

J GROUP LIMITED

CLARENDON ROAD, WOOD GREEN

25-27 CLARENDON ROAD, WOOD GREEN, N8 0DD

FLOOD RISK ASSESSMENT

**REPORT REF.
2401540-R01**

July 2024

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REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	DRAFT	HP	ADS	AD	21/05/2024

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1. Introduction

- 1.1. Ardent Consulting Engineers has been appointed by J Group to advise on flood risk and surface water management matters associated with the proposed redevelopment site situated at '25-27 Clarendon Road' in Wood Green.
- 1.2. The Flood Risk & Surface Water Management Statement has been prepared to support a planning application to provide a 222-dwelling co-living flat unit scheme with commercial workspace.
- 1.3. The site is situated within a Flood Zone 1 area and the developable area is less than one hectare. As such, a formal site-specific Flood Risk Assessment is not required, although the principles outlined within the National Planning Policy Framework (NPPF) and accompanying web-based Planning Practice Guidance, have continued to be adopted.
- 1.4. The NPPF was originally published in March 2012 (updated in December 2023) by the Department for Communities & Local Government (now known as the Ministry of Housing, Communities & Local Government), and is now the acknowledged standard for conducting FRAs/SuDS Statements.
- 1.5. This report aims to demonstrate to the Local Planning Authority and Statutory Consultees that the site can be suitably redeveloped whilst complying with the requirements of the NPPF.
- 1.6. On the basis of this report, supporting evidence is provided to enable the planning application to be determined in terms of flood risk and SuDS/surface water disposal. If additional and/or detailed information is required, it is anticipated that appropriate conditions will be recommended for future consideration.

2. Baseline Parameters

Existing Site

- 2.1. The site's boundaries are formed by: Great Northern railway line to the east; residential properties to the west and commercial properties to the north & south as shown in **Figure 1** below

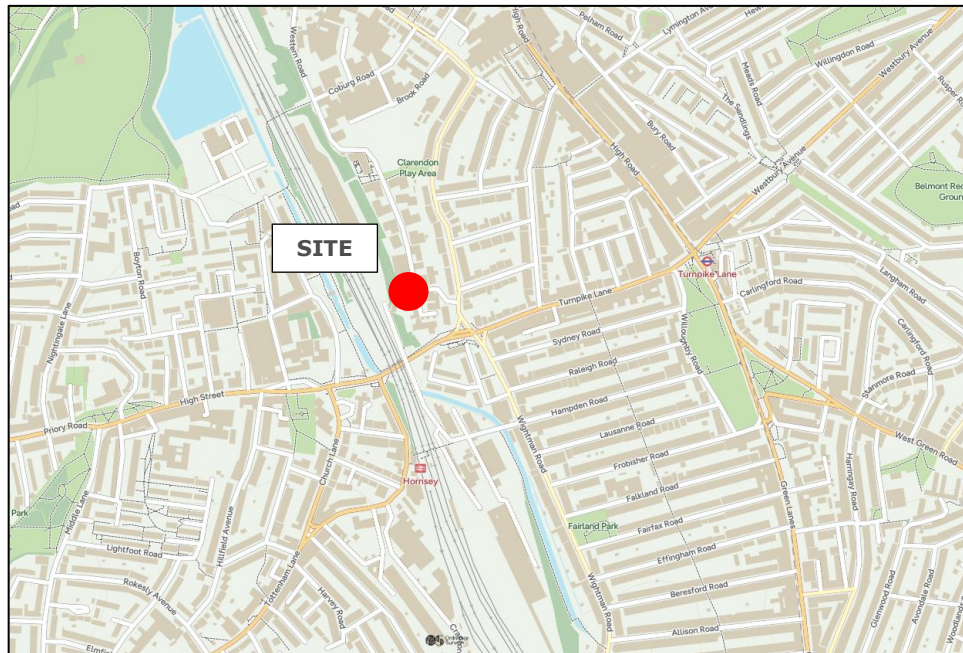


Figure 1: Site's Location

- 2.2. The application boundary comprises an area of circa 0.14 hectares. The site is wholly hardstanding consisting of current commercial premises, as illustrated in **Figure 2** on the following page.



Figure 2: Aerial Imagery

- 2.3. A detailed topographical survey of the site was prepared by Matrix Surveys in March 2022 and all finished ground levels relate to an Ordnance Survey datum. A detailed version of the survey has been included within **Appendix A** of this report for further reference:

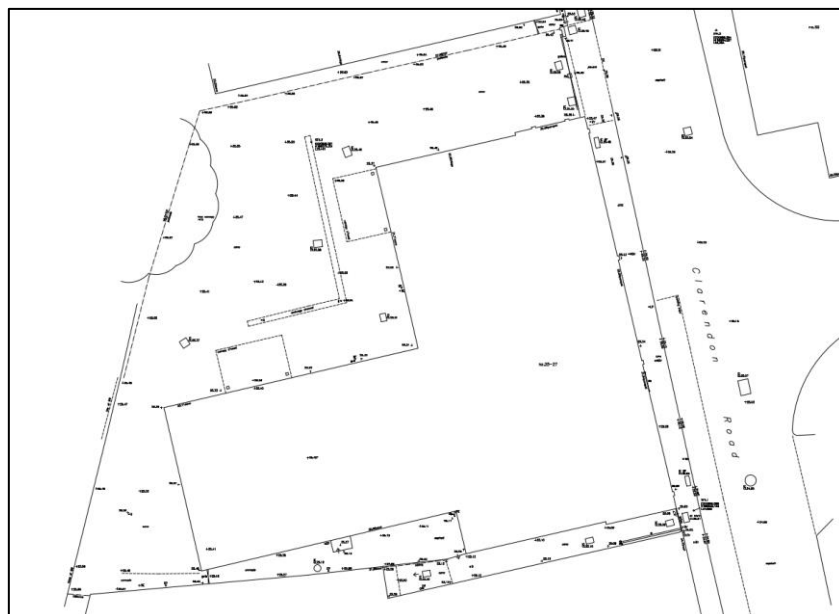


Figure 3: Extract of Topographical Survey

- 2.4. The topographical survey confirms there are no existing impermeable area within the site boundary.
- 2.5. The public sewer asset record plan for the local area has been obtained from the Sewerage Undertaker for the region, Thames Water, which indicates there is an existing foul and surface water sewer running in Clarendon Road. A copy of the records is included at **Appendix B**

Redevelopment Proposals

- 2.6. Planning permission is sought from the local planning authority at Haringey Council London Borough to redevelop the existing site and provide a 222-dwelling co-living flat unit scheme with commercial workspace.
- 2.7. A layout of the proposed site has been prepared by the scheme's Architect (PRP) which outlines the proposals, as illustrated in **Figure 4**:



Figure 4: Development Masterplan Layout

- 2.8. A detailed version of the layout plan has been provided in **Appendix C** of this report for further reference.

