Basement Impact Assessment

in connection with proposed development at

No. 3a Camden Road
Camden
London
NW1 9LG

for

Kentish Town Spaces (UK) Ltd

LBH4571 Ver. 1.4

February 2020

LBH WEMBLEY

ENGINEERING

Document Control

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Executive Summary

It is proposed to construct a single level of basement beneath the entire footprint of an existing retail premises at No. 3a Camden Road.

This report provides an assessment of the potential impacts that the basement development may have upon the surrounding area, neighbouring structures and the local environment.

Geology

The proposed basement will extend into the London Clay

Hydrogeological Impacts

There is no shallow groundwater table at this site and hence no scope for the basement to cause adverse hydrogeological impacts to be caused by the proposed basement construction.

Hydrological Impacts

There will be no change to the flood risk at the site or neighbouring sites.

A SuDS scheme is to be included as part of the development.

Stability Impacts

Ground movement assessments have been undertaken to demonstrate the acceptability of the proposed construction methodology upon the neighbouring structures, resulting in a prediction of Burland Category 1 “Very Slight” damage.

Conclusion

The assessment concludes that no adverse residual or cumulative stability, hydrological or hydrogeological impacts are expected to either neighbouring structures or the wider environment as a result of this development.

Contents

Foreword-Guidance Notes

GENERAL

This report has been prepared for a specific client and to meet a specific brief. The preparation of this report may have been affected by limitations of scope, resources or time scale required by the client. Should any part of this report be relied on by a third party, that party does so wholly at its own risk and LBH WEMBLEY disclaims any liability to such parties.

The observations and conclusions described in this report are based solely upon the agreed scope of work. LBH WEMBLEY has not performed any observations, investigations, studies or testing not specifically set out in the agreed scope of work and cannot accept any liability for the existence of any condition, the discovery of which would require performance of services beyond the agreed scope of work.

VALIDITY

Any use of or reliance upon the report in circumstances other than those for which it was commissioned shall be at the client's sole risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should therefore not be relied upon in such altered circumstances.

THIRD PARTY INFORMATION

The report may present an opinion based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

1. Introduction

1.1 Background

It is proposed to construct a basement beneath the entire footprint of the existing property at No. 3a Camden Road.

A planning application (2019/2894/P) has been submitted to the London Borough of Camden (LBC) in October 2019.

1.2 Brief

LBH WEMBLEY have been appointed by Kentish Town Spaces (UK) Ltd to complete a Basement Impact Assessment (BIA) in support of a forthcoming planning application to be submitted to the London Borough of Camden, in order to satisfy the specific requirements of the 2018 Camden Policy Guidance (CPG) on Basements, and associated 2010 Camden Geological, Hydrogeological and Hydrological Study.

1.3 Planning Policy

The 2017 Camden Local Plan Policy A5 Basements reads as follows:

"The Council will only permit basement development where it is demonstrated to its satisfaction that the proposal would not cause harm to:

a) neighbouring properties;
b) the structural, ground, or water conditions of the area;
c) the character and amenity of the area;
d) the architectural character of the building; and
e) the significance of heritage assets.
In determining proposals for basements and other underground development, the Council will require an assessment of the scheme's impact on drainage, flooding, groundwater conditions and structural stability in the form of a Basement Impact Assessment and where appropriate, a Basement Construction Plan.

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:

f) not comprise of more than one storey;
g) not be built under an existing basement;
h) not exceed 50% of each garden within the property;
i) be less than 1.5 times the footprint of the host building in area;
j) extend into the garden no further than 50% of the depth of the host building measured from the principal rear elevation;
k) not extend into or underneath the garden further than 50% of the depth of the garden;
l) be set back from neighbouring property boundaries where it extends beyond the footprint of the host building; and
m) avoid the loss of garden space or trees of townscape or amenity value.

Exceptions to f. to k. above may be made on large comprehensively planned sites.

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

n. do not harm neighbouring properties, including requiring the provision of a Basement Impact Assessment which shows that the scheme poses a risk of damage to neighbouring properties no higher than Burland Scale 1 'very slight';
o. avoid adversely affecting drainage and run-off or causing other damage to the water environment;
p. avoid cumulative impacts;
q. do not harm the amenity of neighbours;
r. provide satisfactory landscaping, including adequate soil depth;
s. do not harm the appearance or setting of the property or the established character of the surrounding area;
t. protect important archaeological remains; and
u. do not prejudice the ability of the garden to support trees where they are part of the character of the area.

The Council will not permit basement schemes which include habitable rooms and other sensitive uses in areas prone to flooding.

