/Sub Stack/Foul Outlet
CWIC Ø450	Combined Polypropylene Inspection Chamber (PPIC)
	Permeable Paving - see detail

EXTERNAL WORKS KEY

18.30+	Proposed Level
FFL	Finished Floor Level
FBL	Finished Basement Level

ALL DIMENSIONS TO BE CHECKED BY CONTRACTOR
NOTE: CONTRACTOR TO NOTE THE LIKELY PRESENCE OF MULTIPLE EXISTING SERVICES.
ALL SERVICES TO BE CONFIRMED PRIOR TO CONSTRUCTION AND DIVERTED AS NECESSARY



Job No. P5943J3029 Rev.

DRAINAGE NOTES

1. THIS DRAWING IS FOR PLANNING ONLY AND IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SERIES DESIGN DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
2. CONSTRUCTION TO BE IN ACCORDANCE WITH ALL BRITISH AND EUROPEAN STANDARDS AND BUILDING REGULATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES ABOVE LOCAL DATUM.
4. ANY DISCREPANCIES IN THE DETAILS SHOWN ARE TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
5. ALL EXISTING SERVICES ARE TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY WORKS. THE CONTRACTOR MUST NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICT WITH THE PROPOSED WORKS.
6. THE GENERAL SPECIFICATION OF MATERIALS AND WORKMANSHIPS FOR THE CONSTRUCTION OF THE ACCESS ROAD, FOOTPATHS AND OTHER AREAS OF HARDSTANDING SHALL BE THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, VOLUME 1. SPECIFICATION OF HIGHWAY WORKS (SHW) PUBLISHED BY THE STATIONARY OFFICE.
7. ALL LEVELS SHOWN ARE ASSUMED ONLY AND SUBJECT TO SURVEY AND DETAILED DESIGN.
8. ALL RWP AND FO SHOWN ARE INDICATIVE ONLY AND SUBJECT TO APPROVAL AND SETTING OUT BY THE ARCHITECT.
9. NODE NUMBERS REFER TO DRAINAGE MODEL

Notes.

Key dimensions to be checked by engineer before major structural works commence on site.

1. This survey has been computed and drawn about O S National Grid.
2. All levels are in metres and relate to O S National Datum by GPS instruments.
3. This survey was measured for a scale of 1:100, any subsequent enlargements should be verified on site.

Amendments

Rev	Date		By	Chkd

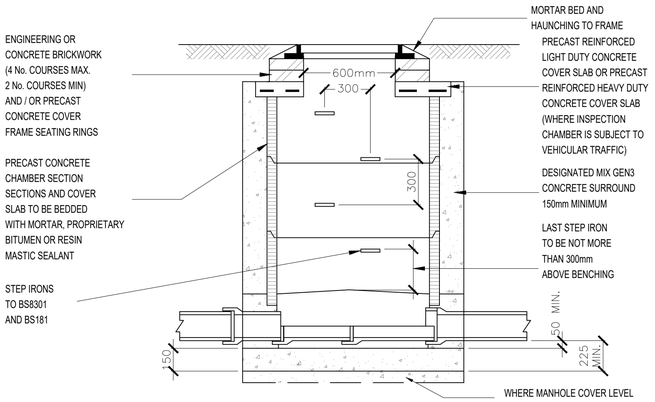
JOMAS
ENGINEERING ENVIRONMENTAL
Jomas Associates Ltd.
Unit 24 Sarum Complex,
Salisbury Road,
Uxbridge, UB8 2RZ

Client
Verve Concepts Limited

Project
24 Burgess Hill, London NW2 2DA

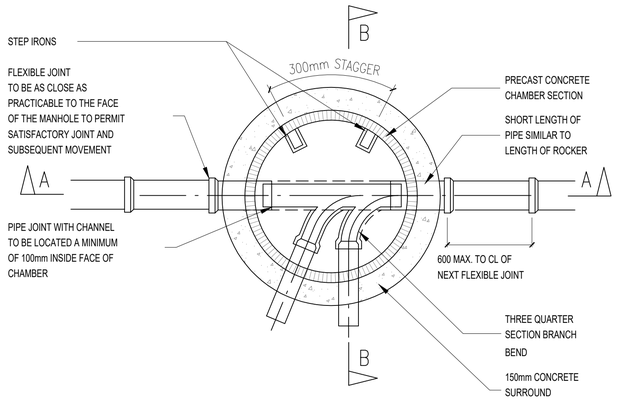
Drawing
Proposed Drainage Plan

Dwg no	Checked	Surveyor
C01	AW	NA
Date 13.09.24	Scale 1:100 @ A1	
Job No. P5943J3029		Rev. -
Grid	Contours	Level Datum

