GeoSmart Information

FloodSmart BIA

Basement Impact Assessment

Site Address

73a Willow Tree Lane
Hillingdon
Hayes
UB4 9BL

Grid Reference

511480, 182130

Report Prepared for

Leonard Kokoli

Date

2024-12-06

Report Status

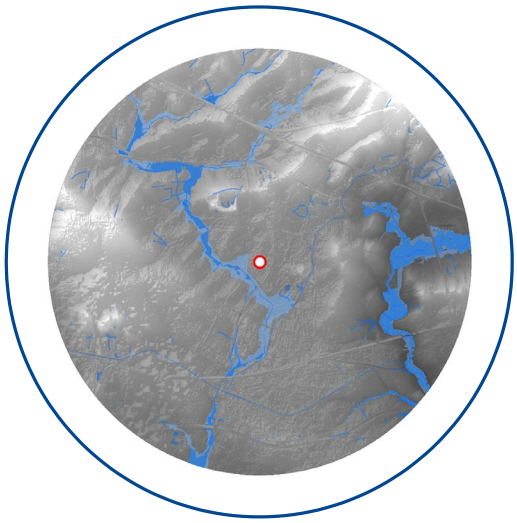
FINAL

Site Area

0.01 ha

Report Reference

84224R1



RISK – Low

The proposed lower ground floor is anticipated to extend into the Langley Silt Member and London Clay Formation, both of which are unlikely to contain significant groundwater. It is acknowledged that groundwater seepage from isolated permeable horizons may be encountered; however, whilst this should be monitored, it is unlikely to be a significant flow.

Given that the proposed lower ground floor is not considered likely to interact appreciably with the underlying groundwater system, it will have no cumulative impacts on or with nearby basements or groundwater.

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1. Executive summary

Site analysis

Flood risks and impacts	Baseline*	After Mitigation **
Groundwater flooding	Low	Low
Surface water flooding	Low	Low

*BASELINE risks have been calculated for the whole Site, using national risk maps, including the benefit of EA flood defences. Note that the risks presented in the baseline mapping are applicable to surface development only, whereas the risks presented on the table are applicable to the proposed subterranean development and therefore may be higher.

**FINAL RISK RATING Includes a detailed analyses of flooding risks over the lifetime of the proposed development, including allowances for climate change AND assumes recommended mitigation measures are implemented.

Summary of existing and proposed development

The Site is currently used within a storage capacity as a storage garage. The entirety of the Site is understood to be covered within concrete paving.

Development proposals comprise the demolition of the existing garage and the construction of a single storey detached dwelling with lower ground floor level, including associated modifications to landscaping and access.

The proposed lower ground floor will be set c. 2.65 m below ground level (bgl), with a finished floor level (FFL) of c. 29.25 mAOD. An open patio is proposed to be set at lower ground floor level, which will be accessible from the lower ground floor as well as via a set of external stairs. The lower ground floor will also be accessible via an internal staircase. The foundations are proposed to be c. 300 mm deep, indicating a maximum depth of excavation of c. 2.95 m bgl (28.95 mAOD).

Summary of groundwater flood risks

The Site setting is summarised as follows:

- No site-specific ground investigation has been undertaken.
- BGS 1:50,000 mapping indicates the Site is underlain by superficial deposits comprising the Langley Silt Member, and bedrock comprising the London Clay Formation, both of which are classified as Unproductive Strata (i.e. unlikely to contain appreciable groundwater).
- The nearest BGS borehole records and London and Thames Valley Model indicates the Langley Silt Member extends to a depth between 1.8 and 3.0 m bgl at the Site, with London Clay beneath to a depth of c. 31 m bgl.

- The nearest relevant borehole (ref: TQ18SW84), c. 150 m north, did not strike water during its 4.6 m depth in December 1963. Borehole ref: TQ18SW85, c. 200 m north-east, struck groundwater at c. 3.4 m bgl (28.95 mAOD) within brown mottled clay in December 1963. It should be noted that from the borehole record it cannot be determined whether groundwater was struck within an isolated permeable horizon or whether it accumulated due to modest permeability over the wider stratum.
    - The nearest borehole records are both a reasonable distance from the Site so are unlikely to be fully representative of the hydrogeological conditions beneath the Site itself; however, they have been included in the absence of site-specific records.
- The Site is located within Flood Zone 1 and the Risk of Flooding from Rivers and Sea (RoFRS) mapping indicates a Very Low risk of fluvial flooding.
    - The Yeading Brook is c. 420 m south-west of the Site. However, this is considered unlikely to be in hydraulic continuity with any groundwater beneath the Site due to the presence of the intervening Langley Silt Member and London Clay bedrock and the brook being located on land with an elevation c. 4 m lower than on-Site ground levels.
- The Risk of Flooding from Surface Water (RoFSW) mapping shows the Site to be at Very Low risk of pluvial flooding.
- It is noted that the surface water flood risk mapping indicates the risk to the development at the surface. The proposed lower ground floor reflects an excavation and the adjacent potential patio could potentially act as an ingress point for surface water; an overall Low risk of surface water flooding has been identified.

The sources reviewed, including BGS mapping, the London Thames Valley Model and BGS borehole data, indicates that the Site is underlain the Langley Silt Member and London Clay bedrock, both of which are unlikely to contain significant groundwater. The proposed lower ground floor is anticipated to extend into the Langley Silt Member so is unlikely to be affected by groundwater flows. It is acknowledged that groundwater seepage from isolated permeable horizons within the Langley Silt Member and London Clay may be encountered; however, whilst this should be monitored, it is unlikely to be a significant flow.

Given that the proposed lower ground floor is not considered to interact significantly with the underlying groundwater system, it will have no cumulative impacts on or with nearby basements or groundwater.

Further Site Investigation is not considered to be required for the purposes of groundwater flood risks and impacts. The proposed development is considered to be compliant with the groundwater aspects of Policy DMHD3 of the Local Plan (London Borough of Hillingdon, 2020).

Recommendations / Next steps

Recommendations for mitigation are provided below, based upon the proposed basement and wider development design:

- A watching brief should be implemented during the construction of the proposed development. Should groundwater be encountered, works should stop, further investigation of the risks should occur, and appropriate mitigation measures should be implemented.
- Standard flood resilient basement design should be implemented within the lower ground floor. As part of this, a water collection system and pump should be considered, alongside non return flap valves on sewer inlets.
- A Sustainable Drainage Strategy should be developed for the Site to ensure that the surface water runoff associated with the proposed development is managed safely on-Site.
- Mitigation measures should be included to reduce the potential for surface water to enter the sunken patio. This should include, where possible, re-grading of ground levels to divert overland flows away from the patio and building foundations, and ensuring that threshold level for the entrance to the lower ground floor from the patio is at least 0.3 m above the general ground levels of the Site. The sunken patio should be positively drained to prevent the collection of surface water flows.

2. Introduction

Background and purpose

GeoSmart Information Ltd was commissioned by Leonard Kokoli in November 2024 to undertake the groundwater and surface water aspects of a Basement Impact Assessment (BIA) for the proposed development at 73a Willow Tree Lane, Hillingdon, Hayes, UB4 9BL, (the Site). The Site is located at national grid reference TQ 11480 82130 within the London Borough of Hillingdon. Existing and proposed Site plans and drawings are provided in Appendix A.

Objective

This document comprises a desk-based assessment of the potential impact of the proposed basement development on surface water and groundwater flow and flooding and has been designed to support a planning submission for the proposed development.

Report scope

The scope of works undertaken includes:

- An outline of the hydrological and hydrogeological conditions with relevance to construction of the basement at the Site.
- An assessment of the impacts of the proposed development on surface water and groundwater flows and levels.
- Assessment will be presented using the clearly-defined reporting framework as outlined in the widely referenced Camden Planning Guidance for Basements. This report will consider the following sections:

    1) Screening – first stage in assessing the impact of a proposed basement development is to recognise what issues are relevant to the proposed site.
    2) Scoping – identify the potential impacts for each of the matters of concern identified in the screening stage.
    3) Recommendations – recommendations are made based on the outcome of the assessment.

Report limitations

It is noted that the findings presented in this report are based on a desk study of information supplied by third parties. Whilst we assume that all information is representative of past and present conditions, we can offer no guarantee as to its validity and a proportionate programme of site investigations would be required to fully verify these findings.

The basemap used is the OS Street View 1:10,000 scale. However, the Site boundary has been drawn using BlueSky aerial imagery to ensure the correct extent and proportion of the Site is analysed.

This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

Datasets

The following table shows the sources of information that have been consulted as part of this report:

Table 1. Datasets consulted to obtain confirmation of sources of flooding and risk

Source of flooding	Datasets consulted				
	Commercial Flood Maps	Local Policy & Guidance Documents*	Environment Agency	Thames Water (Appendix C)	OS Data
Historical	X	X	X		
River (fluvial) / Sea (tidal/coastal)	X	X	X		
Surface water (pluvial)	X	X	X		
Groundwater	X	X			
Sewer		X		X	

Source of flooding	Datasets consulted				
	Commercial Flood Maps	Local Policy & Guidance Documents*	Environment Agency	Thames Water (Appendix C)	OS Data
Culvert/bridges		X			X
Reservoir		X	X		

*Local guidance and policy, referenced below, has been consulted to determine local flood conditions and requirements for flood mitigation measures.

Relevant local guidance

For this report, several documents have been consulted for local policy and guidance and relevant information is outlined below:

Hillingdon Local Plan: Part 1 – Strategic Policies (2012):

Policy EM6: Flood Risk Management

The Council will require new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the National Planning Policy Framework (NPPF).

The subsequent Hillingdon Local Plan: Part 2 -Site Specific Allocations LDD will be subjected to the Sequential Test in accordance with the NPPF. Sites will only be allocated within Flood Zones 2 or 3 where there are overriding issues that outweigh flood risk. In these instances, policy criteria will be set requiring future applicants of these sites to demonstrate that flood risk can be suitably mitigated.

The Council will require all development across the borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer contributions to guarantee the long term maintenance and performance of SUDS is to an appropriate standard.

Local Plan Part 2 – Development Management Policies (London Borough of Hillingdon, 2020):

Policy DMHD 3: Basement Development

- When determining proposals for basement and other underground development, the Council require an assessment of the scheme's impact on drainage, flooding, groundwater conditions and structural stability. The Council will only permit basement and other underground development that does not cause harm to the built and natural environment and local amenity and does not result in flooding or

ground instability. Developers will be required to demonstrate by methodologies appropriate to the site that their proposals:

  - avoid adversely affecting drainage and run-off or causing other damage to the water environment;
  - avoid cumulative impacts upon structural stability or the water environment in the local area;

- Schemes should ensure that they:
  - do not harm the amenity of neighbours;
  - do not lead to the loss of trees of townscape or amenity value;
  - do provide satisfactory landscaping, including adequate soil depth;
  - do not harm the appearance or setting of the property or the established character of the surrounding area, for example through the introduction of front lightwells; and
  - do protect important archaeological remains.
- The Council will not permit basement schemes which include habitable rooms and other sensitive uses in areas prone to flooding.
- The Council will not permit basement schemes in Listed Buildings and will not permit them in Conservation Area locations where their introduction would harm the special architectural or historic character of the area.

Camden Planning Guidance: Basements (Camden Council, 2021):

- The Camden Planning Guidance: Basements policy was adopted in January 2021. The guidance is viewed as an exemplar of policy in regard to development of basements[1] by GeoSmart.
- The Screening questions from this guidance have been used in Section 4 of this report. As the Site is not within the London Borough of Camden, the Screening questions relating to the pond chains on Hampstead Heath have been excluded.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/668958/Basements_Review_Summary_of_Responses.pdf

3. Site Setting

Location Description

The Site is located at 73a Willow Tree Lane in a setting of primarily residential land use. It is bound to the west by Douglas Crescent, with residential gardens bounding the Site to the north, south and east.

The nearest building is within c. 1 m of the proposed development, although no basements have been identified at the neighbouring properties.

