Basement Impact Assessment

Using pro forma 1v0

169 West End Lane
NW6 2LH

Basement Impact Assessment
Planning reference (TBC)

For

LAD Construction Limited

35409.R.002.A.G.RJM

May 2018

Revisions & additional material

All documents within a BIA submission should clearly indicate the site address and planning reference number (where known).

Document numbers, revision numbers and dates of submission should be provided to ensure that only current documents are considered during the planning and BIA audit processes.

Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
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Additional supporting documents

Please note – the review process will be quicker if these are submitted as Word documents or searchable PDFs.

Date	Version	Produced by
May 2018	35409.R.001	Report on Desk Study & Site Investigation

Please list all revisions here: 1

Date	Version	Produced by

All assessment and supporting documents should be referenced to ensure their inclusion in the planning and BIA audit processes.

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- *Slope Angle and Worked Ground Map (LB Camden GHHS figure 16)*
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- Flood Risk Map, Environment Agency (Surface Water Flood Risk)
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Non-Technical Summary

1.1.1. The site location is 169 West End Lane, London, NW6 2LH

1.1.2. The current site arrangement is a 4.5 storey (including basement with same footprint as ground floor) corner plot at the junction of West End Lane and Sherriff Road, approximately 40m south of West Hampstead Station. Lightwells extend from the southern side of the basement with grilled covers at ground floor level, which are flush with the adjoining pavement.

The existing basement is currently empty with some supporting walls and was previously used for storage. At ground floor level there is a dry cleaning shop and there is residential accommodation in the floors above.

1.1.3. The proposed development comprises a basement refurbishment to provide a residential flat. Around 70% of the existing lightwells will be retained, with steps providing access via the lightwell to the new basement flat. The remaining 30% of existing lightwell will be incorporated as an extension to the existing basement.

The existing floor level of the basement will be reduced from 8.24mAOD to 7.815mAOD, to provide additional headroom for a basement flat, and this will require excavation of the existing floor and underpinning of the existing walls.

1.1.4. The following assessments are presented:

- Desk Study & Site Investigation
- Screening
- Scoping
- Additional evidence/assessments
    - *Site investigation*
    - *Infrastructure Drawings (Sewers)*
    - *Annotated extracts from Camden Geological, Hydrogeological and Hydrological Study*
- *Impact Assessment*

1.1.5. The authors of the assessments are Richard Moore, an Engineering Geologist with qualifications: BSc MSc FGS CGeol and more than 25 years experience of site investigation and construction, including a number of basements in Camden.

We have also consulted Jennifer Sturman, a Civil Engineer with qualifications CEng and MICE with more than 25 years experience and Darren Cook, a Structural Engineer with qualifications BEng, CEng, MIStructE, also with more than 25 years experience.

1.1.6. The ground and groundwater conditions beneath the site are such that the existing building is founded directly onto London Clay. A small quantity (<50mm depth) of perched water was found locally on top of the London Clay by investigations and it is anticipated that this is probably seasonal or a result of seepage from drains and sewers in the vicinity of the basement.

1.1.7. The construction methods proposed are hit-and -miss underpinning to deepen the foundations below the basement walls, followed by excavation of the existing floor slab and underlying clay, prior to forming the replacement basement floor as a ground bearing slab, incorporating a proprietary heave mitigation layer underneath.

1.1.8. A structural monitoring strategy to control the works and impacts to neighbouring structures will comprise condition surveys in advance of the works and precise levelling of monitoring studs mounted at representative locations on the existing property and party walls for the duration of the works.

1.1.9. The BIA has assessed land stability and the impacts of the proposed development on neighbouring structures are expected to be not greater than Category 1.

1.1.10. The BIA has identified no significant stability impacts associated with the proposed development.

1.1.11. The BIA has identified no potential hydrological impacts.

1.1.12. The BIA has identified no potential hydrogeological impacts

1.1.13. The BIA has identified a low flood risk for the proposed development.

2.0 Introduction

The purpose of this assessment is to consider the effects of a proposed basement development at *169 West End Lane, NW6 2LH on the local hydrology, geology and hydrogeology and potential impacts to neighbours and the wider environment. The site location is presented in Appendix 1.*

The BIA approach follows current planning procedure for basements and lightwells adopted by LB Camden and comprises the following elements (CPG Basements):

- Desk Study;
- Screening;
- Scoping;
- Site Investigation, monitoring, interpretation. A ground movement assessment is not included because the scoping identified no specific issues.
- Impact Assessment

2.1. Authors

2.1.1. The BIA has been *authored/reviewed/approved by* Richard Moore, an Engineering Geologist with qualifications: BSc MSc FGS CGeol and more than 25 years experience of site investigation and construction.

We have also consulted Jennifer Sturman, a Civil Engineer with qualifications CEng and MICE with more than 25 years experience and Darren Cook, a Structural Engineer with qualifications BEng, CEng, MIStructE, also with more than 25 years experience.

2.2. Sources of Information

The Camden Geological, Hydrogeological and Hydrological Study - Guidance for Subterranean Development (produced by Arup, 2010) – is referred to throughout this document as CGHHS.

The following baseline data have been referenced to complete the BIA in relation to the proposed development:

- Site walkover/Description- *Refer to Groundsure Report provided with Report on Desk Study and Site Investigation, Ref: 35409.R.001.RJM, May 2018,* provided in Appendix 2.
- Current/historical mapping- *Refer to Groundsure Report provided with Report on Desk Study and Site Investigation, Ref: 35409.R.001.RJM, May 2018, summarised in Appendix 2;*
- Geological mapping- *Refer to Groundsure Report provided with Report on Desk Study and Site Investigation, Ref: 35409.R.001.RJM, May 2018, summarised in Appendix 2;*
- Hydrogeological data- *Refer to extracts from CGHHS provided in Appendix 1 and Groundsure Report provided with Report on Desk Study and Site Investigation, Ref: 35409.R.001.RJM, May 2018, summarised in Appendix 2;*
- Current/historical hydrological data- *Refer to extracts from CGHHS provided in Appendix 1 and Groundsure Report provided with Report on Desk Study and Site Investigation, Ref: 35409.R.001.RJM, May 2018, summarised in Appendix 2;*
- Flood risk mapping- *Refer to extracts from CGHHS provided in Appendix 1 and Groundsure Report provided with Report on Desk Study and Site Investigation, Ref: 35409.R.001.RJM, May 2018. Summarised in Appendix 2;*
- LB Camden, Strategic Flood Risk Assessment (produced by URS, 2014);
- LB Camden, Floods in Camden, Report of the Floods Scrutiny Panel (2013);
- LB Camden, Planning Guidance (CPG) – Basements (March 2018);
- LB Camden, Camden Geological, Hydrogeological and Hydrological Study (CGHHS) – Guidance for Subterranean Development (produced by Arup, 2010);

- LB Camden, Local Plan Policy A5 Basements (2017);
- LB Camden's Audit Process Terms of Reference;
- *ASUC Guidelines:* Guidelines on safe and efficient basement construction directly below or near to existing structures

2.3. Existing and Proposed Development

2.3.1. The Application site is located *at the junction of West End Lane and Sherriff Road. The site is not within a wider hillside setting and the immediate area surrounding the site is level. Slope angles in the vicinity of the site are less than 7deg. This is confirmed by a review of Ordnance Survey mapping and by reference to GHHS Figure 16.*

2.3.2. T*he site slope angle is estimated to 0deg. to 1deg. The ground level at the site is approximately 54.0m*

2.3.3. Description of current property/structures on site. T*he condition of the structures is stable with little to no evidence of historical movement*

2.3.4. Description of adjacent properties/structures. *The existing basement floor level is approximately 2.2m below ground level (51.8m) with foundation depth at 0.45m (51.35m) to 0.70m (51.1m) below existing basement floor level. The lightwell floor level is approximately 0.35m below existing basement floor level (51.45m).*

2.3.5. None of the neighbouring buildings are Listed.

2.3.6. There are no gardens or trees directly bordering the site. The northern flank adjoins No171 along its length and the western flank adjoins the next door property on Sherriff Road. The southern and eastern sides face out onto Sherriff Road and West End Lane respectively. The nearest tree is a 9m high Elder located, 5m north in a private garden. (See photographs provided in Appendix 2).

A review of the geotechnical test results indicates that the formation soils underlying 169 West End Lane are unaffected by tree roots (i.e. Natural Moisture Content is greater than Liquid Limit +40% and Plastic Limited +2%) .

Therefore, no further consideration is given to protection of trees or the effects of trees.

2.3.7. Adjacent infrastructure consists of *the public footway to the south and east.*

The mains sewer connection is marked by a manhole in the existing lightwell floor. Thames Water asset plans have been obtained and are provided in Appendix 1 for reference.

2.3.8. There is no major underground infrastructure present beneath/close to the site. (Refer to our summary of the Groundsure Report in Appendix 2 and CGHHS Figure 18 provided in *Appendix 1).*

2.3.9. Existing and Proposed development drawings are presented in *Appendix 3.*

2.3.10. The proposed development will utilise hit-and-miss underpinning methods to increase the foundation depths prior to excavation to form a new floor slab.

2.3.11. The outline construction programme **will be developed in due course.**

2.3.12. To conclude, the proposed improvements to the existing basement and lightwell are in full compliance with London Borough of Camden A5 Basement Requirements summarised below.

Note : Policy A5 Basement Requirements

The siting, location, scale and design of basements must have minimal impact on, and be subordinate to, the host building and property. Basement development should:
- not comprise of more than one storey;
- not be built under an existing basement;
- not exceed 50% of each garden within the property;
- be less than 1.5 times the footprint of the host building in area;
- extend into the garden no further than 50% of the depth of the host building measured from the principal rear elevation;
- not extend into or underneath the garden further than 50% of the depth of the garden;
- be set back from neighbouring property boundaries where it extends beyond the footprint of the host building; and
- avoid the loss of garden space or trees of townscape or amenity value.

3.0 Desk Study

3.1. Site History

3.1.1. *Summary of Historical Map Findings*

On the first supplied map dated 1865, the site was an undeveloped plot of land, partly wooded.

From around 1894, a post office was depicted on site until around 1953 when the post office was no longer denoted. The structure does not appear to have changed significantly in this time.

The site is located in a city setting where there are a number of historic and current off site sources of contamination. However none of these are expected to represent a significant hazard to the subject site.

3.2. Geology

3.2.1. The British Geology Survey (BGS) map of the area (reference) geological mapping provided with the Groundsure Report confirms that the site is underlain by *London Clay and this is confirmed on Figures 3, 4, 5, 6, 7, 16 and 17 of GHHS.*

The geology on site has been confirmed in hand dug pits excavated in April 2018 and reported in Section 6 of this report and in the Report on Desk Study & Site Investigation provided in Appendix 2.

3.3. Hydrogeology

3.3.1. The geology underlying the site is classified as Unproductive Strata related to the underlying London Clay.

3.3.2. LB Camden data indicates the site *is not within a groundwater source protection zone.*

3.4. Hydrology, Drainage and Flood Risk

Relevant reference information is provided in:
- Watercourses, GHHS Figure 11
- Surface Water Features, GHHS Figure 12
- Hampstead Heath Surface Water Catchments and Drainage, GHHS Figure 14
- LB Camden, Strategic Flood Risk Assessment (Figure 6)
- Flood Map, GHHS Figure 12
Additional reference material is available from other sources e.g. Environment Agency.

3.4.1. The site is not located within 250*m radius of surface water features.*

3.4.2. The site is not located within 250*m of a historical water course.*

3.4.3. The site *is not within the catchment of the Hampstead Heath Pond Chain, which is more than 1km north of the site.*

3.4.4. The site surface area will not change. Refer to Appendix 3 for further details of the existing site layout.

3.4.5. The proposed surface area will be mostly hardstanding i.e. the same as existing. Refer to Appendix 3 for proposed site layout plans. The site run-off will not be increased by this development.

3.4.6. The site is classified as a *very low risk of surface water flooding*

3.4.7. The site *is not within a Critical Drainage Area.*

3.5. Other Information

The available information provided and referenced in this report is considered sufficient for this assessment.

4.0 Screening

4.1 Hydrogeology

4.1.1. A screening process has been undertaken and the findings are described below.

Question	Response	Details
1a. Is the site located directly above an aquifer?	No	London Clay is an Unproductive Strata.
1b. Will the proposed basement extend beneath the water table surface?	No	Trial pits dry with exception of minimal perched water on top of London Clay.
2. Is the site within 100mof a watercourse, well (used / disused) or potential spring line?	No	Refer to Appendix 1/ CGHHS.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No	Refer to Appendix 1/ CGHHS.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No	Refer to Appendix 3.
5. 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)?	No	Refer to Appendix 3. No change to surface areas.
6. 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 (not just the pond chains on Hampstead Heath) or spring line?	No	Site is located >1km south of the Hampstead Heath Pond Chains.

