

FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY

GRID REF: 529126E, 188134N

Alford House, Stanhope Road,
HIGHGATE, LONDON, N6 5AL

prepared for
EMPYREAN DEVELOPMENTS

MARCH 2023

REFERENCE: ST3338/FRA-2303
REVISION 0



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1. Introduction

- 1.1.1. Stomor Ltd have been commissioned by Empyrean Developments to prepare a Flood Risk Assessment (FRA) associated with the proposed development at Alford House, Stanhope Road, London. A Site Location Plan is provided in **Appendix A**.
- 1.1.2. The application site is brownfield, with a total area of 0.395ha, currently comprising 2No. detached five-storey blocks of flats, built in the 1960s, and recently extended with four roof level flats, communal lawns, outdoor car parking and two bike and bin stores.
- 1.1.3. Development proposals comprise the development of 2No. semi-detached three-bedroom houses on the existing front car park, which measures approximately 0.0334ha.

1.2. Policy Context

- 1.2.1. The FRA has been prepared in accordance with relevant national, regional and local planning policy and guidance on flooding as follows:
 - The National Planning Policy Framework (NPPF) published by Department for Communities and Local Government (DCLG), and the accompanying National Planning Practice Guidance (NPPG).
 - Department for Environment, Food and Rural Affairs (DEFRA) and The Environment Agency (EA) published Guidance for Planning Applications: Assessing Flood Risk (March 2014, updated February 2017).
 - The EA Flood Risk Standing Advice (FRSA) version 3.1 (April 2012, updated February 2022).
 - The EA's Approach to Groundwater Protection (March 2017, updated March 2018).
 - Haringey Local Plan 2016-2028 (July 2017). currently made up of the Strategic Policies, Development Management Policies, Site Allocations and Tottenham Area Action Plan, alongside the London Plan.
 - Haringey Emerging Local Plan 2022-2037 (formal consultation on the New Local Plan: First Steps ran from 16 November 2020 until 1 March 2021).
 - Highgate Neighbourhood Plan (July 2017).
 - Haringey Local Flood Risk Management Strategy (July 2019).
 - North London Strategic Flood Risk Assessment (August 2008).
 - Haringey Strategic Flood Risk Assessment (Draft, February 2015).

1.2.2. Furthermore, the FRA follows the methodology prescribed in Construction Industry Research and Information Association (CIRIA) document C624: Development and Flood Risk (2004), Guidance for the Construction Industry.

1.3. Flood Risk Vulnerability and the NPPF Sequential Test

1.3.1. The EA Indicative Floodplain Map (**Figure 1.1**) identifies that the site is located within Flood Zone 1, land assessed to have a low probability of flooding.

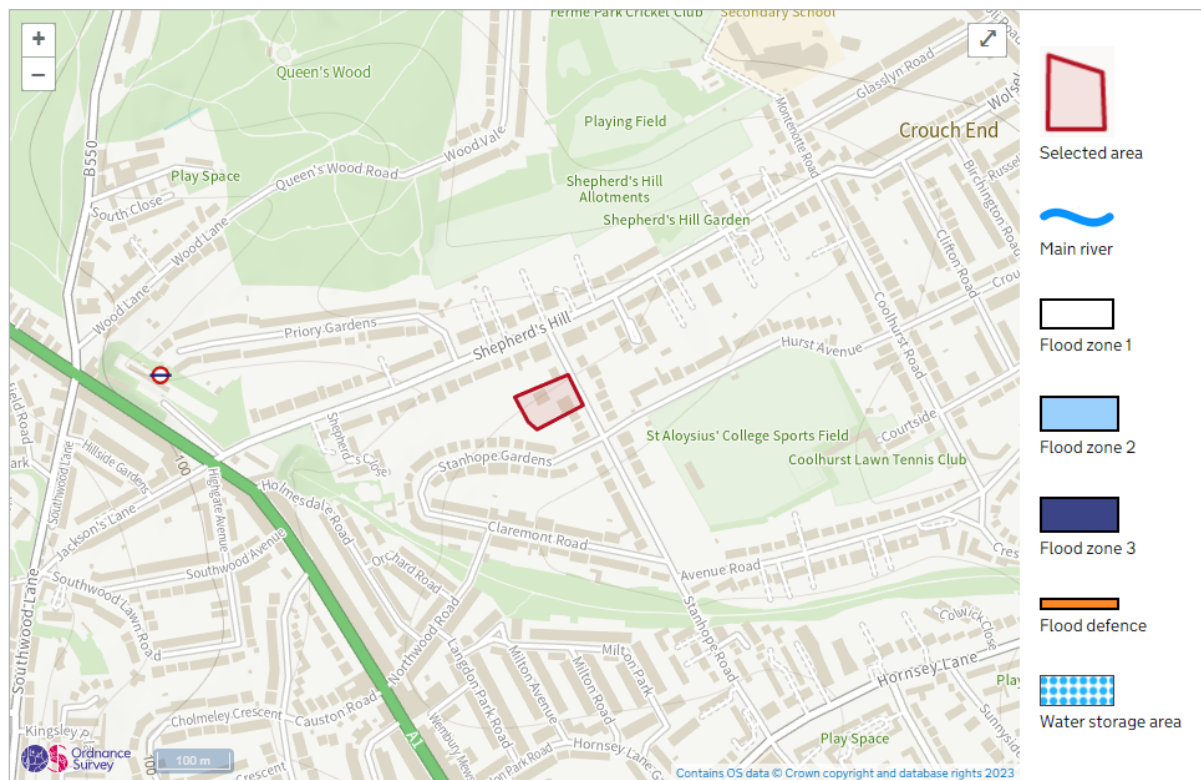


Figure 1.1 - Environment Agency Indicative Floodplain Map

1.3.2. The difference between Flood Zones 1, 2 and 3 are described in Table 1: Flood Zones from the Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government Flood Risk and Coastal Change guidance (updated August 2022), summarised below:

Zone 1 Low Probability	Land assessed as having a less than 0.1% annual probability of river or sea flooding.
Zone 2 Medium Probability	Land assessed as having between a 1% and 0.1% annual probability of river flooding. or land having between a 0.5% and 0.1% annual probability of sea flooding.
Zone 3a High Probability	Land assessed as having a 1% or greater annual probability of river flooding, land having a 0.5% or greater annual probability of flooding from the sea.
Zone 3b The Functional Floodplain	Land where water from rivers or the sea has to flow or be stored in times of flood. Normally comprises land having a 3.3% or greater annual probability of flooding, or land designed to flood (such as a flood attenuation scheme).

- 1.3.3. The Flood Risk and Coastal Change Category (ID7) of the NPPG and associated documents identifies that a Flood Risk Assessment is required for areas at risk of flooding.
- 1.3.4. The Flood Risk and Coastal Change Category of the NPPG and associated documents identify that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.
- 1.3.5. The proposed development would have a NPPF flood risk vulnerability classification of 'More Vulnerable'. NPPG identifies that 'More Vulnerable' uses of land are appropriate within Flood Zone 1 without the need for an Exception Test.

2. Site Location & Surrounding Area

- 2.1.1. The application site comprises approximately 0.395ha of brownfield land, currently comprising 2No. detached five-storey blocks of flats, communal lawns, outdoor car parking and two bike and bin stores. Vehicular access to the site is taken from Stanhope Road to the east.
- 2.1.2. The site is located to the north-east of Highgate, which is located in the south-west of the wider Haringey area. The site boundary is defined by Stanhope Road to the east, residential developments to the north and south, and gardens associated with the residential dwellings fronting on Shepherd's Hill and Stanhope Gardens.
- 2.1.3. Inspection of the topographical survey information provided by the Client indicates that levels within the development site generally fall from north east to south west. Surveyed ground levels range from approximately 77.50m AOD to 79.00m AOD within the development site.
- 2.1.4. The nearest watercourse to the site is Mutton Brook, located approximately 1.6km to the north-west of the site, which is an EA designated Main River. The Moselle, another EA designated Main River, is located approximately 1.77km to the north-east. Another watercourse, the New River, which is an artificial watercourse, is located approximately 2.02km to the north-east.
- 2.1.5. There are a number of Ordinary Watercourses recorded in the SFRA (see **Figure 2.1**). The closest of these is located approximately 350m south of the application site, running west along Claremont Road.

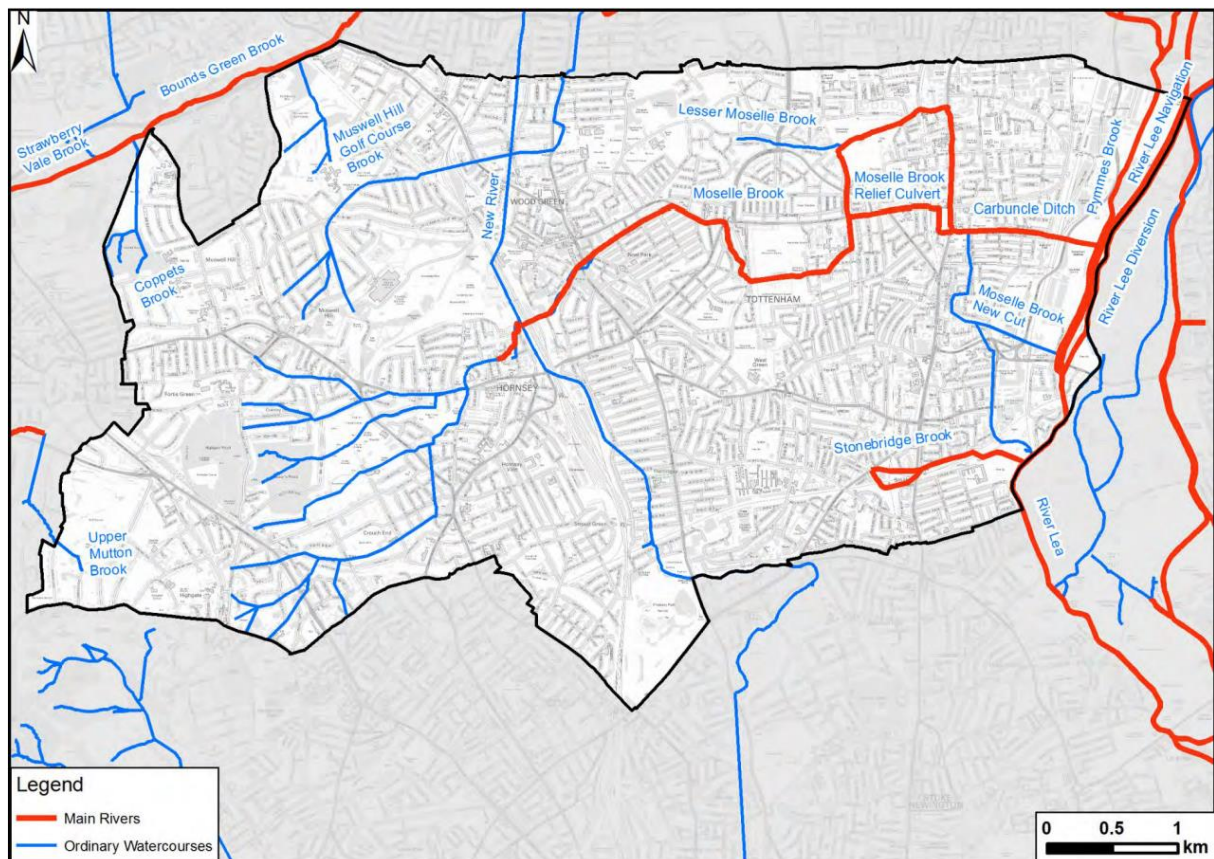


Figure 2.2 – SFRA Extract of watercourses in Haringey.