We will generally require a Construction Management Plan for basement developments.

Given the complex nature of basement development, the Council encourages developers to offer security for expenses for basement development to adjoining neighbours."

The following policies in the Local Plan are also relevant to basement development and will be taken into account when assessing basement schemes:

- "Policy A2 Open space";
- "Policy A3 Biodiversity";
- "Policy D1 Design";
- "Policy D2 Heritage"; and
- "Policy CC3 Water and flooding".

In addition to the Local Plan Policy, Camden publishes Camden Planning Guidance on Basements and Lightwells. These CPG documents do not carry the same weight as the main Camden Development Plan documents (including the above Policy A5) but they are important supporting documents.

1.4 Report Structure

This report commences with a desk study and characterisation of the site, before progressing to BIA screening and scoping assessments, whereby consideration is given to identifying the potential hydrogeological, hydrological and stability impacts to be associated with the proposed development.

A ground model is then developed based on site specific intrusive investigation, which is followed by an outline construction methodology and an assessment of the potential ground movements affecting the neighbouring structures.

Finally, an assessment of the potential impacts of the proposed scheme is presented.

1.5 Documents Consulted

The following documents have been consulted during the preparation of this document:

- Records of Ground Investigation by Fastrack, dated August 2019, Ref: 13358
- Proposed Constuction Programme by Ambigram Architects, see Appendix
- Party Wall Details by Gledsdale Associates, dated July 2019, Ref. 3640/651 Rev. P2
- Proposed Ground Floor Drawing by Ambigram Architects, dated April 2019, Ref. aa-1703 P101
- Proposed Basement Drawing by Ambigram Architects, dated April 2019, Ref. aa-1703 P100
- Proposed Section BB by Ambigram Architects, dated April 2019, Ref. aa-1703 P302
- Proposed Section AA by Ambigram Architects, dated April 2019, Ref. aa-1703 P301
- Outline SuDS Strategy by LBH WEMBLEY ENGINEERING, dated March 2019, ref: LBH4571suds v1.0
- Topographical Survey by Nigel Pavey Surveys, dated January 2019, Ref. 2082.01.001

2. The Site

2.1 Site Location

The site is situated on the northwestern side of Camden Road, approximately 50m to the northeast of Camden Town underground station.

The site may be located approximately by postcode NW1 9LG or by National Grid Reference 528950, 183940.

Location Plan

2.2 Topographical Setting

The site lies on a very gentle southeastwards falling slope on the west bank of the now culverted River Fleet, which runs approximately 200m from the site.

2.3 Site Description

The site is occupied by a late 19th Century three storey terraced building with ground floor level set at approximately +26.4m OD. A single storey extension is present to the rear; beneath which is an access manhole to a combined sewer.

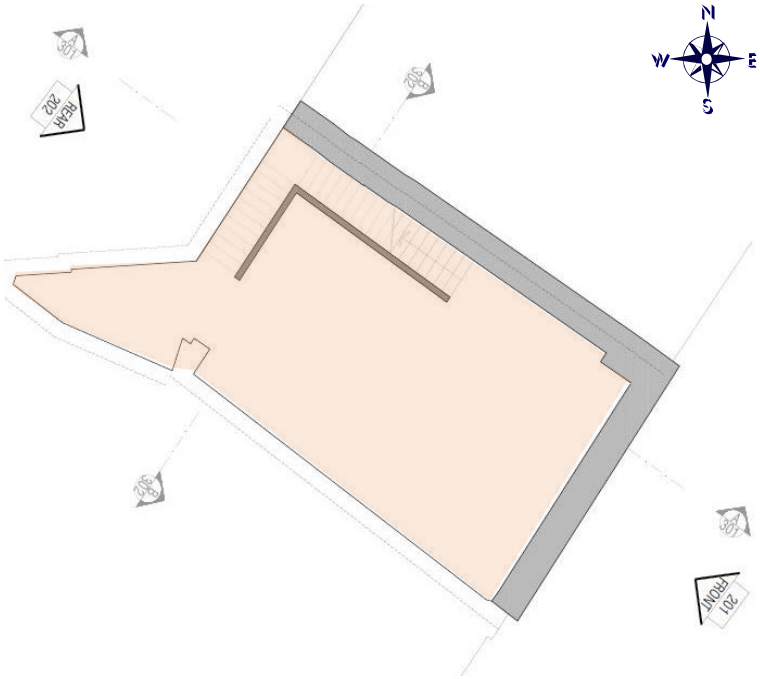
The building is adjoined to the southwest by a similarly constructed three storey building located at No. 3 Camden Road; which includes an approximately 4m deep basement shared with No. 1a Camden Road. To the rear of Nos 1a – 3 Camden Road lies No. 6 Kentish Town Road, which is understood to include a cellar to approximately 2.5m depth.