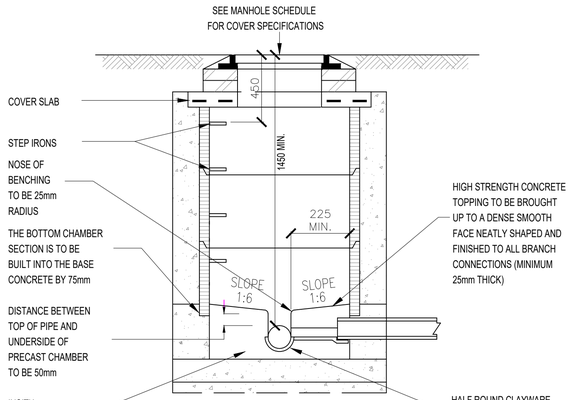


SECTION A-A

ALL MANHOLE BASE SLABS TO HAVE ONE LAYER A393 MESH CENTRALLY PLACED



PLAN



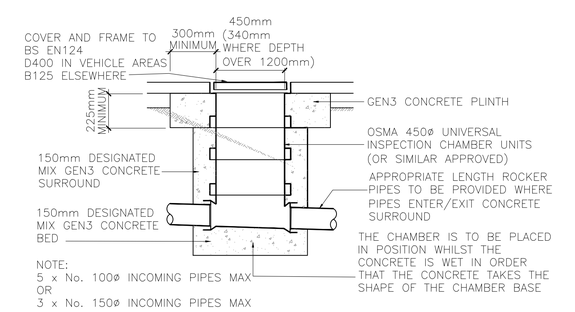
SECTION B-B

SCALE 1:20

PIPE DIAMETER	ROCKER PIPE * LENGTH
150mm-450mm	500mm-750mm
475mm-750mm	750mm-1000mm
OVER 750mm	1200mm

* OR LINTEL AND COMPRESSIBLE SEALANT IN ACCORDANCE WITH CLAUSE 689 OF THE SPECIFICATION.

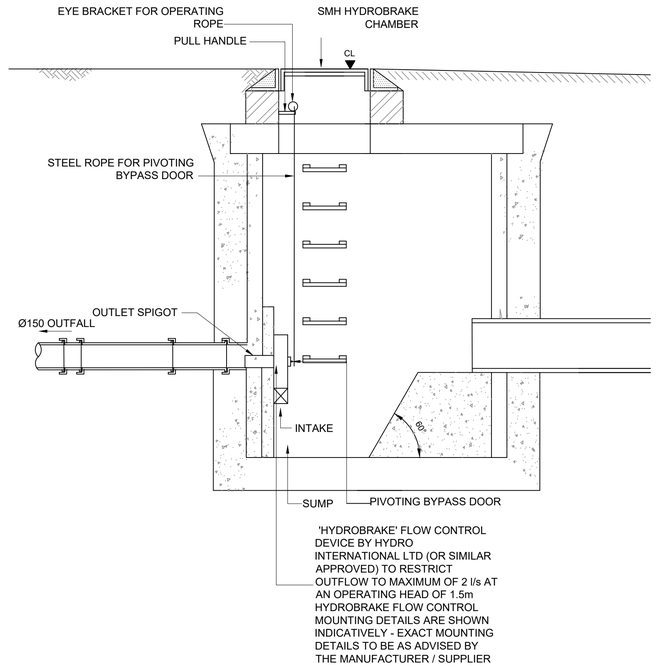
NOTES:
CHAMBERS WITH OUTGOING PIPES GREATER THAN 500mm DIAMETER SHALL BE FITTED WITH GUARD BARS, SAFETY CHAINS OR OTHER SAFETY DEVICES. TOE HOLES TO BE PROVIDED IN BENCHING OF SEWERS GREATER THAN 450mm DIAMETER FOR ACCESS TO INVERT. WHERE INTERNAL HEIGHT EXCEEDS 1800mm MANHOLE MAY BE PROVIDED WITH REDUCING COVER AND SHAFT. SHAFT DIAMETER TO BE 600mm DIAMETER OR 900mm DIAMETER IF LONGER THAN 900mm.



EXTERNAL POLYPROPYLENE INSPECTION CHAMBER (PPIC)

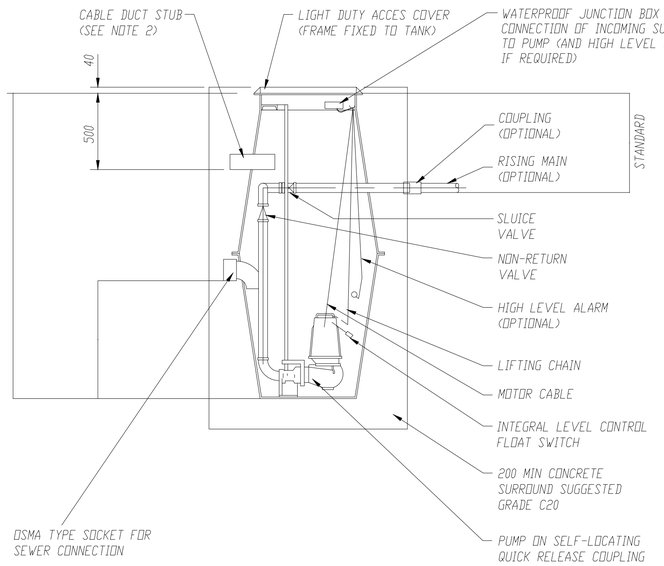
MAXIMUM DEPTH TO INVERT OF CHAMBER TO BE 1200mm (3000mm FOR REDUCED ACCESS)
CUT TO INTERMEDIATE SIZES