4.2. Slope Stability

Question	Response	Details
1. Does the existing site include slopes, natural or man-made greater than 7 degrees (approximately 1 in 8)?	No	Refer to Appendix 1/ CGGHS.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees (approximately 1 in 8)?	No	Refer to Appendix 1/CGHHS & Appendix 3.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees (approximately 1 in 8)?	No	Refer to Site Walkover & Appendix 1.
4. Is the site within a wider hillside setting in which the general slope is greater than 7 degrees (approximately1 in 8)?	No	Refer to Site Walkover & Appendix 1.
5. Is the London Clay the shallowest strata at the site?	No	Refer to Appendix 2- Property if founded o London Clay with some Made Ground above formation level.
6. Will any trees be felled as part of the development and/or are any works proposed	No	Refer to Appendix 2.

within any tree protection zones where trees are to be retained?		
7. Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?`	No	There is a moderate risk highlighted by the Desk Study Report. Refer to findings in Appendix 2.
8. Is the site within 100m of a watercourse or a potential spring line?	No	Refer to Appendix 1/CGHHS.
9. Is the site within an area of previously worked ground?	No	Refer to Appenndix 1 & 2.
10. Is the site within an aquifer. If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No	London Clay is an Unproductive Strata.
11. Is the site within 50m of the Hampstead Heath Ponds?	No	Refer to Appendix 1. Site is more than 1KM south of the ponds.
12. Is the site within 5m of a highway or pedestrian right of way?	No	Refer to Appendix 1.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No	Refer to Appendix 1. Sketch of basement of 171 West End Lane.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No	Refer to Appenndix 1. Site location plan & infrastructure detail map.

4.3. Surface Water and Flooding

Question	Response	Details
1. Is the site within the catchment of the ponds chains on Hampstead Heath?	No	The site more than 1km south of the pond chains.
2. 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	Refer to Appendix 1 & Appendix 2.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	The footprint of the building is not changing significantly. Refer to Appendix 3- Existing & proposed site layout plans.
4. 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	Refer to Appendix 1. There are no watercourses in close proximity to 169 West End Lane.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	Refer to Appendix 1. There are no watercourses in close proximity to 169 West End Lane.
6. 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	Refer to Appendix 1 & Desk Study data. No surface water features in close proximity to 169 West End Lane.

4.4. Non-Technical Summary of Screening Process

4.4.1. The screening process is intended to identify issues to be carried forward to scoping for further assessment: Screening has **NOT** identified any issues to be carried forward to scoping for further assessment.

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

5.0 Scoping

The following issues have been brought forward from the Screening process for further assessment:

5.1.1. Screening has **NOT** identified any issues to be carried forward to scoping for further assessment.

6.0 Site Investigation/Additional Assessments

6.1. Site Investigation

6.1.1 Investigations

5No hand dug pits were excavated to expose the existing foundation details around the footprint of the basement and lightwell.

Beneath foundation formation level, a proportion of the holes were extended to greater depth by hand augering to confirm the underlying strata.

Laboratory testing has been carried out to classify the soil in terms of its index properties and potential effects on buried concrete. The results are attached in Appendix C.

6.1.2 Ground Conditions

Below the floor slab, which is typically not much more than 100-150mm thickness, there is generally a mixed fill consisting of clayey brick and stone which extends down to the base of the foundations at around 0.45m to 0.80m below existing slab level. Below this, the ground conditions are typically firm to stiff brown London CLAY.

Groundwater was encountered only as perched water on top of the London Clay in TP1 Section A-A and in TP5. The other holes were dry.

6.1.3 Existing Foundations

Basement

Trial Pit TP1 in the north east corner of the existing basement confirmed a 2 brick corbel at 0.30m below existing basement slab level. In Section B-B under the West End Lane frontage, the corbel was founded on a 150mm layer of compacted brick fill over a 50mm layer of dry-packed crushed stone/lean mix concrete. In Section A-A, below the boundary with 171 West Lane, there was a 400mm thick layer of dry-packed gravel of brick and stone. Groundwater was struck in Trial Pit TP1 Section A-A but not in TP1 Section B-B. It is concluded that the water is perched within the gravel footing.

TP2 is on the southern side of the basement and encountered a 3 brick corbel resting on a 120mm concrete strip/pad foundation, placed on a 200mm layer of brick fill. No groundwater was encountered.

TP4 is located in the north west corner of the basement, at the foot of the stairs from ground floor. TP4 encountered a 300mm wide brick footing at basement floor level which extended to a depth of 0.27m below floor level and was founded on a 180mm thick layer of lime cemented brick fill. No groundwater was encountered.

In all cases, *insitu* firm to stiff or stiff brown London Clay was encountered at the base of the compacted brick fill foundations.

Lightwell

Trial Pits TP3 and TP5 were excavated within the existing lightwell vaults.

TP3 was similar to TP1 and TP2 and consisted of a 3-brick corbel founded on a 400mm thick layer of lime cemented brick fill. A small amount of seepage occurred at the top of the London Clay and settled as 20mm of perched water on top of the *insitu* London Clay.

TP5 consisted of a single brick corbel resting on a 130mm thick layer of lime cemented brick fill. The clay in TP5 was more damp than in the other four trial pits and we suggest that this is (a) because there was an overhead pipe dripping persistently and (b) because the manhole within the lightwell connects to the mains sewers around this location.

6.1.4 Foundations & Retaining Walls

It is considered that the most appropriate foundation solution for the basement will be to underpin the existing walls so that that they are founded in the stiff London Clay at sufficient depth to accommodate the replacement ground floor slab.

It is suggested that hit-and-miss underpinning methods will be effective. It is possible that a limited amount of perched water may be encountered locally, but it should be feasible to dewater any underpins which encounter perched water by sump pumping. The groundworker undertaking the excavation and underpinning works should not commence any excavations until the necessary equipment is provided on site.

It is not anticipated that significant heave will be encountered but we advise that heave pressures should be calculated pro rata based on 10KN/m2 per metre of depth excavated and we recommend that a proprietary heave mitigation layer is provided underneath the floor slab.

The works should therefore be programmed to ensure that the basement floor slab is constructed without delay following excavation.

Ground gas is not identified as a significant issue at this site and we advise that tanking designed in accordance with BS8102 should provide sufficient mitigation against any residual ground gas risk.

The following parameters are considered appropriate for the design of any retaining walls to be incorporated in the scheme:

Parameter	London Clay
ϕ'	21.5^0
C'	1.0 KN/m^2
χ'	18.5 KN/m^2

6.1.5 Chemical Attack on Buried Concrete

Laboratory testing of soils has determined the following criteria for buried concrete in contact with the soils and localised perched groundwater at this site.

Design Sulphate Class: DS3

ACEC Classification: AC4

Groundwater should be considered as mobile across the site.

6.2. Additional Assessments

— Insert – ditto Section 3.5

Provision of incomplete information or assessment will result in the BIA not being accepted as compliant with the relevant policies. This will result in either rejection of the planning application or the requirement to re-submit a policy compliant BIA. In addition to delaying the planning process, this is likely to incur additional costs for the Applicant.

Where required, these may include:

- Arboricultural report;
- Condition Surveys;
- Asset Owner's Correspondence (e.g. TFL, Thames Water, etc);
- Flood Risk Assessment;
- Surface Water Drainage Strategy / SUDS Assessment;
- Others.

Note that all potential impacts identified during Screening and Scoping will need sufficient additional assessment to demonstrate that residual impacts are policy compliant.

Provision of incomplete information or assessment will result in the BIA not being accepted as compliant with the relevant policies. This will result in either rejection of the planning application or the requirement to re-submit a policy compliant BIA. In addition to delaying the planning process, this is likely to incur additional costs for the Applicant.

7.0 Construction Methodology/ Engineering Statements

7.1. Outline Geotechnical Design Parameters

Design parameters should be presented in accordance with the GHHS, Appendix G3. Note that for the purposes of Planning, all assessments should be reasonably conservative, in accordance with the relevant policies and Audit Terms of Reference.

7.1.1. Reasonably conservative geotechnical parameters have been determined, based on the site investigation data presented *(in Section 6.1.4 and Appendix 2)* and relevant technical guidance (as referenced in para 2.2 of this BIA).

The following parameters are considered appropriate for the design of any retaining walls to be incorporated in the scheme:

Parameter	London Clay
ϕ'	21.5^0
C'	1.0 KN/m^2
χ'	18.5 KN/m^2

7.2. Outline Temporary and Permanent Works Proposals

A description of temporary and permanent works should be provided, including sequencing and propping works. Sketches, drawings and outline retaining wall calculations are required. It should be demonstrated that bearing capacity is adequate. Settlements / heave / uplift should be calculated and be accounted for in the structural design. All resulting risks and impacts should be assessed and mitigated.

7.2.1. The works proposals include....*description of works, including:*

- *Foundations - hit-and-miss underpinning.*
- *Retaining walls - hit-and-miss underpinning.*
- *Temporary works will include propping and localised sump pumping to remove shallow perched water where encountered on top of the London Clay.*
- *Permanent structure – Hit-and-miss underpinning and replacement floor slab*
- *Drainage strategy/SUDS proposals- The site will be positively drained to existing sewers.*
- *Flood risk mitigation measures – The site is not identified as being at risk of flooding.*

7.3. Ground Movement and Damage Impact Assessment

7.3.1. Due to the scale of the scheme and the findings of the BIA Screening (Section 4), a Ground Movement Assessment (GMA) has not been carried out. As it is reasonable to assume that movements will fall within Burland Range Category 0 (Negligible) and 1 (Very slight).

7.4. Control of Construction Works

7.4.1. The construction works will be closely controlled in accordance with *ASUC Guidelines:* Guidelines on safe and efficient basement construction directly below or near to existing structures

7.4.2. A structural monitoring strategy will be implemented to confirm that movements/damage impacts fall within the limits of the Burland Damage Category 0 to 1.

8.0 Basement Impact Assessment

The purpose of this assessment is to consider the effects of a proposed development on the local hydrology, geology and hydrogeology and impacts to neighbouring structures / properties.

Policy A5 Basement Requirements

The Council will require applicants to demonstrate that proposals for basements:

- do not harm neighbouring properties, including demonstrating that the scheme poses a risk of damage to neighbouring properties no higher than Burland Scale 1 'very slight';
- avoid adversely affecting drainage and run-off or causing other damage to the water environment;
- avoid cumulative impacts;
- provide satisfactory landscaping, including adequate soil depth; and
- do not prejudice the ability of the garden to support trees where they are part of the character of the area.

8.1.1. The Conceptual Site Model (CSM) is...*described below*

The CSM should describe the changes to the site e.g. the current / proposed structural arrangements and levels relating existing and proposed levels to the ground model and, in the context of the ground and groundwater conditions, clearly illustrating potential risks, impacts, mitigation activities, residual impacts etc ideally including text and sketches.

- The proven ground conditions are, London Clay at formation level, with some Made Ground above.
- Groundwater level is not present, except for a small amount of perched water (<20mm) on top of the London Clay.
- The site is flat.
- The existing building is founded at 0.45m to 0.80m below existing basement slab level.
- The proposed development will be founded at approximately 51.05mAOD
- The depths of neighbouring foundations/basements are understood to be of similar depth.

- The distance to the footpath is 0.0m. The highway is approximately 5m away.
- There are no adjacent tunnels/utilities.
- No potential impacts have been identified.
- Proposed mitigation will be provided by undertaking monitoring & following a CMP & MS prepared by the structural engineer.
- No residual impacts are identified.

8.2. Land Stability/Slope Stability

Conclusions of assessment should be clearly presented here.

8.2.1. The site investigation has identified a suitable founding stratum of 52.05m.

8.2.2. The risk of movement and damage to this development due to shrink and swell of the London Clay) is *negligible to slight.*

8.2.3. The BIA has concluded that there *will not be risk(s) or stability impact(s) to the development and/or adjacent sites due to slopes.*

8.3. Hydrogeology and Groundwater Flooding

Conclusions of assessment should be clearly presented here.

8.3.1. The BIA has concluded there is a very low risk of groundwater flooding.

8.3.2. The BIA has concluded *there are no impacts* to the wider hydrogeological environment.

8.4. Hydrology, Surface Water Flooding and Sewer Flooding

Conclusions of assessment should be clearly presented here.