- 2.1.6. Inspection of EA Catchment Data identifies that the site is located within the Thames River Basin catchment area and Lees Lower Rivers and Lakes operational catchment area.
- 2.1.7. The site is located within a Critical Drainage Area (**Figures 2.2 and 2.3: Group4_055**), which is an area that has critical drainage problems and has been notified to the Local Planning Authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF).

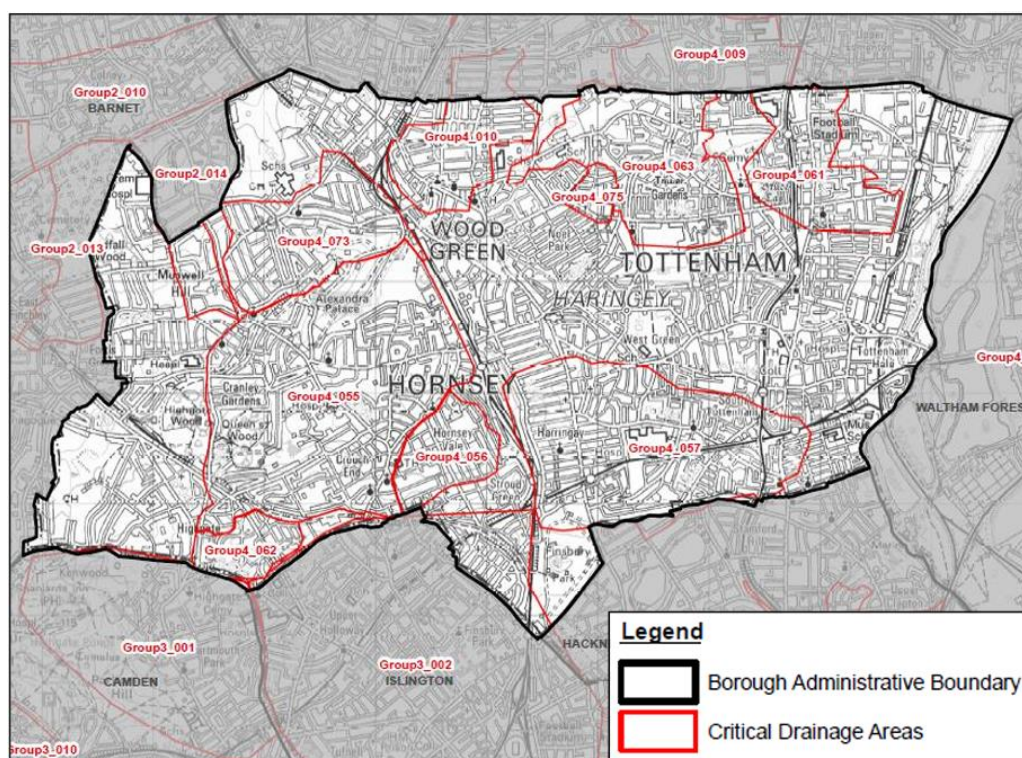


Figure 2.2 – SWMP Extract of Critical Drainage Areas in Haringey.

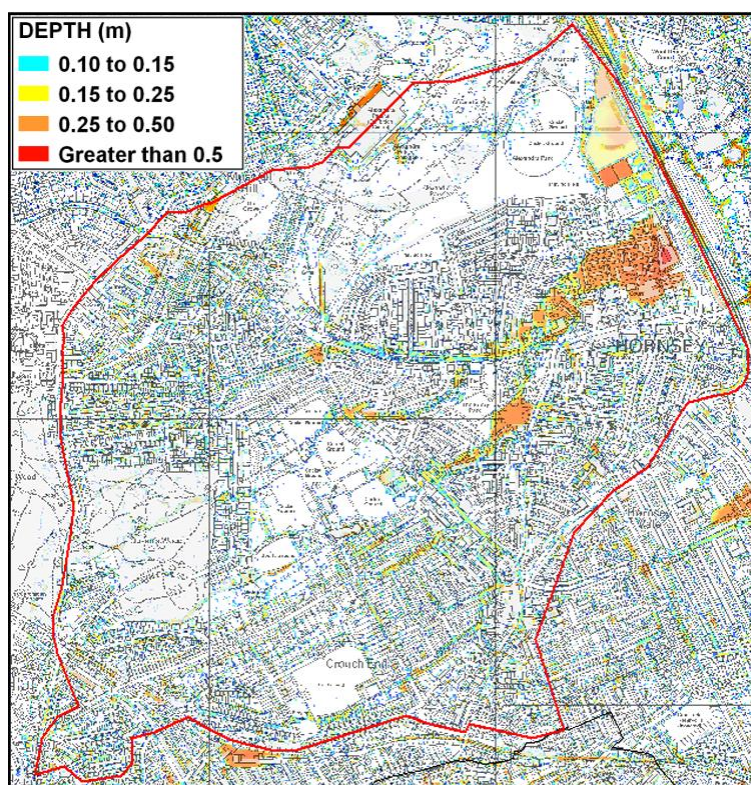


Figure 2.3 – SWMP Extract of Group4_055 Critical Drainage Area.

3. Site Background

- 3.1.1. The site is currently brownfield and is the site of 2No. detached five-storey blocks of flats. Historic OS maps (**Figure 3.1**) identify that the site comprised of undeveloped land in 1894, and by 1935 this land had been developed to comprise three houses.

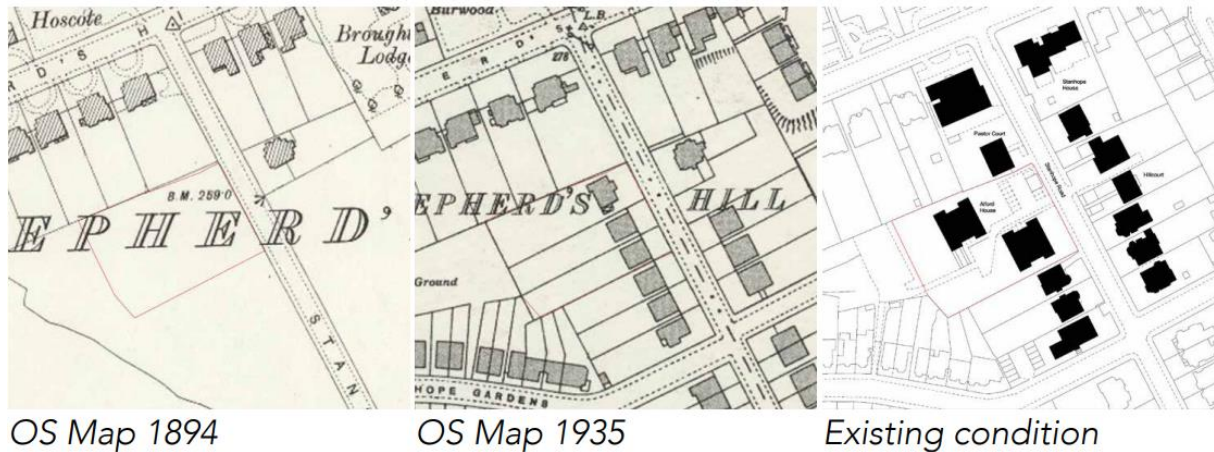


Figure 3.1 – Extract of OS Maps from the Alford Mews Consultation Board Document

- 3.1.2. A Level 2 Strategic Flood Risk Assessment (SFRA) for the area was prepared by JBA Consulting in February 2015. The SFRA is used as a desk-based study to map all forms of flood risk to provide an evidence basis to locate new development primarily within low-risk areas. The information allows the planning authority to identify the level of detail required for site-specific Flood Risk Assessments.
- 3.1.3. Inspection of the British Geological Survey (BGS) website identifies that the underlying ground conditions of the site comprise the London Clay Formation at bedrock. Inspection of the Soilscales website has identified slightly impeded drainage at the site.
- 3.1.4. Inspection of the EA's groundwater source protection zone data shows that the site does not lie within a Groundwater Source Protection Zone. However, planning policies restrict discharging via infiltration methods in this area.
- 3.1.5. Research into planning applications in the vicinity of the application site have identified a geotechnical study dated 2022 for a site less than 250m away. The geotechnical study identifies that the boreholes and trial pits revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground up to 0.70m in thickness resting on the London Clay Formation at depth within the boreholes. Made Ground was encountered to the base of TP2 at 1.50m depth groundwater was encountered at respective depths of 1.64m and 2.04m below ground level in Boreholes 1 and 2 after a period of approximately

eight weeks. Given the presence of a non-aquifer below the site it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large-scale subterranean groundwater flow.

- 3.1.6. Based on the above findings, it is likely that infiltration would not be advisable for this site.

4. Existing Drainage

4.1. Surface Water Drainage

- 4.1.1. As this site is brownfield, there is existing surface water drainage infrastructure on the site.
- 4.1.2. Thames Water Utilities (TWU) sewer records identify public surface water sewers running east along both Shepherds Hill to the north of the site and Stanhope Gardens to the south of the site. A public surface water sewer also runs south along Stanhope Road to the east of the site. A copy of the TWU sewer records is provided in **Appendix B**.
- 4.1.3. A drainage CCTV survey was carried out in June 2022, which confirms connectivity from the site into the TWU sewers. A copy of the CCTV survey is provided in **Appendix C**.
- 4.1.4. Greenfield runoff rates have been calculated based upon the IH124 Method for the area affected by the redevelopment (0.0334ha). Geotechnical information from the WRAP map of the Wallingford Procedure indicate that the underlying soil conditions would reflect Winter Rain Acceptance Potential (WRAP) Soil Class 4, which gives flow rates as follows:

Greenfield Runoff (l/s)		
1 in 1 year	Q1	0.13 l/s
1 in 30 years	Q30	0.34 l/s
1 in 100 years	Q100	0.47 l/s

- 4.1.5. An assessment of existing runoff rates discharging to the TWU sewers from the development site can be estimated using the Modified Rational Method based on the current impermeable area (0.0285ha) as follows:

Existing Brownfield Area Discharging to Sewers		
Storm Event	Rainfall Intensity (i)	Peak Runoff Rate
1 in 1 year	50mm/hr	4.04 l/s
1 in 30 years	126mm/hr	9.59 l/s
1 in 100 years	152mm/hr	12.68 l/s

- 4.1.6. The runoff calculation sheets are provided in **Appendix D**.

4.2. Foul Drainage

- 4.2.1. TWU sewer records identify that there are public foul water sewers adjacent to the surface water sewers running east along both Shepherds Hill to the north of the site and Stanhope Gardens to the south of the site, and running south along Stanhope Road to the east of the site.
- 4.2.2. The Drainage CCTV survey provided in **Appendix C** identifies the connectivity from the site to the TWU public sewers in Stanhope Road.

5. Proposed Development

- 5.1.1. Development proposals currently comprise construction of 2No. semi-detached three-bedroom houses on the front-facing car park within the Alford House site at 50, 52 and 54 Stanhope Road.
- 5.1.2. The existing development comprises an impermeable area of approximately 285m². Based on the current development proposals, redevelopment of the site is expected to generate an impermeable area of approximately 335m², providing an increase of 50m².