To the northeast the building adjoins a similarly constructed three storey terraced property at No. 5 Camden Road, albeit this building does not appear to include a basement..

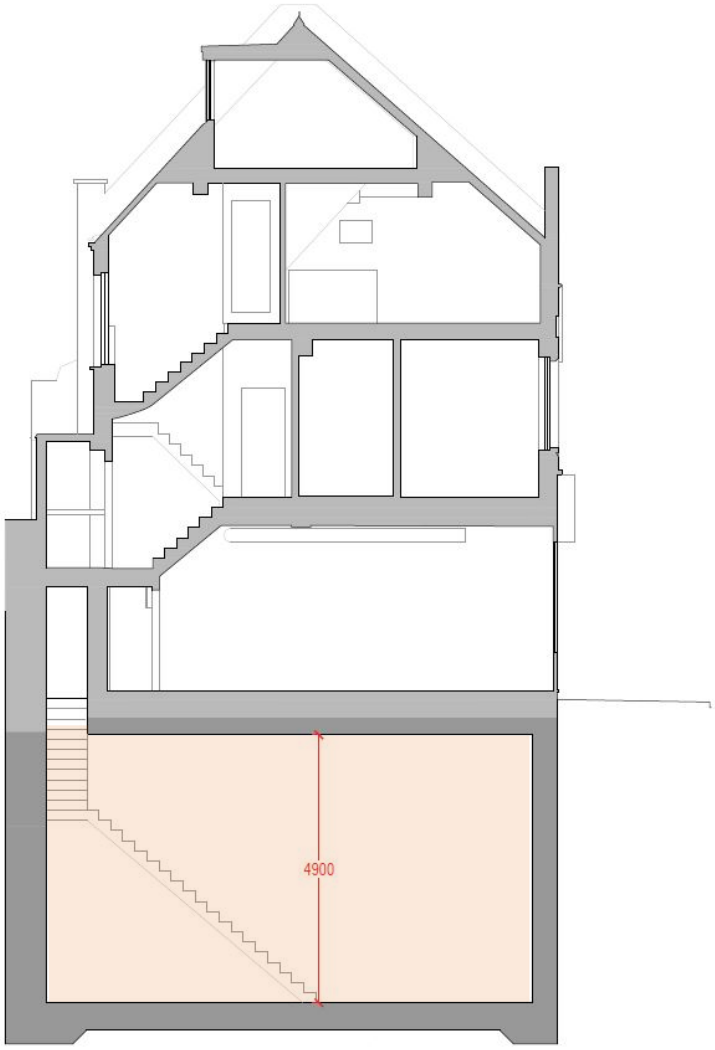
To the rear the site backs onto No. 8 Kentish Town Road, a three storey terraced building with a mansard roof. A recent redevelopment of this property included an excavation of an approximately 4m deep basement (Set at approx. +22m OD) beneath the entire building footprint.

2.4 Proposed Development

It is proposed to construct a basement with beneath the entire footprint of the building. The proposed basement excavation will extend to approximately 5.5m depth beneath the ground floor level (Approx. +20.5m OD) in order to provide an internal headroom of 4.9m.



Proposed Basement Plan



Section showing proposed basement (tinted orange)

3. Desk Study

3.1 Site History

Earlier buildings on and adjacent to the site were demolished at the end of the 19th century and replaced by the existing row of terraced buildings. No. 3a Camden Road is a three storey building that was occupied by a café/restaurant at ground level, with residential flats above. A single storey rear extension is now occupied by the kitchen.

The site has remained relatively unchanged since the early 1900s; however, in recent years, the neighbouring No. 3 Camden Road underwent redevelopment to provide residential accommodation on the upper floors. A basement was also excavated beneath the entire building footprint.

Basements have also recently been excavated beneath No. 8 and Nos. 10-12 Kentish Town Road, adjoining the site to the rear.

3.2 Geological Information

The British Geological Survey (BGS) records indicate that the site is underlain by the London Clay Formation.

3.3 Hydrogeological Information

The London Clay Formation may be considered virtually impermeable; hence no significant groundwater flow is expected to occur beneath the site.