8.4.1. The BIA has concluded there is a *low* risk of *surface water/sewer flooding.*

8.4.2. The BIA has concluded there are *no impacts to the wider hydrological environment.*

Appendices to be provided, as required

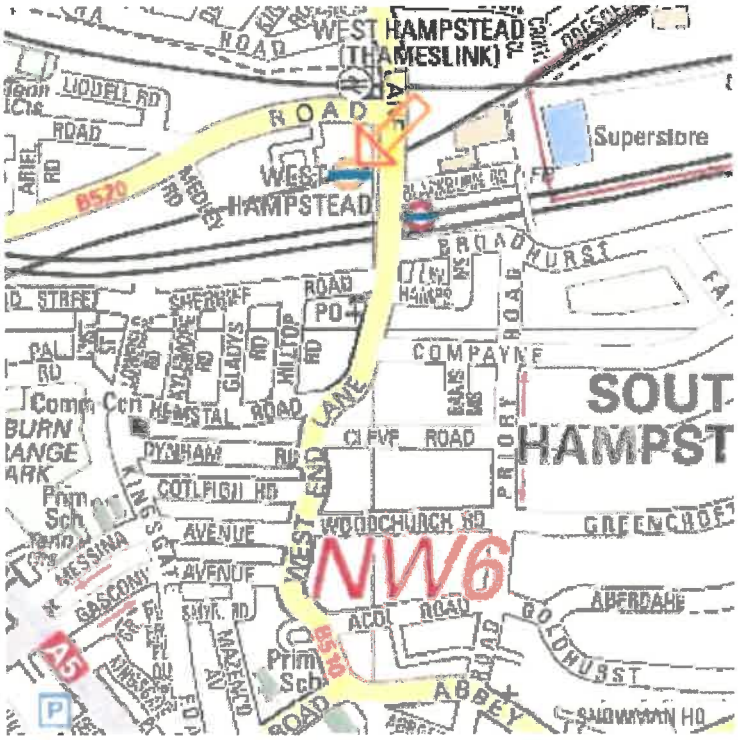
Appendix 1: Desk Study References

Site Location Plan

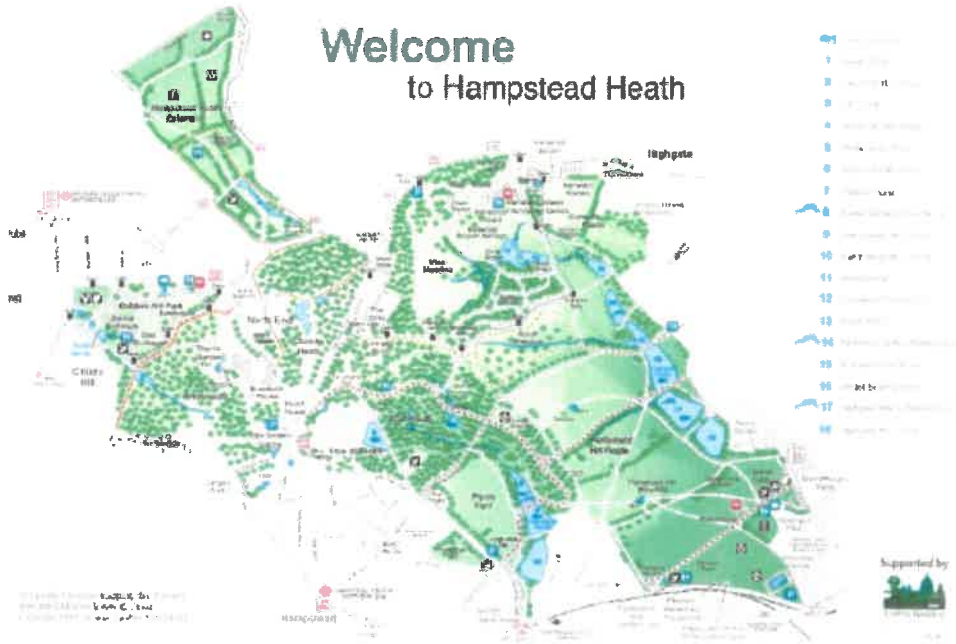
Other mapping/data as required to evidence screening assessments, for instance:

- Site Location

- Site Location

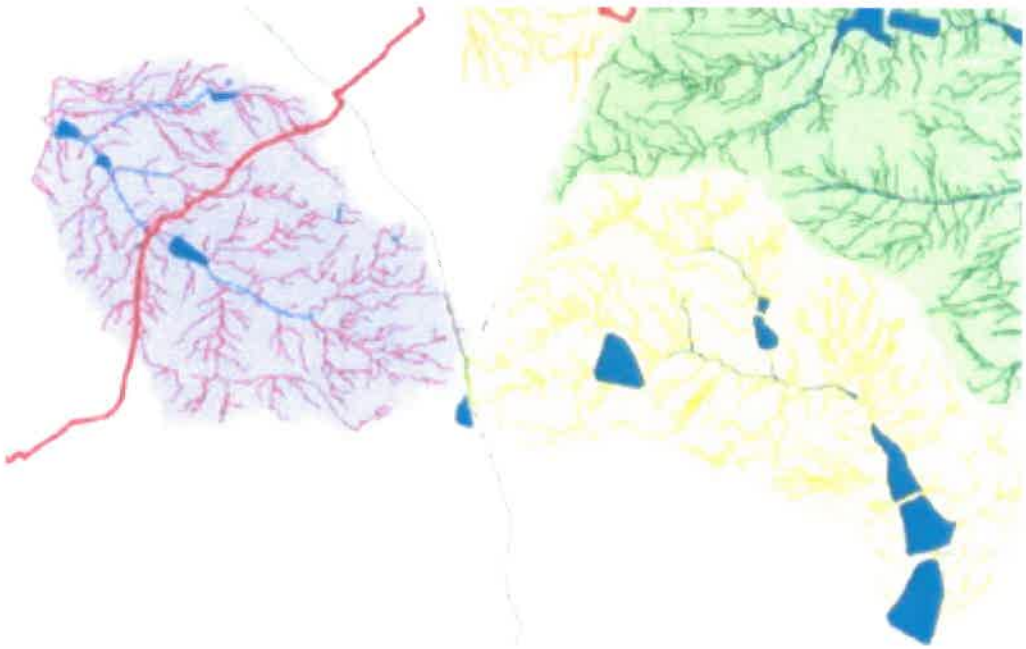


- Hampstead Heath Map (LB Camden GHHS figure 13)



NOTE: The site lies more than 1km south

- Hampstead Heath Surface Water Catchments & Drainage (LB Camden GHHS figure 14)

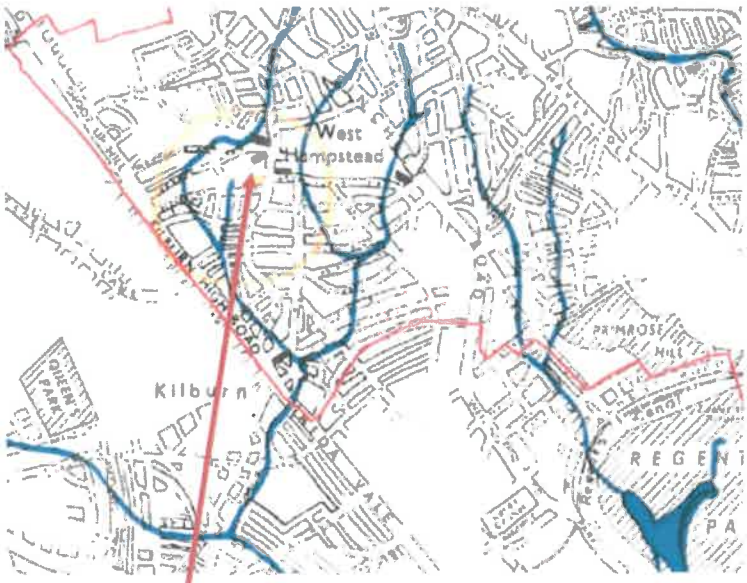


NOTE: The site lies more than 1km south

- WW2 Bomb Damage Map Extract

Site location (No damage indicated)

- Watercourses (LB Camden GHHS figure 11)

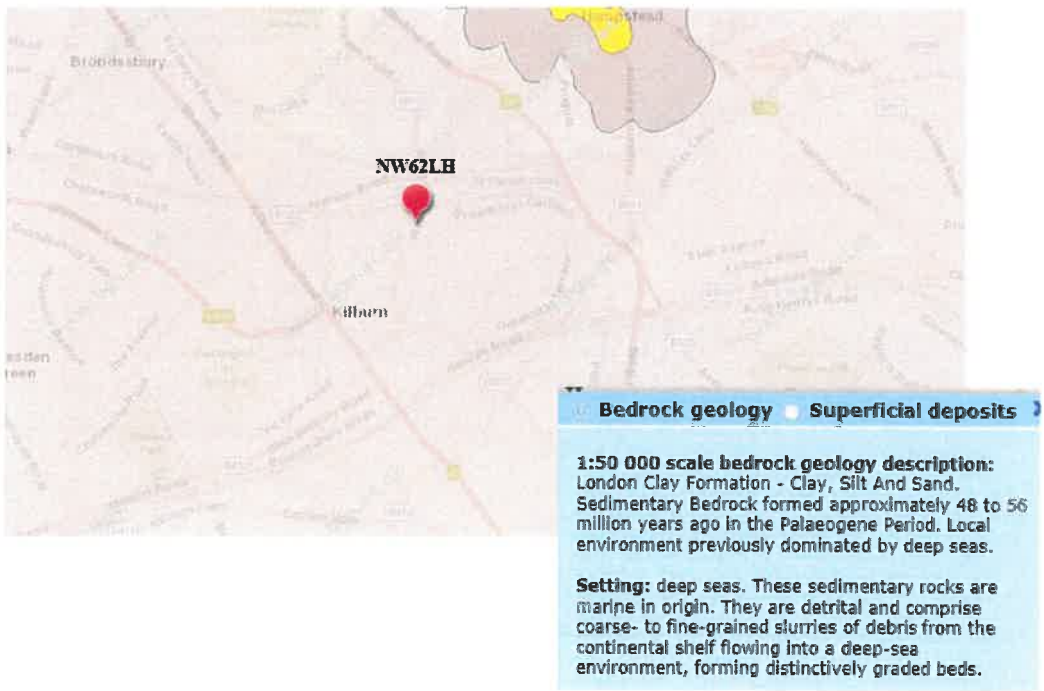


Site Location (No Watercourse)

- Camden Surface Water Features (LB Camden GHHS figure 12)

Site Location (No surface water features noted)

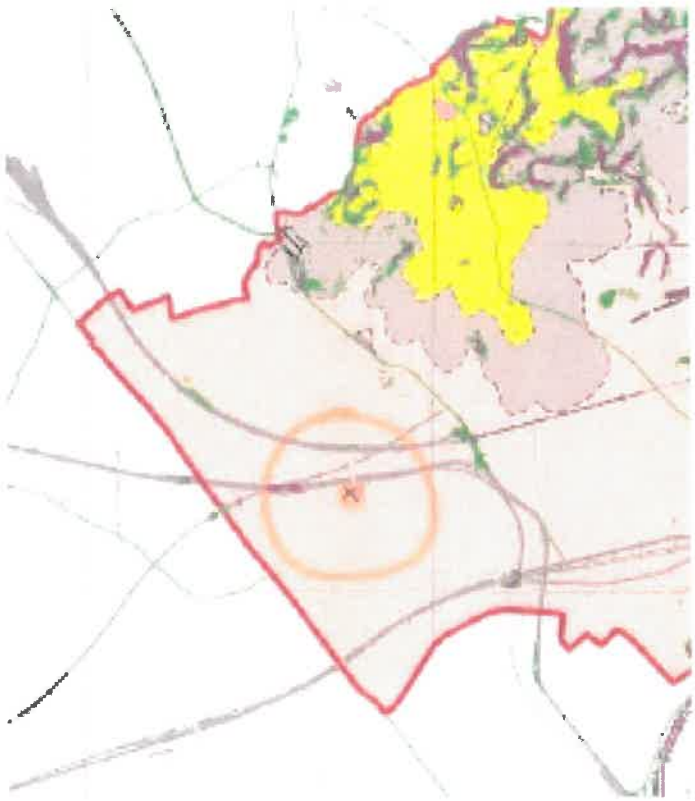
- Geological Map Extract, BGS (Geology of Britain Viewer)



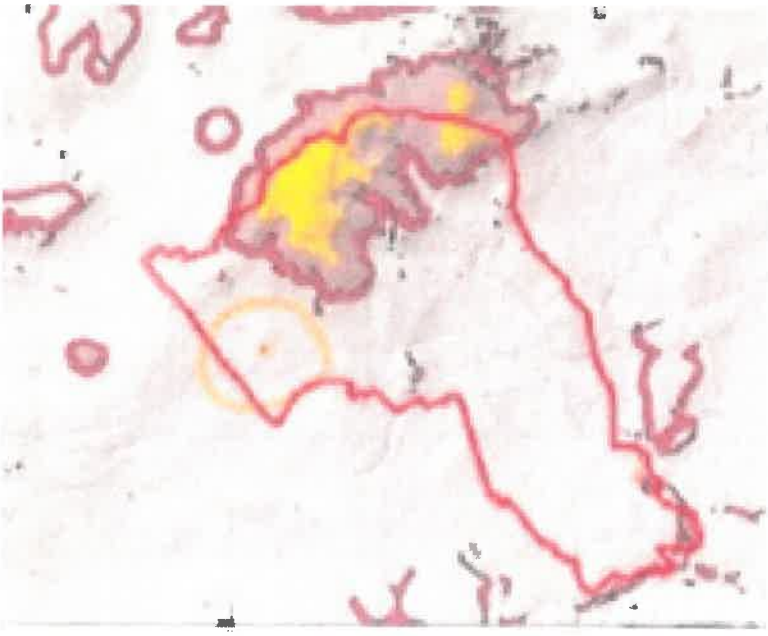
- Flooded Streets Map (LB Camden GHHS Figure 15)

The highlighted streets are known to have flooded in 1975 and 2002 in West End Lane but it is understood that remedial actions described in `Flood in Camden` has reduced the risk of re-occurrence.