Urban Creep

- 2.9. The development scheme is proposed to be co-living flats and commercial work space there is no need to allow for urban creep.

3. Flood Risk/Surface Water Management

Flood Risk Assessment

- 3.1. According to the Environment Agency's indicative floodplain mapping, the redevelopment site is not deemed to be situated within the indicative undefended floodplain of any nearby designated main river/watercourse and/or tidal estuary, as illustrated in **Figure 5** below:

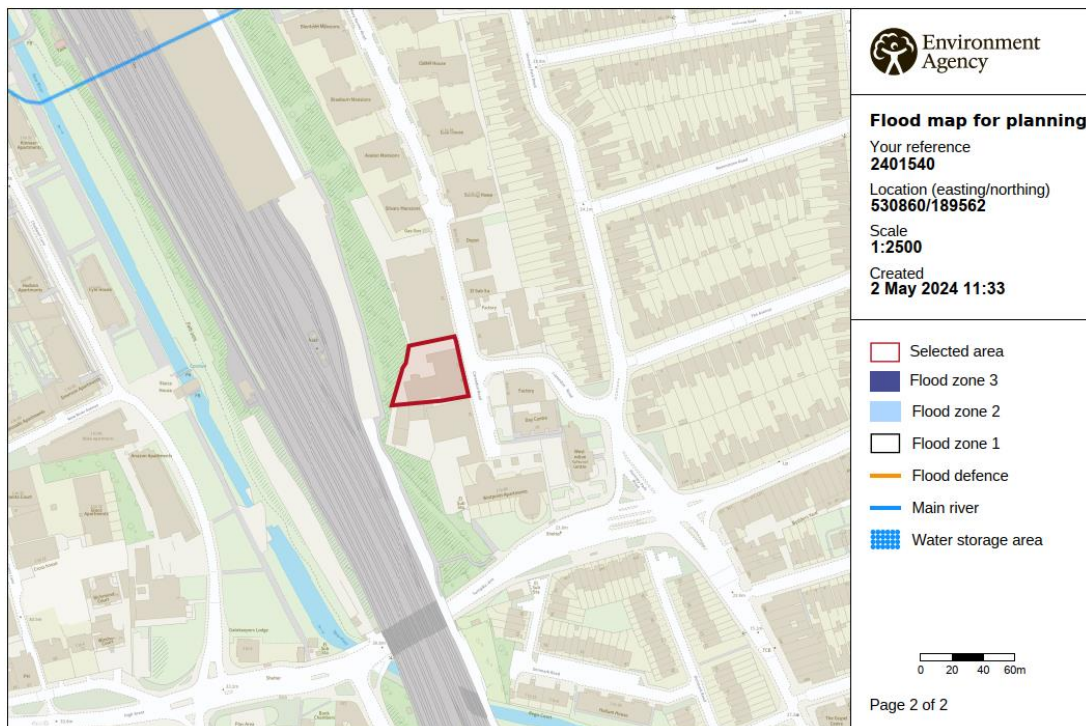


Figure 5: Indicative Fluvial/Tidal Floodplain Extent

- 3.2. The site is therefore classified as a Flood Zone 1 site, at a low probability of fluvial and/or tidal flooding. As the site is situated within a Flood Zone 1 area and the developable area is less than one hectare, a formal site-specific Flood Risk Assessment is not required, although the principles outlined within the National Planning Policy Framework and accompanying web-based Planning Practice Guidance, have continued to be adopted.
- 3.3. 'Planning Policy Statement 25: Development and Flood Risk' (PPS25) was first published in December 2006 by the Department for Communities & Local Government (now known as the Ministry for Housing, Communities & Local Government) but has since been replaced by the National Planning Policy

Framework (NPPF) which was originally published in March 2012 and subsequently revised in December 2023. This study is therefore based on the latest guidance stated within the NPPF and the accompanying web-based Planning Practice Guidance.

- 3.4. The guidance uses the concept of sequential testing and the risk-based approach to flood risk and development. Development priorities are based on the specific flood risk zones outlined within Table 1 of the Planning Practice Guidance. These flood risk zones have been briefly outlined below for reference:

Zone 1 - Low probability: Land assessed as having a less than 1 in 1,000-year annual probability of river and sea flooding (<0.1%) in any year;

Zone 2 – Medium probability: Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1%-0.1%) and between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5%-0.1%) in any year;

Zone 3a – High probability: Land assessed as having a 1 in 100-year or greater annual probability of river flooding (>1%) and a 1 in 200-year or greater annual probability of flooding from the sea (>0.5%) in any year;

Zone 3b – Functional floodplain: Land where water has to flow or be stored in times of flood.

- 3.5. Annex 3 of the NPPF classifies a residential scheme to be a 'more vulnerable' land-class usage, in terms of flood risk:

MORE VULNERABLE

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

- 3.6. Table 3 of the Planning Practice Guidance (Flood Risk Vulnerability and Flood Zone 'Compatibility') determines that a residential scheme in a **Flood Zone 1** area, is deemed to be appropriate:

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Other Potential Sources of Flooding

3.7. A further search of the Environment Agency's mapping also confirms that the site is not shown to be susceptible from flooding as a result of a breach of a nearby reservoir, as illustrated in **Figure 6**:

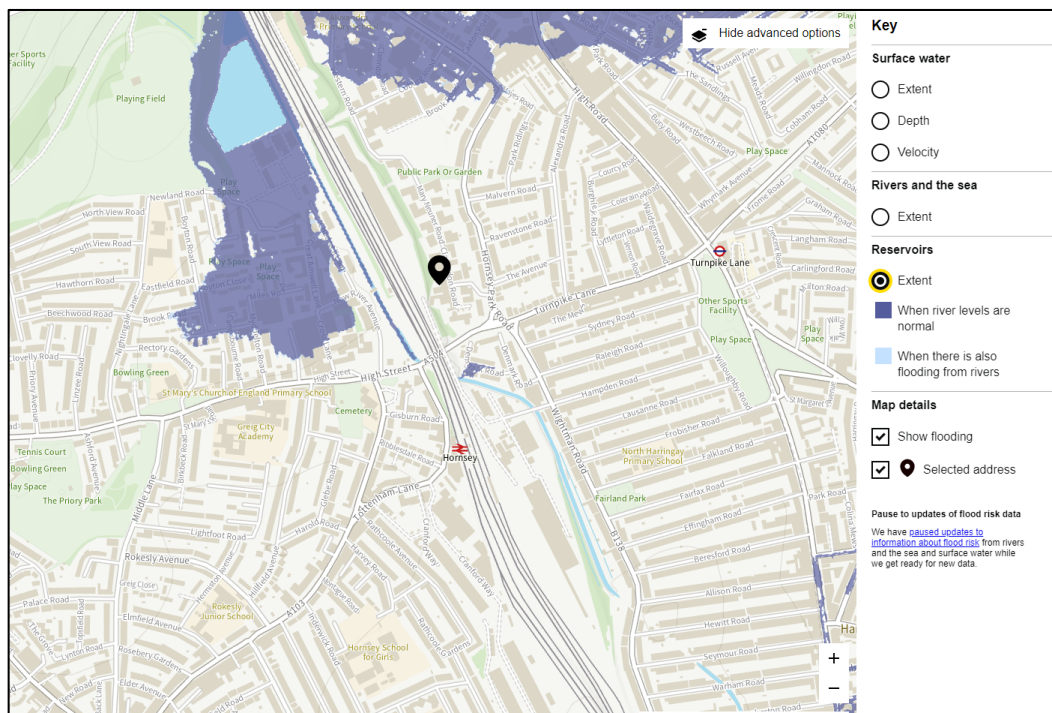


Figure 6: Extent of Reservoir Flooding

- 3.8. According to the Environment Agency's indicative mapping for the local area, the site is not susceptible to pluvial/surface water flooding for the low-risk scenario (1:1000-year event), as illustrated in **Figure 7** on the below:

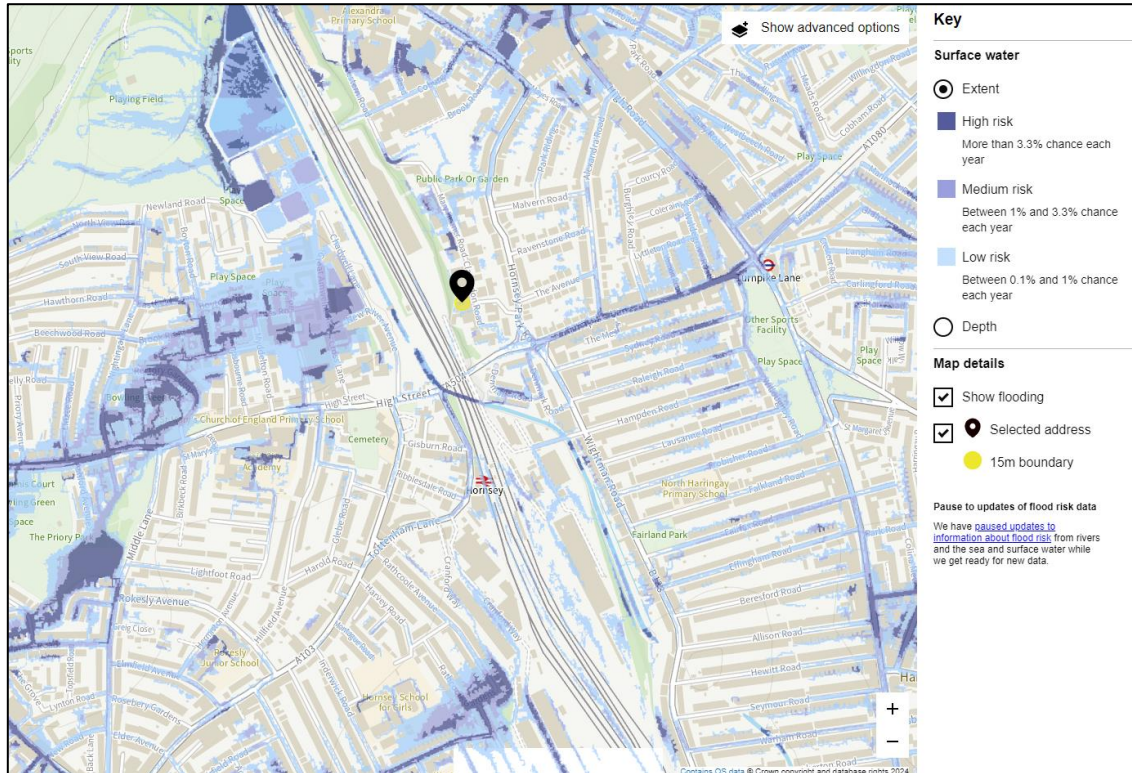


Figure 7: Localised Pluvial/Surface Water Flooding

- 3.9. According to the records held on the British Geological Survey website, a borehole (BGS Reference TQ38NW/3) was drilled to the south of the application site. Groundwater was encountered at a depth of 16.5m below the ground's surface and therefore it is concluded that the site is not at risk of any groundwater flooding, even allowing for seasonal variances. A copy of the borehole record has been included within **Appendix D** of this report for further reference.
- 3.10. In view of this assessment, it is concluded that the scheme is not at risk of flooding from any source including fluvial, tidal, a breach of any nearby reservoir, groundwater or pluvial/surface water.

Pre-Development Run-off

- 3.11. According to the topographical survey, the site is wholly comprised of hard landscape, as a result and for the purposes of this assessment the site is considered brownfield.

3.12. The existing site's greenfield runoff rate has been assessed using the HR Wallingford Greenfield Runoff Tool as presented in **Appendix E** and summarised in **Figure 8** below using hydrological and geological parameters specific to the site location and the total developable site area of 0.14 hectares.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	0.62	0.62
1 in 1 year (l/s):	0.53	0.53
1 in 30 years (l/s):	1.43	1.43
1 in 100 year (l/s):	1.98	1.98
1 in 200 years (l/s):	2.32	2.32

Figure 8: Post-Development Greenfield Run-off Rate

3.13. The above assessment calculates a greenfield runoff rate of 0.53 l/s during the 1 in 1 year rainfall event.

Infiltration Feasibility Appraisal

3.14. The above assessment would only be applicable if a positive outfall is utilised to dispose of the surface water run-off from the scheme. The volume of surface water attenuation could be reduced though, if infiltration drainage techniques can be successfully utilised on the site, providing suitable soil conditions exist.

3.15. The British Geological Survey record plans for the Woods Green area indicate the site is underlain by the London Clay Formation which is described as Clay, Silt and Sand, as illustrated in **Figure 9** on the following page. In view of the anticipated soil conditions at the site, it is considered unlikely that the soil will be suitable for supporting the use of infiltration drainage techniques and therefore an alternative method of disposal is required.