SCALE 1:20



TYPICAL SECTION THROUGH STORM HYDROBRAKE FLOW CONTROL

SCALE 1:20



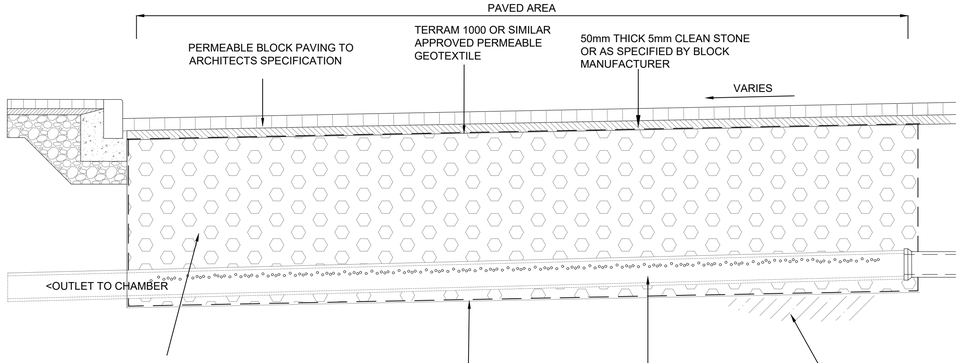
TYPICAL PACKAGE PUMP STATION DETAIL

SCALE 1:20

NOTE: PUMP DETAILS SHOWN INDICATIVELY ONLY AND DETAILED DESIGN SHOULD BE BY A SPECIALIST PUMP ORGANISATION SUCH AS DUTY POINT PUMPS

PUMP NOTES

1. ALL DIMENSIONS IN MILLIMETRES, UNLESS OTHERWISE STATED.
2. CABLE DUCT AND INLET SEWER(S) MAY BE POSITIONED AROUND PERIPHERY TO SUIT CLIENTS REASONABLE REQUIREMENTS. WHERE A PIPE POSITION COINCIDES WITH A STRUCTURAL JOINT IT WILL BE PLACED IN THE NEAREST POSSIBLE LOWER AND/OR ADJACENT LOCATION.
3. THE PUMPS SHALL BE PROGRAMMED TO WORK ALTERNATIVELY SO AS TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.
4. A HIGH WATER LEVEL FLOAT SHALL BE PROVIDED AT A HIGH LEVEL WHICH IS APPROXIMATELY 300mm BELOW THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHOULD START THE OTHER PUMP THAT IS NOT OPERATING
5. AN ALARM SYSTEM SHALL BE PROVIDED WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED WITHIN A COMMON AREA. THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE. CONTACT DETAILS FOR THE ORGANISATION RESPONSIBLE FOR MAINTAINING THE PUMP TO BE PROVIDED NEARBY TO THE ALARM SYSTEM



TANKED PERMEABLE PAVING DETAIL

SCALE 1:20

Job. No. P5943J3029 Rev.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SERIES DESIGN DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
2. CONSTRUCTION TO BE IN ACCORDANCE WITH ALL BRITISH AND EUROPEAN STANDARDS AND BUILDING REGULATIONS.
3. ANY DISCREPANCIES IN THE DETAILS SHOWN ARE TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION
4. ALL EXISTING SERVICES ARE TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY WORKS. THE CONTRACTOR MUST NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICT WITH THE PROPOSED WORKS.
5. FOR GRAVITY SEWERS, ALL DRAINAGE AND FITTINGS ARE TO BE FLEXIBLY JOINTED UPVC TO BS EN 1401-1 OR CLAYWARE TO BS EN295 OR CONCRETE TO BS5911 PART 100
6. CHAMBER WALLS 225 THICK TO BE CONSTRUCTED IN CLASS B ENGINEERING BRICKS TO SHW SERIES 2400 IN DESIGNATION (i) MORTAR OR IN-SITU STRENGTH CLASS C16/20 CONCRETE TO CLAUSE 2602
7. CHAMBER WALLS AND COVER SLAB TO BE CONSTRUCTED IN PRECAST CONCRETE TO BS EN 1917 AND BS 5911-3.
8. CONCRETE MIXES INDICATED ON THIS DRAWING ARE DESIGNATED MIXES IN ACCORDANCE WITH BS8500-1:2006. ALL CONCRETE TO BE SULPHATE RESISTANT
9. BACKFILL TO ALL TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL, ELSEWHERE BACKFILL TO BE IN ACCORDANCE WITH THE SPECIFICATION, FREE DRAINING READILY COMPACTIBLE MATERIAL, FREE FROM RUBBISH AND ORGANIC MATTER, FROZEN SOIL CLAY LUMPS AND LARGE STONES. TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.
10. A FLEXIBLE JOINT SHALL BE PROVIDED AS CLOSE AS IS FEASIBLE TO OUTSIDE FACE OF ANY STRUCTURE INTO WHICH A PIPE IS BUILT, IN ACCORDANCE WITH THE DETAIL.
11. THE GENERAL SPECIFICATION OF MATERIALS AND WORKMANSHIPS FOR THE CONSTRUCTION OF THE ACCESS ROAD FOOTPATHS AND OTHER AREAS OF HARDSTANDING SHALL BE THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, VOLUME 1, SPECIFICATION OF HIGHWAY WORKS (SHW) PUBLISHED BY THE STATIONARY OFFICE.
12. ALL PIPES TO BE LAID SOFFIT TO SOFFIT UNLESS NOTED OTHERWISE.
13. MANHOLE COVERS AND FRAMES SHALL COMPLY WITH BS EN124 AND SHALL BE OF A NON-ROCKING DESIGN WHICH DOES NOT RELY ON THE USE OF CUSHION INSERTS. CLASS D COVERS SHALL BE USED IN CARRIAGEWAYS, HARD SHOULDERS AND PARKING AREAS USED BY ALL TYPE OF ROAD VEHICLES. CLASS C SHALL BE USED IN FOOTWAYS, PEDESTRIAN AREAS AND ALL COMPARABLE LOCATIONS.