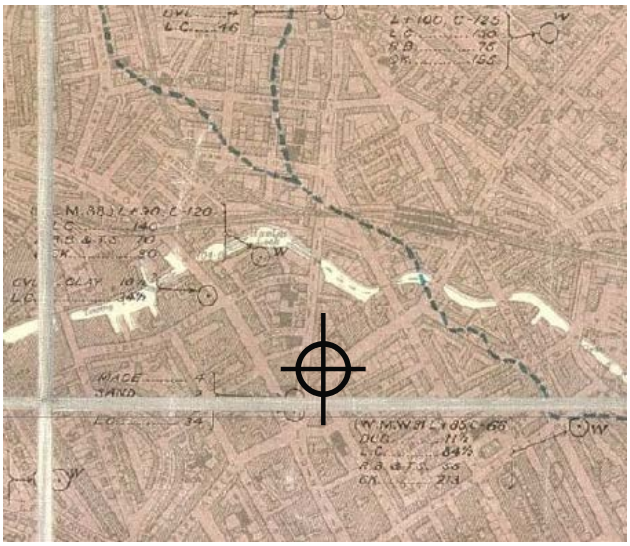
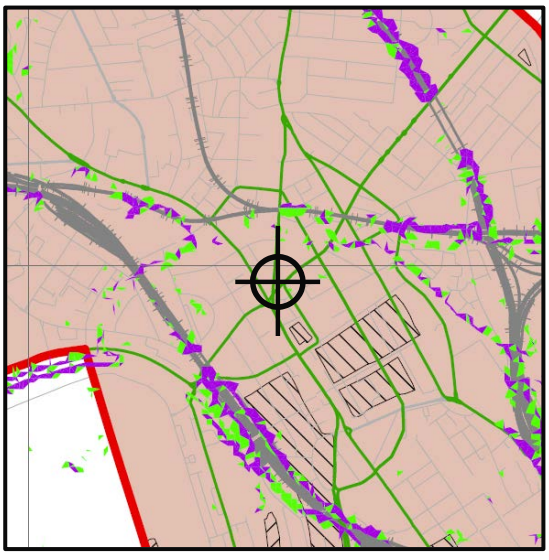


Figure 2: Camden 1920 Geological Map (CGHHS, 2010) (dashed blue line shows the River Fleet)

Extract from Figure 3 of the CGHHS showing that the site is not underlain by worked ground



Extract from Figure 16 of the CGHHS showing no slope angles in excess of 7° are present on site

3.4 Hydrological, Drainage and Flood Risk Information

Figure 2 of the CGHHS indicates that the River Fleet passes approximately 200m to the northeast of the site. There are no surface water features in the vicinity of the site.

Environment Agency (EA) surface water flood maps indicate that the site itself is at a very low risk, although Camden Road is at a low risk of surface water flooding.

Figure 6 of the Camden SFRA indicates that the site lies within a Critical Drainage Area (Group 3 003).

The existing building occupies the entirety of the site.

4. Screening & Scoping Assessments

The Screening & Scoping Assessments have been undertaken with reference to Appendices E and F of the CGHSS, which is a process for determining whether or not a BIA is usually required.

4.1 Screening Assessment

The Screening Assessment consists of a series of checklists that identifies any matters of concern relating to the following:

- Subterranean (groundwater) flow
- Surface flow and flooding
- Slope stability

4.1.1 Screening Checklist for Subterranean (Groundwater) Flow

Question	Response	Justification
Is the site is located directly above an aquifer?	**No**	The Environment Agency (EA) maps indicate that the site is not underlain by an aquifer.
Will the proposed basement extend beneath the water table surface?	**No**	
Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	**No**	The nearest watercourse is the culverted River Fleet, approximately 200m to the northeast of the site.
Is the site within the catchment of the pond chains on Hampstead Heath?	**No**	See CGHHS Fig.14.
Will the proposed development result in a change in the area of hard-surfaced/paved areas?	**No**	Both the existing site and proposed development are entirely hard surfaced.
Will more surface water (e.g. rainfall and run-off) than at present will be discharged to the ground (e.g. via soakaways and/or SUDS)?	**No**	All surface water falling within the development will be attenuated and discharged to the Thames Water combined sewer.
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?	**No**	See CGHHS Fig.12.

4.1.2 Screening Checklist for Surface Flow and Flooding

Question	Response	Justification
Is the site within the catchment area of the pond chains on Hampstead Heath?	**No**	See CGHHS Fig.14.
As part of the site drainage, will surface water flows (e.g. rainfall and run-off) be materially changed from the existing route?	**No**	The existing drainage arrangement will be maintained.
Will the proposed basement development result in a change in the proportion of hard-surfaced/paved areas?	**No**	Both the existing site and proposed development are entirely hard surfaced.
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**	The existing drainage arrangement will be maintained.
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	**No**	The existing drainage arrangement will be maintained.
Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding for example because the proposed basement is below the static water level of a nearby surface water feature?	**No**	Although Camden Road is indicated to be at a low risk of surface water flooding, the site itself is indicated to be at a very low risk.