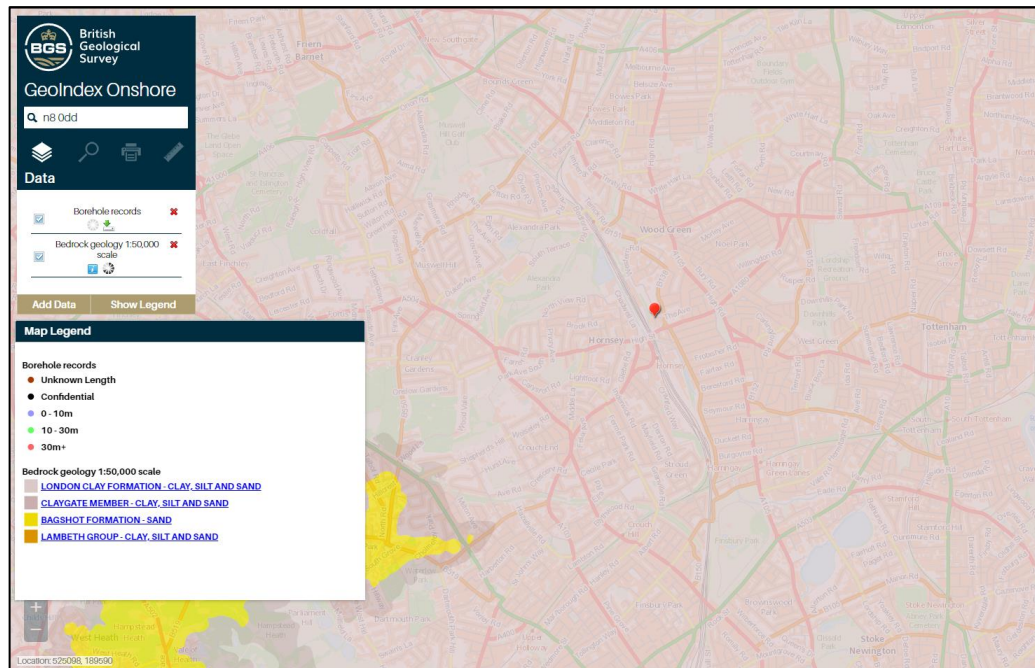


Figure 9: Extract of BGS's Geology Record Plan

- 3.16. As there is not an existing open channel watercourse/ditch present on-site, a connection to the public sewer will be required under S106 of the Water Industry Act 1991 in agreement with Anglian Water Services Ltd.

Post-Development Run-off

- 3.17 In accordance with the current Haringey Council London Borough policy the post-development run-off rate should be limited to the 1 in 1 year greenfield runoff rate; however the risk of blockages where the 1 in 1 year greenfield runoff rate is less than 1.0 l/s, the peak discharge rate may be limited to 1.0 l/s to mitigate the risk of blockages and resultant flood risk.

- 3.18 The site is currently fully impermeable. A conservative approach has been taken in assuming that the new development is also fully impermeable though there will be incidental planting and permeable materials used.

Attenuation Provision

- 3.17. To drain the site in a sustainable manner whilst complying with the requirements of the NPPF, the strategy will adopt an appropriate form of sustainable drainage systems (SuDS). These forms of SuDS could comprise permeable surfaces, geo-cellular units and/or over-sized pipes where feasible.

3.18. Adopting the design parameters outlined below, the following preliminary assessment has been conducted using 'Micro Drainage' computer hydraulic modelling suite. Within the simulations, we have also included an additional 40% storage provision as allowance for any potential climate change impact (based on the guidance published by the Environment Agency in for the year 2070 to 2115 scenario for a residential scheme):

Table 2: peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

3.19. In order to achieve the proposed discharge rate of 1.0 l/s, it is proposed that a total storage volume of approximately 79-103m³ will be provided within the proposed cellular storage crates. Based on the Microdrainage Quick storage estimate for all events up to and including the 1 in 100-year storm event including climate change summarised in **Figure 10** below:

The screenshot shows the 'Variables' tab in the Micro Drainage software. The interface includes a sidebar with navigation options: Variables (selected), Results, Design, Overview 2D, Overview 3D, and Vt. The main area displays various input parameters and their values:

- FSR Rainfall**: Selected from a dropdown menu.
- Return Period (years)**: 100
- Region**: England and Wales (selected from a dropdown menu)
- Map**: M5-60 (mm) with a value of 20.400
- Ratio R**: 0.448
- Cv (Summer)**: 0.750
- Cv (Winter)**: 0.840
- Impervious Area (ha)**: 0.140
- Maximum Allowable Discharge (l/s)**: 1.0
- Infiltration Coefficient (m/hr)**: 0.00000
- Safety Factor**: 1.0
- Climate Change (%)**: 40

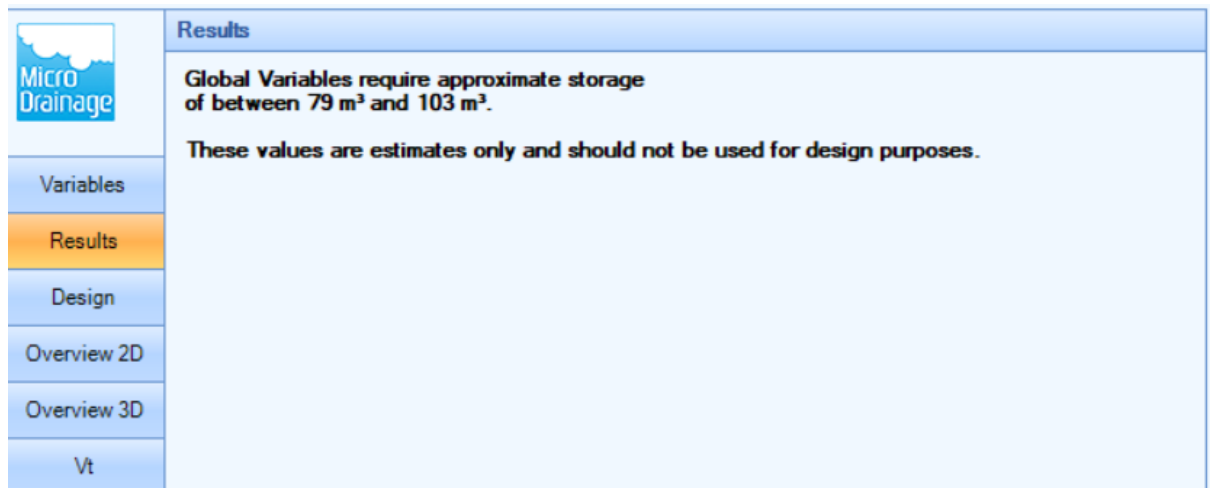


Figure 10: Microdrainage Quick Storage Results

3.20. The above assessment merely provides an initial preliminary estimate of the volume required at this stage of the report. Detailed information has been included within the SuDS/Surface Water Drainage Strategy section of this report that follows.