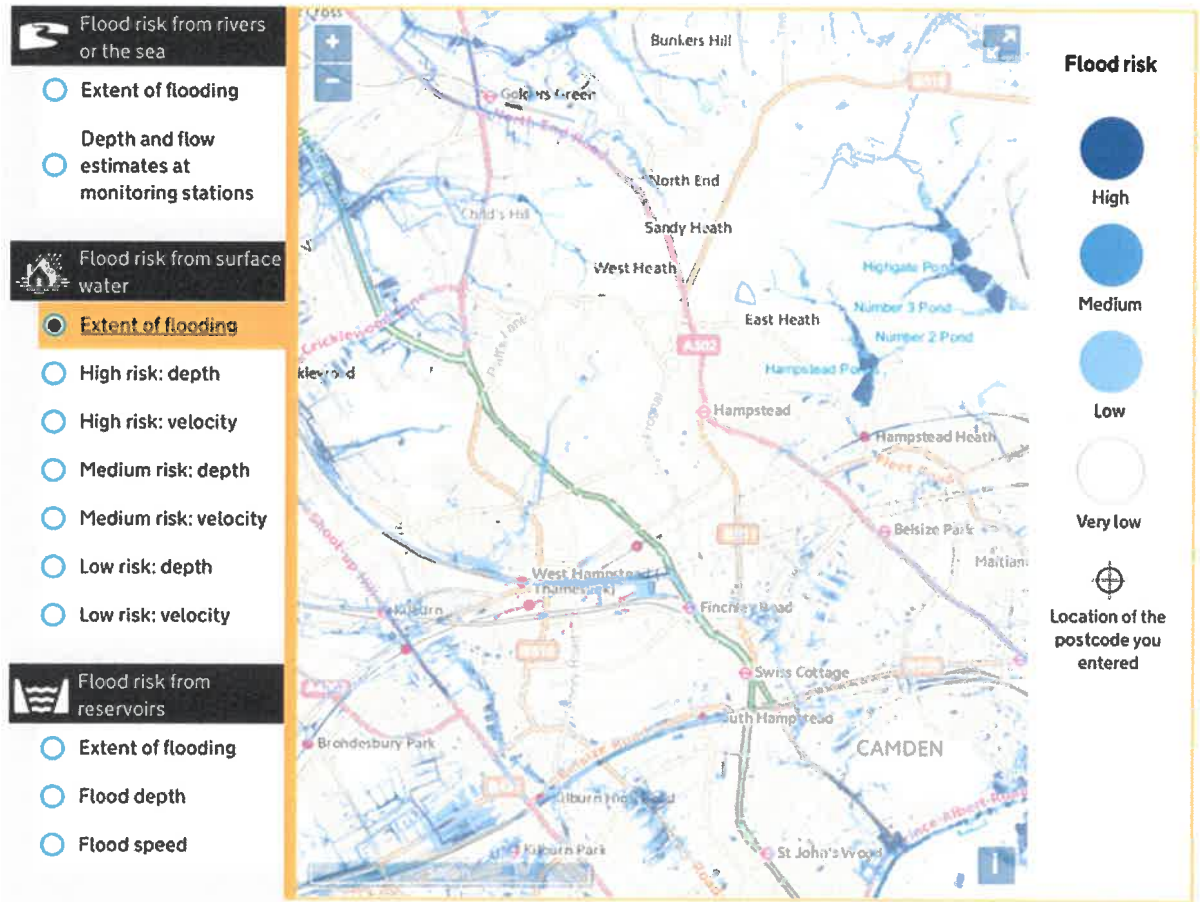
- Slope Angle and Worked Ground Map (LB Camden GHHS figure 16)



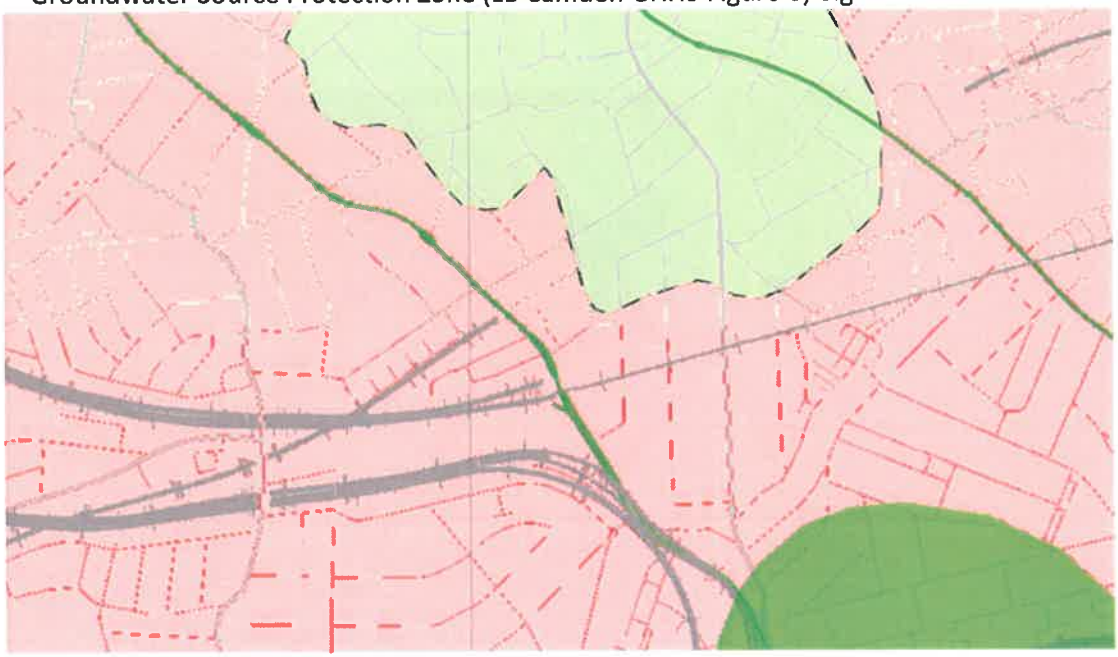
- Areas of landslide potential (LB Camden GHHS figure 17)



- Flood Risk Map, Environment Agency (Surface Water Flood Risk)

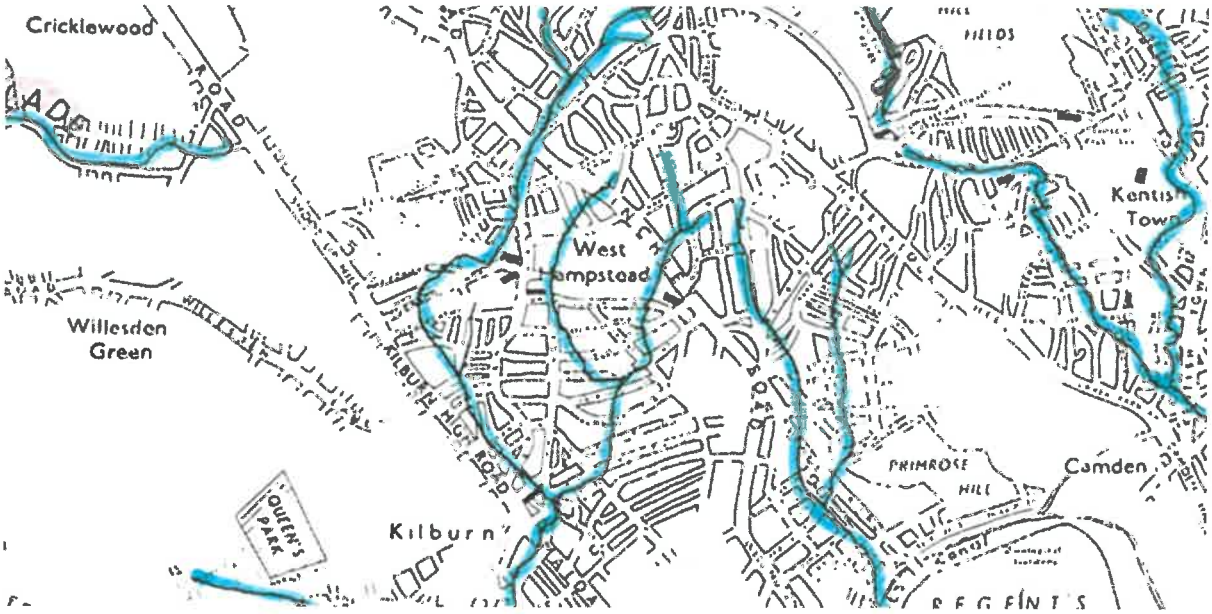


- Groundwater Source Protection Zone (LB Camden GHHS Figure 8) e.g

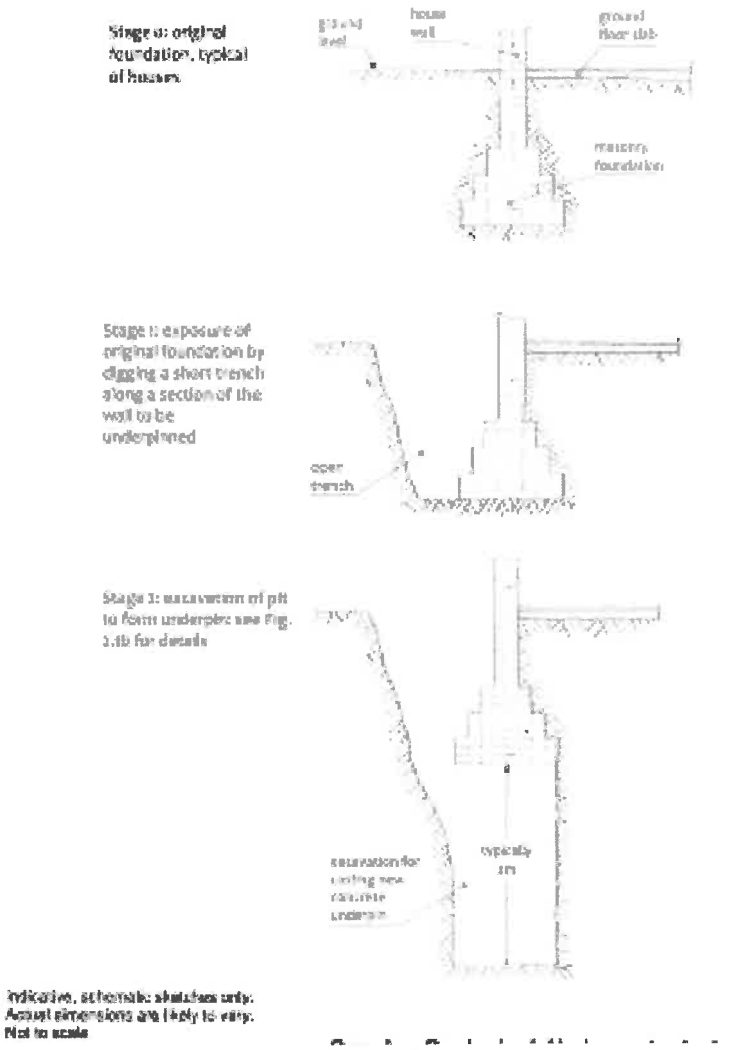


- Transport Infrastructure (LB Camden GHHS Figure 18)

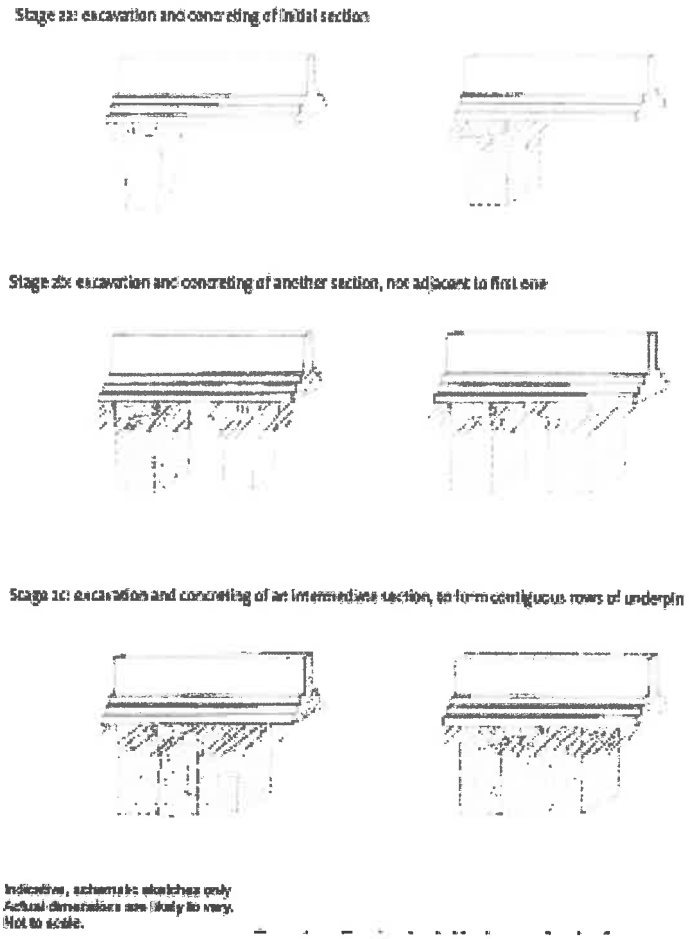
- Historical Water Courses (LB Camden GHHS Figure 11)



- Typical underpinning construction sequence (LB Camden GHHS Figure 19)



- Underpinning construction sequence with `hit and miss` pattern (LB Camden GHHS Figure 20)



Appendix 2: Site Investigation Data

Extract taken from KHPL Desk Study-

3. SITE INVESTIGATION

3.1 Investigations

5No hand dug pits were excavated to expose the existing foundation details around the footprint of the basement and lightwell.