4.1.3 Screening Checklist for Stability

Question	Response	Justification
Does the existing site include slopes, natural or manmade, greater than 7 degrees?	**No**	There are no slopes greater than 7 degrees within the site.
Does the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees?	**No**	No re-profiling is planned at the site.
Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees?	**No**	There are no slopes greater than 7 degrees within the development land.

Is the site within a wider hillside setting in which the general slope is greater than 7 degrees?	**No**	Figure 6 of the CGHHS indicates that the general slope of the wider hillside is less than 7 degrees.
Is London Clay the shallowest strata at the site?	**Yes**	The site is underlain by London Clay.
Will trees be felled as part of the proposed development and/or are works proposed within tree protection zones where trees are to be retained?	**No**	There are no trees on the site.
Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	**No**	
Is the site within 100m of a watercourse of a potential spring line?	**No**	The nearest watercourse is the culverted River Fleet, roughly 200m to the northeast of the site.
Is the site within an area of previously worked ground?	**No**	The British Geological Survey (BGS) records do not indicate that the site lies within an area of previously worked ground.
Is the site within an aquifer?	**No**	The Environment Agency (EA) maps indicate that the site is not underlain by an aquifer.
Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	**No**	
Is the site within 50m of the Hampstead Heath ponds?	**No**	See CGHHS Fig.14.
Is the site within 5m of a highway or pedestrian right of way?	**Yes**	The proposed basement adjoins the pedestrian right of way on Camden Road.
Will the proposed basement significantly increase the differential depth of foundations relative to the neighbouring properties?	**Yes**	The proposed basement will increase the differential depth to foundations to Nos. 1a – 3 and No. 5 Camden Road.
Is the site over (or within the exclusion zone of) tunnels, e.g. railway lines?	**No**	The site is approx. 25m away from the LUL Northern Line tunnels which run beneath Kentish Town Road.

4.2 Scoping Assessment

Where the checklist is answered with a “yes” or “unknown” to any of the questions posed in the flowcharts, these matters are carried forward to the scoping stage of the BIA process. 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.

The scoping produces a statement which defines further the matters of concern identified in the screening stage. This defining should be in terms of ground processes, in order that a site specific BIA can be designed and executed (Section 6.3 of the CGHHS).

4.2.1 Scoping for Stability

- **Is the London Clay the shallowest strata at the site?**

The guidance advises that of the soil strata present in LB Camden, the London Clay is the most prone to seasonal shrink-swell (subsidence and heave).

- **Is the site within 5m of a highway or pedestrian right of way?**

The guidance advises that excavation for a basement may result in damage to the road, pathway or any underground services buried in trenches beneath the road or pathway.

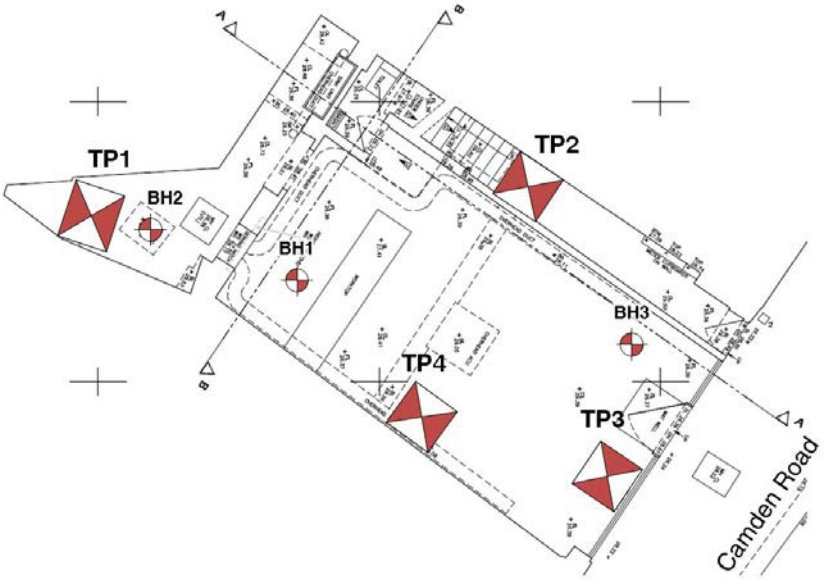
- **Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?**

The guidance advises that excavation for a basement may result in structural damage to neighbouring properties if there is a significant differential depth between adjacent foundations.