Notes.

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3. This survey was measured for a scale of 1:100, any subsequent enlargements should be verified on site.

Amendments

Rev	Date		By	Chkd

JOMAS
ENGINEERING ENVIRONMENTAL
Jomas Associates Ltd.
Unit 24 Sarum Complex,
Salisbury Road,
Uxbridge, UB8 2RZ

Client
Verve Concepts Limited

Project
24 Burgess Hill, London NW2 2DA

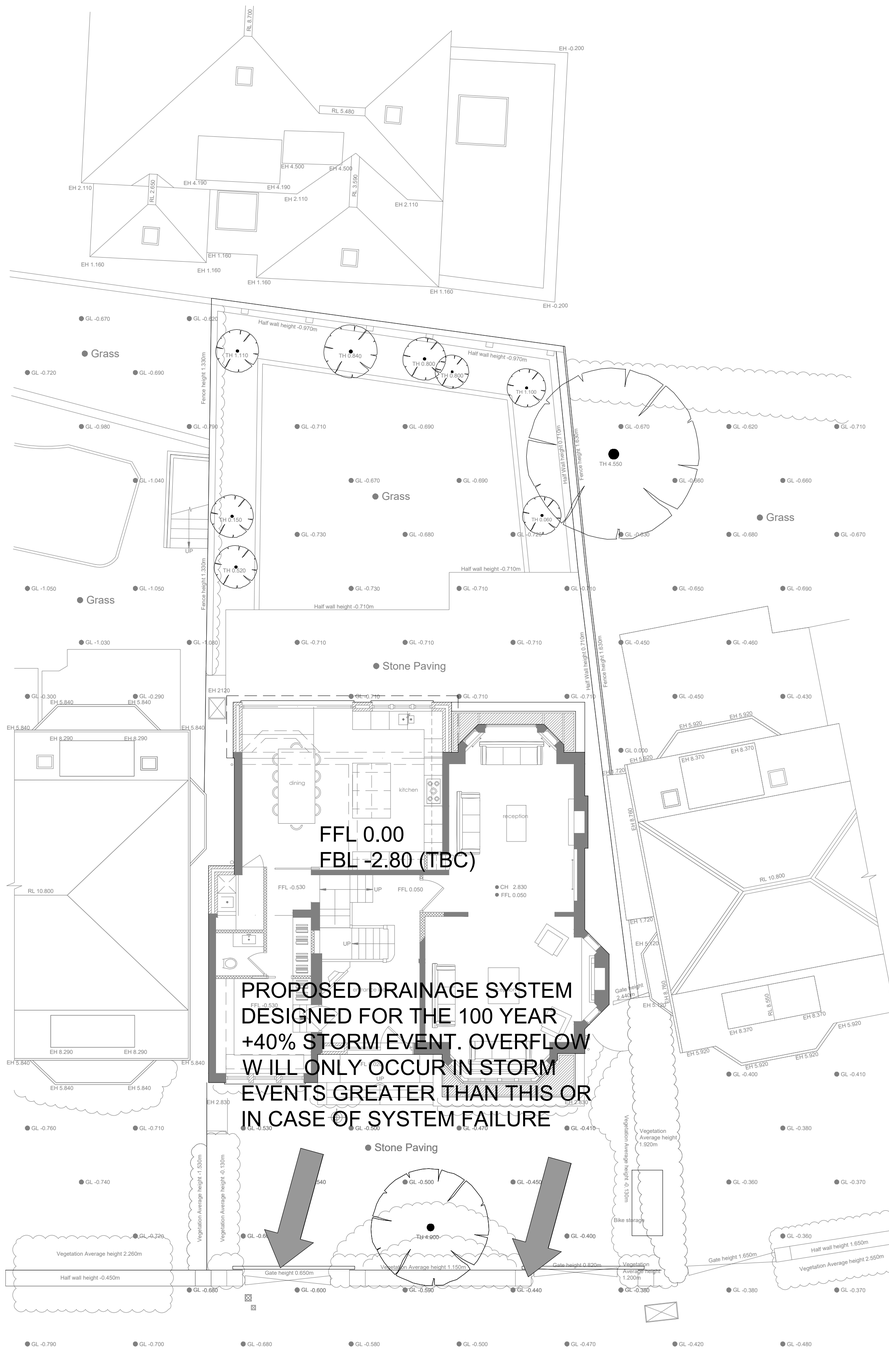
Drawing
Proposed Drainage Details

Dwg no	Checked	Surveyor
C02	AW	NA

Date 13.09.24 Scale AS SHOWN

Job No. P5943J3029 Rev. -

Grid | Contours | Level Datum



Site Plan

Job. No. P5943J3029 | Rev.