6. Proposed Site Drainage

6.1. Surface Water Drainage

- 6.1.1. The site is currently brownfield. Based upon the proposed layout, the development would be expected to generate an increase in impermeable area by 50m².
- 6.1.2. In accordance with EA guidance, the order of consideration for the disposal of surface water runoff from a development should be as follows: infiltration methods, watercourses, then public sewer network.
- 6.1.3. The general soil profile at the site indicates limited potential for surface water infiltration, though tests to confirm this have not been undertaken at this stage. However, a geotechnical study carried out 250m from the site has confirmed the presence of the London Clay formation suggesting that infiltration is not likely to be effective. In addition, planning policies in this area restrict the use of infiltration methods.
- 6.1.4. Surface water runoff from the existing site discharges to the public surface water sewer running south along Stanhope Road to the east.
- 6.1.5. The nearest watercourse to the site is Mutton Brook, located approximately 1.6km to the north-west of the site, which is an EA designated Main River. The Moselle, another EA designated Main River, is located approximately 1.77km to the north-east. Another watercourse, New River, located approximately 2.02km to the north-east, does not appear to have an EA designation. Discharge to these watercourses is likely to be prohibitive.
- 6.1.6. An Indicative Drainage Strategy is provided in **Appendix F**. The strategy demonstrates how the proposed development can be effectively drained and the amount of storage required to avoid flooding within the site during all storms up to and including the 1 in 100-year storm event plus a 40% allowance for climate change.
- 6.1.7. The proposed drainage strategy has been modelled using Micro Drainage. Copies of Micro Drainage output files for the development are provided in **Appendix G**, demonstrating that the proposed SuDS features provide sufficient storage to avoid flooding during the 1 in 100-year storm event plus 40% allowance for climate change.
- 6.1.8. The indicative drainage strategy incorporates SuDS components which will need to have clear, enforceable maintenance regimes in place so that they provide effective flood protection and water treatment for the long term.

- 6.1.9. The CIRIA SuDS Manual C753 promotes the use of the Simple Index Approach as a method of determining water quality risk management and is generally regarded as the accepted method within the industry.
- 6.1.10. Table 26.2 of the SuDS Manual gives pollution hazard indices for different land use classifications. A summarised version of this table is reproduced below:

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Residential driveways, low traffic roads and non-residential car parking with infrequent change (i.e. <300 traffic movements/day)	Low	0.5	0.4	0.4

- 6.1.11. Table 26.3 of the SuDS Manual provides typical treatments levels from various SuDS components discharging to surface waters. The following SuDS components will be included as part of the surface water drainage proposals for the development:

	Mitigation Indices		
Type Of SuDS Component	TSS	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7

- 6.1.12. To deliver adequate treatment, the selected SuDS components should have a total mitigation index that equals or is greater than the pollution hazard index. Where a single SuDS component is insufficient, additional components in a series would be required, where:

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

- 6.1.13. A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations. In a series of multiple subsequent components, each is halved.
- 6.1.14. As a minimum at the site, surface water runoff from residential roofs and low traffic roads will pass through permeable paving. Therefore, at minimum, the total SuDS mitigation index would be as follows:

	Mitigation indices		
SuDS components	TSS	Metals	Hydrocarbons
1) Permeable Pavement	0.7	0.6	0.7
Total	0.7	0.6	0.7

- 6.1.15. From the above tables the SuDS proposed on the development would provide an adequate level of water treatment for the potential pollution hazards generated by the land uses, as the total mitigation index is greater than the hazard index for all predicted contaminants.

6.2. Foul Drainage

- 6.2.1. There is an existing public foul water sewer located to the east of the site, running south along Stanhope Road.
- 6.2.2. It is anticipated that foul water flows generated as part of the proposed development will discharge to this public foul sewer.

6.3. Detailed Design and Approvals

- 6.4.1 During detailed design stage, discharge rates and connections will need to be approved by the LLFA, TWU and the Local Planning Authority.
- 6.3.1. Proposed detailed drainage systems will need to be modelled in Micro Drainage to confirm required pipe sizes and storage volumes.
- 6.3.2. Overland flow routes have been shown on the drainage plan through the development, to identify proposed flow paths for surface water runoff during extreme storm events. Final external levels will be designed to prevent overland flow routes from entering buildings.

6.4. Maintenance of Drainage Features

- 6.4.1. The design process should consider the maintenance of the components (access, waste management etc.) including any corrective maintenance to repair defects or improve performance of SuDS. Inlets, outlets, control structures or other below ground features should be as shallow as reasonably possible to allow easy access for maintenance and to reduce safety risks, while ensuring that sufficient depth is maintained for structural stability.
- 6.4.2. A SuDS Management Plan must be provided prior to the first occupation which will identify the following:
- The function of SuDS,
 - How and why it works on the site,
 - Impacts on amenity and wildlife, indicating how they can be enhanced.
 - Health and safety issues,
 - Long-term expectations for the SuDS on site.

6.4.3. Usually, SuDS components are on or near the surface and most can be managed using landscape maintenance techniques. Typical inspection and maintenance requirements for surface SuDS features are identified below:

Activity	Indicative frequency	Typical tasks
Routine/regular maintenance	Monthly (for normal care of SuDS)	• litter picking • grass cutting (cuttings to compost, wildlife piles or removed from site) Height and frequency dependent upon amenity of grass area. • inspection of inlets, outlets and control structures.
Occasional maintenance	Annually (dependent on the design)	• silt control around components • vegetation management around components • suction sweeping of permeable paving in autumn after leaf fall • silt and debris removal from inlets, outlets, gratings, catchpits, control chambers, soakaways and cellular storage. • strim wet swale or pond edges in September to October or 3-year rotation for wildlife value • wetland vegetation to be cut to 30% height annually and to 100mm on a 3-year rotation • remove overhanging trees or growth within SuDS features
Remedial maintenance	As required (tasks to repair problems due to damage or vandalism)	• inlet/outlet repair • erosion repairs • reinstatement of edgings • reinstatement following pollution • removal of silt build up.

6.4.4. For below-ground SuDS such as permeable paving the manufacturer or designer should provide maintenance advice. This should include routine and long-term actions that can be incorporated into the SuDS Management Plan.

6.4.5. Funding for the maintenance of SuDS features on the site should be resolved at the start of the development process.

7. Potential Sources of Flooding

7.1. Flooding from Rivers or Sea

- 7.1.1. The EA Indicative Floodplain Map identifies that the site lies within Flood Zone 1 – Very Low Probability of Flooding which is defined as land having a less than 1 in 1,000 annual probability of river or sea flooding.
- 7.1.2. Surveyed ground levels range from approximately 77.50m AOD to 79.00m AOD within the development site.
- 7.1.3. The SFRA identifies that the main sources of fluvial flooding in Haringey are two EA designated Main Rivers, the River Lee, located approximately 5.6km to the east, and the River Moselle, located 1.77km to the north-east. However, data does not indicate that these rivers affect the site. The SFRA also identifies that the risk of flooding from the artificial New River, located approximately 2.02km to the east of the site, is low.
- 7.1.4. The nearest area within a fluvial flood risk zone is EA designated Main River Mutton Brook, located 1.6km to the north-west, though this is not mentioned in the SFRA.
- 7.1.5. Based on the above, it is considered that the development site would be at very low risk of fluvial flooding.

7.2. Flooding from Land (Surface Water)

- 7.2.1. Flooding from land occurs when intense rainfall is unable to soak into the ground or enter drainage systems. Local topography and built form can have a strong influence on the direction and depth of flow.
- 7.2.2. The EA Indicative Surface Water Flood Map (**Figure 7.1**) identifies that the site has a very low risk of flooding from surface water.

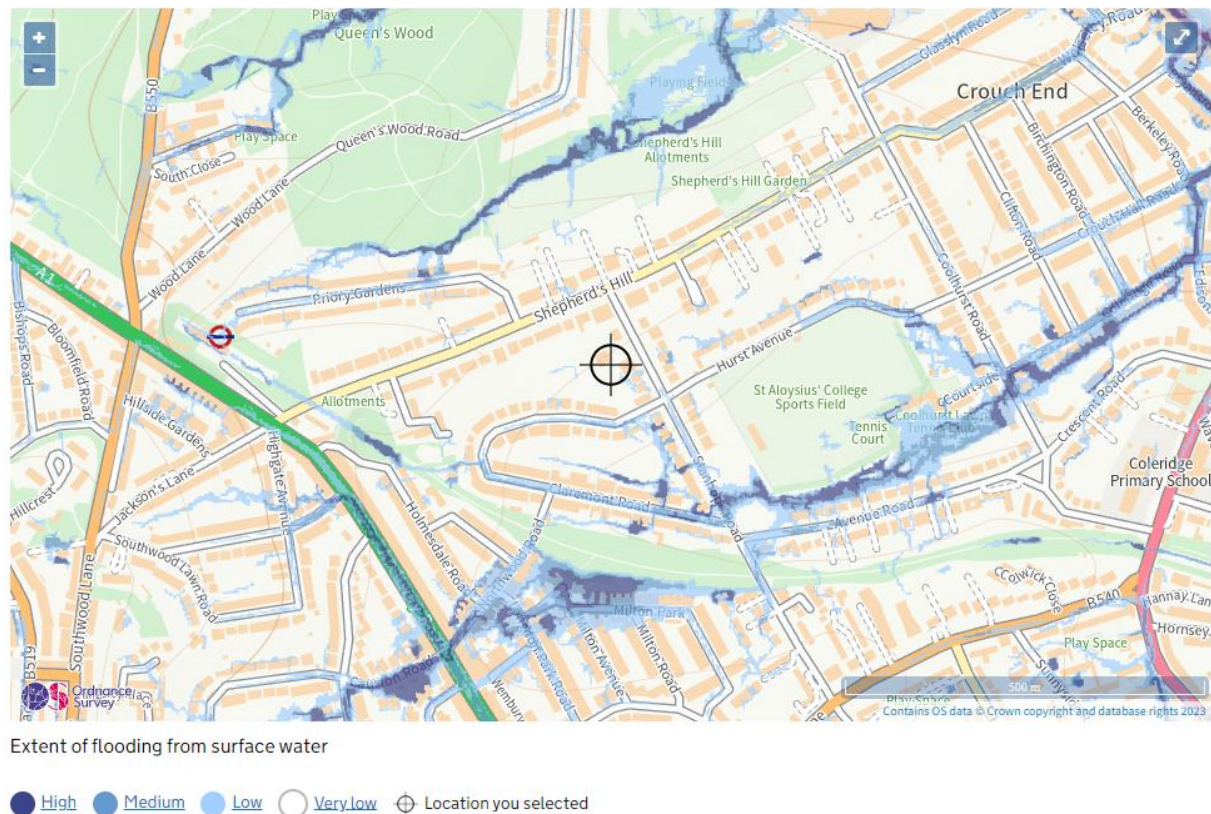


Figure 7.1 – EA Indicative Surface Water Flood Map

- 7.2.3. There is a low-risk surface water flooding flow route associated with Parkland Walk to the south of the site, and a medium to high-risk surface water flooding flow route along Coleridge Road to the east of the site extending to the south of the St Aloysius' College Sports Field and to Claremont Road to the south of the site. However, these areas do not appear to affect the application site.
- 7.2.4. **Figure 7.2** also identifies a surface water flood route flow path to the west of the site, extending between Cranley Gardens and Upper Holloway.