5. Site Investigation

An intrusive ground investigation, comprising three window sample boreholes and four hand excavated trial pits was undertaken in June 2019.

The site plan above indicates the approximate locations of the exploratory positions, while the associated exploratory logs are appended.



5.1 Ground Conditions

The ground investigation found the London Clay Formation to be present at shallow depth and to consist of typical firm, becoming stiff, pale brown silty clay.

5.2 Groundwater

No shallow groundwater table is present beneath the site.

6. Basement Construction

6.1 Excavation

The basement excavation will extend down into the London Clay Formation.

The basement perimeter walls will be formed by conventional underpinning and the construction of L-shaped reinforced concrete segments excavated and cast in-situ in a 'hit and miss' sequence of 1m wide sections.

The party wall with No. 5 Camden Road and the front wall of the property are founded on shallow strip foundations extending to approximately 1.5m depth below the existing ground floor level; hence approximately 4.5m of underpinning will be required. Two stages of underpinning will therefore be necessary.

Nos. 1a – 3 Camden Road is understood to include a basement; however, given the depth of the proposed basement at No. 3a, a single stage of underpinning of no more than 2m is envisaged.

Similarly, No. 8 Kentish Town Road is already underpinned to approximately 4m depth; hence a single stage of underpinning will be required. This would be best undertaken following the first stage of underpinning of the front wall and the party wall with No. 5 Camden Road in order to provide availability for lateral propping.

During the works, propping will be installed to ensure that lateral ground movements are minimised. As a precursor to the main basement excavation, it is envisaged full width propping will be provided at ground floor level to restrain the newly underpinned walls during the main basement excavation.

As the main basement excavation proceeds, additional temporary propping will be installed at lower levels where necessary to ensure that lateral ground movements are prevented. Where two stages of underpinning will be necessary, horizontal propping must be provided at the base of the first stage of underpinning.

In the permanent situation the reinforced concrete underpins will connect to the basement slab to form a rigid concrete box to support the vertical structural loading of the overlying building. Both the basement raft slab and the ground floor slab will act as props.

6.1.1 Waterproofing

There is potential for water to collect around the basement in the long term. Hence, the basement is to be fully waterproofed and designed to withstand hydrostatic pressures in accordance with BS8102:2009, Code of Practice for the Protection of Below-Ground Structures against Water from the Ground. An assumed hydrostatic level at 1m depth is to be adopted for the purposes of assessing hydrostatic pressures.

6.1.2 Basement Heave

Given the depth of excavation, it is evident that the self-weight of the new structure will not match the weight of soil removed and that there may as a result be some potential for residual net uplift.

An assessment of the likely extent of any long term uplift is made in Section 7 of this report.

6.2 Underpinning

Underpinning sections will be excavated in short widths not exceeding 1000mm.

The sequence of the underpinning will be in an extended 1, 3, 5, 2, 4 & 6 type numbering sequence, such that any given underpin will be completed, dry packed, and a minimum period of 48 hours lapsed before and adjacent excavation is commenced to form another underpin.

Each pin excavation will be undertaken only under the direct supervision of a suitably experienced and competent person. In the event that the vertical soil face to an underpin is judged to be potentially unstable, face support and lateral propping will be provided by perforated plywood sheeting supported by timber walings held by adjustable steel trench “acrow” props.

6.3 Retaining Walls

The following parameters may be considered in the design of the retaining walls:-

Stratum	**Bulk Unit Weight**	**Effective Cohesion**	**Effective Friction Angle**
	(kN/m^3)	(c' - kN/m^2)	(ϕ'- degrees)
London Clay Formation	20	Zero	20

6.4 Underground Infrastructure

The southbound and northbound tunnels of the Northern Line, High Barnet branch are present approximately 25m to the west of the property, beneath Kentish Town Road.

A 230mm diameter combined sewer is indicated beneath the rear extension of the property by Thames Water Records, running towards the north.

This sewer will need to be investigated further and, if still in use, it will be necessary to re-route the sewer as part of the development. The sewer will be de-commissioned if no longer in use.

6.5 Construction Sequence

1. Underpin the façade and No. 5 Camden Road party wall in reinforced concrete L-sections.
2. Install additional ground floor level propping to underpinning.
3. Commence main excavation.
4. Install lower level propping.
5. Complete excavation down to the basement slab formation level.
6. Install below-slab drainage for foul and ground water, sumps and pumps.
7. Place slab reinforcement and cast remaining basement slab.
8. Remove low level temporary propping.
9. Construct basement liner walls, membranes, cavity drainage, insulation and screed.