Beneath foundation formation level, a proportion of the holes were extended to greater depth by hand augering to confirm the underlying strata.

Laboratory testing has been carried out to classify the soil in terms of its index properties and potential effects on buried concrete. The results are attached in Appendix C.

3.2 Ground Conditions

Below the floor slab, which is typically not much more than 100-150mm thickness, there is generally a mixed fill consisting of clayey brick and stone which extends down to the base of the foundations at around 0.45m to 0.80m below existing slab level. Below this, the ground conditions are typically firm to stiff brown London CLAY.

Groundwater was encountered only as perched water on top of the London Clay in TP1 Section A-A and in TP5. The other holes were dry.

3.3 Existing Foundations

Basement

Trial Pit TP1 in the north east corner of the existing basement confirmed a 2 brick corbel at 0.30m below existing basement slab level. In Section B-B under the West End Lane frontage, the corbel was founded on a 150mm layer of compacted brick fill over a 50mm layer of dry-packed crushed stone/lean mix concrete. In Section A-A, below the boundary with 171 West Lane, there was a 400mm thick layer of dry-packed gravel of brick and stone. Groundwater was struck in Trial Pit TP1 Section A-A but not in TP1 Section B-B. It is concluded that the water is perched within the gravel footing.

TP2 is on the southern side of the basement and encountered a 3 brick corbel resting on a 120mm concrete strip/pad foundation, placed on a 200mm layer of brick fill. No groundwater was encountered.

TP4 is located in the north west corner of the basement, at the foot of the stairs from ground floor. TP4 encountered a 300mm wide brick footing at basement floor level which extended to a depth of 0.27m below floor level and was founded on a 180mm thick layer of lime cemented brick fill. No groundwater was encountered.

In all cases, *insitu* firm to stiff or stiff brown London Clay was encountered at the base of the compacted brick fill foundations.

Lightwell

Trial Pits TP3 and TP5 were excavated within the existing lightwell vaults.

TP3 was similar to TP1 and TP2 and consisted of a 3-brick corbel founded on a 400mm thick layer of lime cemented brick fill. A small amount of seepage occurred at the top of the London Clay and settled as 20mm of perched water on top of the *insitu* London Clay.

TP5 consisted of a single brick corbel resting on a 130mm thick layer of lime cemented brick fill. The clay in TP5 was more damp than in the other four trial pits and we suggest that this is (a) because there was an overhead pipe dripping persistently and (b) because the manhole within the lightwell connects to the mains sewers around this location.

3.4 Foundations & Retaining Walls

It is considered that the most appropriate foundation solution for the basement will be to underpin the existing walls so that that they are founded in the stiff London Clay at sufficient depth to accommodate the replacement ground floor slab.

It is suggested that hit-and-miss underpinning methods will be effective. It is possible that a limited amount of perched water may be encountered locally, but it should be feasible to dewater any underpins which encounter perched water by sump pumping. The groundworker undertaking the excavation and underpinning works should not commence any excavations until the necessary equipment is provided on site.

It is not anticipated that significant heave will be encountered but we advise that heave pressures should be calculated pro rata based on 10KN/m2 per metre of depth excavated and we recommend that a proprietary heave mitigation layer is provided underneath the floor slab.

The works should therefore be programmed to ensure that the basement floor slab is constructed without delay following excavation.

Ground gas is not identified as a significant issue at this site and we advise that tanking designed in accordance with BS8102 should provide sufficient mitigation against any residual ground gas risk.

The following parameters are considered appropriate for the design of any retaining walls to be incorporated in the scheme:

Parameter	London Clay
ϕ'	21.5^0
C'	1.0 KN/m^2
γ'	18.5 KN/m^2

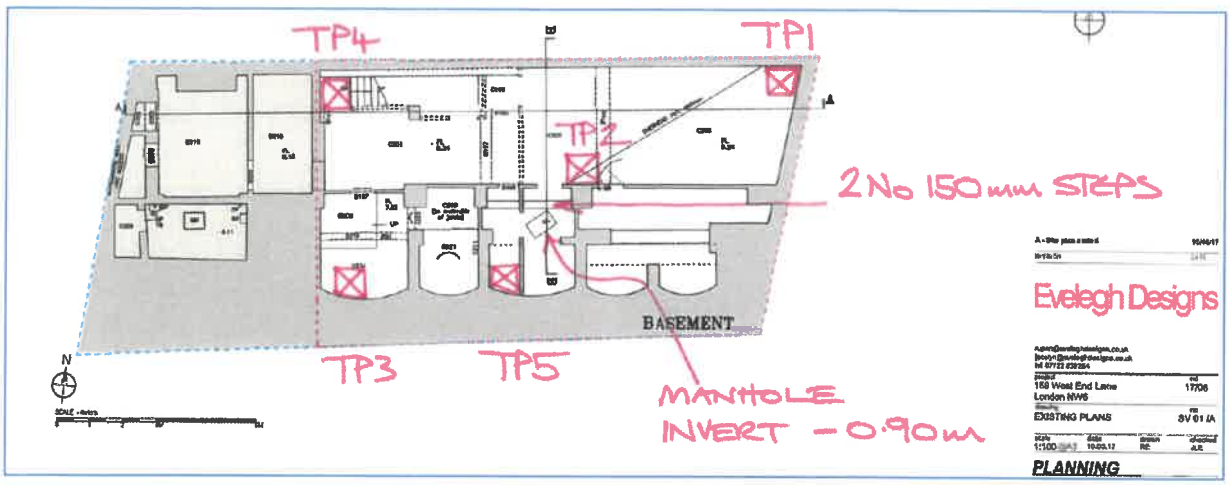
Chemical Attack on Buried Concrete

Laboratory testing of soils has determined the following criteria for buried concrete in contact with the soils and localised perched groundwater at this site.

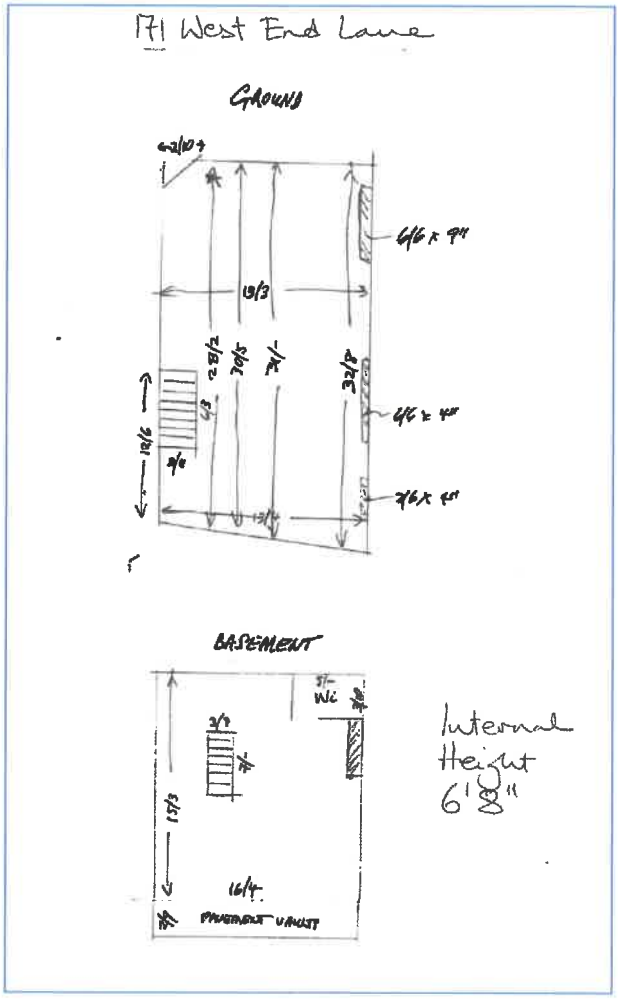
Design Sulphate Class: DS3

ACEC Classification: AC3

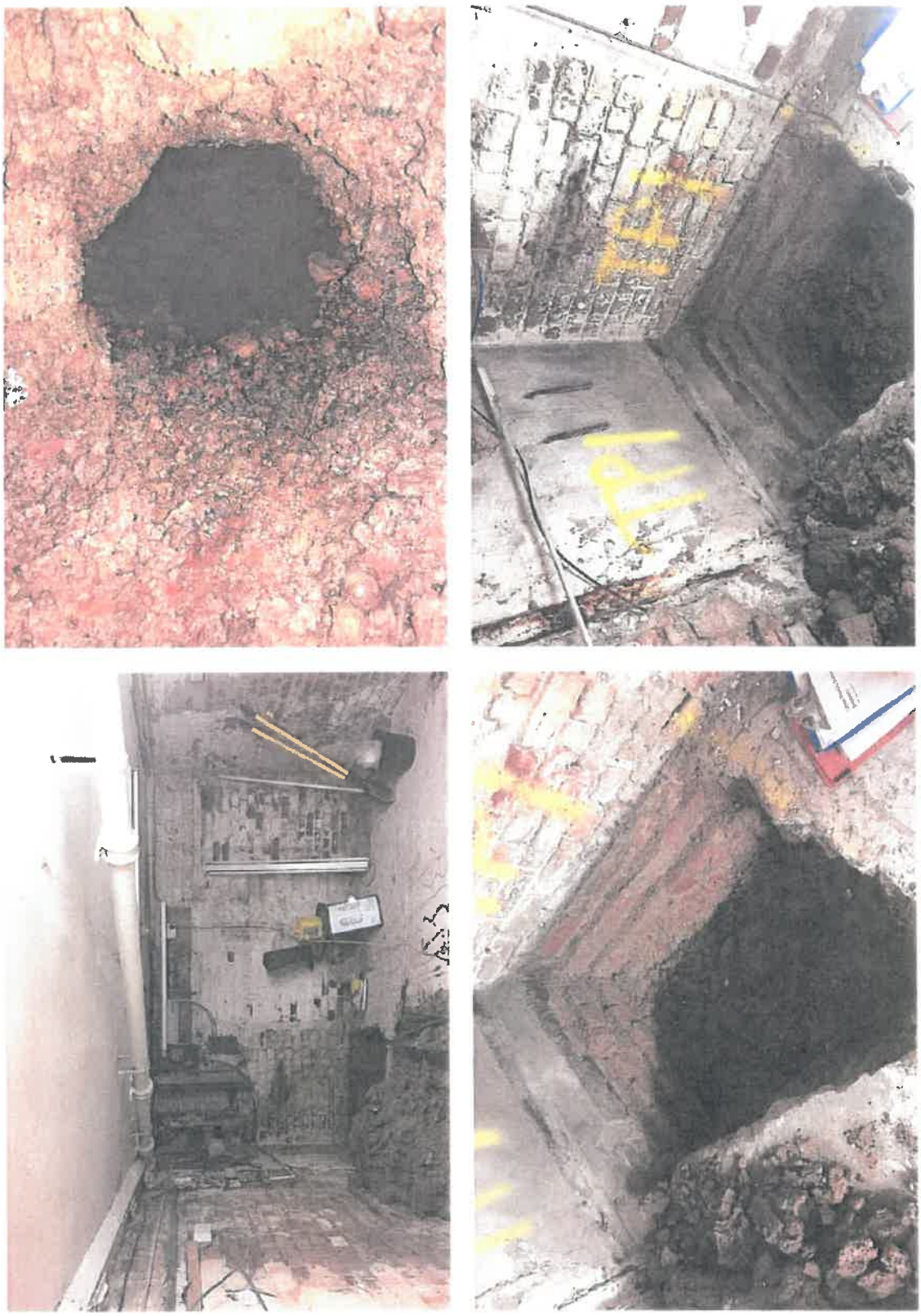
Groundwater should be considered as mobile across the site.



2.1 169 West End Lane Trial pit Location Plan.