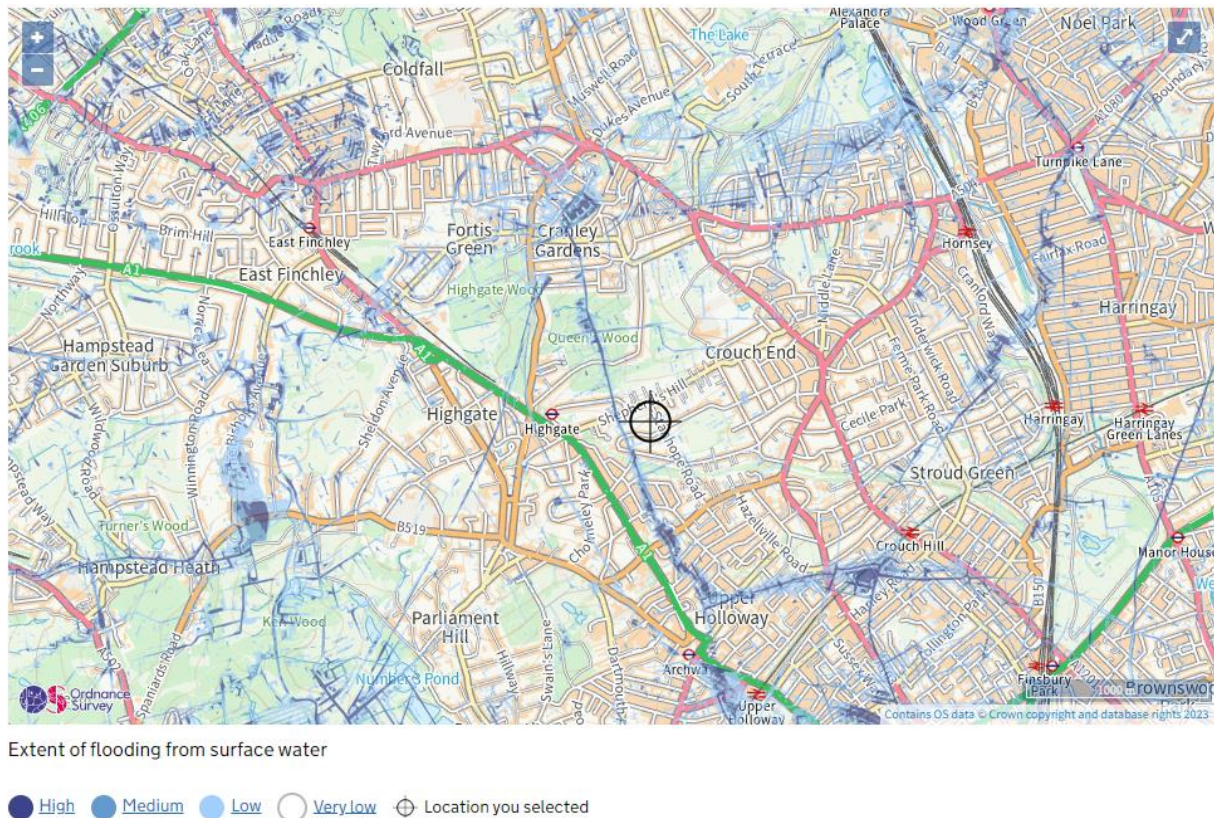


Figure 7.2 – Wider Extent of the EA Indicative Surface Water Flood Map

7.2.5. The SFRA and BGS website identify that the local geology of Haringey and that of the application site is predominantly London Clay, with a low capability for surface water infiltration, which results in an increased volume of surface water runoff. However, there is no evidence of ponding, or flow routes affecting the site.

7.2.6. Areas with a low risk of surface water flooding have a likeliness of occurring between 0.1% and 1% per year. Overland flow routes will be taken into consideration in the design levels for the proposed development to direct any overland flows away from buildings.

7.2.7. The development is currently considered to be at very low risk of flooding from surface water.

7.3. Flooding from Groundwater

7.3.1. Groundwater flooding occurs when water levels in the ground rise above surface elevations. Groundwater flooding events are most likely to occur in low lying areas underlain by permeable rocks (aquifers).

7.3.2. The SFRA identifies that while the wider Haringey area is at risk of fluvial, pluvial and sewer flooding, there is no risk from tidal or groundwater flooding.

7.3.3. Overland flow routes will be taken into account in the design of levels for the proposed development and, should groundwater flooding occur on the site, flows will tend to run overland towards drainage features situated at the low areas of the site.

7.4. Flooding from Sewers

7.4.1. A Sewer Flooding History Enquiry has been carried out with TWU which confirms that there have been no reported incidents of flooding in the requested area as a result of surcharging public sewers. A copy of the Sewer Flooding History Enquiry is provided in **Appendix E**.

7.4.2. The development layout will be designed with consideration of flood routing, to ensure that new buildings and occupants of the site will not be subject to detrimental impacts in the event of flooding from infrastructure failure within or upstream of the site.

7.5. Flooding from Reservoirs, Canals and Other Artificial Sources

7.5.1. Inspection of the EA flood maps (**Figure 7.3**) confirm the site is not at risk of flooding from reservoirs, canals or other artificial sources.

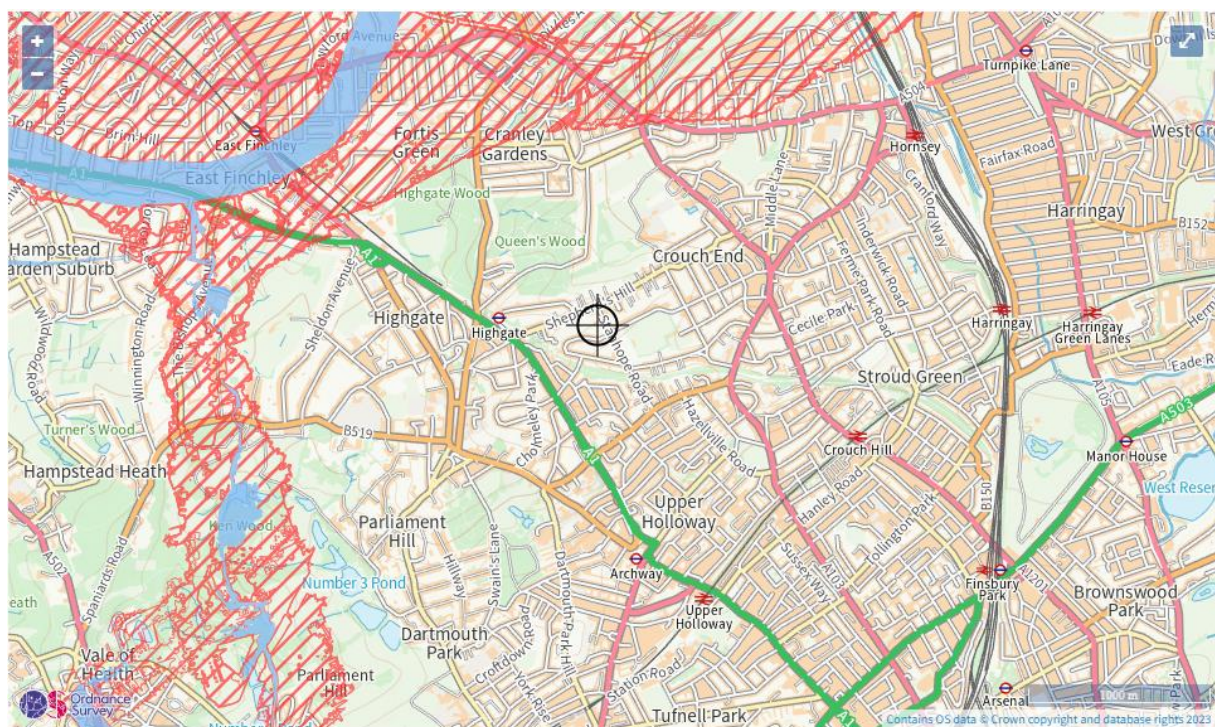


Figure 7.3 – EA Indicative Flood Map from Reservoirs

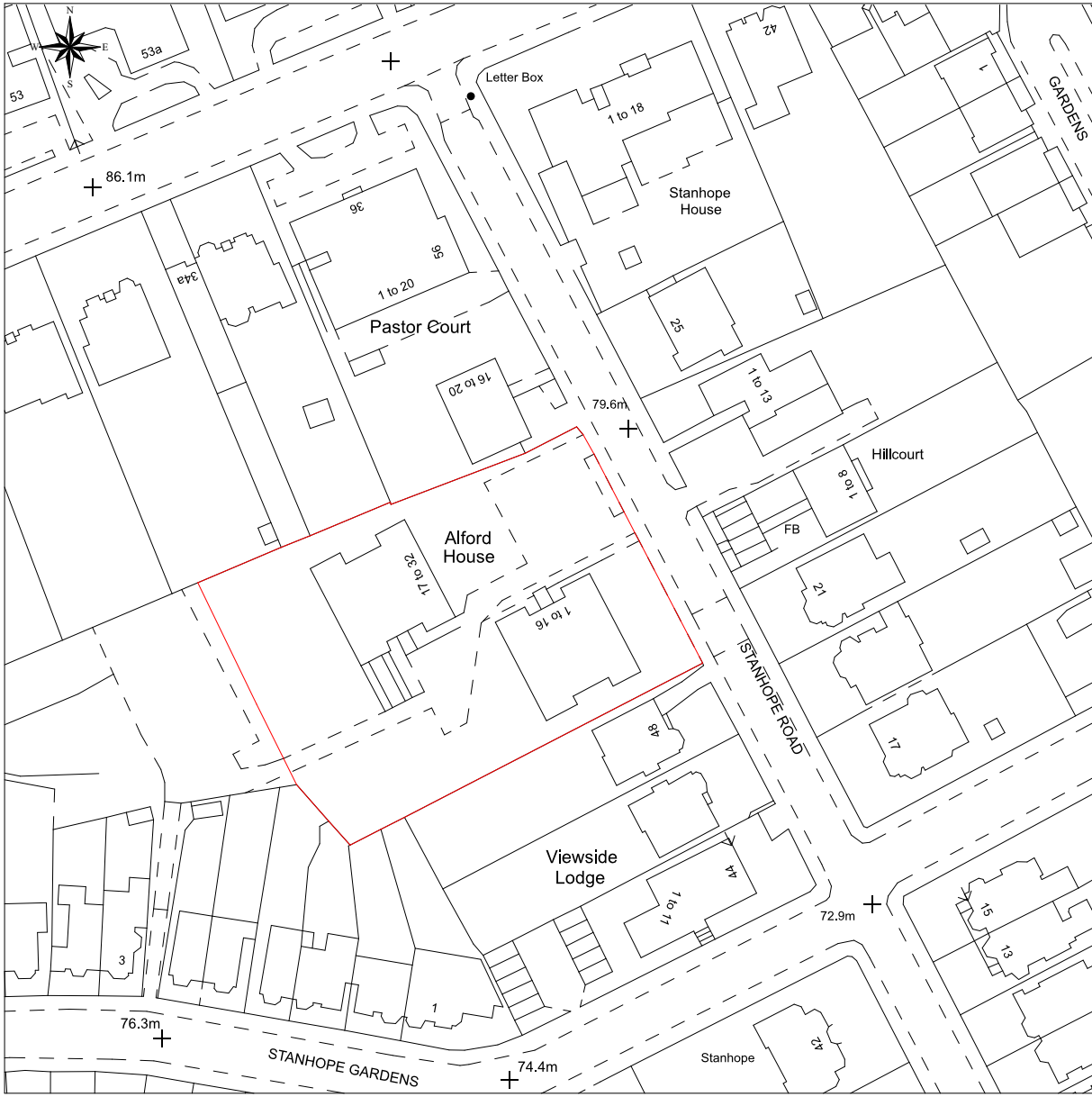
7.5.2. No other non-natural or artificial sources of flooding where water is retained above natural ground level, operational and redundant industrial processes including mining,

quarrying and sand and gravel extraction, would appear to be located in the vicinity of the site which may cause increase floodwater depths or velocities.