10. Construct ground floor slab.

11. Remove ground level propping.

7. Ground Movement to Neighbouring Properties

Camden Council seeks to ensure that harm will not be caused to neighbouring properties by basement development.

Camden Local Plan (June 2017) states that the BIA must demonstrate that the proposed basement scheme has a risk of damage to the neighbouring properties no higher than Burland Scale 1 'Very Slight'.

7.1 Structures Assessed for Ground Movement

7.1.1 No. 8 & Nos. 10-12 Kentish Town Road

No. 8 Kentish Town Road, located to the northwest of No. 3a Camden Road is already underpinned to approximately 4m depth (+22m OD) by virtue of the existing basement at this property; hence the required depth of underpinning is expected to amount to approximately 1.5m.

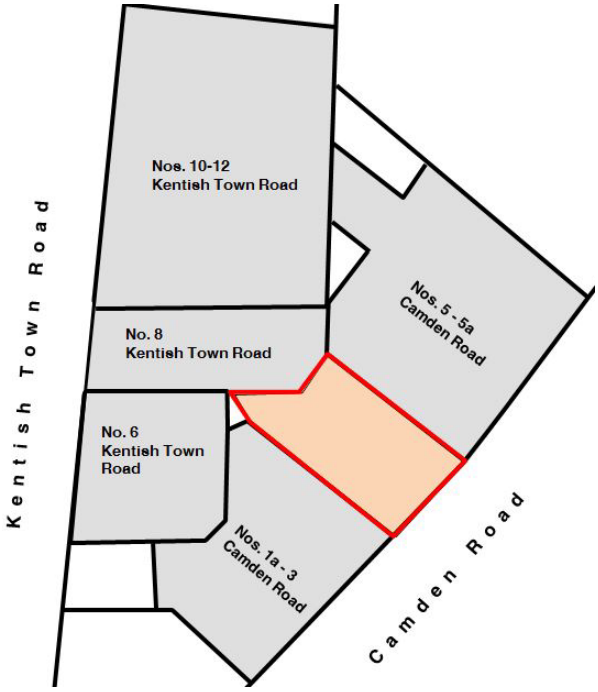
Nos. 10-12 Kentish Town Road adjoins No. 8 to the north and also comprises a recently built basement, to the same depth as No.8.

7.1.2 No. 6 Kentish Town Road

No. 6 Kentish Town Road is located to the west of No. 3a Camden Road and comprises a three storey building with an existing 2.5m deep cellar.

7.1.3 Nos. 1a – 3 Camden Road

Nos. 1a – 3 Camden Road is a three storey terraced building that adjoins the site to the southwest.



Plan showing the nearby buildings

This building comprises a basement beneath the full extent of the building, which is understood to extend to approximately 4m depth; hence a single stage of underpinning of approximately 1.5m depth will be required.

7.1.4 Nos. 5 Camden Road

Nos. 5 Camden Road is a three storey terraced building, which adjoins the site to the northeast.

7.2 The trial pitting exercise confirmed the party wall with No. 5 is supported by strip foundations extending to approximately 1.5m depth. Two stages of underpinning will therefore be required.Modelled Ground Conditions

Excavation of the basement will result in unloading of the clay leading to theoretical heave movement of the underlying soil in both the short and long term. An analysis of the vertical movements has been carried out using the soil stiffness model detailed in the table below.

For design purposes a conservative undrained strength profile has been adopted, assuming an average Cu of 70kN/m^2 at the surface of the London Clay Formation, increase by 8kN/m^2 per m depth.

The Undrained Modulus of Elasticity (Eu) has been based upon an empirical relationship of Eu = 750 x undrained cohesion (Cu), and the Drained Modulus of Elasticity (E') has been based upon an empirical relationship of 350 x Cu.

Stratum:	**Undrained Elastic Modulus Eu (kN/m^2)**	**Drained Elastic Modulus E' (kN/m^2)**
London Clay Formation	52,500kN/m^2 at surface increasing linearly to 232,500kN/m^2 at 30m depth	35,000kN/m^2 at surface increasing linearly to 155,000kN/m^2 at 30m depth

Poisson's Ratios of 0.5 and 0.2 have been used for short term (undrained) and long term (drained) conditions respectively.

The analysis uses the above parameters for stratified homogeneity with the introduction of an assumed rigid boundary at approximately 30m depth.