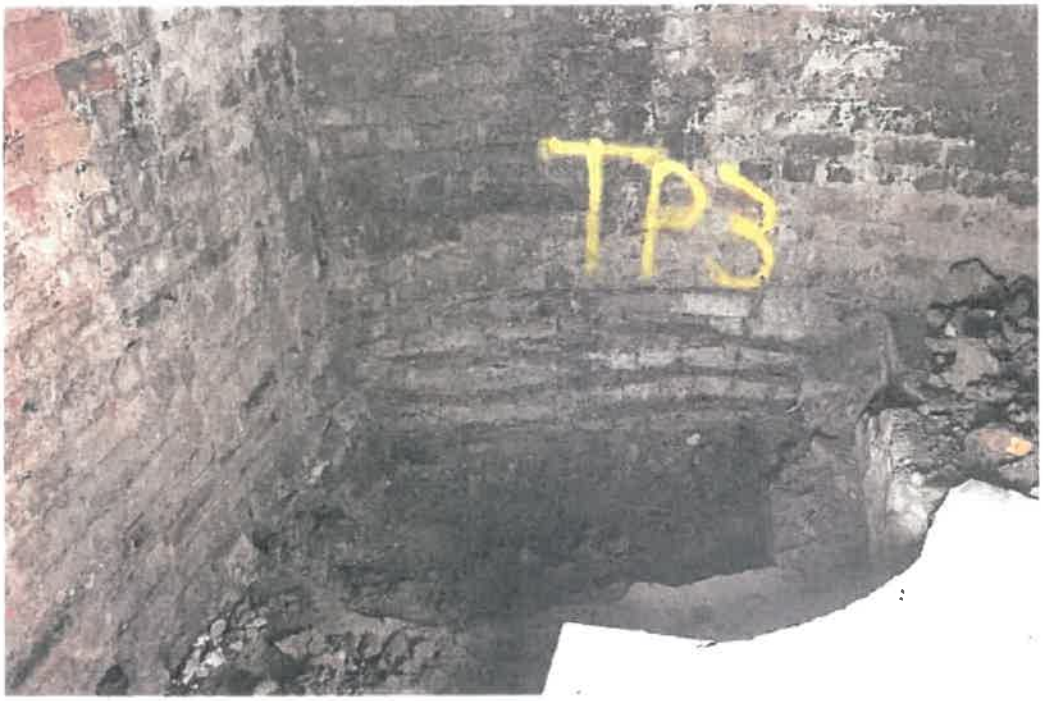


2.2 Sketches of 171 West End Lane.



169 West End Lane – Trial Pit 1 (TP1)

169 West End Lane – Trial Pit 1 (TP1)



169 West End Lane – Trial Pit 3 (TP3)

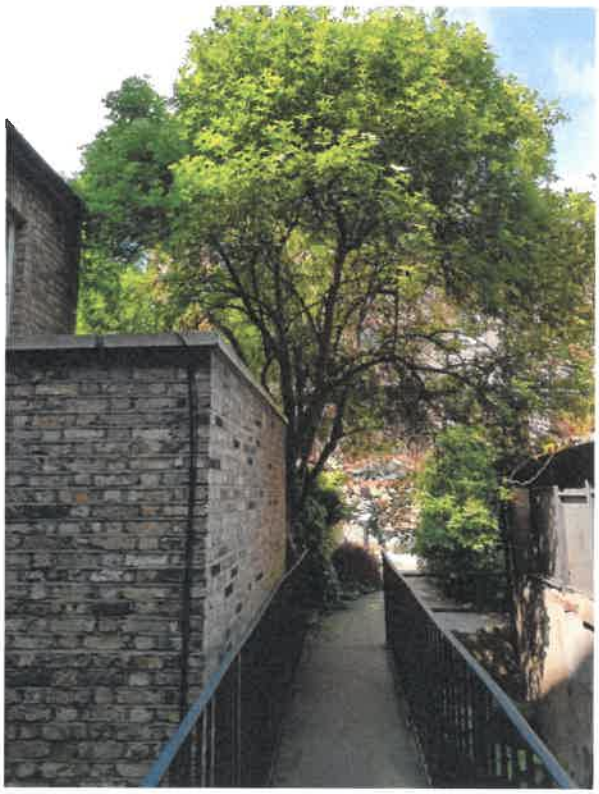
169 West End Lane – Trial Pit 4 (TP4)

169 West End Lane- Services mounted on existing basement ceiling.

169 West End Lane – Trial Pit 5 (TP5)

171 West End Lane- Existing basement & General Views.

Rear yard of 169 West End Lane



Trees noted adjacent to 169 West End Lane.

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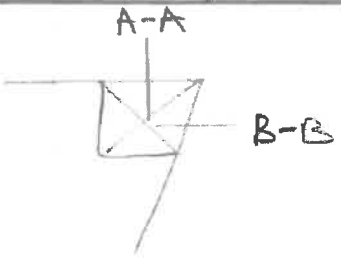
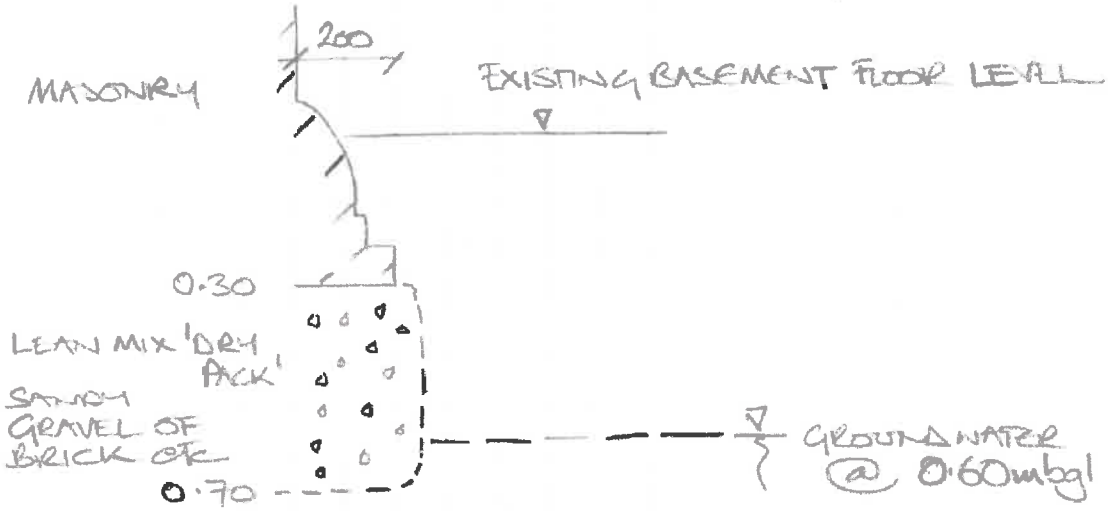
Project: 169 WEST END LANE, NW6		Job Ref: 35409	Page No.
Designed by:	Date:	Checked by:	Date: APR 18

TRIAL PIT TP1 ~ PLAN

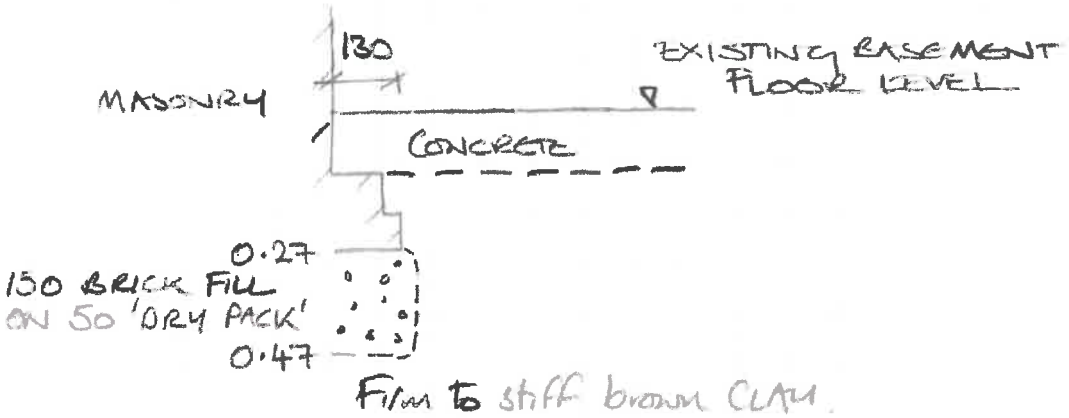


SECTION A-A



Firm to stiff brown CLAY

SECTION B-B



Firm to stiff brown CLAY

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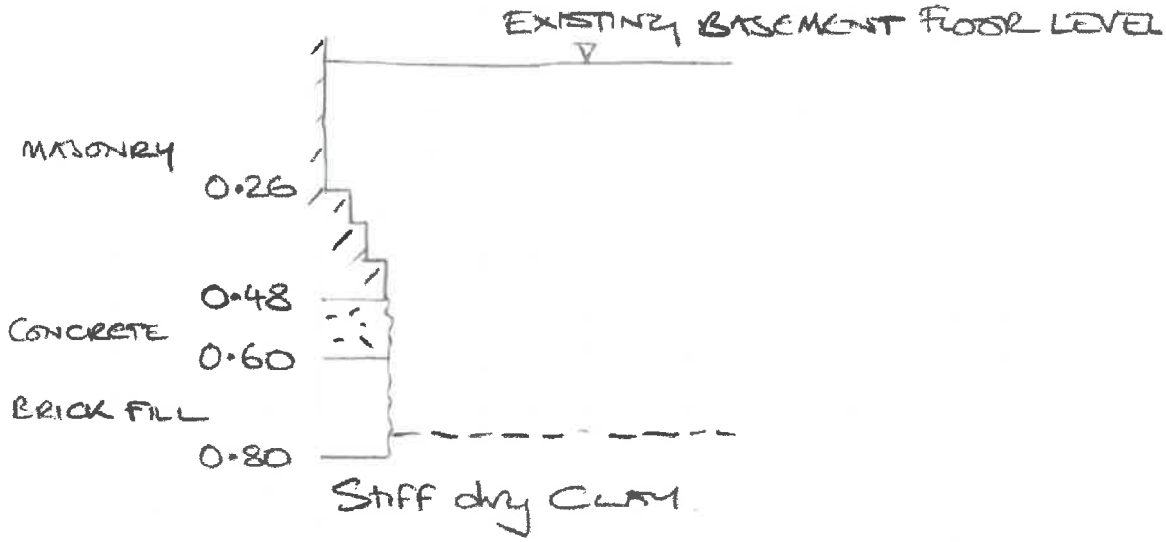
Designed by:	Date:	Checked by:		Date: APR'18

TRIAL PIT TP2.



Camden

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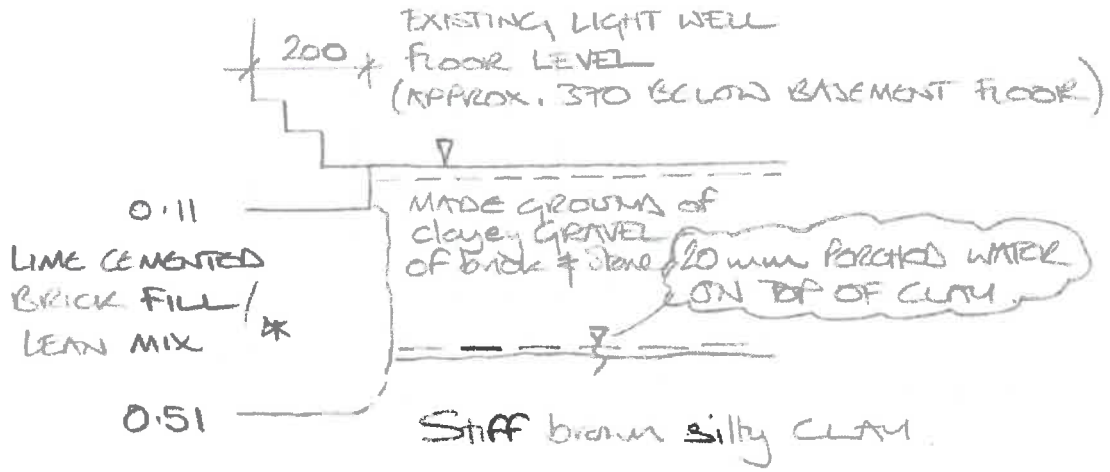
Designed by:	Date:	Checked by:		Date: APR'18

TRIAL PIT TP3



* LOCALLY WITH CONCRETE OF IRREGULAR EXTENT & DEPTH

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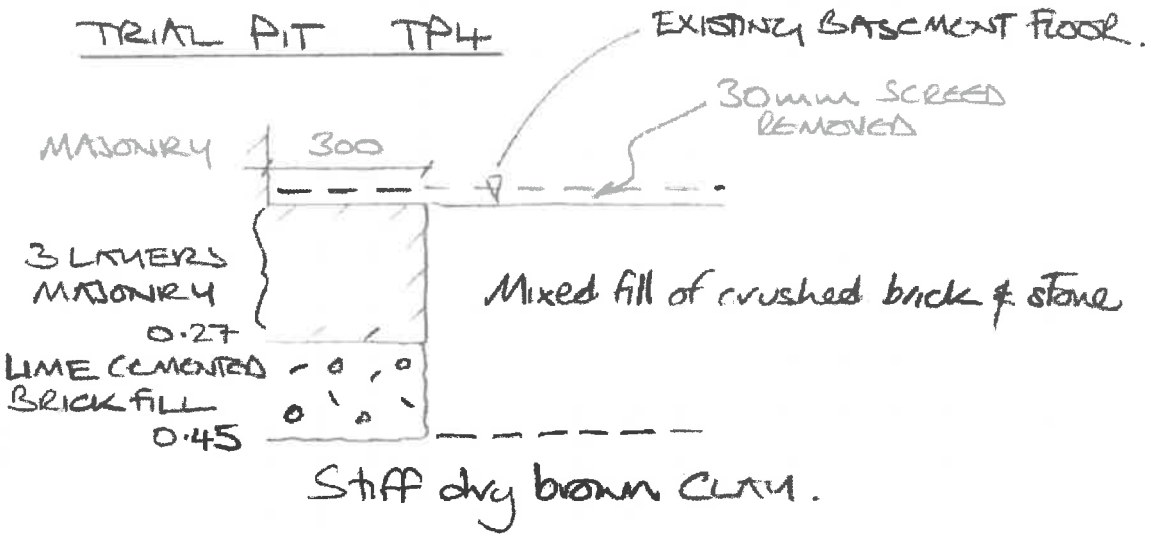
Designed by:	Date:	Checked by:	Date: APR'18



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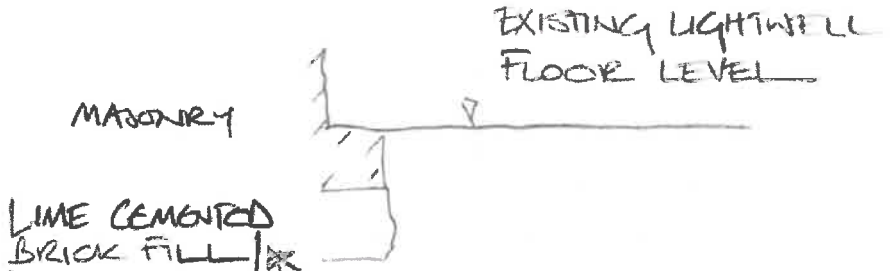
TRIAL PIT TP5



Soft to firm damp CLAY
Becomes stiff at 0.7m.