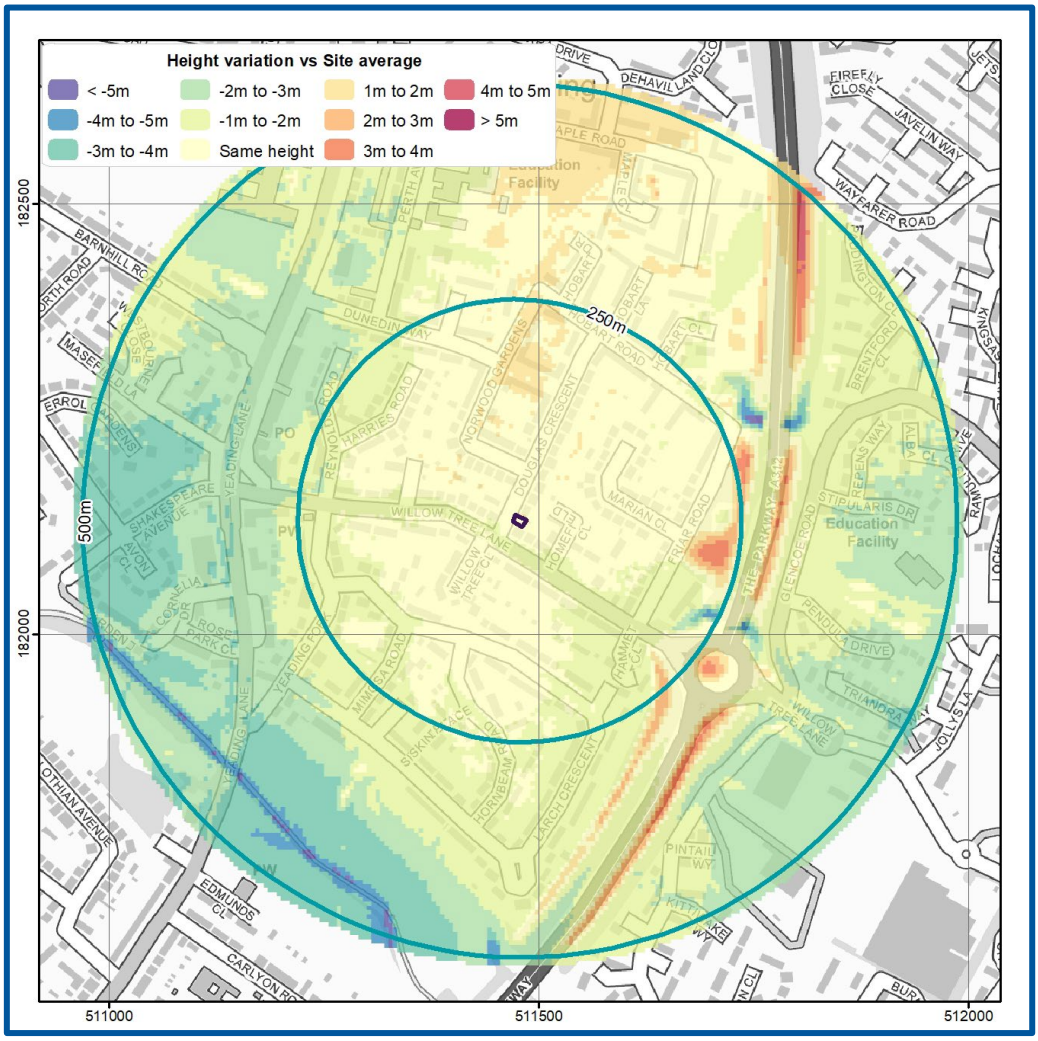
It is not known whether basement development is present within the vicinity of the Site, with no basements identified using Google Streetview or within the Hillingdon planning portal.

Figure 1. Aerial image of the Site (Bluesky, 2024).

Figure 2 indicates that ground levels within 500m of the Site fall in south westerly and easterly directions, towards the Yeading Brook.

According to OS data, the level of the Site is between 32.01 and 32.50 mAOD with the Site falling in a westerly direction. This is based on EA elevation data obtained for the Site to a 1 m resolution with a vertical accuracy of ± 0.15 m (Appendix B).

Figure 2. Site Location and Relative Elevations (GeoSmart, 2024).



Proposed Development

The Site is currently used within a storage capacity as a storage garage. The entirety of the Site is understood to be comprise concrete paving hardstanding. Site plans are included within Appendix A.

Development proposals comprise the demolition of the existing garage and the construction of a single storey detached dwelling with lower ground floor level, including associated modifications to landscaping and access.

The proposed lower ground floor will be set c. 2.65 m below ground level (bgl), with a finished floor level (FFL) of c. 29.25 mAOD. An open patio is proposed to be set at lower ground floor level, which will be accessible from the lower ground floor as well as via a set of external stairs. The lower ground floor will also be accessible via an internal staircase. The foundations are proposed to be c. 300 mm deep, indicating a maximum depth of excavation of c. 2.95 m bgl (28.95 mAOD).

The effect of the overall development will result in an increase in number of occupants and/or users of the Site and will result in the change of use, nature or times of occupation. The estimated lifespan of the development is 100 years.

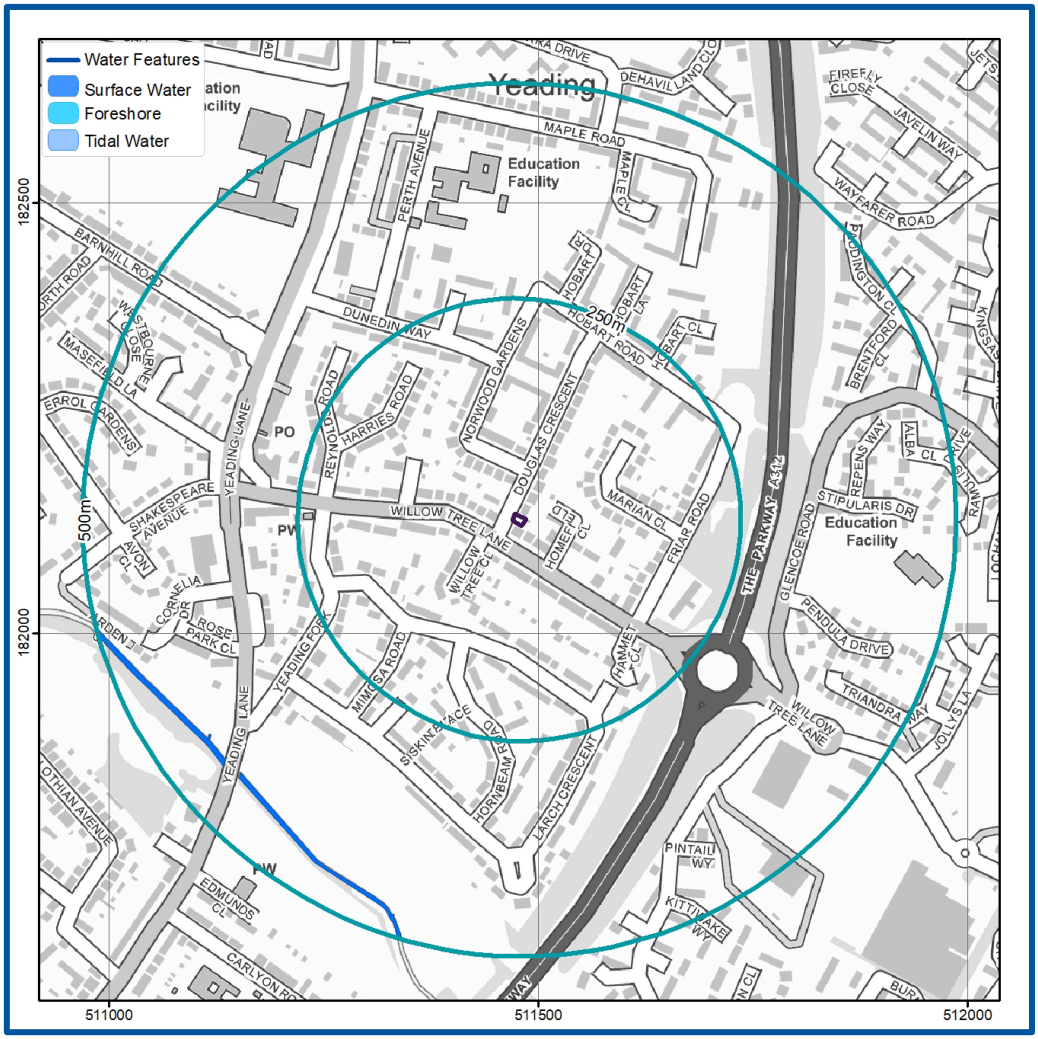
Surface Water Features

According to Ordnance Survey (OS) mapping included in Figure 3, a single surface water feature is located within 500 m of the Site.

The Yeading Brook is c. 430 m south-west of the Site. Its water level has been estimated at 27.89 mAOD using LiDAR elevation mapping, although it should be noted that rainfall recharge impacts the derived level.

No subterranean rivers have been identified within the vicinity of the Site (Talling, 2024; Barton & Myers, 2016; Metis Consultants, 2024).

Figure 3. EA Surface Water Features (OS, 2024)



Ground Conditions

British Geological Survey (BGS) mapping (Figure 4) indicates the underlying superficial geology (Figure 4) consists of the Langley Silt Member (LASI) (BGS, 2024) and is classified as Unproductive Strata (EA, 2024).

The Langley Silt Member comprises silt and clay and therefore is unlikely to contain any significant groundwater.

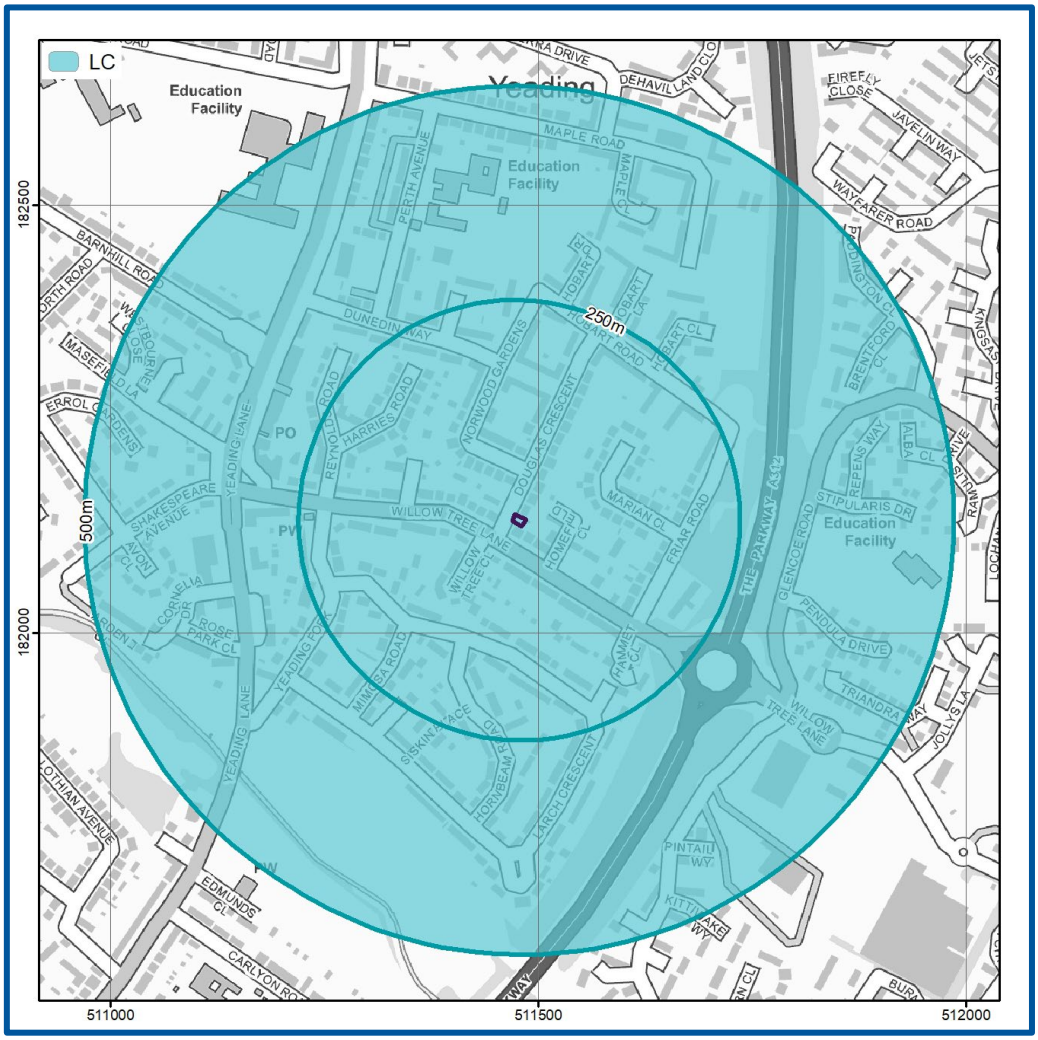
Figure 4. Superficial Geology (BGS, 2024)

BGS mapping indicates the underlying bedrock geology (Figure 5) consists of the London Clay Formation (LC) (BGS, 2024) and is classified as Unproductive Strata (EA, 2024).

London Clay bedrock mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay (BGS, 2024). It is unlikely to support significant groundwater flow (EA, 2024).

Based on the known history of the Site, significant Made Ground is not anticipated to be present at the Site.

Figure 5. Bedrock Geology (BGS, 2024)



BGS Borehole Database

The BGS website was used to extract ground information from the nearest borehole records to the Site (Figure 6). The full logs are presented in Appendix D.