8. Summary and Recommendations

- 8.1.1. Stomor Ltd have been commissioned by Empyrean Developments to prepare a Flood Risk Assessment (FRA) associated with the proposed development at Alford House, Stanhope Road, London.
- 8.1.2. The application site is brownfield, with a total area of 0.395ha, currently comprising 2No. detached five-storey blocks of flats, built in the 1960s, and recently extended with four roof level flats, communal lawns, outdoor car parking and two bike and bin stores.
- 8.1.3. Development proposals comprise the development of 2No. semi-detached three-bedroom houses on the existing front car park.
- 8.1.4. The site is located in Flood Zone 1, land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding.
- 8.1.5. The nearest watercourse to the site is Mutton Brook, located approximately 1.6km to the north-west of the site, which is an EA designated Main River. The Moselle, another EA designated Main River, is located approximately 1.77km to the north-east. Another watercourse, the New River, which is an artificial watercourse, is located approximately 2.02km to the north-east, and does not appear to have an EA designation.
- 8.1.6. The site is located within a Critical Drainage Area, which is an area that has critical drainage problems and has been notified to the local planning authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF).
- 8.1.7. The proposed development would have a NPPF flood risk vulnerability classification of 'More Vulnerable'. NPPG identifies 'More Vulnerable' development as being appropriate within Flood Zone 1.
- 8.1.8. It is considered that the site is at very low risk of flooding from rivers and the sea, and surface water, and at low risk of flooding from sewers and groundwater sources.
- 8.1.9. Overland flow paths and exceedance routes will be taken into account in design of levels for the proposed development to direct overland flows away from buildings.
- 8.1.10. The site can be effectively drained, providing a 50% betterment for the discharge rate, including SuDS to provide water treatment and attenuation.

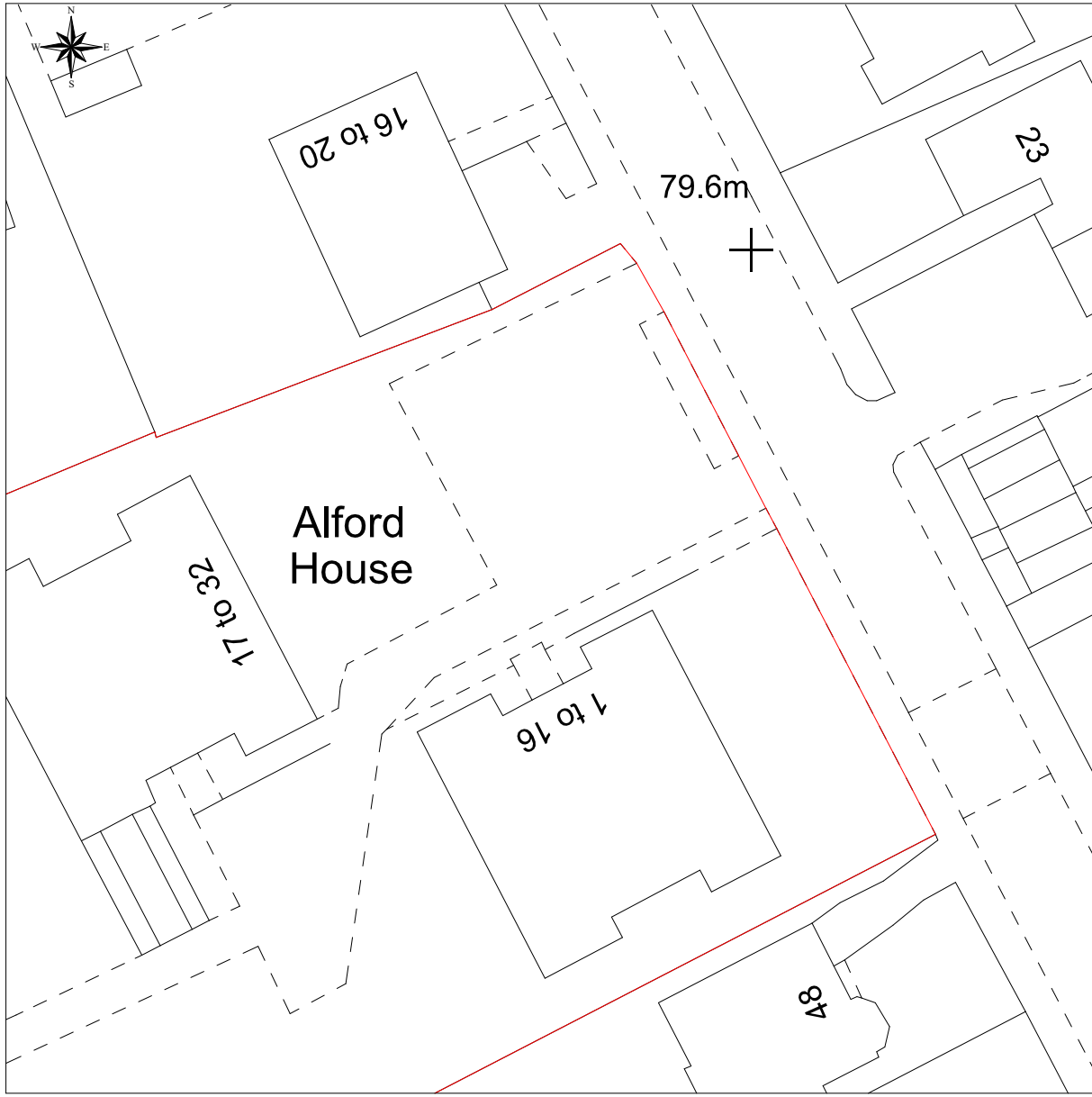




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Location Plan



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Scale: 1:500

Block / Site Plan

The original PDF of a printed copy of this drawing might contain information in colour. Check the PDF for reference. Do not scale from printed copies unless print settings can be verified. Refer to scale bars, dimension lines, height markers etc. All existing site, tree, building and boundary information is based on third party survey data. Measurements are indicative only, all dimensions to be double checked on site. Errors to be reported immediately to Architect. Building Services shown indicatively only. Drawings only show the general position, not exact line of site boundaries.

ERBAR MATTES

+44 (0)20 3865 8066
studio@erbarmattes.com

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Registered in England and Wales No. 09699619

Project Alford House Site, 50, 52 and 54 Stanhope Road, London N6 5AL
Client LonPro Highgate Limited
Date February 2023
Scale / A3 1:1250 & 1:500

Drawing Name Location Plan & Block Plan

Project No 141
Issue Planning
Drawing No 141_00_01_PL1
Status Planning Application



Asset location search



Property Searches

Stomor Ltd
Suite 2 Portmill house
1ft floorPortmill lane
HITCHIN
SG5 1DJ

Search address supplied Alford House
Alford House
Stanhope Road
London
N6 5AL

Your reference ST-3338

Our reference ALS/ALS Standard/2023_4789670

Search date 22 February 2023

Notification of Price Changes

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

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

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



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



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



0800 009 4540

Search address supplied: Alford House, Alford House, Stanhope Road, London, N6 5AL

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

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

Clean Water Services

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

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

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



For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

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

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

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

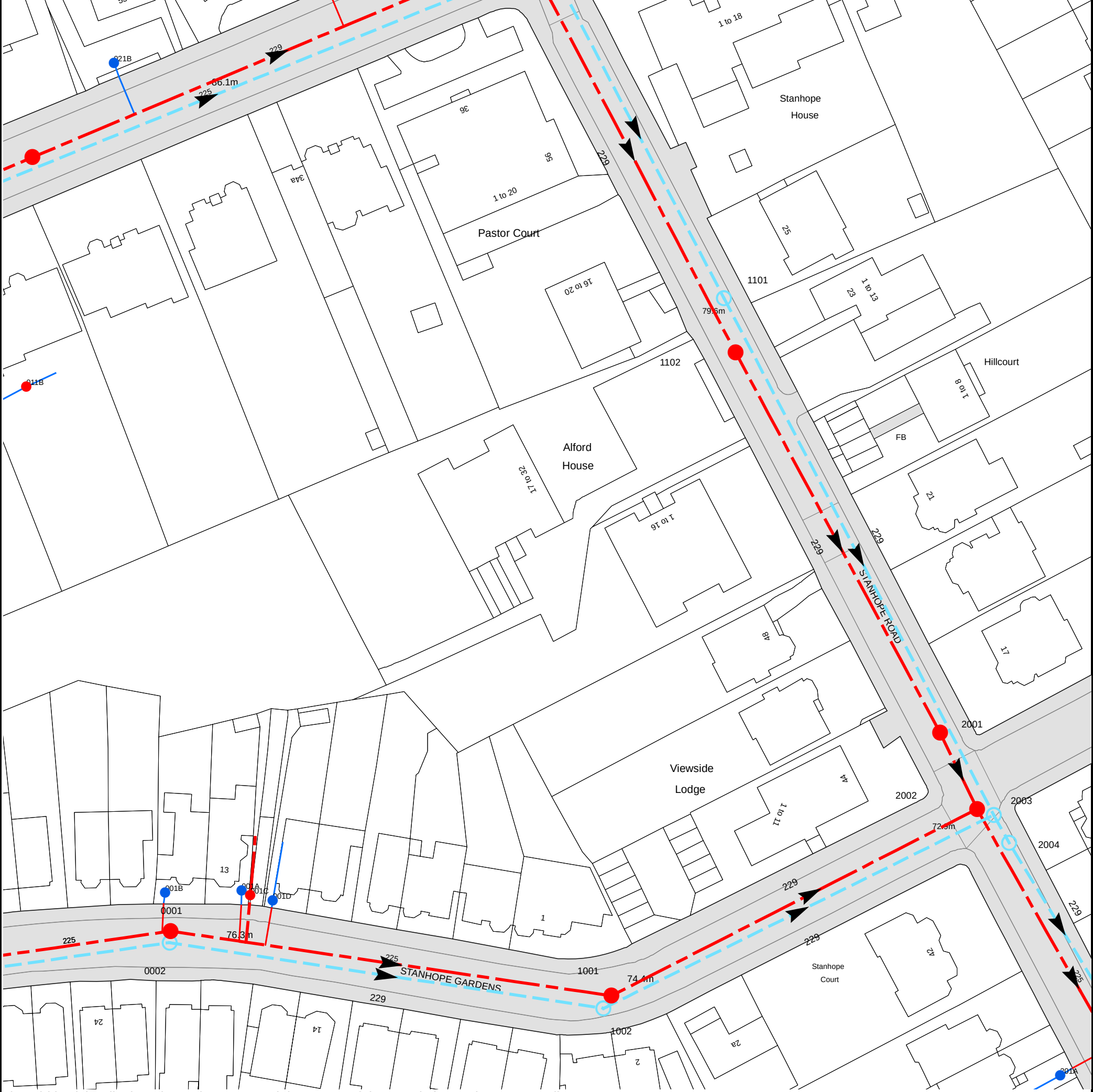
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

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

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

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



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
2004	72.01	68.73
201A	n/a	n/a
011B	n/a	n/a
0103	87.17	83.14
021B	n/a	n/a
001B	n/a	n/a
0002	77.12	73.26
0001	77.09	72.41
001A	n/a	n/a
001C	n/a	n/a
001D	n/a	n/a
1002	74.2	70.54
1001	74.25	69.65
1101	79.76	76.49
1102	79.17	74.9
2001	73.42	68.75
2002	72.63	67.88
2003	72.45	69.13
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

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

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

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

Notes:

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

Sewer Fittings

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

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

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

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

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

	Inlet		Outfall
	Undefined End		

Other Symbols

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

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

Areas

Lines denoting areas of underground surveys, etc.