DRAINAGE NOTES

1. THIS DRAWING IS FOR PLANNING ONLY AND IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SERIES DESIGN DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
2. CONSTRUCTION TO BE IN ACCORDANCE WITH ALL BRITISH AND EUROPEAN STANDARDS AND BUILDING REGULATIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES ABOVE LOCAL DATUM.
4. ANY DISCREPANCIES IN THE DETAILS SHOWN ARE TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
5. ALL EXISTING SERVICES ARE TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY WORKS. THE CONTRACTOR MUST NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICT WITH THE PROPOSED WORKS.
6. THE GENERAL SPECIFICATION OF MATERIALS AND WORKMANSHIPS FOR THE CONSTRUCTION OF THE ACCESS ROAD, FOOTPATHS AND OTHER AREAS OF HARDSTANDING SHALL BE THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, VOLUME 1. SPECIFICATION OF HIGHWAY WORKS (SHW) PUBLISHED BY THE STATIONARY OFFICE.
7. ALL RWP AND FO SHOWN ARE INDICATIVE ONLY AND SUBJECT TO APPROVAL AND SETTING OUT BY THE ARCHITECT.
8. UNLESS NOTED OTHERWISE, PIPES TO BE:
   FOUL PIPES UNDER BUILDING ø100@1:40,
   FOUL PIPES EXTERNAL ø100@1:80,
   SURFACE WATER PIPES ø150@1:100

STORMWATER CONCEPT LEGEND

Overland flow

Notes.

Key dimensions to be checked by engineer before major structural works commence on site.

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Amendments

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Jomas Associates Ltd.
Unit 24 Sarum Complex,
Salisbury Road,
Uxbridge, UB8 2RZ

Client
Verve Concepts Limited

Project
24 Burgess Hill, London
NW2 2DA

Drawing
Proposed Overland Flow

Dwg no	Checked	Surveyor
C03	AW	NA

Date 13.09.24 | Scale 1:100 @ A1

Job No. P5943J3029 | Rev. -

Grid	Contours	Level Datum

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	10	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	2.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1			-0.680	450	100.000	100.000	1.520
2			-0.600	450	100.000	105.000	1.450
3	0.011	2.00	-0.600	1200	102.000	106.000	1.300
4	0.010	2.00	-0.700	450	110.000	110.000	1.000
5	0.010	2.00	-0.700	450	100.000	110.000	1.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.002	2	1	5.000	0.600	-2.050	-2.200	0.150	33.3	100	2.21	50.0
1.001	3	2	2.236	0.600	-1.900	-2.050	0.150	14.9	100	2.15	50.0
1.000	4	3	8.944	0.600	-1.700	-1.900	0.200	44.7	100	2.13	50.0
2.000	5	3	4.472	0.600	-1.700	-1.900	0.200	22.4	100	2.05	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.002	1.340	10.5	4.2	1.350	1.420	0.031	0.0	44	1.268
1.001	2.011	15.8	4.2	1.200	1.350	0.031	0.0	36	1.710
1.000	1.156	9.1	1.4	0.900	1.200	0.010	0.0	26	0.830
2.000	1.639	12.9	1.4	0.900	1.200	0.010	0.0	22	1.072

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
										2.99	50.0
										2.72	50.0
										2.46	50.0
										2.40	50.0

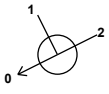
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.002	5.000	33.3	100	Circular	-0.600	-2.050	1.350	-0.680	-2.200	1.420
1.001	2.236	14.9	100	Circular	-0.600	-1.900	1.200	-0.600	-2.050	1.350
1.000	8.944	44.7	100	Circular	-0.700	-1.700	0.900	-0.600	-1.900	1.200
2.000	4.472	22.4	100	Circular	-0.700	-1.700	0.900	-0.600	-1.900	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	2	450	Manhole	Adoptable	1	450	Manhole	Adoptable
1.001	3	1200	Manhole	Adoptable	2	450	Manhole	Adoptable
1.000	4	450	Manhole	Adoptable	3	1200	Manhole	Adoptable
2.000	5	450	Manhole	Adoptable	3	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
1	100.000	100.000	-0.680	1.520	450		1	1.002	-2.200	100
2	100.000	105.000	-0.600	1.450	450		1	1.001	-2.050	100
							0	1.002	-2.050	100
3	102.000	106.000	-0.600	1.300	1200		1	2.000	-1.900	100
							2	1.000	-1.900	100
							0	1.001	-1.900	100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
4	110.000	110.000	-0.700	1.000	450	 0	1.000	-1.700	100
5	100.000	110.000	-0.700	1.000	450	 0	2.000	-1.700	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	-1.900	Product Number	CTL-SHE-0064-2000-1200-2000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	-1.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	49