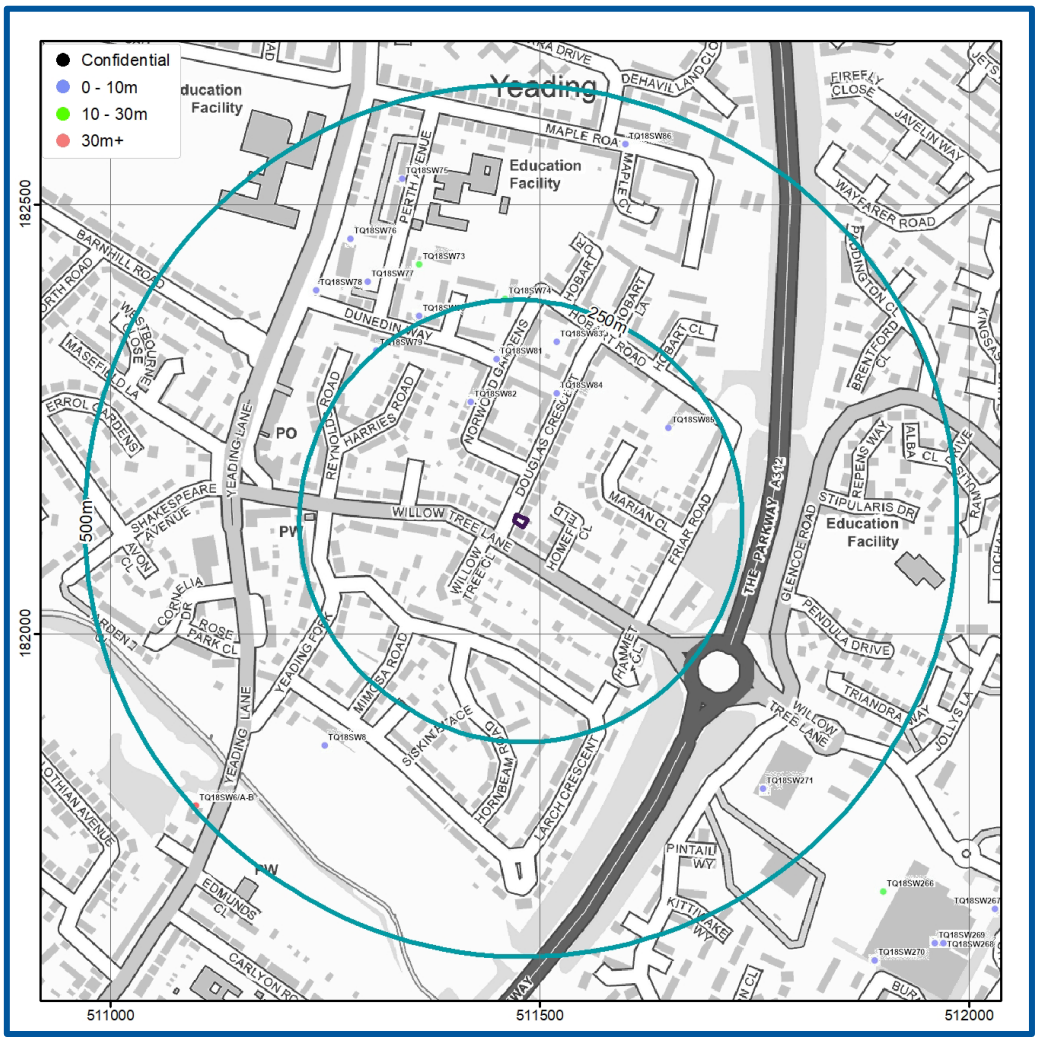
The nearest BGS borehole record within the same geological strata as the Site on the BGS Borehole Data Archive at the GeoIndex (Onshore) website is located c. 150 m to the north of the Site at an elevation of c. 32.76 mAOD (ref: TQ18SW84), which indicates the underlying geology to comprise:

- Topsoil to a depth of c. 0.3 m bgl;
- Soft brown clay to c. 1.2 m bgl;
- Brown clay with gravel to c. 1.8 m bgl;
- Brown mottled clay to c. 4.6 m bgl, at which depth the borehole was terminated.

Another nearby borehole (ref: TQ17SW85) is located c. 200 m to the north-east of the Site at an elevation of 32.35 mAOD and indicates the underlying geology to comprise:

- Topsoil to a depth of c. 0.3 m bgl;
- Brown clay to c. 0.9 m bgl;
- Gravelly clay to c. 1.8 m bgl;
- Brown mottled clay to c. 4.6 m bgl, at which depth the borehole was terminated.

Figure 6. Borehole records (BGS, 2024)



London and Thames Valley Model

The London and Thames Valley Model has also been considered to further infer the local geology at the Site (BGS, 2024) (Figure 7). This model is a visualisation of the geology across the London and Thames Valley Model, which is constructed from publicly available data, and as such should not be used as a replacement for site investigation. However, it is a useful tool at inferring the stratigraphy that could be at the Site and presenting the data in a helpful visualization.

The London and Thames Valley Model indicates the geology underlying the Site comprises:

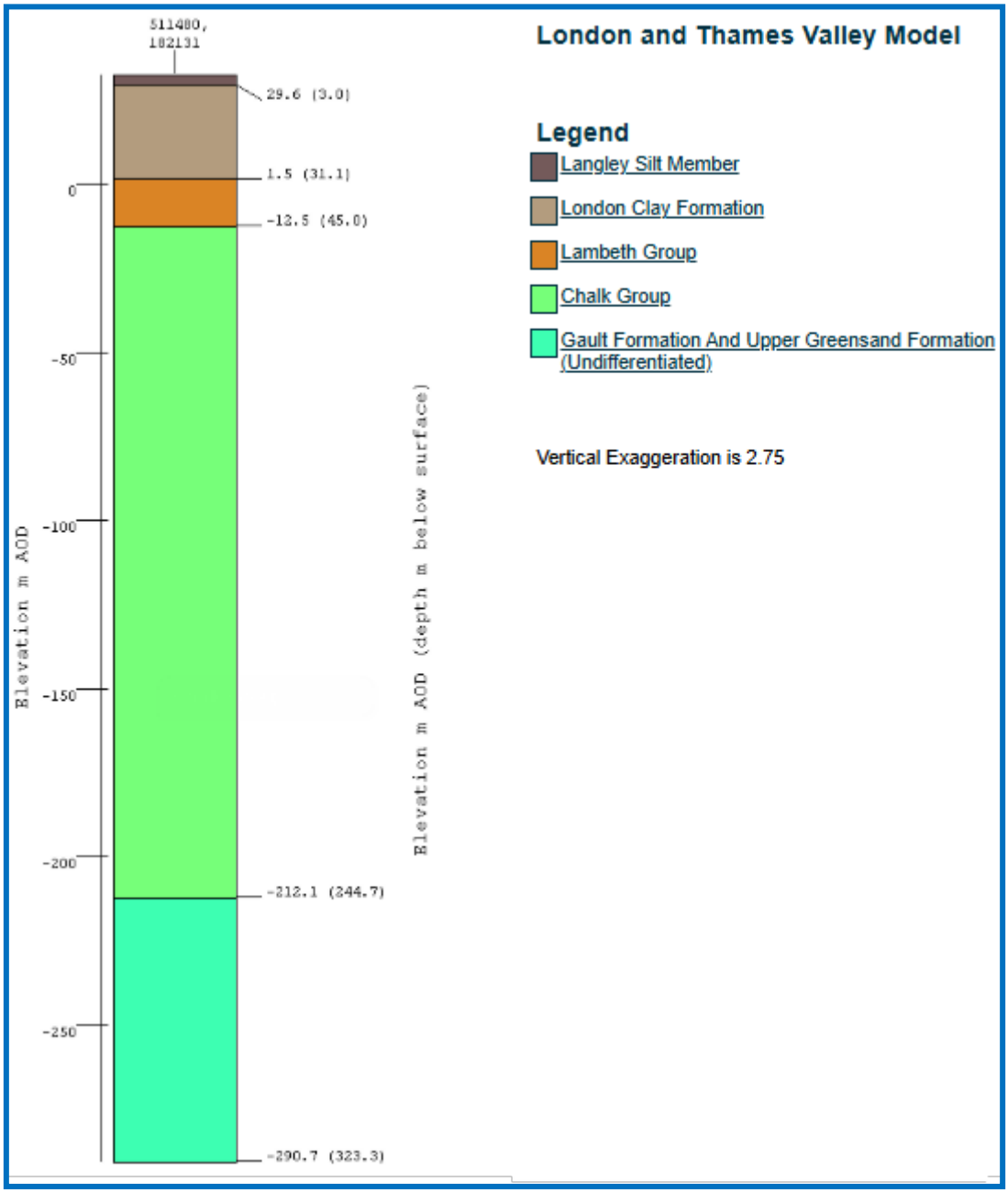
- Langley Silt Member to a depth of c. 3.0 m bgl (29.6 mAOD);
- London Clay to c. 31 m bgl (2 mAOD);
- Lambeth Group to c. 45 m bgl (-13 mAOD);
- Chalk Group to c. 245 m bgl (-212 mAOD);

- The Chalk Group is a Principal Aquifer which is likely to contain significant groundwater; however, this groundwater is at such a significant depth that the risk to the Site from the chalk aquifer is negligible.

- Gault Formation And Upper Greensand Formation (Undifferentiated) to c. 323 m bgl (-291 mAOD).

The boreholes and London and Thames Valley Model are consistent with the published geological mapping (BGS, 2024) and indicate the underlying geology to comprise the Langley Silt Member (comprising clay with some gravel) to c. 1.8 to 3.0 m bgl, underlain by London Clay (comprising clay) to c. 31 m bgl.

Figure 7. BGS London and Thames Valley Model (BGS, 2024)



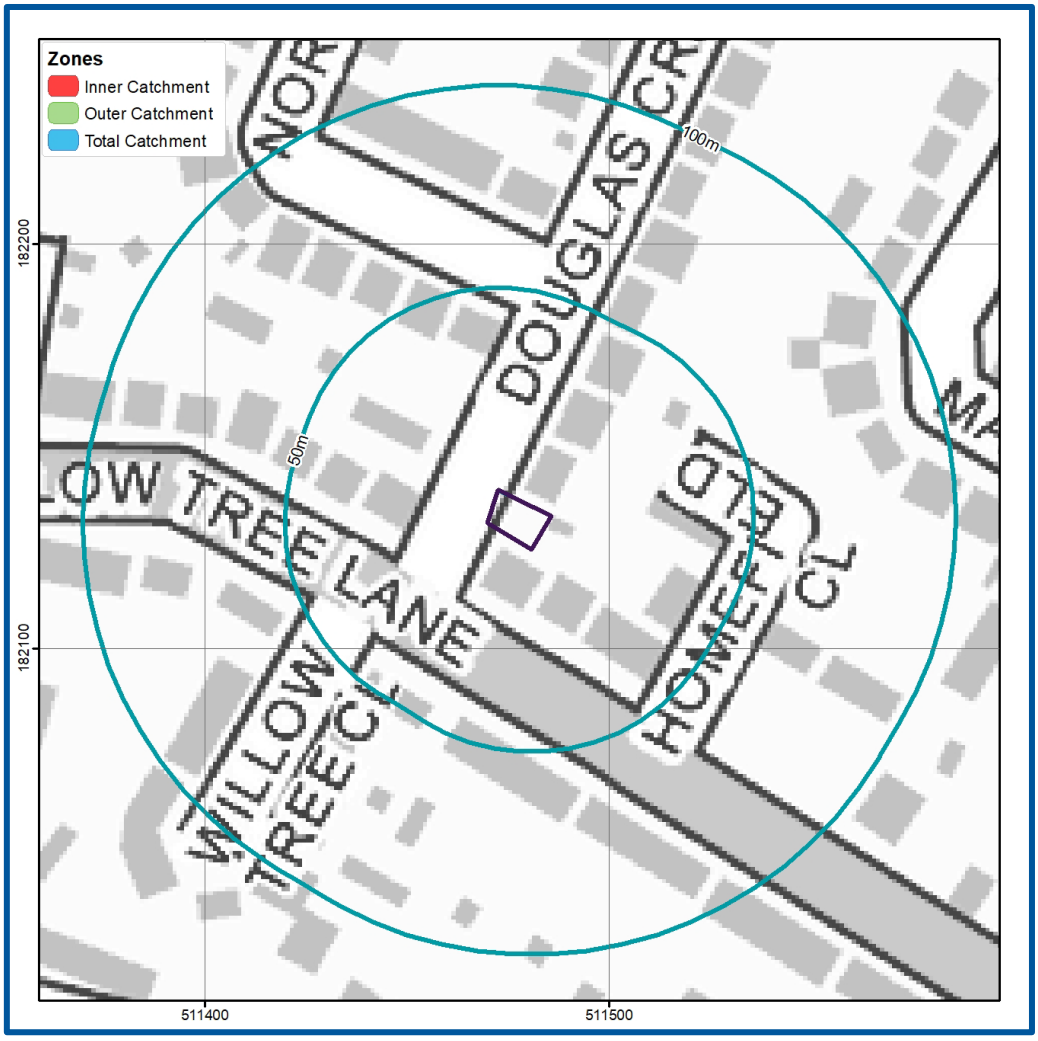
Site investigation

A site-specific ground investigation has not been undertaken at the Site, and no nearby site investigations were identified using the Hillingdon planning portal.

Source protection zones

An assessment of the EA's groundwater Source Protection Zones (SPZs) has been undertaken (Figure 8) within the vicinity of the Site and confirms the Site is not located within an SPZ.

Figure 8. Source protection zone map (EA, 2024)



Groundwater

There have been no site-specific ground investigations to confirm the depth of the water table.

BGS borehole ref: TQ18SW84 did not strike water during its 4.6 m depth in December 1963.

BGS borehole ref: TQ18SW85 struck groundwater at c. 3.4 m bgl (28.95 mAOD) within brown mottled clay in December 1963. It should be noted that from the borehole record it cannot be determined whether groundwater was struck within an isolated permeable horizon or whether it accumulated due to modest permeability over the wider stratum.

The Yeading Brook is c. 430 m south-west of the Site. Its water level has been estimated at 27.89 mAOD using LiDAR elevation mapping, subject to seasonal variations, which provides an indication of the groundwater levels adjacent to the brook. It should be noted that both the Site and Yeading Brook are underlain by low permeability strata, which is likely to prevent hydraulic continuity between the watercourse and groundwater beneath the Site.

According to the water well dataset included within the GeoIndex Onshore website (BGS, 2024), no water wells are present within 100 m of the Site.