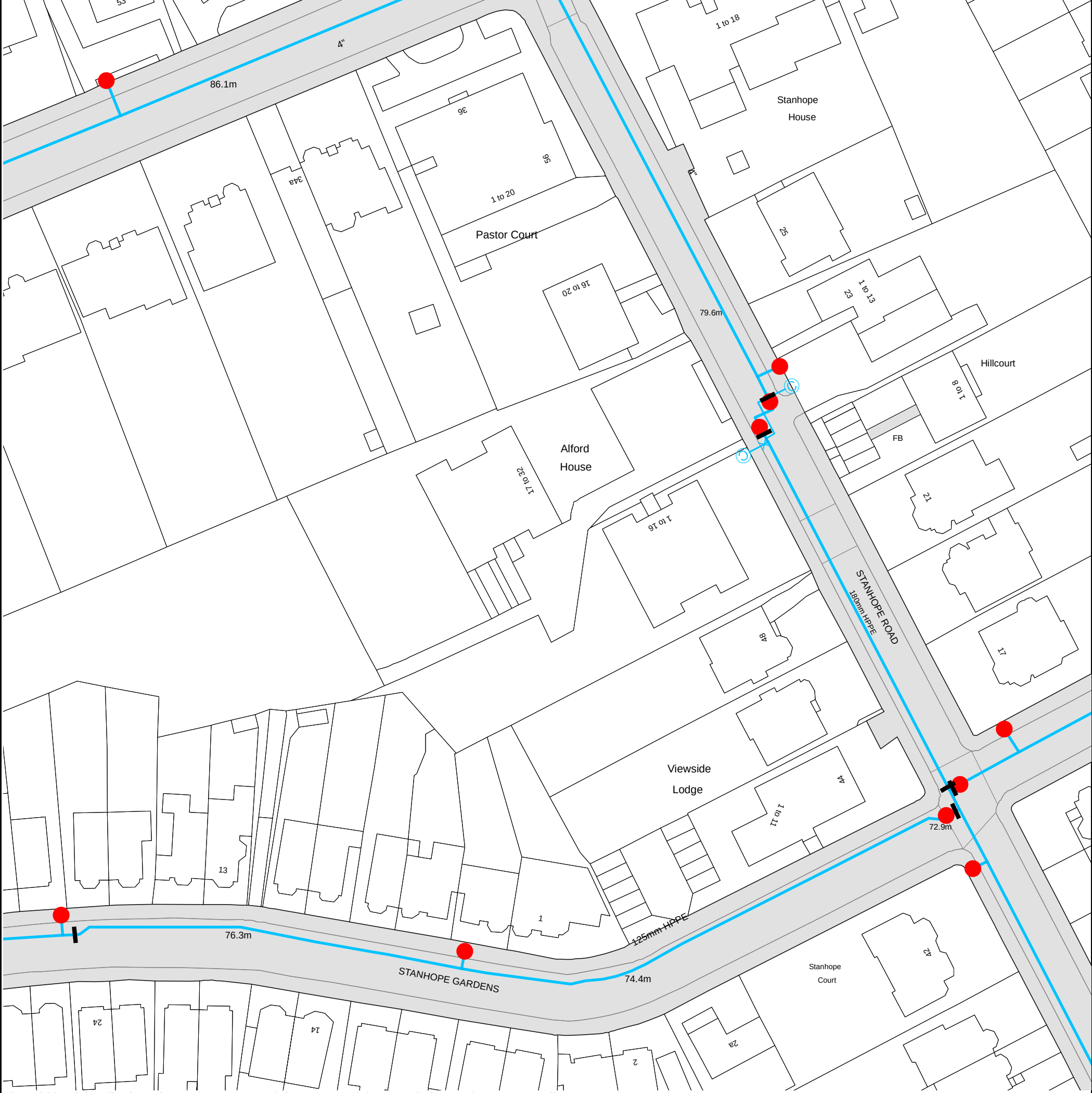
	Agreement
	Chamber
	Operational Site

Ducts or Crossings

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

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

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



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 529138, 188127.
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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



Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

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

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

Valves

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

Hydrants

- Single Hydrant

Meters

- Meter

End Items

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

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

Operational Sites

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

Other Symbols

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

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

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

Terms and Conditions

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

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

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

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

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

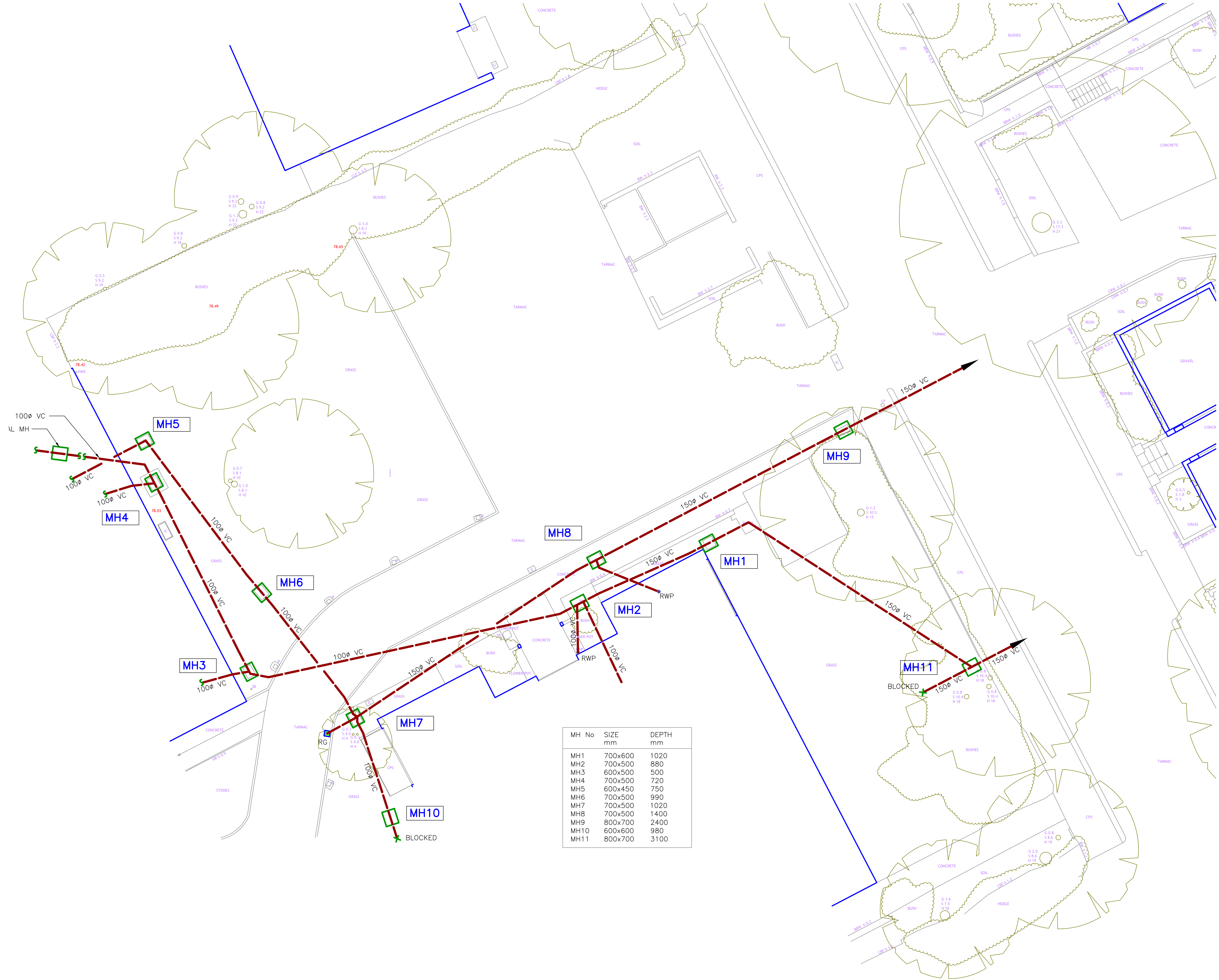
If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria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

Ways to pay your bill

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

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





- NOTES:
- THIS DRAWING TO BE READ IN CONJUNCTION WITH
JPD TECHNICAL SERVICES
REPORT DATED 24 JUN 2022
SURVEY CARRIED OUT 20 JUN 2022
 - | | |
|-------|---------------------------------|
| MH | MANHOLE |
| CP | CATCHPIT |
| PC | PUMPING CHAMBER |
| PRM | PUMPED RISING MAIN |
| FWD | FOUL WATER DRAIN |
| SWD | SURFACE WATER DRAIN |
| CD | COMBINED DRAIN SWD/FWD |
| DP | DRAIN POINT |
| RWP | RAIN WATER PIPE |
| SVP | SOIL VENT PIPE |
| SS | STUB STACK |
| VP | VENT PIPE |
| WP | WASTE PIPE |
| VC | VITRIFIED CLAY |
| CI | CAST IRON |
| PVC | PLASTIC PIPE |
| PF | PITCHFIBRE |
| GY | GULLY |
| RG | ROAD GULLY |
| OTG | OPEN TRAPPED GULLY |
| OTBIG | OPEN TRAPPED BACK INLET GULLY |
| STBIG | SEALED TRAPPED BACK INLET GULLY |
| IT | INTERCEPTOR TRAP |
| RAIT | REVERSE ARM INTERCEPTOR TRAP |
| RE | RODDING EYE |
| AP | ACCESS POINT |
| BD | BACK DROP |
| UTS | UNABLE TO SURVEY |
| UTL | UNABLE TO LIFT |
| UTSF | UNABLE TO SURVEY FURTHER |
| BAC | BOLTED ACCESS CHAMBER |
| CL: | COVER LEVEL |
| IL: | INVERT LEVEL |
 - ALL PIPEWORK IS 100Ø UNLESS OTHERWISE STATED
 - | |
|-------------------------------------|
| FOUL WATER BELOW GROUND DRAINAGE |
| SURFACE WATER BELOW GROUND DRAINAGE |
| ASSUMED BELOW GROUND DRAINAGE |
| ABOVE GROUND DRAINAGE |
| ABOVE GROUND WASTE PIPES |
| PUMPED RISING MAIN |
| BRANCH REFERENCE Nos (SEE REPORT) |

MH No	SIZE mm	DEPTH mm
MH1	700x600	1020
MH2	700x500	880
MH3	600x500	500
MH4	700x500	720
MH5	600x450	750
MH6	700x500	990
MH7	700x500	1020
MH8	700x500	1400
MH9	800x700	2400
MH10	600x600	980
MH11	800x700	3100

REVNo

DATE

REVISION

jpd technical services

PUBLIC HEALTH ENGINEERS SURVEY:DESIGN:CONTRACT

14 Fairdene Road

Coulsdon, Surrey CR5 1RA

TEL: 01737 555054 WWW.JPDTECH.CO.UK

CLIENT

EBAR MATTES

PROJECT

50-54 STANHOPE ROAD
LONDON N6 5AL

TITLE

SITE PLAN
EXISTING UNDERGROUND
DRAINAGE LAYOUT

DRAWN

SDS

CHECKED

JEB/JPD

SCALE

1:100 @ A1 DO NOT SCALE

DATE

JUN 2022

DRAWING No

6466-1



jpd technical services ltd

PUBLIC HEALTH ENGINEERS SURVEY : DESIGN : CONTRACT

14 Fairdene Road
Coulsdon
Surrey
CR5 1RA
T: 01737 555054

E: jpdtechnicalservices@outlook.com

www.jpdttech.co.uk

30 June 2022

Erbar Mattes
Unit 6D
Thane Works
London
N7 7NU

For the attention Mr H Mattes

ALFORD HOUSE SITE, 50-54 STANHOPE ROAD, LONDON N6 5AL

The tracking and CCTV survey of the existing underground drainage serving the above premises was carried out on the 30 June 2022 and the findings were as follows.