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	70.0	0.0	0.400	70.0	0.0	0.401	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	109.521	30.991
1 year 15 minute winter	76.857	30.991
1 year 30 minute summer	71.439	20.215
1 year 30 minute winter	50.133	20.215
1 year 60 minute summer	48.435	12.800
1 year 60 minute winter	32.179	12.800
1 year 120 minute summer	30.053	7.942
1 year 120 minute winter	19.966	7.942
1 year 180 minute summer	23.233	5.979
1 year 180 minute winter	15.102	5.979
1 year 240 minute summer	18.475	4.882
1 year 240 minute winter	12.274	4.882
1 year 360 minute summer	14.169	3.646
1 year 360 minute winter	9.210	3.646
1 year 480 minute summer	11.185	2.956
1 year 480 minute winter	7.431	2.956
1 year 600 minute summer	9.182	2.511
1 year 600 minute winter	6.274	2.511
1 year 720 minute summer	8.203	2.199
1 year 720 minute winter	5.513	2.199
1 year 960 minute summer	6.768	1.782
1 year 960 minute winter	4.483	1.782
1 year 1440 minute summer	4.949	1.326
1 year 1440 minute winter	3.326	1.326
1 year 2160 minute summer	3.574	0.988
1 year 2160 minute winter	2.462	0.988
1 year 2880 minute summer	2.986	0.800
1 year 2880 minute winter	2.007	0.800
1 year 4320 minute summer	2.276	0.595
1 year 4320 minute winter	1.499	0.595
1 year 5760 minute summer	1.885	0.483
1 year 5760 minute winter	1.220	0.483
1 year 7200 minute summer	1.609	0.410
1 year 7200 minute winter	1.038	0.410
1 year 8640 minute summer	1.409	0.359
1 year 8640 minute winter	0.910	0.359
1 year 10080 minute summer	1.260	0.322
1 year 10080 minute winter	0.813	0.322
10 year 15 minute summer	211.819	59.937
10 year 15 minute winter	148.645	59.937
10 year 30 minute summer	136.831	38.718
10 year 30 minute winter	96.022	38.718
10 year 60 minute summer	90.826	24.003
10 year 60 minute winter	60.342	24.003
10 year 120 minute summer	54.899	14.508
10 year 120 minute winter	36.474	14.508
10 year 180 minute summer	41.666	10.722
10 year 180 minute winter	27.084	10.722
10 year 240 minute summer	32.645	8.627
10 year 240 minute winter	21.689	8.627
10 year 360 minute summer	24.632	6.339
10 year 360 minute winter	16.012	6.339

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
10 year 480 minute summer	19.260	5.090
10 year 480 minute winter	12.796	5.090
10 year 600 minute summer	15.690	4.291
10 year 600 minute winter	10.720	4.291
10 year 720 minute summer	13.925	3.732
10 year 720 minute winter	9.358	3.732
10 year 960 minute summer	11.365	2.993
10 year 960 minute winter	7.528	2.993
10 year 1440 minute summer	8.174	2.191
10 year 1440 minute winter	5.493	2.191
10 year 2160 minute summer	5.799	1.603
10 year 2160 minute winter	3.996	1.603
10 year 2880 minute summer	4.788	1.283
10 year 2880 minute winter	3.218	1.283
10 year 4320 minute summer	3.587	0.938
10 year 4320 minute winter	2.362	0.938
10 year 5760 minute summer	2.932	0.751
10 year 5760 minute winter	1.898	0.751
10 year 7200 minute summer	2.475	0.631
10 year 7200 minute winter	1.597	0.631
10 year 8640 minute summer	2.148	0.548
10 year 8640 minute winter	1.387	0.548
10 year 10080 minute summer	1.906	0.486
10 year 10080 minute winter	1.230	0.486
30 year 15 minute summer	268.706	76.035
30 year 15 minute winter	188.566	76.035
30 year 30 minute summer	174.929	49.499
30 year 30 minute winter	122.757	49.499
30 year 60 minute summer	116.589	30.811
30 year 60 minute winter	77.459	30.811
30 year 120 minute summer	70.438	18.615
30 year 120 minute winter	46.797	18.615
30 year 180 minute summer	53.298	13.715
30 year 180 minute winter	34.645	13.715
30 year 240 minute summer	41.604	10.995
30 year 240 minute winter	27.641	10.995
30 year 360 minute summer	31.221	8.034
30 year 360 minute winter	20.295	8.034
30 year 480 minute summer	24.324	6.428
30 year 480 minute winter	16.160	6.428
30 year 600 minute summer	19.756	5.404
30 year 600 minute winter	13.498	5.404
30 year 720 minute summer	17.490	4.687
30 year 720 minute winter	11.754	4.687
30 year 960 minute summer	14.215	3.743
30 year 960 minute winter	9.416	3.743
30 year 1440 minute summer	10.161	2.723
30 year 1440 minute winter	6.829	2.723
30 year 2160 minute summer	7.160	1.979
30 year 2160 minute winter	4.933	1.979
30 year 2880 minute summer	5.883	1.577
30 year 2880 minute winter	3.953	1.577

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 4320 minute summer	4.374	1.143
30 year 4320 minute winter	2.880	1.143
30 year 5760 minute summer	3.554	0.910
30 year 5760 minute winter	2.301	0.910
30 year 7200 minute summer	2.987	0.762
30 year 7200 minute winter	1.928	0.762
30 year 8640 minute summer	2.583	0.659
30 year 8640 minute winter	1.667	0.659
30 year 10080 minute summer	2.284	0.583
30 year 10080 minute winter	1.474	0.583
100 year 15 minute summer	348.738	98.681
100 year 15 minute winter	244.728	98.681
100 year 30 minute summer	228.965	64.789
100 year 30 minute winter	160.677	64.789
100 year 60 minute summer	153.288	40.510
100 year 60 minute winter	101.841	40.510
100 year 120 minute summer	92.562	24.461
100 year 120 minute winter	61.496	24.461
100 year 180 minute summer	69.806	17.964
100 year 180 minute winter	45.376	17.964
100 year 240 minute summer	54.269	14.342
100 year 240 minute winter	36.055	14.342
100 year 360 minute summer	40.484	10.418
100 year 360 minute winter	26.315	10.418
100 year 480 minute summer	31.414	8.302
100 year 480 minute winter	20.871	8.302
100 year 600 minute summer	25.431	6.956
100 year 600 minute winter	17.376	6.956
100 year 720 minute summer	22.452	6.017
100 year 720 minute winter	15.089	6.017
100 year 960 minute summer	18.166	4.784
100 year 960 minute winter	12.033	4.784
100 year 1440 minute summer	12.896	3.456
100 year 1440 minute winter	8.667	3.456
100 year 2160 minute summer	9.021	2.493
100 year 2160 minute winter	6.216	2.493
100 year 2880 minute summer	7.371	1.975
100 year 2880 minute winter	4.954	1.975
100 year 4320 minute summer	5.435	1.421
100 year 4320 minute winter	3.579	1.421
100 year 5760 minute summer	4.390	1.124
100 year 5760 minute winter	2.841	1.124
100 year 7200 minute summer	3.670	0.936
100 year 7200 minute winter	2.368	0.936
100 year 8640 minute summer	3.160	0.806
100 year 8640 minute winter	2.039	0.806
100 year 10080 minute summer	2.784	0.710
100 year 10080 minute winter	1.797	0.710
100 year +40% CC 15 minute summer	488.233	138.153
100 year +40% CC 15 minute winter	342.620	138.153
100 year +40% CC 30 minute summer	320.551	90.705
100 year +40% CC 30 minute winter	224.948	90.705