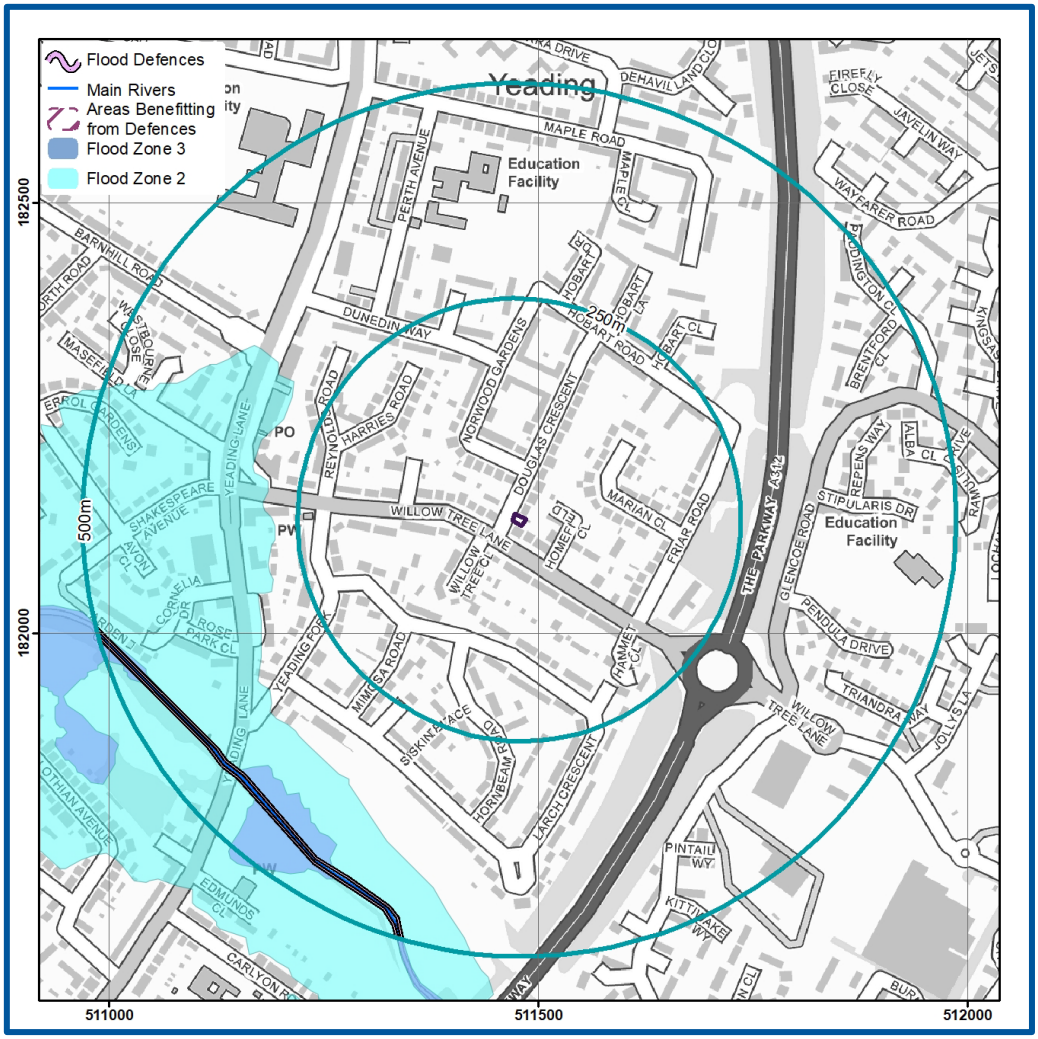
4. Flood risk

Fluvial and tidal flood risk

According to the Environment Agency's (EA) Flood Map for Planning Purposes (Figure 9), the Site is located within Flood Zone 1 and is classified as being at Low probability of fluvial and tidal flooding (EA, 2024).

The interactive Policy Map included within the West London SFRA (Metis Consultants, 2024) confirms the Site is not located in Flood Zones 3a or 3b for fluvial or tidal flood risk.

Figure 9. EA Flood Map for Planning Purposes (EA, 2024)



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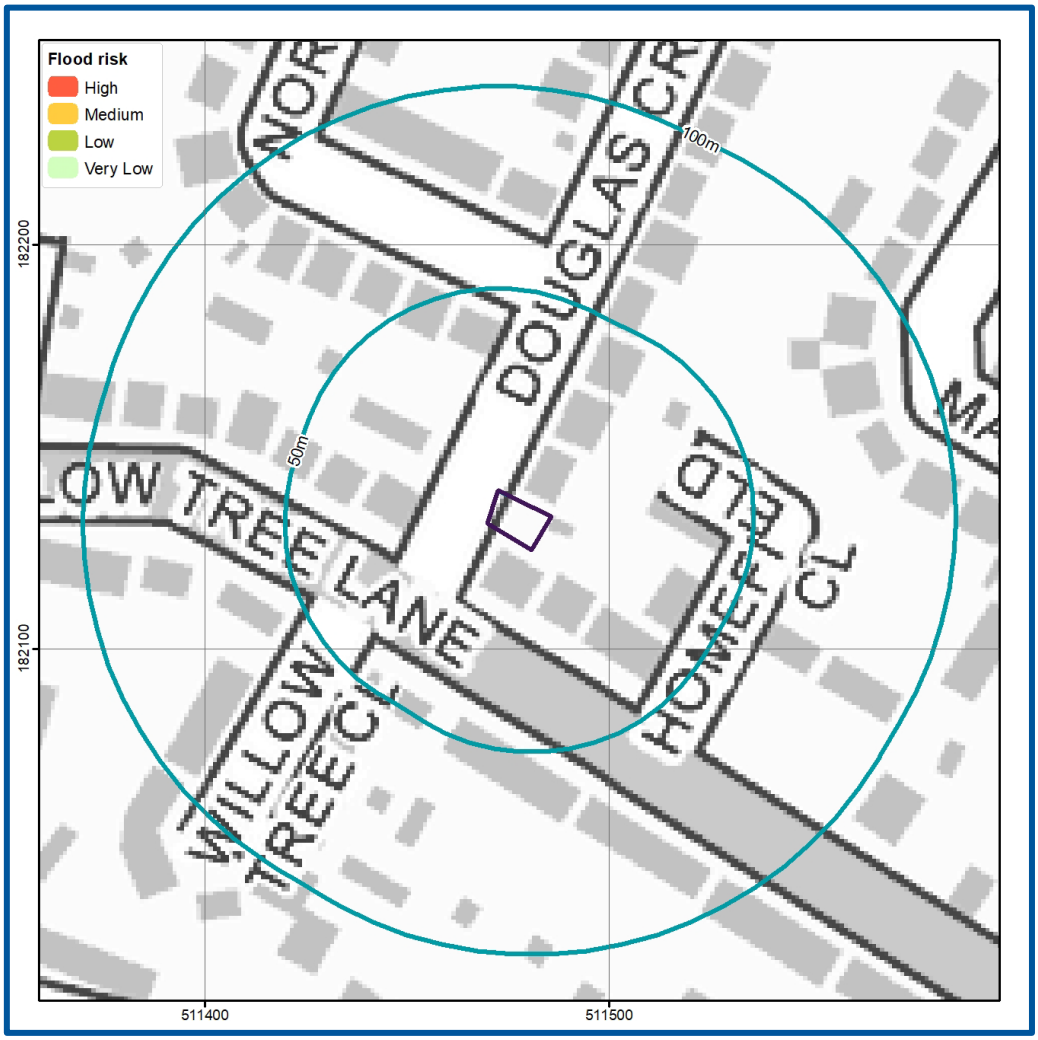
According to the EA's Risk of Flooding from Rivers and the Sea (RoFRS) mapping (Figure 10), which considers the crest height, standard of protection and condition of defences, the flood risk from Rivers and the Sea is Very Low.

Figure 10. Risk of Flooding from Rivers and Sea map (EA, 2024)



Surface water (pluvial) flood risk

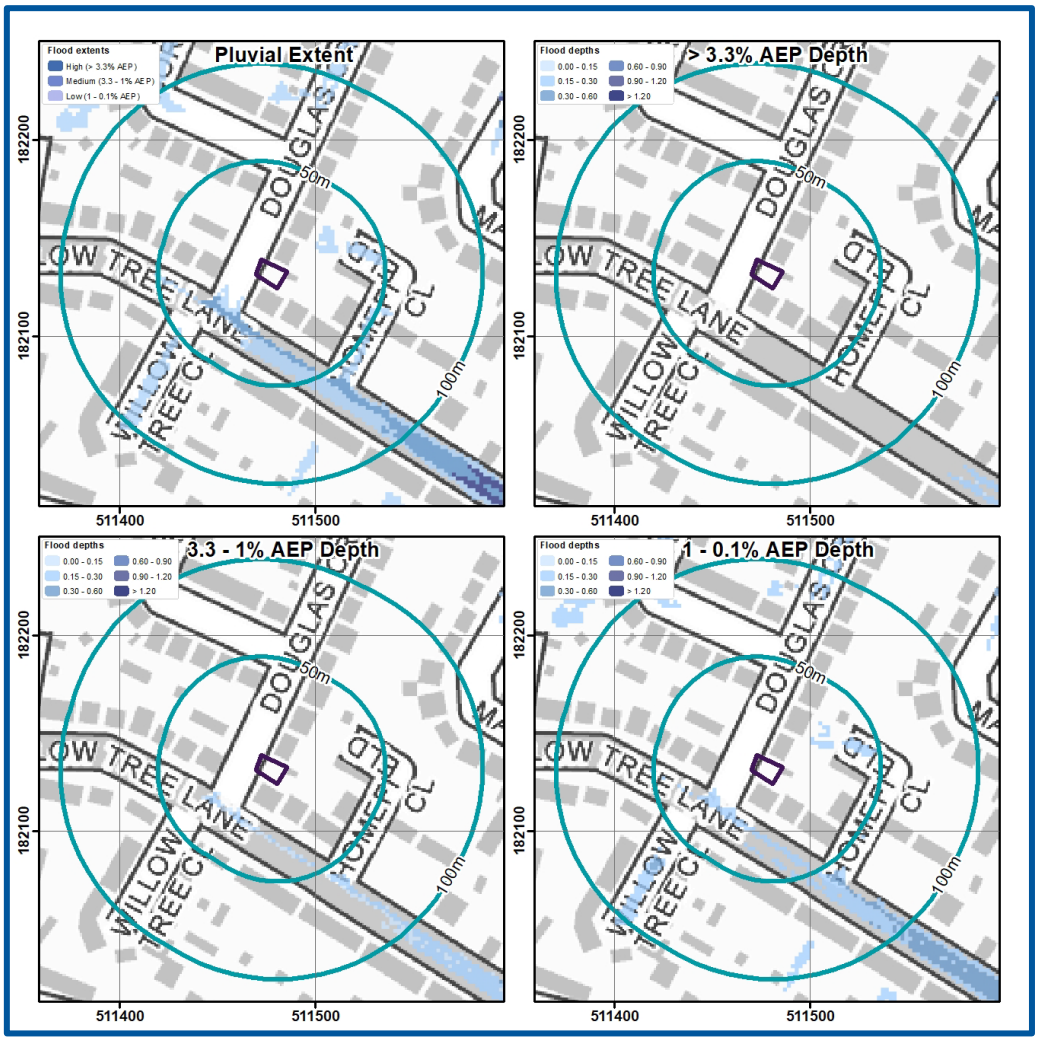
Surface water flooding occurs when intense rainfall exceeds the infiltration capacity of the ground and overwhelms the drainage systems. It can occur in most locations even at higher elevations and at significant distances from river and coastal floodplains.

According to the EA's Risk of Flooding from Surface Water (pluvial) flood mapping, the Site has a Very Low risk of pluvial flooding.

Figure 11 (overleaf) confirms the extent and depth of flooding during a 3.3% AEP (1 in 30 year - high risk) event; 1% AEP (1 in 100 year - medium risk) event and a 0.1% AEP (1 in 1000 year - low risk) event. This indicates the proposed development is located in an area at Very Low risk of surface water flooding.

The interactive Policy Map included within the West London SFRA (Metis Consultants, 2024) confirms the Site is not located in Flood Zone 3a for pluvial flood risk or within a Critical Drainage Area. The SFRA's interactive Surface Water Flood Risk Map also indicates that the Site is at Very Low risk of surface water flooding.