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ME8 6PL

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T +44 (0) 1634 234332 / 717974

Client:	Knapp Hicks and Partners	**Report No:**	1073/02/MC1
Address:	Prospect House 1 Highpoint Business Village Henwood, Ashford Kent TN24 8DH	**Your Ref:**	35409G
		Report Date:	25/05/2018
Client Contact:	Mr Richard Moore		
Site:	West End Lane		

Test Requested: Determination of Moisture Content, Liquid, Plastic Limits & Plasticity Index
Test Method: BS 1377-2: 1990, Test Nos. 3.2; 4.4 (1 point LL); 5.3; & 5.4

Sample Details:

Sampled and submitted by:	Client
Date Sampled:	19/04/2018
Date Received:	20/04/2018
Date Tested:	24/04/2018

TEST RESULTS:

Laboratory Reference	Client Reference		MC (%)	L.L. (%)	P.L (%)	P.I (%)	% Retained on 425µm sieve	Condition of Test	Sample Type
	BH/WS/TP	Ref.							
1073/02/01	TP1 @ 0.65m	N/A	33	70	24	46	0	Natural	D
1073/02/03	TP1 @ 0.75m	N/A	33	-	-	-	-	-	D
1073/02/04	TP1 @ 0.85m	N/A	31	-	-	-	-	-	D
1073/02/05	TP1 @ 0.90m	N/A	31	-	-	-	-	-	D
1073/02/06	TP1 @ 1.00-1.25m	N/A	31	71	25	46	0	Natural	D
1073/02/07	TP1 @ 1.50-1.55m	N/A	29	-	-	-	-	-	D

Visual Descriptions:

Laboratory Reference	Client Reference	Description
1073/02/01	TP1 @ 0.65m	Brown mottled grey CLAY with selenite crystals
1073/02/03	TP1 @ 0.75m	Brown mottled grey CLAY with selenite crystals
1073/02/04	TP1 @ 0.85m	Brown CLAY
1073/02/05	TP1 @ 0.90m	Brown mottled grey CLAY with selenite crystals
1073/02/06	TP1 @ 1.00-1.25m	Brown mottled grey CLAY with selenite crystals
1073/02/07	TP1 @ 1.50-1.55m	Brown CLAY with selenite crystals

Note: All samples received for this job shall be disposed of after 28 days of this report.

.....END OF TEST REPORT.....

Signed: _____ Kwaku Baah - Laboratory Manager

For and on behalf of PBA Laboratories

Director Mr P Baxter CEng MICE Registered Address Beaufort House, Rochester, Kent ME2 4FB Company Registration 3028997

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A subsidiary of Peter Baxter Associates
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ME8 6PL

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Client:	Knapp Hicks and Partners	**Report No:**	1073/02/MC2
Address:	Prospect House 1 Highpoint Business Village Henwood, Ashford Kent TN24 8DH	**Your Ref:**	35409G
		Report Date:	25/05/2018
Client Contact:	Mr Richard Moore		
Site:	West End Lane		

Test Requested: **Determination of Moisture Content, Liquid, Plastic Limits & Plasticity Index**
Test Method: BS 1377-2: 1990, Test Nos. 3.2; 4.4 (1 point LL); 5.3; & 5.4

Sample Details:

Sampled and submitted by:	Client
Date Sampled:	19/04/2018
Date Received:	20/04/2018
Date Tested:	24/04/2018

TEST RESULTS:

Laboratory Reference	Client Reference		MC (%)	L.L (%)	P.L (%)	P.I (%)	% Retained on 425µm sieve	Condition of Test	Sample Type
	BH/WS/TP	Ref.							
1073/02/08	TP3 @ 0.50-0.80m	N/A	33	-	-	-	-	-	D
1073/02/09	TP4 @ 0.45-0.60m	N/A	31	-	-	-	-	-	D
1073/02/10	TP4 @ 0.60-0.80m	N/A	30	-	-	-	-	-	D
1073/02/11	TP4 @ 1.15m	N/A	29	-	-	-	-	-	D
1073/02/12	TP4 @ 1.25-1.55m	N/A	29	-	-	-	-	-	D

Visual Descriptions:

Laboratory Reference	Client Reference	Description
1073/02/08	TP3 @ 0.50-0.80m	Brown mottled grey CLAY with selenite crystals
1073/02/09	TP4 @ 0.45-0.60m	Brown mottled grey CLAY with selenite crystals
1073/02/10	TP4 @ 0.60-0.80m	Brown mottled grey CLAY with selenite crystals
1073/02/11	TP4 @ 1.15m	Brown mottled grey CLAY with selenite crystals
1073/02/12	TP4 @ 1.25-1.55m	Brown mottled grey CLAY with selenite crystals

Note: All samples received for this job shall be disposed of after 28 days of this report.

.....END OF TEST REPORT.....

Signed: _____ Kwaku Baah - Laboratory Manager

For and on behalf of PBA Laboratories

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Client: Knapp Hicks and Partners

Address: Prospect House
1 Highpoint Business Village
Henwood, Ashford
Kent
TN24 8DH

Report No: 1073/02/CH1
Your Ref: 35409G
Report Date: 25/05/2018

Client Contact: Mr Richard Moore
Site: West End Lane

Test Requested: Determination of pH Value and Sulphate Content
Test Method: BS 1377-3: 1990, Clauses 5.5 & 9.5

Sample Details:
Sampled and submitted by: Client
Date Sampled: 19/04/2018
Date Received: 20/04/2018
Date Tested: 25/04/2018

TEST RESULTS:

Laboratory Reference	Client Reference		Soil Sulphates as SO_4		Water Sulphates as SO4	pH	CLASS*	Dry Mass Passing 2mm test sieve	Description
	BH/WS	Sample Ref	Total (%)	Water Soluble (g/L)	(g/L)			(%)	
1073/02/01	TP1 @ 0.65m	N/A	-	2.1	-	8.7	DS-3	100	Brown mottled grey CLAY with selenite crystals
1073/02/02	TP1 @ 0.70m	N/A	-	0.0	-	8.2	DS-1	N/A	Water

* Classification based on Tables C1 & C2: BRE Special Digest 1:2005

.....END OF TEST REPORT.....

Signed: Kwaku Baah - Laboratory Manager

For and on behalf of PBA Laboratories

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Client: Knapp Hicks and Partners

Address: Prospect House
1 Highpoint Business Village
Henwood, Ashford
Kent
TN24 8DH

Client Contact: Mr Richard Moore
Site: West End Lane

Report No: 1073/02/CH2
Your Ref: 95409G
Report Date: 25/05/2018

Test Requested: Determination of pH Value and Sulphate Content
Test Method: BS 1377-3: 1990, Clauses 5.5 & 9.5

Sample Details:

Sampled and submitted by:	Client
Date Sampled:	19/04/2018
Date Received:	20/04/2018
Date Tested:	25/04/2018

TEST RESULTS:

Laboratory Reference	Client Reference		Soil Sulphates as SO_4		Water Sulphates as SO4	pH	CLASS*	Dry Mass Passing 2mm test sieve	Description
	BH/WS	Sample Ref	Total (%)	Water Soluble (g/L)	(g/L)			(%)	
1073/02/09	TP4 @ 0.45-0.60m	N/A	-	1.9	-	6.8	DS-3	100	Brown mottled grey CLAY with selenite crystals
1073/02/11	TP4 @ 1.15m	N/A	-	2.5	-	6.8	DS-3	100	Brown mottled grey CLAY with selenite crystals

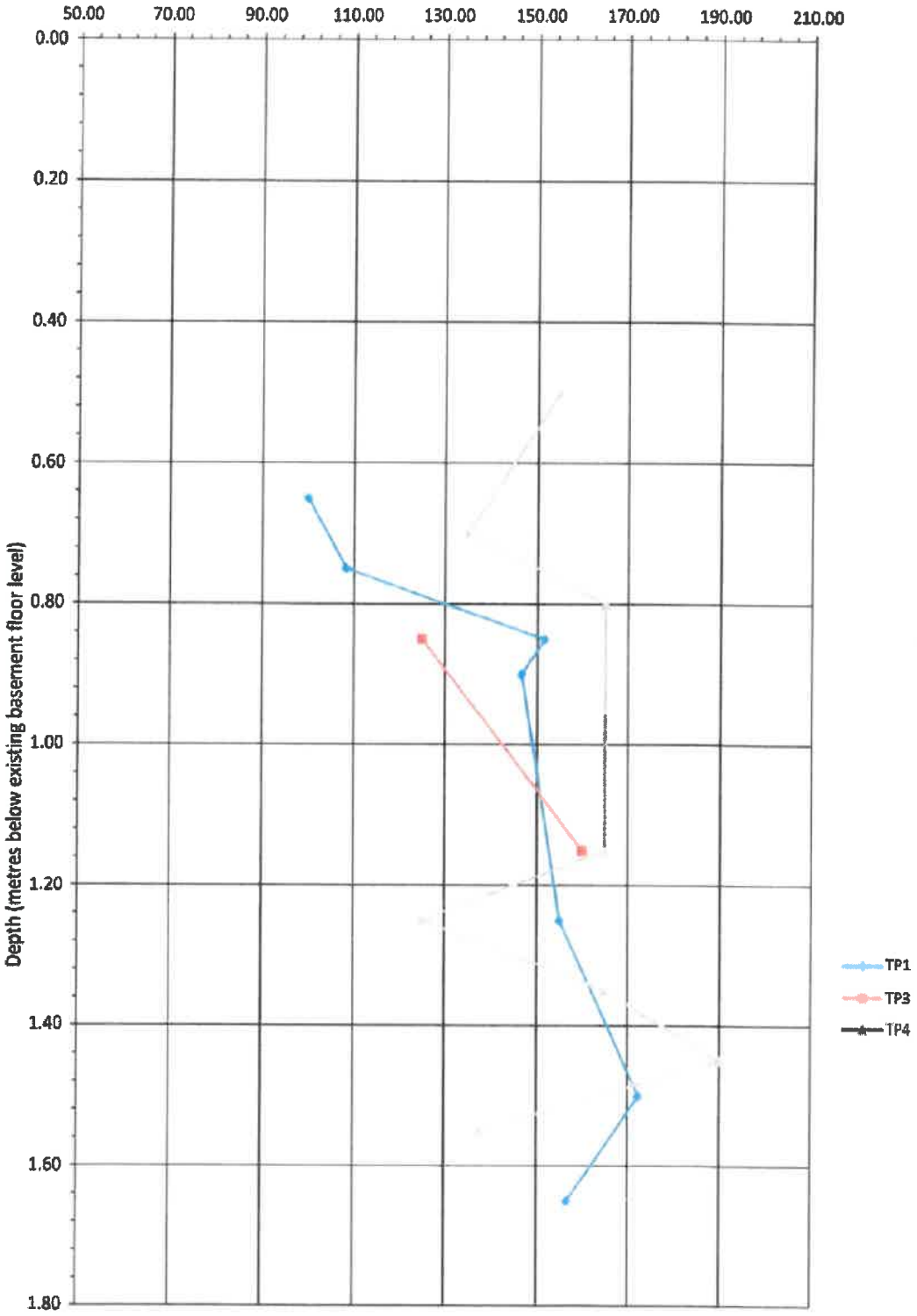
* Classification based on Tables C1 & C2: BRE Special Digest 1:2005