SuDS/Surface Water Drainage Strategy

3.21. For the purposes of this assessment, a SuDS/surface water drainage strategy has been prepared to demonstrate how the run-off will be disposed of, and that the system will be capable of withstanding a 1:100-year rainfall event (including an additional 40% as an allowance for climate change).

3.22. To dispose of the surface water run-off generated by the redevelopment scheme, it is anticipated that the run-off will be directed to the existing public sewer network present to the east of the site, within Clarendon Road.

3.23. To facilitate the connection works, it is acknowledged that the formal consent will be required from Thames Water prior to commencing the works under S106 of the Water Industry Act 1991.

3.24. The principles of the strategy will comprise:

- Surface water run-off will be restricted to a reduced discharge rate no greater than 1 litres/sec for all events, up to and including the 1:100-year (plus 40% climate change) rainfall event, this being the lowest practicable rate suitable to avoid blockages;

- A suitable flow-control device (such as an hydrobrake) will be utilised at the site outfall to ensure the post-development discharge is not exceeded for events up to and including the 1:100-year event (including 40% climate change);
- It is proposed that a living roof is to be utilised to provide both water quality improvements to the discharge as well as reducing the overall runoff by 20% as set out in "The Gro Green Roof Code". This is a conservative approach with the actual reduction in runoff likely to be greater depending on the type of green roof
- To accommodate the attenuated volume generated by the 1:100-year rainfall event (including an additional 40% as an allowance for climate change), the run-off will be contained within an underground attenuation tank;
- The peak attenuation volume required will be 82.4m³ when allowance for the green roof has been considered.
- To mitigate the risk of the run-off being polluted, beyond the benefits of the greenroof, it is proposed to provide a filter drain to the outfall from the site.

3.25. The principles of the SuDS/surface water drainage strategy have been presented on **Drawing No. 2401540-D001** appended to this report at **Appendix F** for further reference.

Water Quality Treatment Indices Assessment

3.26. The following tables outline the water quality assessment in accordance with CIRIA SuDS Manual 753:

Land-use	Pollution Hazard level	Total Suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 1: Pollution hazard indices for different land-use classifications (land-use shaded yellow applicable for the development)

To ensure the target-indices are met, the following performance can be expected from the SuDS/surface water drainage strategy:

Type of SuDS component	Mitigation indices		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bio retention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Downstream Defender (Proprietary Treatment System*)	0.5	0.4	0.8
*Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1-year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 2: Indicative SuDS mitigation indices for discharges to surface waters (SuDS components shaded yellow applicable to this development)

Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day			
	Required mitigation indices		
Source	TSS	Metals	Hydrocarbons
Low	0.3	0.2	0.05
Mitigation Indices			
Filter Drain	0.4	0.4	0.4
Total Performance	0.1	0.2	0.35
Check	Criteria Exceeded	Criteria Exceeded	Criteria Exceeded

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + (0.5 \times \text{mitigation index}_2)$$

Table 3: Indicative SuDS mitigation indices for discharge to surface waters

- 3.27. As demonstrated in Tables 1 to 3 above, the mitigation of pollution provided by the development is appropriate for the low risk it represents. The performance criteria can be met by implementing a filter drain.

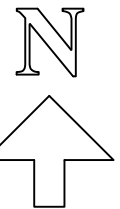
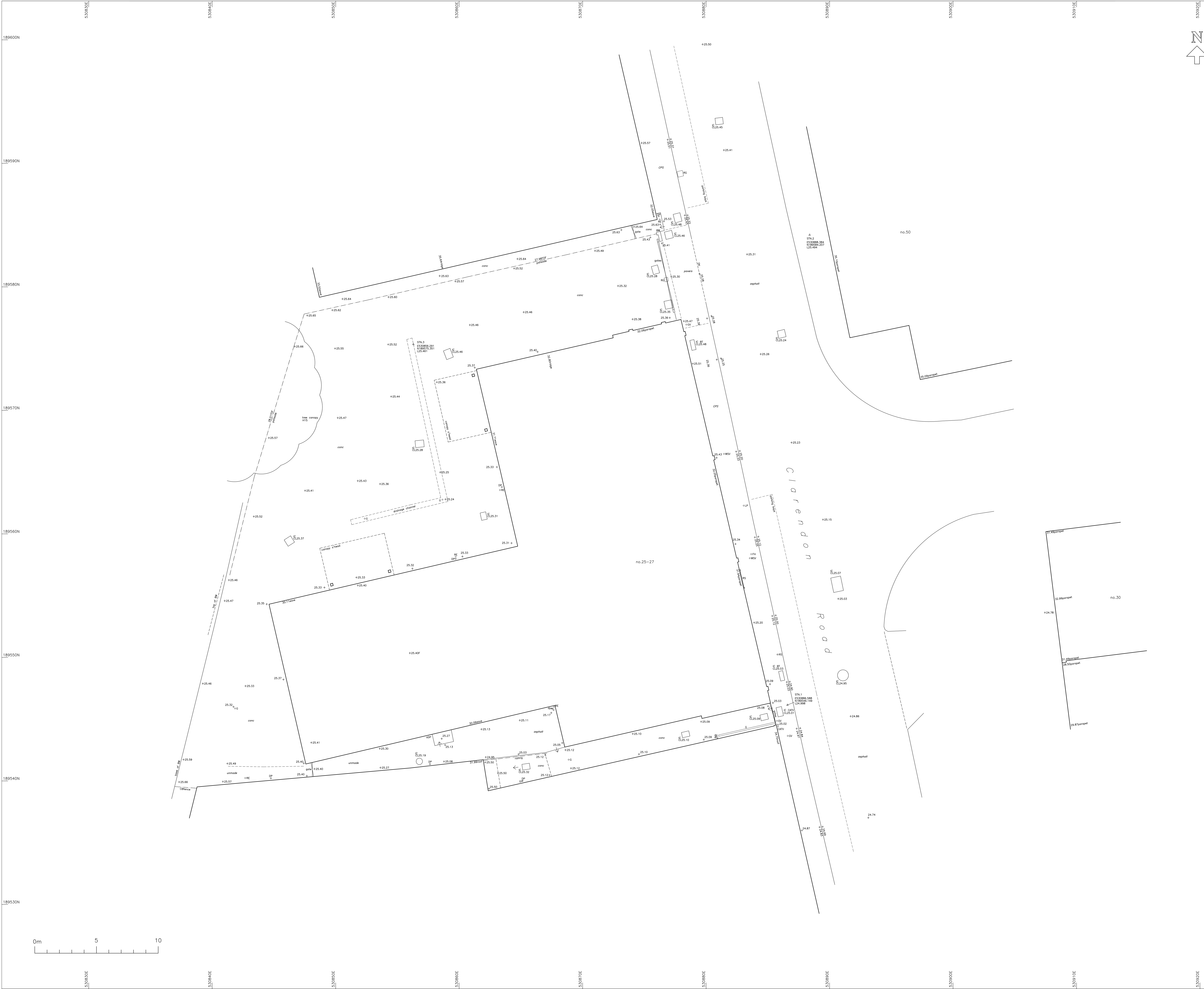
Maintenance Regime