The purpose of the survey was to fully establish the layout and condition of the existing drainage system within the boundary as instructed.

1. Survey Information

For details of individual sections of drain see survey notes (1 - 9), CCTV survey footage, survey photographs and record drawing 6466/1.

2. Description of System

The existing drainage system is separate and collects foul and surface water discharge from the ground, upper floors, roofs and surrounding hard standing areas of the building before discharging to the TWA sewers in Stanhope Road via the following outfalls.

- MH9 – 150dia vitrified clay surface water outfall to Stanhope Road
- MH11 – 150dia vitrified clay foul water outfall to Stanhope Road

An interceptor trap has been installed in the foul water outfall manhole (MH11) to separate the site drainage from the public sewer.

The pipework surveyed is vitrified clay with traditional spigot and socket joints.

Manholes are either of brick construction with clay channels and have medium duty, single seal cast iron access covers.

3. Summary

The pipework surveyed is generally in a fair condition and suitable for re-use once the remedial works have been carried out.

Open/displaced joints were noted in the VC sections of drainage however this is fairly typical for traditionally jointed clay pipework.

Multiple cracks were noted in the downstream section of MH5 (see survey notes).

Silt/debris was noted in some sections of pipework surveyed. These will require HV water jet cleaning so that they can be left in a free flowing condition.

4. Recommendations

These recommendations are based on the existing drainage system and should be incorporated as part of any on-going site maintenance.

- a. All retained sections of drainage pipework to be HV water jet cleaned to a maximum 1700psi to prevent any further structural damage occurring. Cleaning to include all traps and gullies. CCTV monitoring can be carried out during any cleaning works.
- b. All existing retained pipework to be tested for soundness prior to re-use. Any defective sections to be replaced or structurally lined accordingly.
- c. The whole of the drainage system to be HV water jet cleaned and CCTV surveyed on completion of the project and prior to handover.

Should you require any further information or costs for our recommended remedial works then please contact the undersigned.

Yours Sincerely

J Sanger-Brown

James Sanger-Brown
JPD Technical Services



	ST-3338
Project Name	Alford House, Stanhope Road
Date	Mar-23

Greenfield Runoff Calculation

Based upon Environment Agency Report – SC030219 Rainfall runoff management for developments, The SuDS Manual C753 and EA/Defra Technical Report W5-074/A/TR/1

Site Area:	0.0334	ha
SAAR	656	mm
Soil Type	4	
SPR (see table)	0.47	
Hydrological Area	6	

Soil Type	SPR
1	0.1
2	0.3
3	0.37
4	0.47
5	0.53

$$QBAR_{rural} = 1.08 AREA^{0.89} SAAR^{1.17} SPR^{2.17}$$

Use Area = 0.5km² for calculation

$$QBAR_{rural} = 1.08 \times 0.54 \times 1976 \times 0.1943 = \frac{223.74}{4.4747} \text{ l/s for 50ha site}$$

From Growth Curves obtained from DEFRA report (see tabs)

Q1	$QBAR_{rural} \times 0.90 = 4.03$	l/s/ha
Q30	$QBAR_{rural} \times 2.30 = 10.29$	l/s/ha
Q100	$QBAR_{rural} \times 3.15 = 14.10$	l/s/ha

For site specific flows

Q1	$4.027258 \times 0.03 = 0.13$	l/s
Q30	$10.29188 \times 0.03 = 0.34$	l/s
Q100	$14.0954 \times 0.03 = 0.47$	l/s

	ST 3338
Project Name	Alford House
	Stanhope Road
Date	09.03.23

Brownfield Runoff Calculation

Based upon the Modified Rational Method

$$Q = C \times A_p \times r$$

Q = Flow Rate in litres/second

C = Dimensionless Runoff Coefficient of 2.78

A_p = Impermeable Drained Area (ha)

r = Rainfall Intensity Rate in mm/hour; Storm Duration 60 minutes

r (1 in 1 year) 51 mm/hr

r (1 in 30 year) 121 mm/hr

r (1 in 100 year) 160 mm/hr

Brownfield Runoff Rate:

1 in 1 year $Q = 4.04$ l/s

1 in 30 year $Q = 9.59$ l/s

1 in 100 year $Q = 12.68$ l/s



Sewer Flooding

History Enquiry



Property
Searches

Stomor Ltd

Portmill lane

Search address supplied Alford House
Alford House
Stanhope Road
London
N6 5AL

Your reference ST-3338

Our reference SFH/SFH Standard/2023_4789673

Received date **22 February 2023**

Search date **22 February 2023**



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



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



0800 009 4540

Sewer Flooding

History Enquiry



Property
Searches

Search address supplied: Alford House, Alford House, Stanhope Road, London, N6 5AL

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



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



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



0800 009 4540

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk



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

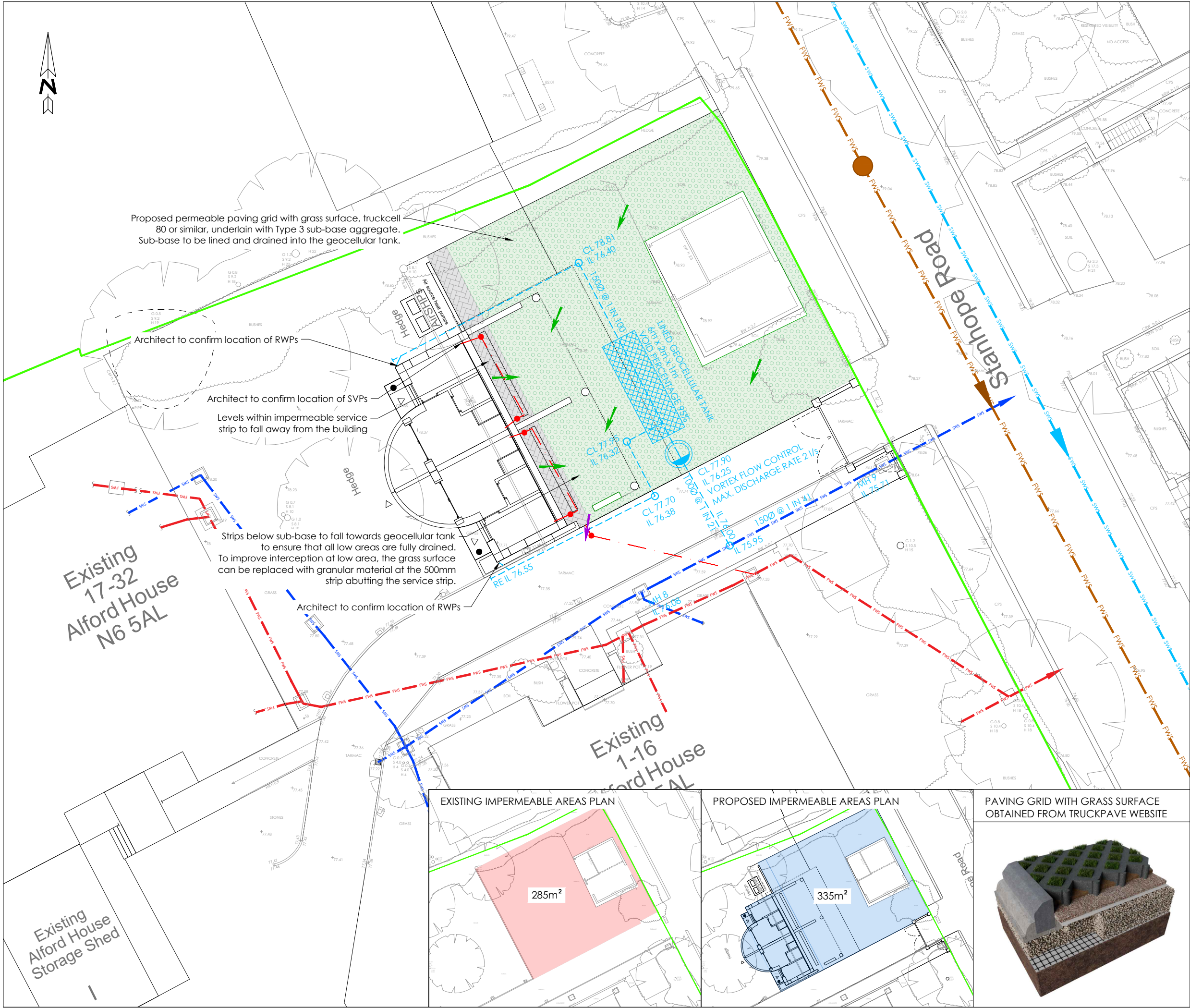


searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540





PRE-DEVELOPMENT RUNOFF RATES:

Q1	4.0 l/s
Q30	9.6 l/s
Q100	12.7 l/s

POST-DEVELOPMENT RUNOFF RATES:

Q1	2.0 l/s
Q30	2.0 l/s
Q100	2.0 l/s
Q100+ 40%CC	2.0 l/s

THE DEVELOPMENT PROVIDES A 50% BETTERMENT FOR THE 1 IN 1 YEAR STORM EVENT. THE BETTERMENT IS GREATER FOR MORE SEVERE STORM EVENTS.

KEY

- SITE BOUNDARY
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- EXISTING PRIVATE FOUL WATER SEWER
- EXISTING PRIVATE SURFACE WATER SEWER
- PROPOSED SERVICE STRIP (IMPERMEABLE PAVEMENT)
- PROPOSED PERMEABLE GRASS PAVING GRID (LINED)
- OVERLAND FLOW ROUTES
- EXCEEDANCE FLOW ROUTES
- PROPOSED SURFACE WATER PIPE RUN
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED LINED GEOCELLULAR TANK
- PROPOSED VORTEX FLOW CONTROL
- PROPOSED FOUL WATER PIPE RUN
- PROPOSED FOUL WATER INSPECTION CHAMBER

0 2 4 6 8 10m
SCALE BAR 1:200

THIS IS AN INDICATIVE DRAINAGE STRATEGY AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN. THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES ARE SUBJECT TO A DETAILED SURVEY.

Rev	Description	Date	Drawn	Checked	Apvd.
Project	Alford House Site, 50, 52 And 54 Stanhope Road				

Drawing Description	Indicative Drainage Strategy
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Project Number ST-3338		Drawing Number 01		
Scale 1:200@A3	Date 09.03.23	Drawn SIV	Checked SJB	Approved SJB
Client		Architect		

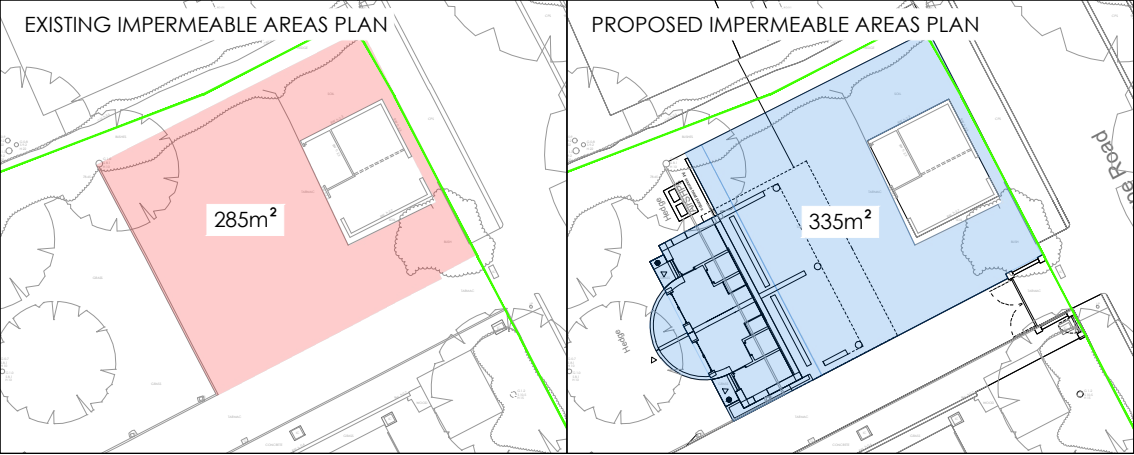
Do not scale off the drawing. Only written dimensions should be taken. Any discrepancies or errors should be brought to the attention of the engineer immediately. This document is copyright and may not be reproduced without permission of the owner.