Figure 11. Risk of Flooding from Surface Water (pluvial) depth map (EA, 2024)



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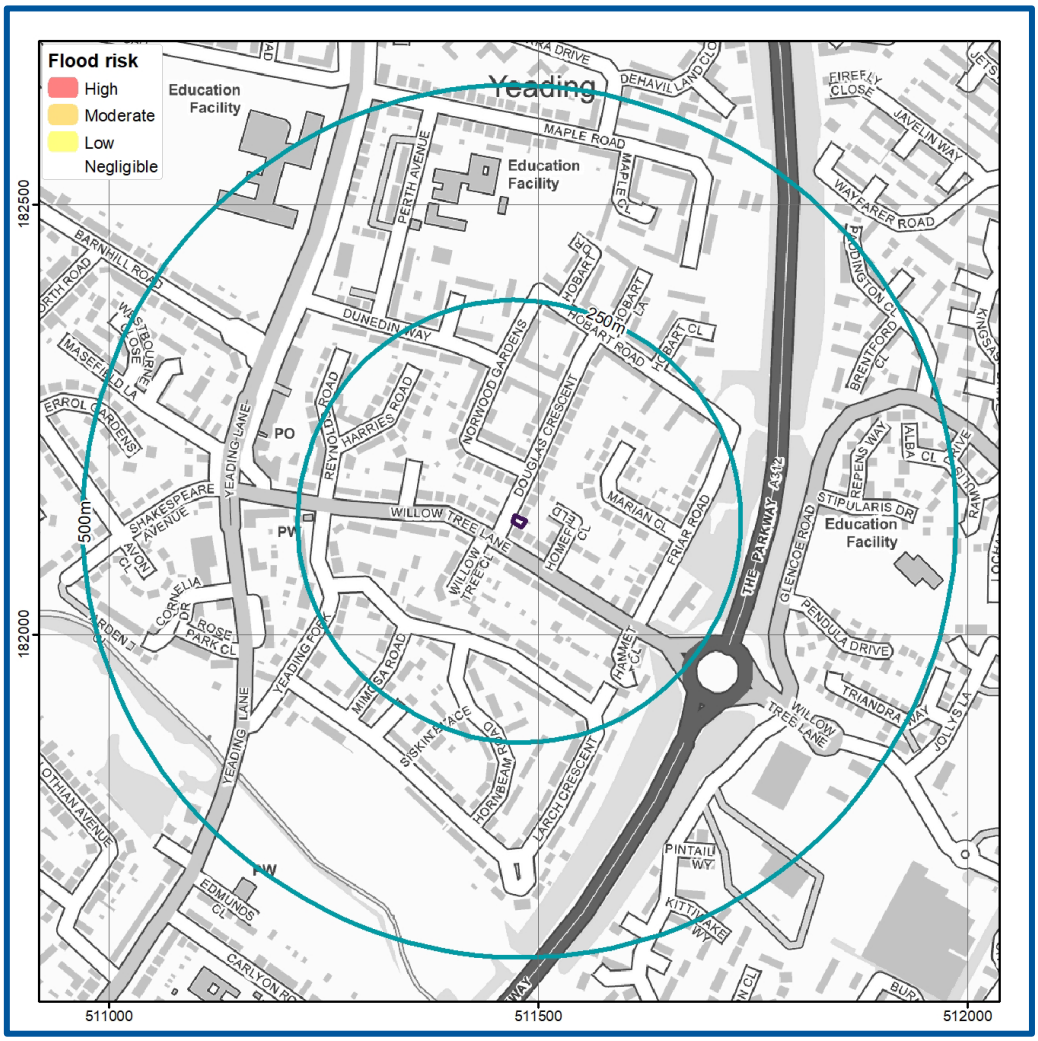
It is noted that the surface water flood risk mapping indicates the risk to the development at the surface. The proposed basement reflects an excavation and therefore is at increased risk of ponding or collection of interflows, with the open sunken patio potentially acting as an ingress point. However, based on the EA's mapping, the proposed basement is not located in an area at risk of surface water flooding and therefore the risks of ponding within the basement are considered to be reduced.

Groundwater flood risk

Groundwater flooding occurs when sub-surface water emerges from the ground at the surface or into Made Ground and structures. This may be as a result of persistent rainfall that recharges aquifers until they are full; or may be as a result of high river levels, or tides, driving water through near-surface deposits. Flooding may last a long time compared to surface water flooding, from weeks to months. Hence the amount of damage that is caused to property may be substantially higher.

Groundwater Flood Risk screening data (Figure 12) indicates there is a Negligible risk of groundwater flooding at surface in the vicinity from regional scale mechanisms during a 1 in 100 year event.

Figure 12. GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2024)



The risks will be higher for the proposed lower ground floor level. The risks to the lower ground floor are summarised below:

- The Site is underlain by the Langley Silt Member, with London Clay bedrock beneath. Both of these units are classified as Unproductive Strata (i.e. unlikely to hold appreciable groundwater).
- There have been no site-specific ground investigations to confirm the depth of the water table.
- The nearest relevant borehole (ref: TQ18SW84), c. 150 m north, did not strike water during its 4.6 m depth in December 1963. Borehole ref: TQ18SW85, c. 200 m north-east, struck groundwater at c. 3.4 m bgl (28.95 mAOD) within brown mottled clay in December 1963. It should be noted that from the borehole record it cannot be determined whether groundwater was struck within an isolated permeable horizon or whether it accumulated due to modest permeability over the wider stratum.
    - The nearest borehole records are both a reasonable distance from the Site so are unlikely to be fully representative of the hydrogeological conditions beneath the Site itself; however, they have been included in the absence of site-specific records.
- The Yeading Brook is c. 420 m south-west. However, this is considered unlikely to be in hydraulic continuity with any groundwater beneath the Site due to the presence of the intervening Langley Silt Member and London Clay bedrock, as well as the brook being located on land which is c. 4 m lower than on-Site ground levels; as such, the brook is not considered relevant to the hydrogeological condition of the Site.
- The interactive Sewer, Groundwater & Artificial Flood Risk map included within the SFRA (Metis Consultants, 2024) includes the Susceptibility to Groundwater Flooding mapping, which indicates the Site is located in an area where the land is not susceptible to groundwater flooding (BGS, 2024). The mapping also indicates that the Site is not in an area with an increased potential for elevated groundwater according to GLA (2011).

The proposed lower ground floor foundations will be located within the Langley Silt Member, which is located above London Clay bedrock. Both units are unlikely to contain significant groundwater, although it is possible that some groundwater is present within isolated permeable lenses.

Given that the proposed lower ground floor is not considered likely to appreciably interact with the underlying groundwater system, it will have no impacts on groundwater or any nearby basements. It is noted that basements have not been identified within the vicinity of the Site using Google Streetview or the Hillingdon planning portal.

Flooding from artificial sources

Artificial sources of flood risk include waterbodies or watercourses that have been amended by means of human intervention rather than natural processes. Examples include reservoirs (and associated water supply infrastructure), docks, sewers and canals. The flooding mechanism associated with flood risk from artificial sources is primarily related to breach or failure of structures (reservoir, lake, sewer, canal, flood storage areas, etc.)

Sewer flood risk

The interactive Sewer, Groundwater & Artificial Flood Risk map included within the SFRA indicates 21 to 40 incidents of flooding as a result of surcharging sewers have occurred within the UB4 9 postcode. However, it is recognised that this four digit postcode covers a large area, and instances of flooding are not specific to the Site (Metis Consultants, 2024).

Records held by Thames Water indicate that there have been no incidences of flooding related to the surcharging of public sewers at the Site (Thames Water, 2024; Appendix C).

Note that in the event of a leak in the sewer or water main service trenches could provide a potential pathway for water to enter the basement. It is therefore recommended that water proof construction methods are used on the basement.

Canal failure

According to Ordnance Survey (OS) mapping, there are no canals within 500 m of the Site.

Culverts and bridges

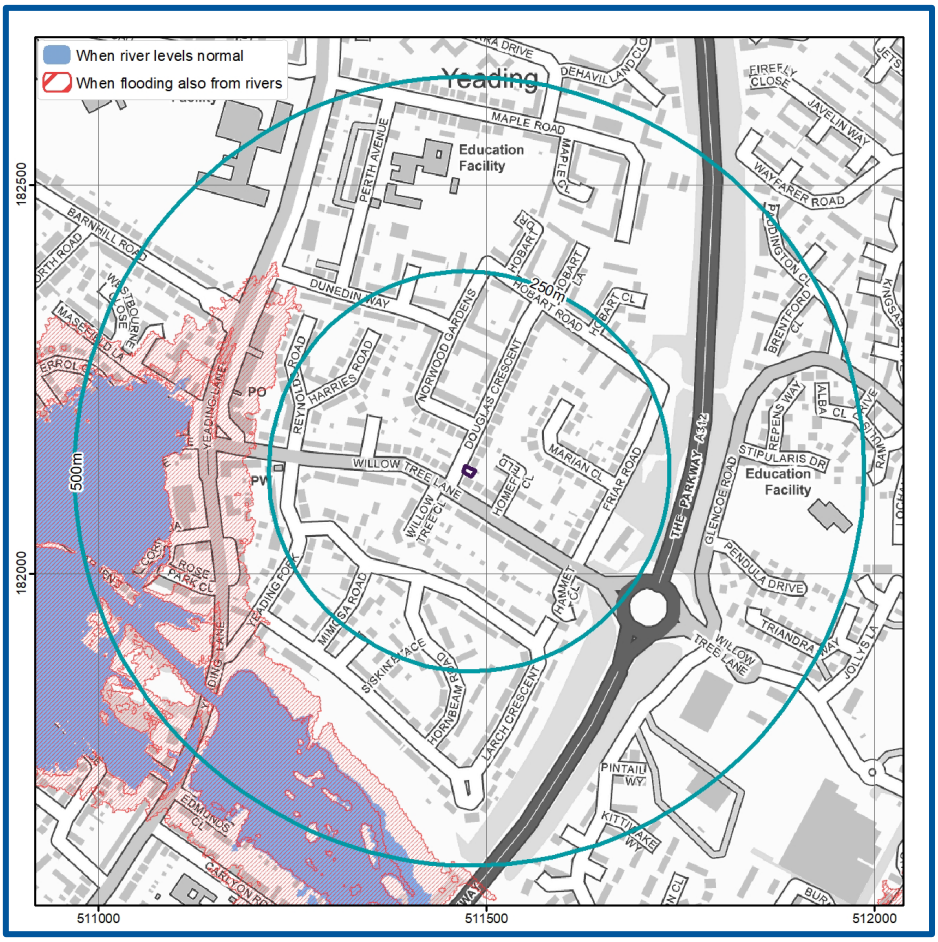
The blockage of watercourses or structures by debris (that is, any material moved by a flowing stream including vegetation, sediment and man-made materials or refuse) reduces flow capacity and raises water levels, potentially increasing the risk of flooding. High water levels can cause saturation, seepage and percolation leading to failure of earth embankments or other structures. Debris accumulations can change flow patterns, leading to scour, sedimentation or structural failure.

Culverts and bridges have not been identified within 50 m of the Site.

Reservoir Flooding

According to the EA's Risk of Flooding from Reservoir mapping, the Site is not at risk of flooding from reservoirs (Figure 13) (EA, 2024).

Figure 13. Risk of reservoir flooding map (GeoSmart, 2024)



5. Basement Impact Assessment

The following sections follow guidance discussed in the relevant sections of the Camden Planning Guidance for Basements. This provides a clearly defined reporting framework against which to consider potential matters of concern and to scope out further work required.

Screening

Table 2. Groundwater Screening

Groundwater			
Impact Question	Answer	Justification	Reference
1a. Is the site located directly above an aquifer?	No	The Site is underlain by superficial deposits comprising the Langley Silt Member and bedrock comprising the London Clay Formation, both of which are classified as Unproductive Strata (i.e. unlikely to contain appreciable groundwater).	BGS (2024) EA (2024)

1b. Will the proposed basement extend beneath the water table surface?	Unlikely	Site investigation has not been undertaken at the Site to confirm the depth to the local water table. BGS records indicate that Langley Silt Member extends to a depth between 1.8 and 3.0 m bgl at the Site, with London Clay beneath. The proposed lower ground floor has a finished floor level (FFL) of c. 2.65 m bgl and therefore will be located entirely within the Langley Silt Member. Given this unit is unlikely to be able to support significant groundwater flows, the proposed lower ground floor will not extend beneath the water table, although there remains potential for the basement to extend through groundwater within isolated permeable horizons.	BGS (2024) Site plans
2. Is the site within 100m of a watercourse, well (used / disused) or potential spring line?	No	There are no watercourses within 100 m of the Site. No wells or potential spring lines have been identified within 100 m of the Site.	OS (2024) EA (2024) BGS (2024)
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	Yes	Given that the existing development comprises 100% hard standing and the proposed development includes landscaping, there will be a decrease in the proportion of impermeable areas at the Site.	Site plans
4. As part of site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	Yes	The proposed development involves an decrease in impermeable surfaces at the Site and therefore more surface water will infiltrate to ground.	Site plans

5. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond or spring line?	No	The Yeading Brook is c. 430 m south-west of the Site. Its water level has been estimated at 27.89 mAOD at its closest point using LiDAR elevation mapping. The proposed lower ground floor has an FFL of c. 29.25 mAOD and is therefore located above the water level within the watercourse. There are no other surface water features within 500 m of the Site.	OS (2024) EA (2024)

Table 3. Surface Water and Flooding Screening

Surface Water and Flooding			
1. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No	Surface water runoff from the proposed development is presumed to drain into the public sewer network.	Site plans
2. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	Yes	Given that the existing development comprises 100% hard standing and the proposed development includes landscaping, there will be a decrease in the proportion of impermeable areas at the Site.	Site plans
3. Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	No	Surface water runoff from the proposed development should continue to drain into the public sewer network. This would prevent any changes to the profile of surface water inflows to nearby properties.	Site plans
4. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	Yes	The existing development comprises a storage garage, whilst the proposed development is residential. Therefore, an increase in the quality of surface water runoff from the development is anticipated to occur.	Site plans

5. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature.	No	The Site is not identified as having surface water flood risk in the Strategic Flood Risk Assessment. The risk of pluvial flooding across the Site is Very Low according to EA mapping.	SFRA (Metis Consultants, 2024) EA (2024)

Screening summary

The screening process identifies the following issues to be carried forward to scoping for further assessment:

- The proportion of impermeable areas at the Site will decrease as a result of the proposed development, which could result in an increase in surface water infiltrating to ground;
- The quality of surface water runoff is likely to increase as a result of the proposed development.

The other potential concerns considered within the screening process have been demonstrated to be not applicable or not significant when applied to the proposed development.

Scoping

Where a potential impact has been identified at the screening stage above, the potential further need for assessment is considered and scoped. The scoping stage should aim to build on the information provided in the screening stage. During this phase, a desk study should be undertaken to determine the preliminary impacts of the proposed basement development. This initial assessment should be used to identify any site investigation works required.