- 3.28. Drainage systems will be placed under a formal agreement with an independent Maintenance Company to carry out periodic inspections and any necessary remediation/maintenance works, thus safeguarding the development for the on-going future.
- 3.29. The maintenance of all SuDS components will be in accord with best practice and the CIRIA Manual C753.
- 3.30. Details of the typical processes required for the site have been provided in **Appendix G.**

4. Summary

- 4.1. The proposal to redevelop the existing site is considered to follow the national planning legislation which prefers the redevelopment of previously developed brownfield sites.
- 4.2. A residential scheme located in a Flood Zone 1 area is deemed to be suitable for development, as defined by the NPPF. The site is not at risk of flooding from a fluvial source and/or tidal estuary, groundwater, pluvial/surface water or a breach of any nearby reservoir.
- 4.3. The post-development discharge rate has been based upon the practical minimum discharge rate of an orifice at 1.0 l/s in lieu of the 1 in 1 year greenfield rate presenting a blockage risk, thus reducing flood risk.
- 4.4. Hydraulic modelling has been carried out which demonstrates that the proposed SuDS/surface water drainage system can withstand the impact of a 1:100-year rainfall event (including an additional 40% as an allowance for climate change), thus complying with the requirements of the NPPF.
- 4.5. It is acknowledged that a S106 connection consent will need to be obtained from Thames Water prior to carrying out the construction works, under the Water Industry Act 1991.
- 4.6. In view of this assessment, the report concludes that:
 - The redevelopment scheme and its occupants will not be at an increased risk of flooding;
 - The redevelopment scheme will not increase the risk of flooding elsewhere;
 - A sustainable drainage scheme can be implemented.
- 4.7. The findings of this report identify the opportunity to provide a scheme which fully adopts the principles outlined within the NPPF. In this respect, it is anticipated that planning permission can be granted for this application on flood risk and drainage matters. Where additional or further information is required, appropriate planning conditions should be recommended for future consideration.

**Appendix A
Topographical Survey**



DO NOT SCALE FROM DRAWING ALL DIMENSIONS TO BE CHECKED ON SITE		
© Copyright retained by Matrix Surveys Ltd.		
NOTES:		
ALL MEASUREMENTS TAKEN TO EXISTING SURFACE FINISHES UNLESS STATED OTHERWISE		
ALL LEVELS IN METRES		
ALL ARROWS POINT UP		
SURVEY GRID & LEVELS RELATED TO ORDNANCE SURVEY BY GPS OBSERVATION		
LEGEND:		
20.00F FLOOR LEVEL 20.00H WINDOW HEAD LEVEL 20.00S WINDOW SILL LEVEL 20.00C CEILING LEVEL 20.00SC SUPPLEMENTED CEILING LEVEL 20.00B BEAM LEVEL 20.00D DOOR HEAD LEVEL		
AB AIRBRICK B BILLIARD BH HEIGHT TO BEAM UNDERSIDE BM BRICK MILE BT BRITISH TELECOM CATV CABLE TV CB CONCRETE PAVING SLABS CPC CUPBOARD DK DROP KERB EP EARTH BED FB FLOWER BED FH FIRE HYDRANT FW FULL WATER G GULLY IC INSPECTION CHAMBER IL INLET LEVEL LP LAMP POST P POST RE ROADING EYE RD ROAD GULLY RW ROAD SIGN SWP SWIL VENT PIPE SW SURFACE WATER TL TRAFFIC LIGHT TOP TOP OF FENCE LEVEL TOW TOP OF WALL LEVEL TP TELEGRAPH POLE V VENT VP VENT PIPE WM WATER METER WP WASTE PIPE WSV WATER STOP VALVE		
FENCE TYPES BW Barbed Wire CB Close Board CW Chain Link CL Chain Link CR Concrete Panel CP Chestnut Piling		
CW Chain Wire IW Interlocking IR Iron Rolling OB Openboard PP Post and Rail PW Post and Wire		
All tree details should be checked by an Arborologist		
REVISIONS	DATE	BY
 100 Salford Quay Road, London W1 3SR T: 020 7888 0800 E: info@matrixsurveys.co.uk		
PROJECT		
25-27 CLARENDON ROAD LONDON N8 ODD		
TITLE		
TOPOGRAPHICAL SURVEY		
AS EXISTING		
SCALE	1/1000@A0	DATE MARCH 2022
DRAWN BY	RF	CHECKED BY SN
DRAWING No.	01	FILE No. 22/2646