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CIVIL ENGINEERING CONSULTANTS

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Portmill Lane, Hitchin, Herts, SG5 1DJ
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 60 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Control (l/s)</th><th>Max Σ Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>76.938</td><td>0.688</td><td>0.0</td><td>1.8</td><td>1.8</td><td>7.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>77.088</td><td>0.838</td><td>0.0</td><td>1.8</td><td>1.8</td><td>9.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>77.135</td><td>0.885</td><td>0.0</td><td>1.8</td><td>1.8</td><td>10.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>77.078</td><td>0.828</td><td>0.0</td><td>1.8</td><td>1.8</td><td>9.4</td><td>O K</td></tr><tr><td>180 min Summer</td><td>77.001</td><td>0.751</td><td>0.0</td><td>1.8</td><td>1.8</td><td>8.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>76.923</td><td>0.673</td><td>0.0</td><td>1.8</td><td>1.8</td><td>7.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>76.752</td><td>0.502</td><td>0.0</td><td>1.8</td><td>1.8</td><td>5.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>76.616</td><td>0.366</td><td>0.0</td><td>1.8</td><td>1.8</td><td>4.2</td><td>O K</td></tr><tr><td>600 min Summer</td><td>76.519</td><td>0.269</td><td>0.0</td><td>1.8</td><td>1.8</td><td>3.1</td><td>O K</td></tr><tr><td>720 min Summer</td><td>76.453</td><td>0.203</td><td>0.0</td><td>1.7</td><td>1.7</td><td>2.3</td><td>O K</td></tr><tr><td>960 min Summer</td><td>76.376</td><td>0.126</td><td>0.0</td><td>1.6</td><td>1.6</td><td>1.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>76.327</td><td>0.077</td><td>0.0</td><td>1.3</td><td>1.3</td><td>0.9</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>76.306</td><td>0.056</td><td>0.0</td><td>0.9</td><td>0.9</td><td>0.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>76.297</td><td>0.047</td><td>0.0</td><td>0.7</td><td>0.7</td><td>0.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>76.288</td><td>0.038</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>76.283</td><td>0.033</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>76.280</td><td>0.030</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>76.277</td><td>0.027</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>76.275</td><td>0.025</td><td>0.0</td><td>0.3</td><td>0.3</td><td>0.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>77.033</td><td>0.783</td><td>0.0</td><td>1.8</td><td>1.8</td><td>8.9</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>150.344</td><td>0.0</td><td>9.6</td><td>23</td></tr><tr><td>30 min Summer</td><td>96.858</td><td>0.0</td><td>12.3</td><td>35</td></tr><tr><td>60 min Summer</td><td>59.321</td><td>0.0</td><td>15.1</td><td>58</td></tr><tr><td>120 min Summer</td><td>35.092</td><td>0.0</td><td>17.9</td><td>90</td></tr><tr><td>180 min Summer</td><td>25.484</td><td>0.0</td><td>19.5</td><td>124</td></tr><tr><td>240 min Summer</td><td>20.200</td><td>0.0</td><td>20.6</td><td>160</td></tr><tr><td>360 min Summer</td><td>14.540</td><td>0.0</td><td>22.2</td><td>224</td></tr><tr><td>480 min Summer</td><td>11.510</td><td>0.0</td><td>23.5</td><td>280</td></tr><tr><td>600 min Summer</td><td>9.596</td><td>0.0</td><td>24.5</td><td>336</td></tr><tr><td>720 min Summer</td><td>8.267</td><td>0.0</td><td>25.3</td><td>392</td></tr><tr><td>960 min Summer</td><td>6.531</td><td>0.0</td><td>26.6</td><td>506</td></tr><tr><td>1440 min Summer</td><td>4.678</td><td>0.0</td><td>28.6</td><td>736</td></tr><tr><td>2160 min Summer</td><td>3.346</td><td>0.0</td><td>30.7</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>2.636</td><td>0.0</td><td>32.3</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>1.882</td><td>0.0</td><td>34.5</td><td>2188</td></tr><tr><td>5760 min Summer</td><td>1.480</td><td>0.0</td><td>36.2</td><td>2880</td></tr><tr><td>7200 min Summer</td><td>1.228</td><td>0.0</td><td>37.6</td><td>3632</td></tr><tr><td>8640 min Summer</td><td>1.054</td><td>0.0</td><td>38.7</td><td>4360</td></tr><tr><td>10080 min Summer</td><td>0.926</td><td>0.0</td><td>39.7</td><td>5136</td></tr><tr><td>15 min Winter</td><td>150.344</td><td>0.0</td><td>10.7</td><td>23</td></tr></table>				Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	76.938	0.688	0.0	1.8	1.8	7.8	O K	30 min Summer	77.088	0.838	0.0	1.8	1.8	9.6	O K	60 min Summer	77.135	0.885	0.0	1.8	1.8	10.1	O K	120 min Summer	77.078	0.828	0.0	1.8	1.8	9.4	O K	180 min Summer	77.001	0.751	0.0	1.8	1.8	8.6	O K	240 min Summer	76.923	0.673	0.0	1.8	1.8	7.7	O K	360 min Summer	76.752	0.502	0.0	1.8	1.8	5.7	O K	480 min Summer	76.616	0.366	0.0	1.8	1.8	4.2	O K	600 min Summer	76.519	0.269	0.0	1.8	1.8	3.1	O K	720 min Summer	76.453	0.203	0.0	1.7	1.7	2.3	O K	960 min Summer	76.376	0.126	0.0	1.6	1.6	1.4	O K	1440 min Summer	76.327	0.077	0.0	1.3	1.3	0.9	O K	2160 min Summer	76.306	0.056	0.0	0.9	0.9	0.6	O K	2880 min Summer	76.297	0.047	0.0	0.7	0.7	0.5	O K	4320 min Summer	76.288	0.038	0.0	0.5	0.5	0.4	O K	5760 min Summer	76.283	0.033	0.0	0.4	0.4	0.4	O K	7200 min Summer	76.280	0.030	0.0	0.3	0.3	0.3	O K	8640 min Summer	76.277	0.027	0.0	0.3	0.3	0.3	O K	10080 min Summer	76.275	0.025	0.0	0.3	0.3	0.3	O K	15 min Winter	77.033	0.783	0.0	1.8	1.8	8.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	150.344	0.0	9.6	23	30 min Summer	96.858	0.0	12.3	35	60 min Summer	59.321	0.0	15.1	58	120 min Summer	35.092	0.0	17.9	90	180 min Summer	25.484	0.0	19.5	124	240 min Summer	20.200	0.0	20.6	160	360 min Summer	14.540	0.0	22.2	224	480 min Summer	11.510	0.0	23.5	280	600 min Summer	9.596	0.0	24.5	336	720 min Summer	8.267	0.0	25.3	392	960 min Summer	6.531	0.0	26.6	506	1440 min Summer	4.678	0.0	28.6	736	2160 min Summer	3.346	0.0	30.7	1100	2880 min Summer	2.636	0.0	32.3	1468	4320 min Summer	1.882	0.0	34.5	2188	5760 min Summer	1.480	0.0	36.2	2880	7200 min Summer	1.228	0.0	37.6	3632	8640 min Summer	1.054	0.0	38.7	4360	10080 min Summer	0.926	0.0	39.7	5136	15 min Winter	150.344	0.0	10.7	23
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32 Beehive Lane

Welwyn Garden City

Herts AL7 4BQ

Date 09/03/2023 16:17

File ST-3338.SRCX

Designed by SamuelIraola

Checked by

Micro Drainage

Source Control 2020.1

Micro Drainage

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	77.208	0.958	0.0	1.8	1.8	10.9	O K
60 min Winter	77.336	1.086	0.0	1.9	1.9	11.7	O K
120 min Winter	77.198	0.948	0.0	1.8	1.8	10.8	O K
180 min Winter	77.088	0.838	0.0	1.8	1.8	9.6	O K
240 min Winter	76.973	0.723	0.0	1.8	1.8	8.2	O K
360 min Winter	76.711	0.461	0.0	1.8	1.8	5.3	O K
480 min Winter	76.527	0.277	0.0	1.8	1.8	3.2	O K
600 min Winter	76.423	0.173	0.0	1.7	1.7	2.0	O K
720 min Winter	76.368	0.118	0.0	1.6	1.6	1.3	O K
960 min Winter	76.328	0.078	0.0	1.3	1.3	0.9	O K
1440 min Winter	76.306	0.056	0.0	0.9	0.9	0.6	O K
2160 min Winter	76.294	0.044	0.0	0.7	0.7	0.5	O K
2880 min Winter	76.288	0.038	0.0	0.5	0.5	0.4	O K
4320 min Winter	76.282	0.032	0.0	0.4	0.4	0.4	O K
5760 min Winter	76.278	0.028	0.0	0.3	0.3	0.3	O K
7200 min Winter	76.275	0.025	0.0	0.2	0.2	0.3	O K
8640 min Winter	76.273	0.023	0.0	0.2	0.2	0.3	O K
10080 min Winter	76.271	0.021	0.0	0.2	0.2	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	96.858	0.0	13.8	35
60 min Winter	59.321	0.0	16.9	60
120 min Winter	35.092	0.0	20.0	96
180 min Winter	25.484	0.0	21.8	134
240 min Winter	20.200	0.0	23.1	172
360 min Winter	14.540	0.0	24.9	236
480 min Winter	11.510	0.0	26.3	290
600 min Winter	9.596	0.0	27.4	340
720 min Winter	8.267	0.0	28.3	392
960 min Winter	6.531	0.0	29.8	496
1440 min Winter	4.678	0.0	32.1	736
2160 min Winter	3.346	0.0	34.4	1100
2880 min Winter	2.636	0.0	36.1	1448
4320 min Winter	1.882	0.0	38.7	2192
5760 min Winter	1.480	0.0	40.6	2912
7200 min Winter	1.228	0.0	42.1	3568
8640 min Winter	1.054	0.0	43.4	4296
10080 min Winter	0.926	0.0	44.4	5128

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32 Beehive Lane Welwyn Garden City Herts AL7 4BQ																																												
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Model Details

Storage is Online Cover Level (m) 77.900

Complex Structure

Cellular Storage

Invert Level (m) 76.250 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	12.0	0.0	1.010	0.0	0.0
1.000	12.0	0.0			

Filter Drain

Infiltration Coefficient Base (m/hr) 0.00000 Pipe Diameter (m) 0.100
Infiltration Coefficient Side (m/hr) 0.00000 Pipe Depth above Invert (m) 0.000
Safety Factor 2.0 Slope (1:X) 100.0
Porosity 0.30 Cap Volume Depth (m) 0.000
Invert Level (m) 77.250 Cap Infiltration Depth (m) 0.000
Trench Width (m) 2.0 Number of Pipes 1
Trench Length (m) 6.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0064-2000-1200-2000
Design Head (m) 1.200
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 64
Invert Level (m) 76.250
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.0
Flush-Flo™	0.282	1.8
Kick-Flo®	0.573	1.4
Mean Flow over Head Range	-	1.6

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

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