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 60 minute summer	214.603	56.713
100 year +40% CC 60 minute winter	142.577	56.713
100 year +40% CC 120 minute summer	129.587	34.246
100 year +40% CC 120 minute winter	86.094	34.246
100 year +40% CC 180 minute summer	97.729	25.149
100 year +40% CC 180 minute winter	63.526	25.149
100 year +40% CC 240 minute summer	75.977	20.078
100 year +40% CC 240 minute winter	50.477	20.078
100 year +40% CC 360 minute summer	56.677	14.585
100 year +40% CC 360 minute winter	36.841	14.585
100 year +40% CC 480 minute summer	43.979	11.622
100 year +40% CC 480 minute winter	29.219	11.622
100 year +40% CC 600 minute summer	35.604	9.738
100 year +40% CC 600 minute winter	24.327	9.738
100 year +40% CC 720 minute summer	31.433	8.424
100 year +40% CC 720 minute winter	21.125	8.424
100 year +40% CC 960 minute summer	25.432	6.697
100 year +40% CC 960 minute winter	16.847	6.697
100 year +40% CC 1440 minute summer	18.055	4.839
100 year +40% CC 1440 minute winter	12.134	4.839
100 year +40% CC 2160 minute summer	12.630	3.490
100 year +40% CC 2160 minute winter	8.702	3.490
100 year +40% CC 2880 minute summer	10.319	2.766
100 year +40% CC 2880 minute winter	6.935	2.766
100 year +40% CC 4320 minute summer	7.609	1.989
100 year +40% CC 4320 minute winter	5.011	1.989
100 year +40% CC 5760 minute summer	6.145	1.573
100 year +40% CC 5760 minute winter	3.978	1.573
100 year +40% CC 7200 minute summer	5.137	1.311
100 year +40% CC 7200 minute winter	3.316	1.311
100 year +40% CC 8640 minute summer	4.424	1.129
100 year +40% CC 8640 minute winter	2.855	1.129
100 year +40% CC 10080 minute summer	3.897	0.994
100 year +40% CC 10080 minute winter	2.515	0.994

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	16	-2.172	0.028	1.8	0.0000	0.0000	OK
15 minute summer	2	16	-2.021	0.029	1.8	0.0046	0.0000	OK
15 minute winter	3	12	-1.509	0.391	3.8	0.4420	0.0000	SURCHARGED
15 minute winter	4	12	-1.508	0.192	1.7	0.0305	0.0000	SURCHARGED
15 minute winter	5	12	-1.509	0.191	2.2	0.0304	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	2	1.002	1	1.8	0.964	0.168	0.0092	1.8
15 minute winter	3	Hydro-Brake®	2	1.8				
15 minute winter	4	1.000	3	1.2	0.233	0.132	0.0700	
15 minute winter	5	2.000	3	1.2	0.325	0.096	0.0350	

Results for 10 year Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	1	88	-2.172	0.028	1.8	0.0000	0.0000	OK
120 minute summer	2	88	-2.021	0.029	1.8	0.0046	0.0000	OK
30 minute winter	3	24	-1.084	0.816	4.0	1.2761	0.0000	SURCHARGED
30 minute winter	4	24	-1.083	0.617	2.2	0.0981	0.0000	SURCHARGED
30 minute winter	5	24	-1.083	0.617	2.2	0.0980	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	2	1.002	1	1.8	0.964	0.168	0.0092	6.6
30 minute winter	3	Hydro-Brake®	2	1.8				
30 minute winter	4	1.000	3	1.4	0.277	0.153	0.0700	
30 minute winter	5	2.000	3	1.1	0.386	0.089	0.0350	

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	1	156	-2.172	0.028	1.8	0.0000	0.0000	OK
240 minute summer	2	156	-2.021	0.029	1.8	0.0046	0.0000	OK
30 minute winter	3	25	-1.035	0.865	8.5	2.3623	0.0000	SURCHARGED
30 minute winter	4	25	-1.034	0.666	2.9	0.1059	0.0000	SURCHARGED
30 minute winter	5	25	-1.034	0.666	2.9	0.1059	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	2	1.002	1	1.8	0.964	0.168	0.0092	10.4
30 minute winter	3	Hydro-Brake®	2	1.8				
30 minute winter	4	1.000	3	2.7	0.345	0.298	0.0700	
30 minute winter	5	2.000	3	2.8	0.424	0.220	0.0350	