**Appendix B
Public Sewer Asset Record Plan**

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

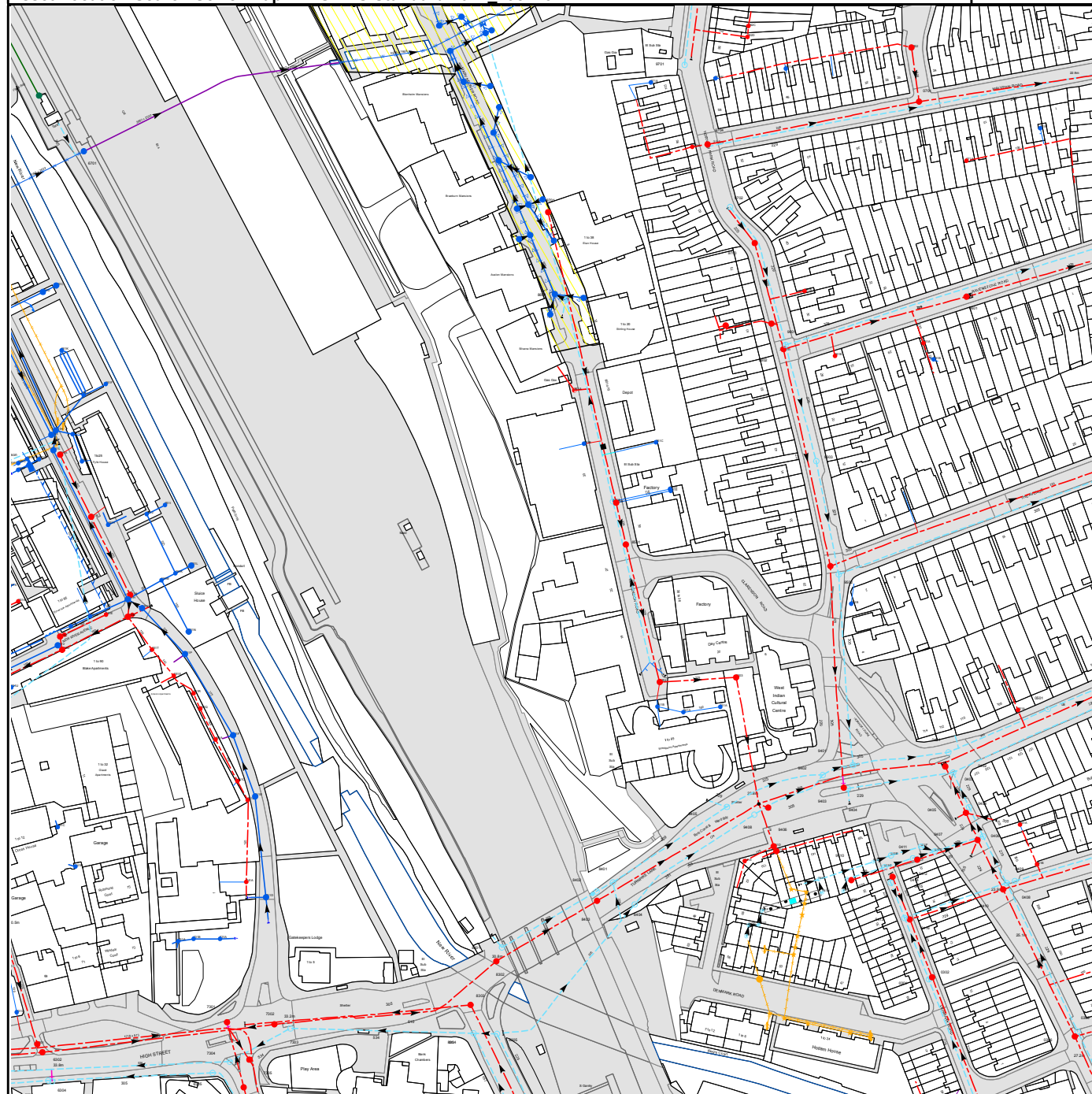
Clean Water queries

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 4984132



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 530855,189574

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
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
8701	24.33	21.75
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
8601	25.34	22.28
n/a	n/a	n/a
851A	n/a	n/a
851B	n/a	n/a
961D	n/a	n/a
961E	n/a	n/a
971V	n/a	n/a
961A	n/a	n/a
0802	23.2	22.39
0701	23.46	21.94
061B	n/a	n/a
0601	23.51	21.5
071A	n/a	n/a
071B	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
9701	n/a	n/a
982D	n/a	n/a
982C	n/a	n/a
661D	31.03	30
661C	31.36	30.2
6701	n/a	n/a
671B	n/a	n/a
651K	30.803	29.575
651P	n/a	n/a
651N	n/a	n/a
651L	31.3	30
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
861A	n/a	n/a
861B	n/a	n/a
8501	25.33	21.24
871A	n/a	n/a
961C	n/a	n/a
971U	n/a	n/a
9704	23.9	22.25
971W	n/a	n/a
9604	n/a	n/a
9702	24.16	23.37
9703	24.32	22.63
9605	n/a	n/a
9602	24.44	22.25
951B	n/a	n/a
9502	24.01	22.29
9501	23.94	21.55
9603	24.25	22.65
961B	n/a	n/a
9601	24.43	22.87
061A	n/a	n/a
0306	26.51	24.3
0305	26.52	25.36
0301	25.93	24.41
0302	25.92	24.17
0416	25.02	23.32
0413	24.97	23.73
0410	24.02	21.92
0408	23.94	22.82
0415	24.64	23.8
0409	24.13	22.95
9409	24.63	22.97
0414	24.61	23.57
041B	n/a	n/a
041C	n/a	n/a
941J	n/a	n/a
0412	24.24	22.46
0411	24.22	22.82
041E	n/a	n/a
041D	n/a	n/a
041F	n/a	n/a
0407	23.55	21.62
0406	23.49	22.35
041A	n/a	n/a
0405	23.26	21.28
0404	23.11	21.95
0403	22.71	21.65

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0402	22.76	20.45
0401	22.72	21.65
051A	n/a	n/a
0501	22.34	21.21
9311	n/a	n/a
9420	n/a	n/a
941G	n/a	n/a
941F	n/a	n/a
941H	n/a	n/a
9411	25.04	23.46
941I	n/a	n/a
9410	24.61	23.46
941E	n/a	n/a
941C	n/a	n/a
941D	n/a	n/a
9408	23.57	22.94
9406	23.65	n/a
9405	23.72	22.71
9404	23.18	22.03
9403	23.19	n/a
9402	23.26	22.12
9401	23.03	21.9
941A	n/a	n/a
951A	n/a	n/a
941B	n/a	n/a
9504	24.45	21
9503	23.8	20.84
731A	n/a	n/a
7301	34.19	n/a
7304	34.28	27.32
741F	n/a	n/a
741C	30.93	29.34
7306	34.54	31.13
741A	31.11	29.99
741B	30.93	29.48
7305	34.1	n/a
741E	n/a	n/a
741D	n/a	n/a
7302	33.55	27.2
7303	33.29	27.47
8303	31.6	28.07
8304	31.79	27.88
8302	30.64	23.37
8305	31.84	30.22
8301	30.4	29.73
8402	27.49	26.02
8403	27.51	23.32
8401	26.83	24.62
8404	27.39	25.33
661M	21.53	20.15
661Q	n/a	n/a
661E	30.35	26.45
661L	n/a	n/a
661H	n/a	n/a
651V	n/a	n/a
651C	28.2	26.29
661A	30.31	29.29
661K	n/a	n/a
651D	28.21	26.13
651F	n/a	n/a
661J	30.585	28.525
661I	n/a	n/a
661G	n/a	n/a
651G	28.353	27
661B	30.33	28.98
661F	n/a	n/a
651E	29.57	27.24
651Y	n/a	n/a
651H	30.4	26.6
651B	n/a	n/a
651A	30.27	28.57
651O	n/a	n/a
651J	31.15	29
651T	30.89	28.17
651M	30.4	29
651I	31.3	30
631D	n/a	n/a
6301	33	n/a
6302	33.23	23.9
6303	33.41	31.38
6304	33.58	n/a
6305	34.64	33.25
631A	n/a	n/a
631B	n/a	n/a
641B	n/a	n/a
641C	n/a	n/a
641A	30.94	29.03
651Q	30.91	n/a
651R	30.89	n/a
651U	n/a	n/a
651S	30.91	28.47
661P	n/a	n/a
661O	n/a	n/a