Table 4. Groundwater Scoping

Groundwater		
Impact Question	Answer	Potential Impact & Assessment
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas? 4. As part of site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	Yes	Given that the existing development comprises 100% hard standing and the proposed development includes landscaping, there will be a decrease in the proportion of impermeable areas at the Site. This could result in an increase in surface water runoff infiltrating to ground. The re-introduction of landscaped areas on-Site is likely to reflect a betterment compared to the existing development, due to a decrease in the proportion of impermeable areas and therefore a reduction in the quantity of surface water runoff produced. This is unlikely to have any negative consequences for the proposed development or neighbouring properties. As such, no further assessment of the possible impacts is considered necessary.

Table 5. Surface Water and Flooding Scoping

Surface Water and Flooding		
2. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	Yes	Given that the existing development comprises 100% hard standing and the proposed development includes landscaping, there will be a decrease in the proportion of impermeable areas at the Site. This could result in an increase in surface water runoff infiltrating to ground. The re-introduction of landscaped areas on-Site is likely to reflect a betterment compared to the existing development, due to a decrease in the proportion of impermeable areas and therefore a reduction in the quantity of surface water runoff produced. This is unlikely to have any negative consequences for the proposed development or neighbouring properties. As such, no further assessment of the possible impacts is considered necessary.
4. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	Yes	The existing development comprises a storage garage, whilst the proposed development is residential. Therefore, an increase in the quality of surface water runoff from the development is anticipated to occur. The increase in water quality at the Site is unlikely to have any negative consequences for the proposed development or neighbouring properties and would reflect a betterment compared to the existing development. As such, no further assessment of the possible impacts is considered necessary.

6. Conclusions and Recommendations

Site setting constraints

Flood risks and impacts	Baseline*	After Mitigation **
Groundwater flooding	Low	Low
Surface water flooding	Low	Low

*BASELINE risks have been calculated for the whole Site, using national risk maps, including the benefit of EA flood defences. Note that the risks presented in the baseline mapping are applicable to surface development only, whereas the risks presented on the table are applicable to the proposed subterranean development and therefore may be higher.

**FINAL RISK RATING Includes a detailed analyses of flooding risks over the lifetime of the proposed development, including allowances for climate change AND assumes recommended mitigation measures are implemented.

Recommendations / Next steps

Recommendations for mitigation are provided below, based upon the proposed basement and wider development design:

- A watching brief should be implemented during the construction of the proposed development. Should groundwater be encountered, works should stop, further investigation of the risks should occur, and appropriate mitigation measures should be implemented.
- Standard flood resilient basement design should be implemented within the lower ground floor. As part of this, a water collection system and pump should be considered, alongside non return flap valves on sewer inlets.
- A Sustainable Drainage Strategy should be developed for the Site to ensure that the surface water runoff associated with the proposed development is managed safely on-Site.
- Mitigation measures should be included to reduce the potential for surface water to enter the sunken patio. This should include, where possible, re-grading of ground levels to divert overland flows away from the patio and building foundations, and ensuring that threshold level for the entrance to the lower ground floor from the patio is at least 0.3 m above the general ground levels of the Site. The sunken patio should be positively drained to prevent the collection of surface water flows.

7. Further information

The following table includes a list of additional products by GeoSmart:

Additional GeoSmart Products			
✓	Additional assessment: SuDSmart Report *(recommended within this assessment)*		The SuDSmart Report range assesses which drainage options are available for a Site. They build on technical detail starting from simple infiltration screening and work up to more complex SuDS Assessments detailing alternative options and designs. Please contact info@geosmartinfo.co.uk for further information.
	Additional assessment: EnviroSmart Report *(not recommended within this assessment)*		Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective. Our EnviroSmart reports are designed to be the most cost effective solution for planning conditions. Each report is individually prepared by a highly experienced consultant conversant with Local Authority requirements. Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions. Please contact info@geosmartinfo.co.uk for further information.

8. References and glossary

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London Borough of Hillingdon (2020). Local Plan Part 2 – Development Management Policies. Accessed from: https://www.hillingdon.gov.uk/local-plan-and-review on 25/11/2024.

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Talling (2024). London's Lost Rivers. Accessed from: https://www.londonslostrivers.com/ on 25/11/2024.

Thames Water (2024). Thames Water Property Searches – Sewer Flooding History Enquiry. SFH/SFH Standard/2024_5084240.

GeoSmart Information

Glossary

General terms

BGS	British Geological Survey
EA	Environment Agency
GeoSmart groundwater flood risk model	GeoSmart's national groundwater flood risk model takes advantage of all the available data and provides a preliminary indication of groundwater flood risk on a 50m grid covering England and Wales. The model indicates the risk of the water table coming within 1 m of the ground surface for an indicative 1 in 100 year return period scenario.
Dry-Island	An area considered at low risk of flooding (e.g. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (e.g. Flood Zone 2 and 3)
Flood resilience	Flood resilience or wet-proofing accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Mitigation measures that reduce the damage to a property caused by flooding can include water entry strategies, raising electrical sockets off the floor, hard flooring.
Flood resistance	Flood resistance, or dry-proofing, stops water entering a building. Mitigation measures that prevent or reduce the likelihood of water entering a property can include raising flood levels or installation of sandbags.
Flood Zone 1	This zone has less than a 0.1% annual probability of river flooding
Flood Zone 2	This zone has between 0.1 and 1% annual probability of river flooding and between 0.1% and 0.5 % annual probability sea flooding
Flood Zone 3	This zone has more than a 1% annual probability of river flooding and 0.5% annual probability of sea flooding
Functional Flood Plain	An area of land where water has to flow or be stored in times of flood.
Hydrologic model	A computer model that simulates surface run-off or fluvial flow. The typical accuracy of hydrologic models such as this is ±0.25m for estimating flood levels at particular locations.
OS	Ordnance Survey
Residual Flood Risk	The flood risk remaining after taking mitigating actions.
SFRA	Strategic Flood Risk Assessment. This is a brief flood risk assessment provided by the local council

SuDS	A Sustainable drainage system (SuDS) is designed to replicate, as closely as possible, the natural drainage from the Site (before development) to ensure that the flood risk downstream of the Site does not increase as a result of the land being developed. SuDS also significantly improve the quality of water leaving the Site and can also improve the amenity and biodiversity that a Site has to offer. There are a range of SuDS options available to provide effective surface water management that intercept and store excess run-off. Sites over 1 Ha will usually require a sustainable drainage assessment if planning permission is required. The current proposal is that from April 2014 for more than a single dwelling the drainage system will require approval from the SuDS Approval Board (SABs).

Aquifer Types

Principal aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
Secondary A aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Secondary B aquifer	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
Secondary undifferentiated	Has been assigned in cases where it has not been possible to attribute either category A or B to a rock type due to the variable characteristics of the rock type.
Unproductive Strata	These are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.

NPPF (2023) terms

Exception test	Applied once the sequential test has been passed. For the exception test to be passed it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk and a site-specific FRA must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
Sequential test	Aims to steer new development to areas with the lowest probability of flooding.
Essential infrastructure	Essential infrastructure includes essential transport infrastructure, essential utility infrastructure and wind turbines.

Water compatible	Water compatible land uses include flood control infrastructure, water-based recreation and lifeguard/coastal stations.
Less vulnerable	Less vulnerable land uses include police/ambulance/fire stations which are not required to be operational during flooding and buildings used for shops/financial/professional/other services.
More vulnerable	More vulnerable land uses include hospitals, residential institutions, buildings used for dwelling houses/student halls/drinking establishments/hotels and sites used for holiday or short-let caravans and camping.
Highly vulnerable	Highly vulnerable land uses include police/ambulance/fire stations which are required to be operational during flooding, basement dwellings and caravans/mobile homes/park homes intended for permanent residential use.

Data Sources

Aerial Photography	Contains Ordnance Survey data © Crown copyright and database right 2024 BlueSky copyright and database rights 2024
Geology (Bedrock/Superficial/Borehole locations)	Contains British Geological Survey materials © NERC 2024 Ordnance Survey data © Crown copyright and database right 2024
Flood Risk (Flood Zone/RoFRS/Pluvial/Surface Water Features/Reservoir/SPZ)	Environment Agency copyright and database rights 2024 Ordnance Survey data © Crown copyright and database right 2024
Flood Risk (Groundwater)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2024) Contains British Geological Survey materials © NERC 2024 Ordnance Survey data © Crown copyright and database right 202
Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2024 Environment Agency copyright and database rights 2024

9. Appendices

GeoSmart Information

Appendix A

Site plans

10 0 10 20 30 40 50

SITE LOCALITY MAP
PLA
Scale 1:1250

PROJECT

DEMOLITION OF GARAGE AND ERECTION OF GROUND FLOOR OVER BASEMENT ONE BEDROOM DWELLING

73a WILLOW TREE LANE, HILLINGDON, HAYES, UB4 9BL

IMPORTANT: THIS DRAWING IS FOR A PLANNING APPLICATION.
OBTAIN BUILDING REGULATION COMPLIANCE DRAWINGS
FOR CONSTRUCTION. CHECK ALL DIMENSIONS ON SITE AND REPORT
DISCREPANCIES TO THE DESIGNER / RESPONSIBLE PERSON.

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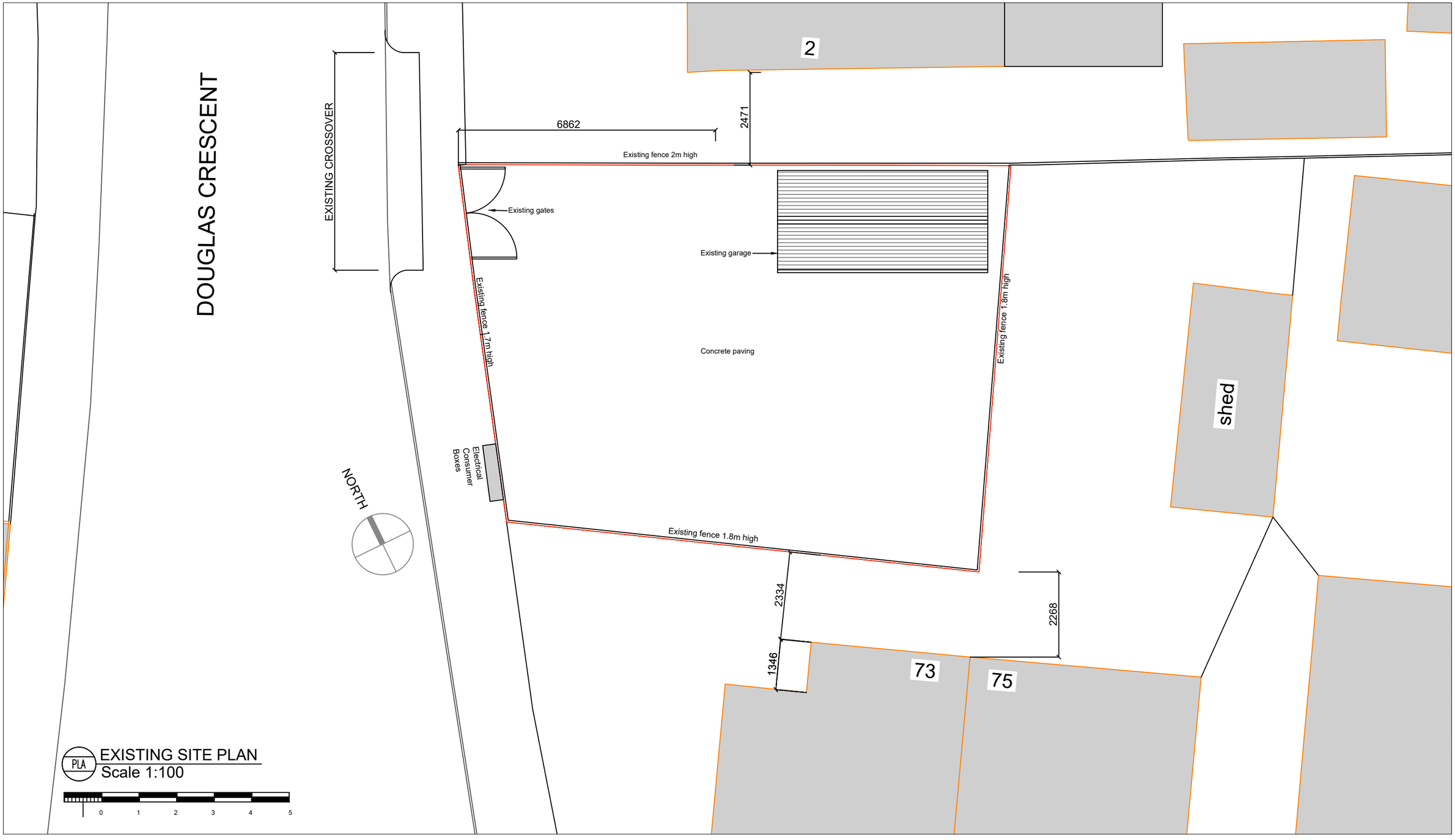

PROJECT

DEMOLITION OF GARAGE AND ERECTION OF GROUND FLOOR OVER BASEMENT ONE BEDROOM DWELLING

73a WILLOW TREE LANE, HILLINGDON, HAYES, UB4 9BL

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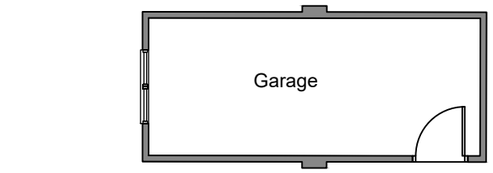