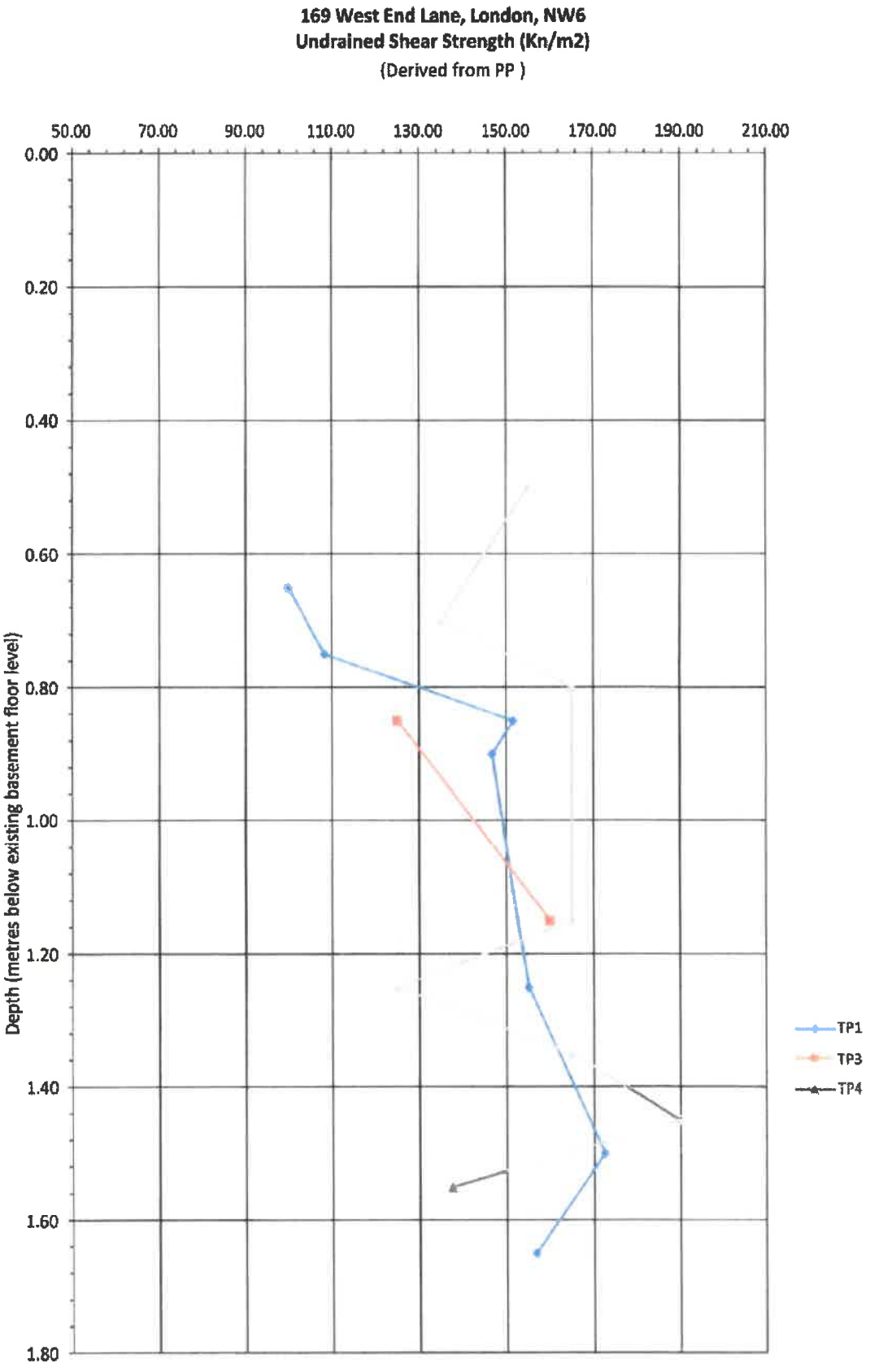
.....END OF TEST REPORT.....

Signed: Kwaku Baah - Laboratory Manager

For and on behalf of PBA Laboratories

169 West End Lane, London, NW6
Undrained Shear Strength (Kn/m2)
(Derived from PP)




169 West End Lane, London, NW6
Undrained Shear Strength (Kn/m2)
(Derived from PP)
50.00
70.00
90.00
110.00
130.00
150.00
170.00
190.00
210.00
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
Depth (metres below existing basement floor level)
TP1
TP3
TP4

Appendix 3: Existing and Proposed Development Drawings

Lower Ground Floor Ground Floor

Eveleigh Designs
PLANNING
SOUTH ELEVATION (SECTION E-E')

Eveleigh Designs


SITE PLAN


Evetech Designs


GROUND FLOOR


BASEMENT

Eveleigh Designs
PLANNING
SECTION B-B
SECTION A-A
SECTION D-D
SECTION C-C

Appendix 4: Ground Movement and Damage Impact Assessment

NOT REQUIRED- REFER TO SCREENING IN SECTION 4

Appendix 5: Structural Engineer's Statement and Calculations

NOT REQUIRED- REFER TO SCREENING IN SECTION 4

Appendix 6: Arboricultural Report/Other Reports (as required)

NOT REQUIRED- REFER TO SCREENING IN SECTION 4

Appendix 7: Utility and Infrastructure Consultations

Asset location search

Property Searches

Knapp Hicks & Partners Ltd
Unit 1 Highpoint Business Vil

ASHFORD
TN24 8DH

Search address supplied	WEST END LANE 169 West End Lane London NW6 2LH
Your reference	35409G
Our reference	ALS/ALS Standard/2018_3789044
Search date	6 May 2018

Keeping you up-to-date

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

searches@thameswater.co.uk
www.thameswaterpropertysearches.co.uk

0845 070 9148

Asset location search

Property Searches

Search address supplied: WEST END LANE, 169, West End Lane, London, NW6 2LH

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

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

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

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

Clean Water Services

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

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

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

Asset location search

Property Searches

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.

Asset location search

Property Searches

Further contacts:

Waste Water queries

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

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

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

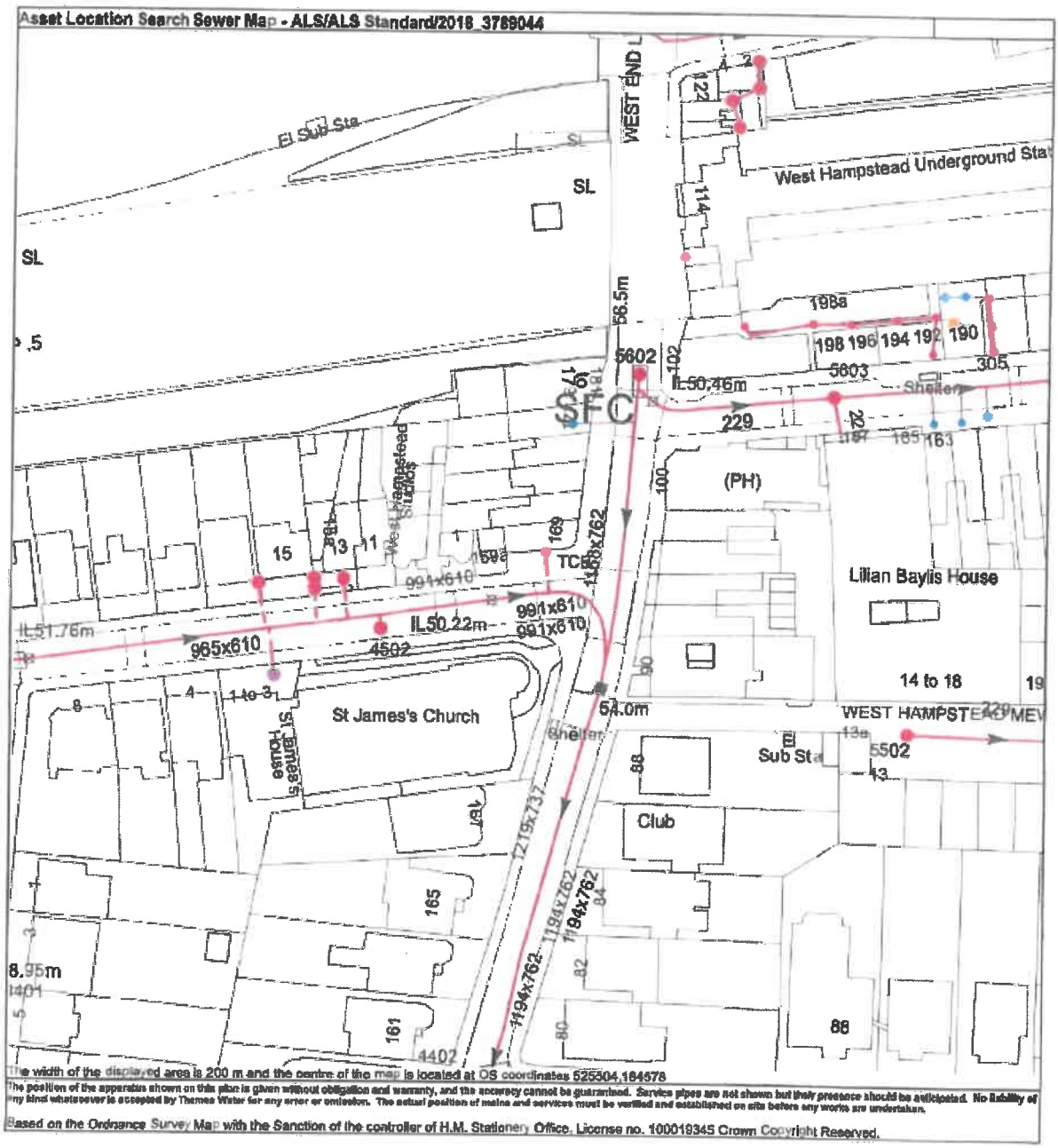
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

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

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

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


Asset Location Search Sewer Map - ALS/ALS Standard/2018_3789044
WEST END L
El Sub Sta
SL
West Hampstead Underground Sta
56.5m
198a
198 196 194 192 190
305
5602
5603
IL 50.46m
Shelter
229
(PH)
Lilian Bayliss House
14 to 18
WEST HAMPSTEAD
5502
El Sub Sta
Club
St James's Church
St James's House
IL 51.76m
965x610
IL 50.22m
4502
991x610
991x610
991x610
1188x762
TCB
54.0m
1215x737
1194x762
1194x762
1194x762
8.95m
4401
4402
165
161
88
The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 525504,184578
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 with the Sanction of the controller of H.M. Stationery Office. License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
561G	n/a	n/a
561F	n/a	n/a
561E	n/a	n/a
56CD	n/a	n/a
56CC	n/a	n/a
56CI	n/a	n/a
56CB	n/a	n/a
561A	n/a	n/a
561B	n/a	n/a
56BG	n/a	n/a
56BE	n/a	n/a
56BF	n/a	n/a
56BH	n/a	n/a
4504	n/a	n/a
451A	n/a	n/a
4505	n/a	n/a
4507	n/a	n/a
4506	n/a	n/a
4502	n/a	n/a
551A	n/a	n/a
561C	n/a	n/a
5602	55.69	49.55
561D	n/a	n/a
56DC	n/a	n/a
56DB	n/a	n/a
5603	53.54	49.43
56DA	n/a	n/a
56CJ	n/a	n/a
5502	52.33	50.48
56DD	n/a	n/a

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

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Trunk Surface Water
- Trunk Foul
- Storm Relief
- Trunk Combined
- Vent Pipe
- Bio-solids (Sludge)
- Proposed Thames Surface Water Sewer
- Proposed Thames Water Foul Sewer
- Gulley
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Sludge Rising Main
- Proposed Thames Water Rising Main
- Vacuum

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
- Dam Chase
- Fitting
- Meter
- Vent Column

Operational Controls

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

- Control Valve
- Drop Pipe
- Ancillary
- 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.

- Outfall
- Undefined End
- Inlet

Other Symbols

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

- Public/Private Pumping Station
- Change of characteristic indicator (C.O.C.I.)
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Operational Site
- Chamber
- Tunnel
- Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

- Foul Sewer
- Surface Water Sewer
- Combined Sewer
- Gulley
- Culverted Watercourse
- Proposed
- Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'nd' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. 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 present on the plan, please contact a member of Property Insight on 0845 070 9148.

Thames Water Utilities Ltd, Property Searches, PO Box 3189, Slough SL1 4W. DX 151280 Slough 13
T 0845 070 9148 E searches@thameswater.co.uk I www.thameswater-propertysearches.co.uk

Camden

Thames Water Utilities Ltd, Property Searches, PO Box 3189, Slough SL1 4W, DX 151280 Slough 13
T 0845 070 9148 E searches@thameswater.co.uk I www.thameswaterpropertysearches.co.uk

ALS Water Map 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")	1150mm (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

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

- **Other Water Company Water:** 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 Water:** 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.

Thames Water Utilities Ltd, Property Searches, PO Box 3189, Slough SL1 4WY. DX 151280 Slough 13
T 0845 070 9148 E searches@thameswater.co.uk I www.thameswater.co.uk/propertysearches

Camden

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 **0845 070 9148** 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**

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which 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 practise 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 compensation of up to £5,000 to you if he finds that you have suffered actual loss 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