**Appendix C
Development Masterplan Layout**

**Appendix D
BGS's Borehole Record Log**

Name and Number of Shaft or Borehole: <i>Jensen Brewery</i>	6-in Map	Page
	Registration No. <i>1038NW/3</i>	
	National Grid	
	Reference <i>3092.8949</i>	

GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	IN	FT	IN
	Brought Forward				
	Summary of Progress (1906) p. 151				
	Hornsey. HORNSEY BREWERY, MESSRS. CAFFYN, Clarendon Road, 250 yards north of Hornsey Station, G.N.R., eastern side of Line, 1898 ?). London Map 3 N.W. Height above Ordnance Datum, 85 feet. Made and communicated by Messrs. ISLER. Lined with 184 feet of tube, 5 inches in diameter. Water-level 11 feet down. Supply 1,000 gallons an hour.				
		Thickness.	Depth.		
		Ft.	Ft.		
	Well [? old], the rest bored	15	5		
	[London Yellow clay	9	20		
	Clay] Blue clay	83	29		
	Yellow clay	7	112		
	[Reading Grey mottled clay	2	119		
	Beds, Sandy clay	17	121		
	27 feet?] Dead sand	6	123		
	Clay and shells	12	140		
	[Thanet Dead sand	10	146	44.50	
	Sand, 22 feet] Black pebbles [flints ?] and sand ...	10	158		
	Chalk and flints... ..	112	168	5.21	
			280		
				85.24	

TQ 38NW/23

256 TQ 38/23
129

NGR TQ 3087 8956

Hornsey

Middx.

*Tr. 1 R.F. Rhodes (V.F. Rhodes & Co., Ltd.)
Messrs. Caffyn, Hornsey Brewery, Clarendon
Road, 250 yds north of Hornsey Station, G.N.R.,
eastern side of line, 1898.*

Made & communicated by Isler.

Details in Summary of Progress, 1906, p. 151.

*Visited by D.T. Campbell, May 1947.
Well damaged.*

Depth. approx 500 ft. O.D. + 20.

*Vis. 100. Old spindle pump site in position and
pit full of water. Inaccessible. 25.6.62 km*

**Hornsey, HORNSEY BREWERY, MESSRS. CAFFYN, Clarendon
Road, 250 yards north of Hornsey Station, G.N.R.,
eastern side of Line, 1898 ?).**

London Map 3 N.W. Height above Ordnance Datum, 85 feet.

Made and communicated by Messrs. ISLER.

Lined with 184 feet of tube, 5 inches in diameter.

Water-level 11 feet down. Supply 1,000 gallons an hour.

		Thickness.	Depth.
		Ft.	Ft.
Well [? old], the rest bored	...	—	5
[London Clay]	Yellow clay	15	20
	Yellow clay and stone	9	29
	Blue clay	83	112
	Yellow clay	7	119
[Reading Beds, 27 feet ?]	Grey mottled clay	2	121
	Sandy clay	2	123
	Dead sand	17	140
	Clay and shells	6	146
[Thanet Sand, 22 feet]	Dead sand	12	158
	Black pebbles [flints ?] and sand	10	168
	Chalk and flints...	112	280



256/129
TQ 38/23

256/129

Well
London Clay
Woolwich & Reading Beds (? Intermediate Type)
Thanet Sand
Upper Chalk

ft	m
5	0
114	0
? 27	0
22	0
112	

Sussex

**Appendix E
Pre-Development Runoff Rates**

Calculated by:	Harry Pryke
Site name:	2401540 - Clarendon Rd
Site location:	Woods Green

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:	51.58967° N
Longitude:	0.11227° W
Reference:	341225663
Date:	May 02 2024 11:43

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):

0.14

Methodology

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

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.

Soil characteristics

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

(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.

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

(3) Is $SPR/SPRHOST \leq 0.3$?

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):	0.62	0.62
1 in 1 year (l/s):	0.53	0.53
1 in 30 years (l/s):	1.43	1.43
1 in 100 year (l/s):	1.98	1.98
1 in 200 years (l/s):	2.32	2.32

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 F
Hydraulic Strategy Calculations**

DRAINAGE KEY

- EXISTING SURFACE WATER SEWER & MANHOLE
- EXISTING FOUL WATER SEWER & MANHOLE
- PROPOSED FOUL WATER SEWER
- PROPOSED SURFACE WATER SEWER & MANHOLE
- GEOCELLULAR STORAGE
- FILTER DRAIN
- BUFFER TO FOUNDATIONS

INFORMATION SUMMARY

INFORMATION TYPE	SOURCE	REFERENCE	REVISION & DATE
TOPOGRAPHICAL SURVEY	MATRIX SURVEYS	22 / 2646	March 2022
SITE LAYOUT	PRP	1100	June 2024

- NOTES:
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DRAFT

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E-mail: enquiries@ardent-ce.co.uk



Client	J GROUP		
Project Title:	CLARENDON ROAD		
Drawing Title:	DRAINAGE STRATEGY		
Drawn by	AD	Checked by	AD
A3 Scale	1:250	Date	JUNE 24
Approved by	MR	Revision	-
Drawing Number	2401540-ACE-P-DR-N-0601		

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Appendix G

Indicative Surface Water Drainage Strategy

SUDS Element	Green Roofs	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	6 monthly and annually, or as required
	During establishment (i.e. year one) replace dead plants	Monthly
	Post establishment, replace dead plants as required (where >5% coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial Work	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required.
	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources or erosion damage should be identified and controlled	As required.
Monitoring	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of	Annually and after severe storms.

	waterproofing and structural stability.	
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources.	Annually and after severe storms.
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system.	Annually and after severe storms.
	Inspect underside of roof for evidence of leakage.	Annually and after severe storms.

SuDS Element	Filter Drains	
Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six Monthly
	Remove sediment from pre-treatment devices	Six Monthly or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg. NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforate pipework of blockages	As required