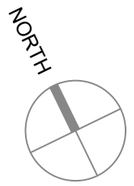

PLA EXISTING FLOOR PLAN
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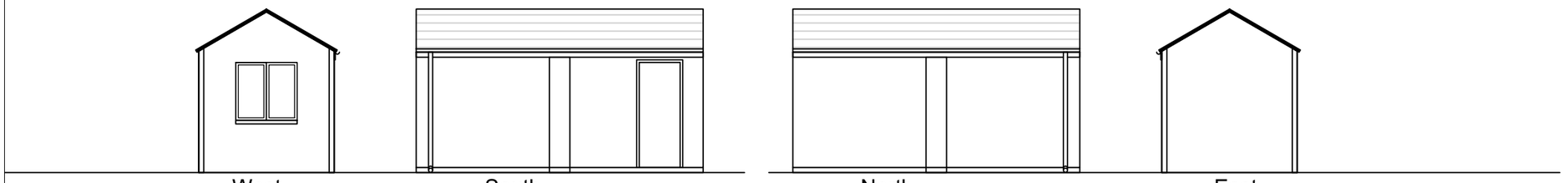

PLA EXISTING ELEVATIONS
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PROJECT DEMOLITION OF GARAGE AND ERECTION OF GROUND FLOOR OVER BASEMENT ONE BEDROOM DWELLING 73a WILLOW TREE LANE, HILLINGDON, HAYES, UB4 9BL	IMPORTANT: THIS DRAWING IS FOR A PLANNING APPLICATION. OBTAIN BUILDING REGULATION COMPLIANCE DRAWINGS FOR CONSTRUCTION. CHECK ALL DIMENSIONS ON SITE AND REPORT DISCREPANCIES TO THE DESIGNER / RESPONSIBLE PERSON.	Frank Smith Architecture & Interior Design	**27 Nevis Park, Inverness, IV3 8RX** **email Franksmith@franksmitharchitecture.co.uk** **Mob: 075 18 75 6845**
		PLANNING APPLICATION	**SCALE** 1:100@ A3
			DRAWING NUMBER 23018-PLA-203 REV000

DOUGLAS CRESCENT

EXISTING CROSSOVER

6862

2471

EXISTING FENCE TO NO 2 = 2m HIGH

2

600 maximum height garden wall

45° visibility splay

NEW FENCE 1.7m HIGH

plant bed

2400

bin shelter

plant bed

Parking / Set down

1894

2400

M4(2) potential set down space 4.5 x3.3m

EXTENDED CROSSOVER

Green Roof

plant bed

600 maximum height garden wall

45° visibility splay

NEW FENCE 1.7m HIGH

lawn

bicycle shelter

Lower Ground Patio

EXISTING FENCE 1.8m HIGH

shed

Outdoor Amenity

EXISTING FENCE 1.7m HIGH

UTILITY BOXES

EXISTING FENCE 1.8m HIGH

plant bed

2334

2268

1346

NORTH

71a

73

75

PLA PROPOSED SITE AND ROOF PLAN
Scale 1:100

0 1 2 3 4 5

PROJECT DEMOLITION OF GARAGE AND ERECTION OF GROUND FLOOR OVER BASEMENT ONE BEDROOM DWELLING 73a WILLOW TREE LANE, HILLINGDON, HAYES, UB4 9BL	IMPORTANT: THIS DRAWING IS FOR A PLANNING APPLICATION. OBTAIN BUILDING REGULATION COMPLIANCE DRAWINGS FOR CONSTRUCTION. CHECK ALL DIMENSIONS ON SITE AND REPORT DISCREPANCIES TO THE DESIGNER / RESPONSIBLE PERSON.	Frank Smith Architecture & Interior Design **27 Nevis Park, Inverness, IV3 8RX** **email Franksmith@franksmitharchitecture.co.uk** **Mob: 075 18 75 6845**

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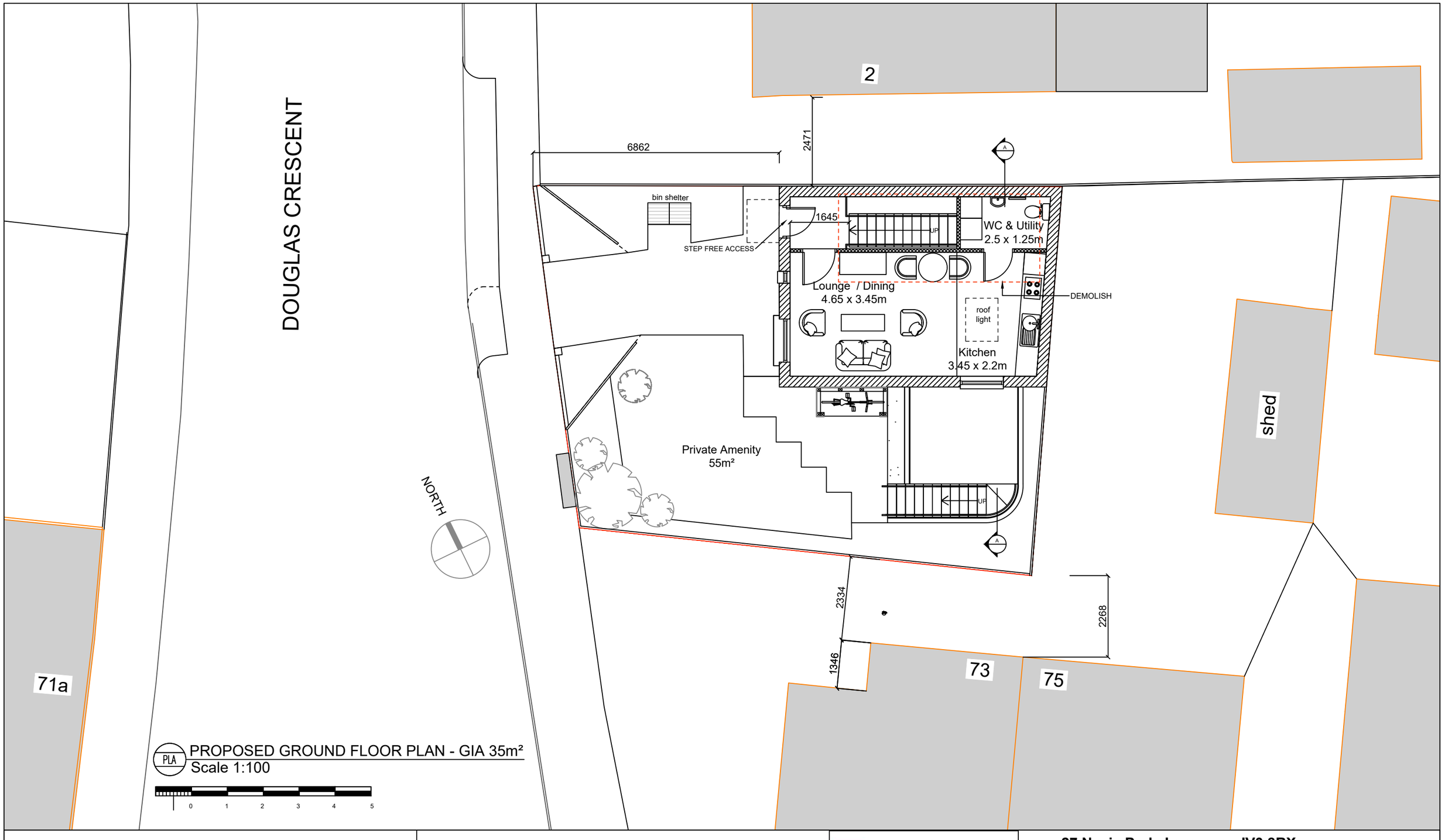

PROJECT

DEMOLITION OF GARAGE AND ERECTION OF GROUND FLOOR OVER BASEMENT ONE BEDROOM DWELLING

73a WILLOW TREE LANE, HILLINGDON, HAYES, UB4 9BL

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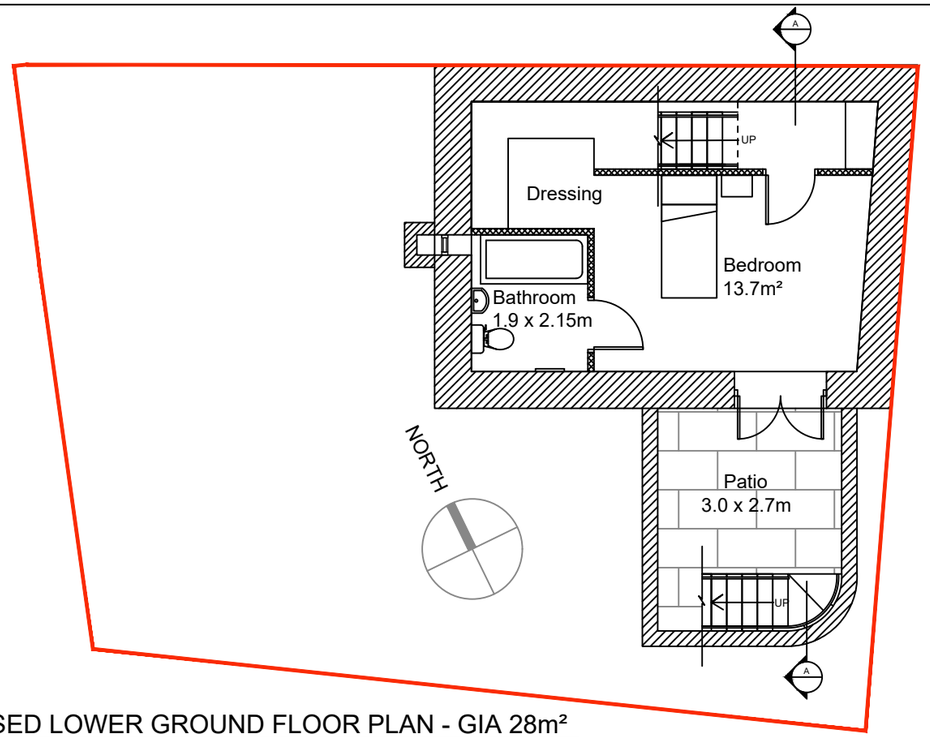
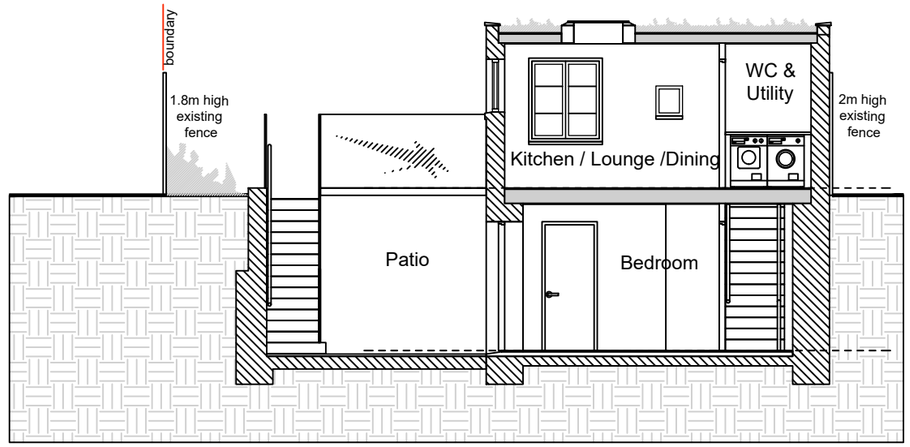


PLA PROPOSED LOWER GROUND FLOOR PLAN - GIA 28m²
Scale 1:100



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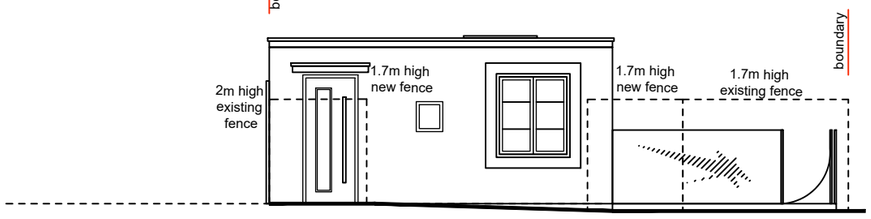

PLA PROPOSED WEST ELEVATION
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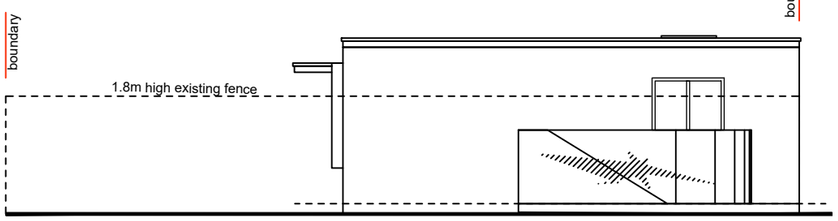

PLA PROPOSED SOUTH ELEVATION
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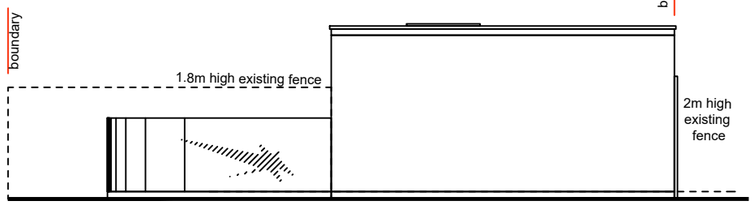