Results for 100 year Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	1	29	-2.172	0.028	1.8	0.0000	0.0000	OK
30 minute winter	2	29	-2.021	0.029	1.8	0.0047	0.0000	OK
30 minute winter	3	29	-0.958	0.942	10.7	4.0655	0.0000	SURCHARGED
30 minute winter	4	28	-0.957	0.743	3.7	0.1182	0.0000	FLOOD RISK
30 minute winter	5	29	-0.957	0.743	3.7	0.1181	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	2	1.002	1	1.8	0.968	0.171	0.0093	8.5
30 minute winter	3	Hydro-Brake®	2	1.8				
30 minute winter	4	1.000	3	3.3	0.420	0.362	0.0700	
30 minute winter	5	2.000	3	3.3	0.448	0.254	0.0350	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	1	49	-2.171	0.029	1.9	0.0000	0.0000	OK
60 minute winter	2	49	-2.020	0.030	1.9	0.0048	0.0000	OK
60 minute winter	3	49	-0.822	1.078	9.6	7.0571	0.0000	FLOOD RISK
60 minute winter	4	51	-0.821	0.879	3.3	0.1397	0.0000	FLOOD RISK
60 minute winter	5	51	-0.822	0.878	3.3	0.1396	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	2	1.002	1	1.9	0.983	0.181	0.0097	14.7
60 minute winter	3	Hydro-Brake®	2	1.9				
60 minute winter	4	1.000	3	2.9	0.377	0.325	0.0700	
60 minute winter	5	2.000	3	3.0	0.377	0.229	0.0350	

APPENDIX C: MAINTENANCE REPORT

JOMAS ENGINEERING ENVIRONMENTAL LAND REMEDIATION

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DRAINAGE MAINTENANCE PLAN

24 Burgess Hill, London, NW2 2DA

JOMAS ASSOCIATES LTD

Unit 24 Sarum Complex, Salisbury Road, Uxbridge, UB8 2RZ

www.jomasassociates.com info@jomasassociates.com

Report Title: **Drainage and SUDS Maintenance Plan for** 24 Burgess Hill, London, NW2 2DA

Report Status: **Final**

Job No: **P5943J3029**

Date: **September 2024**

Control: Previous Release

Version	Date	Issued By
V1.0	13/09/2024	A Wallace

Prepared by: **JOMAS ASSOCIATES LTD** **For:** **Verve Concepts Limited**

Should you have any queries relating to this report, please contact

JOMAS ASSOCIATES LTD

www.jomasassociates.com

0843 289 2187

info@jomasassociates.com

1.1 General

1.1.1 Sustainable Drainage Systems (SuDS) are an environmentally friendly approach to managing rainfall. SuDS techniques use landscape features to deal with surface water with the aim to:

- Control the flow, volume and frequency of water leaving a development.
- Prevent pollution by intercepting silt and cleaning runoff from hard surfaces.
- Provide attractive surroundings for the community.

1.1.2 The surface water drainage strategy for this development utilises permeable paving as the main SUDS feature. The following sections provides a brief description of these features and outlines the maintenance programme that should be adopted.

1.2 Cleaning of the Drainage System

1.2.1 Drainage systems should be inspected at regular intervals and where necessary, thoroughly cleaned out at the same time. Any defects discovered should be made good.

1.2.2 The following operations should be carried out during the periodic cleaning of a drainage system.

Table 1: Drainage Maintenance

Product Type	Period	Responsibility	Maintenance Methods
Silt Trap	As necessary and before wet season	Owner or Maintenance Company for communal areas	• Sediment and debris that accumulated during summer needs to be removed before the wet season. • Inspect and clean out routinely prior to inlet pipework to minimise debris reaching the tank. • Conduct inspections more frequently during the wet season for the area where sediment or trash accumulates more often. Clean and repair as needed.
Standard Manholes/ Inspection Chambers	As necessary	Owner or Maintenance Company for communal areas	• Remove and clean any soil and vegetation that covers the manhole cover to prevent blockage of the drainage system at the manhole. • Renew/replace any damaged/missing bolts and damaged/missing manhole covers.
Drainage Pipes	Six monthly interval	Owner or Maintenance Company for communal areas	• Inspect underground drainage pipes to ensure that the distribution pipework arrangement is operational and free from blockages. If required, take remedial action.

Product Type	Period	Responsibility	Maintenance Methods
Permeable Paving	As required	Maintenance Company	• Inspect the surface after any precipitation to ensure no displacement of any organic matter onto the surface.
	Annually and after large storms	Maintenance Company	• Inspection/check of all inlets to ensure that they are in good condition and operating as designed.
Pumps and Flow Control	Annually and after large storms	Maintenance Company	• Inspection/check of all inlets to ensure that they are in good condition and operating as designed. • Renew and replace any damaged/missing items. • Visual survey of the pump and cleaning as required

1.3 Sketches and Plans

1.3.1 The locations of the above features can be found by examining Drawing P5943J3029-C01

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JOMAS ASSOCIATES LTD

Unit 24 Sarum Complex

Salisbury Rd

Uxbridge

UB8 2RZ

CONTACT US

Website: www.jomasassociates.com

Tel: 0333 305 9054

Email: info@jomasassociates.com