PLA PROPOSED EAST ELEVATION
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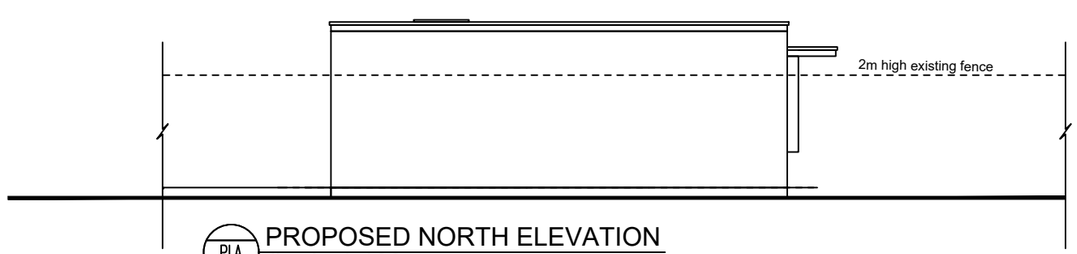

PLA PROPOSED NORTH ELEVATION
Scale 1:100

PROJECT

DEMOLITION OF GARAGE AND ERECTION OF GROUND FLOOR OVER BASEMENT ONE BEDROOM DWELLING

73a WILLOW TREE LANE, HILLINGDON, HAYES, UB4 9BL

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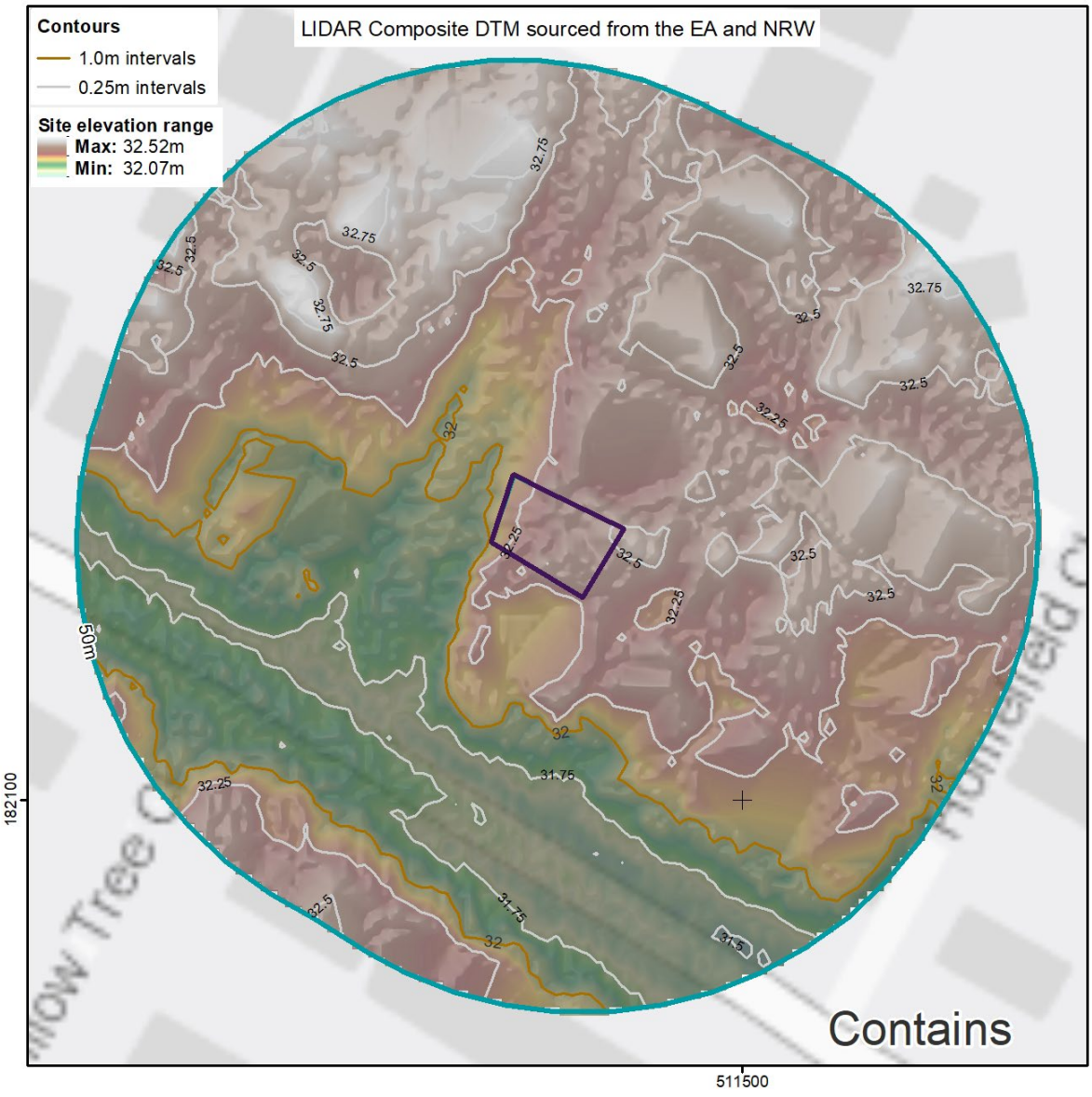
GeoSmart Information

Appendix B

Environment Agency LiDAR map



GeoSmart Information

Appendix C

Thames Water sewer flooding report

Sewer Flooding
History Enquiry

Property Searches

GeoSmart Information Ltd

Bellstone

Search address supplied	73 Willow Tree Lane Hayes UB4 9BL
Your reference	84224
Our reference	SFH/SFH Standard/2024_5084240
Received date	**21 November 2024**
Search date	**21 November 2024**

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

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

0800 009 4540

Sewer Flooding
History Enquiry

Property Searches

Search address supplied: 73,Willow Tree Lane,Hayes,UB4 9BL

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

searches@thameswater.co.uk
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Sewer Flooding
History Enquiry

Thames Water Property Searches

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

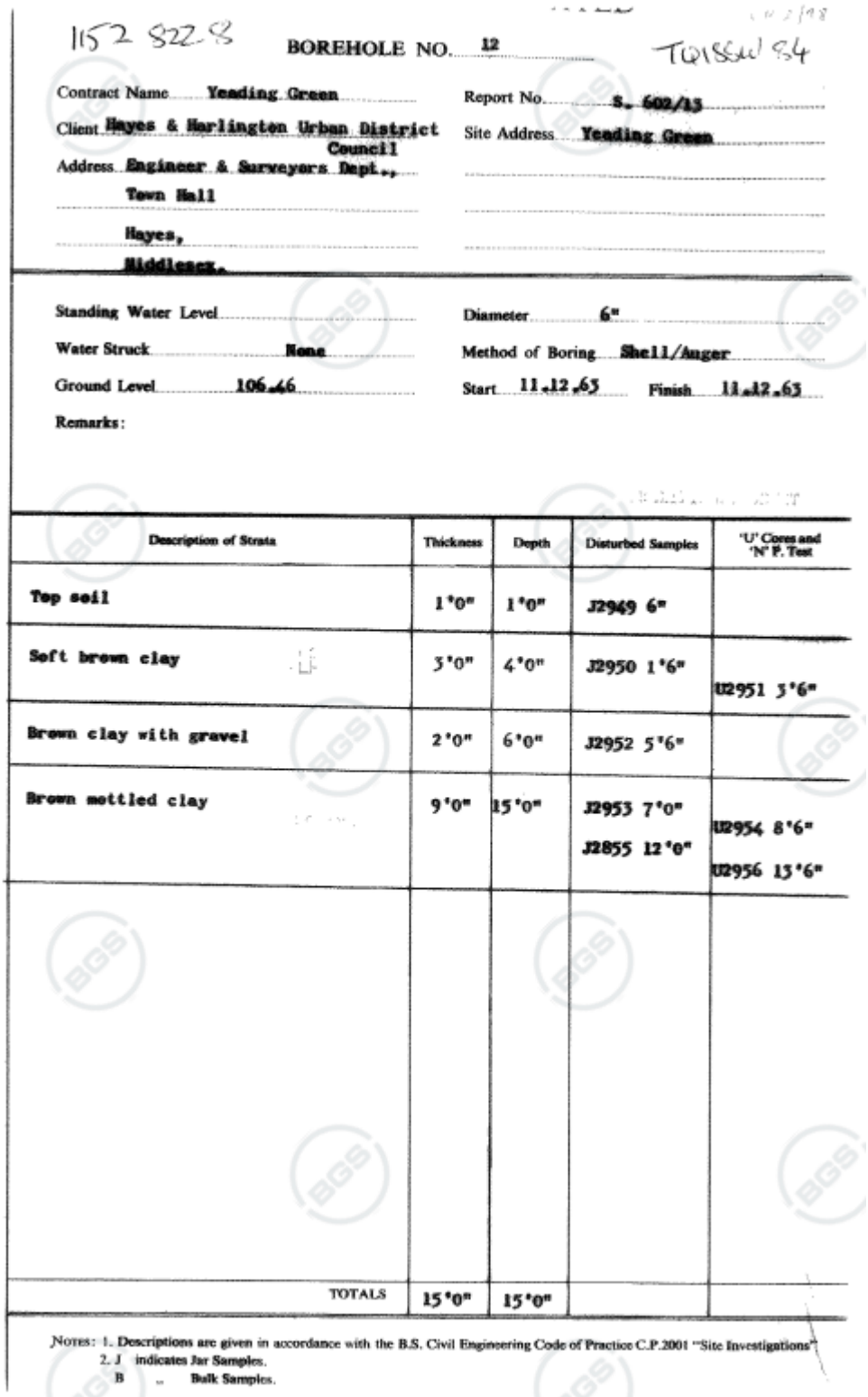
Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

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

0800 009 4540

Appendix D

BGS Borehole logs



1152 822.8

BOREHOLE NO. 12

TQ15SW 84

Contract Name Yeading Green

Report No. S. 602/13

Client Hayes & Harlington Urban District Council

Site Address Yeading Green

Address Engineer & Surveyors Dept.,
Town Hall
Hayes,
Middlesex.

Standing Water Level

Diameter 6"

Water Struck None

Method of Boring Shell/Auger

Ground Level 106.46

Start 11.12.63 Finish 11.12.63

Remarks:

Description of Strata	Thickness	Depth	Disturbed Samples	'U' Cores and 'N' P. Test
Top soil	1'0"	1'0"	J2949 6"	
Soft brown clay	3'0"	4'0"	J2950 1'6"	U2951 3'6"
Brown clay with gravel	2'0"	6'0"	J2952 5'6"	
Brown mottled clay	9'0"	15'0"	J2953 7'0" J2855 12'0"	U2954 8'6" U2956 13'6"
TOTALS	15'0"	15'0"		

NOTES: 1. Descriptions are given in accordance with the B.S. Civil Engineering Code of Practice C.P.2001 "Site Investigations"
2. J indicates Jar Samples.
B " Bulk Samples.

TERRESEARCH LIMITED

1165 4224

BOREHOLE NO. 13

TQ18SW 85

Contract Name: Yeading Green

Report No.: S. 602/13

Client: Hayes & Harlington Urban District Council

Site Address: Yeading Green

Address: Engineer & Surveyors Dept.,
Town Hall,
Hayes,
Middlesex.

Standing Water Level: 4'6" 11.12.63

Diameter: 8"

Water Struck: 11'0" 10.12.63

Method of Boring: Shell / Auger

Ground Level: 104.65

Start: 10.12.63 Finish: 11.12.63

Remarks:

Description of Strata	Thickness	Depth	Disturbed Samples	'U' Cores and 'N' P. Test
Top soil	1'0"	1'0"	J2931 6"	
Brown clay	2'0"	3'0"	J2932 1'6"	
Gravelly clay	3'0"	6'0"	J2934 5'0"	U2933 3'6"
Brown mottled clay	9'0"	15'0"	J2935 7'0" J2937 12'6"	U2936 8'6" U2938 13'6"
			W2939	
TOTALS	15'0"	15'0"		

Disclaimer

This report has been prepared by GeoSmart in its professional capacity as soil, groundwater, flood risk and drainage specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by GeoSmart solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to GeoSmart at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, GeoSmart may, by prior written agreement, agree to such release, provided that it is acknowledged that GeoSmart accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. GeoSmart accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against GeoSmart except as expressly agreed with GeoSmart in writing.

For full T&Cs see http://geosmartinfo.co.uk/terms-conditions

Important consumer protection information

This search has been produced by GeoSmart Information Limited, Suite 9-11, 1st Floor, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU.

Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

GeoSmart Information Limited is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom.
- sets out minimum standards which firms compiling and selling search reports have to meet.
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals.
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.
- By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports.
- act with integrity and carry out work with due skill, care and diligence.
- at all times maintain adequate and appropriate insurance to protect consumers.
- conduct business in an honest, fair and professional manner.
- handle complaints speedily and fairly.
- ensure that products and services comply with industry registration rules and standards and relevant laws.
- monitor their compliance with the Code.

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs contact details:

The Property Ombudsman scheme

Milford House

43-55 Milford Street

Salisbury

Wiltshire SP1 2BP

Tel: 01722 333306

Fax: 01722 332296

Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

Please ask your search provider if you would like a copy of the search code

Complaints procedure

GeoSmart Information Limited is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly. If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision. Complaints should be sent to:

Martin Lucass

Commercial Director

GeoSmart Information Limited

Suite 9-11, 1st Floor,

Old Bank Buildings,

Bellstone, Shrewsbury, SY1 1HU

Tel: 01743 298 100

martinlucass@geosmartinfo.co.uk

10. Terms and conditions, CDM regulations and data limitations

Terms and conditions can be found on our website:

http://geosmartinfo.co.uk/terms-conditions/

CDM regulations can be found on our website:

http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/

Data use and limitations can be found on our website:

http://geosmartinfo.co.uk/data-limitations/