7.3 Short Term Vertical Movements

There are two components of short term movement that will interact to affect the neighbouring structures.

These components are firstly progressive sagging movements of the underpinned walls due to imperfections in the underpinning process itself and then secondly elastic heave of the ground as a direct response to a net unloading of -110kN/m^2 caused by excavation of the new basement.

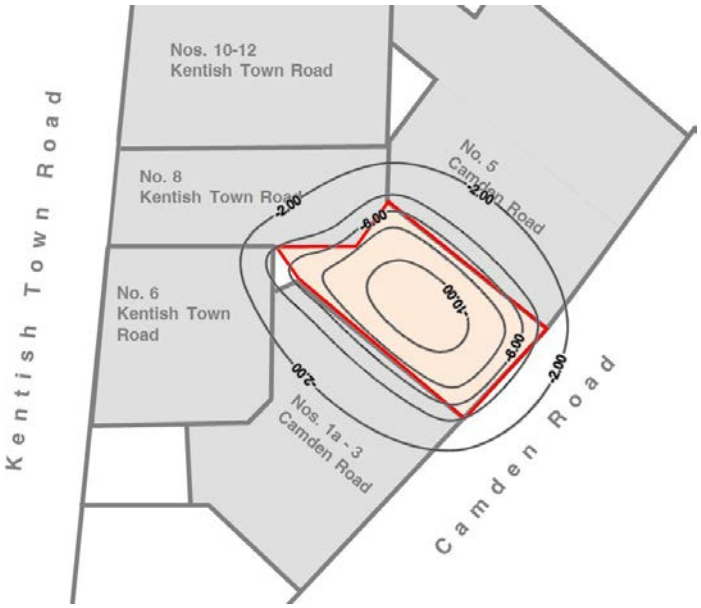
7.3.1 Short Term Movement due to Underpinning

It is not possible to rigorously model the extent of party wall settlement arising from underpinning and experience indicates that amount of any movements are very much dependent on workmanship. However, it is suggested that given dry conditions and good workmanship, the amount of vertical movement of the party walls can reasonably be expected to be a maximum of 5mm per stage of underpinning.

On the simplistic assumption of a 45 degree angle of support to any walls extending away in a direction perpendicular to the party walls, the scale of this vertical movement associated with the underpinning process itself is assumed to extend to a distance of 5.5m behind the wall.

7.3.2 Short Term Movements due to Excavation heave

Any short term movements below the excavation itself will go un-noticed, and the analysis suggests less than 10mm heave movement of the surrounding party walls and new underpinning.

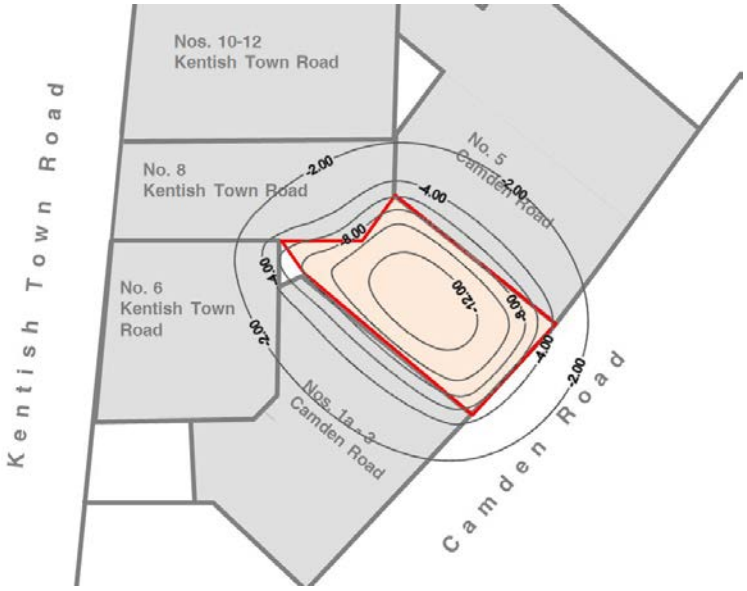


Plan showing theoretical approximate short term heave contours (mm) due to basement excavation (orange colour)

7.4 Post Construction Vertical Movements

There will be a mismatch between the weight of soil that is removed and the weight of the new structure. In this situation, a component of long term heave is inevitable and this could proceed for decades.

The results of the heave analysis, as presented on the plan shown below, suggest that the scale of this post-construction heave will potentially amount to 12mm within the new basement, decreasing to less than 10mm beneath the party walls to No. 3 Camden Road, No. 5 Camden Road and No. 8 Kentish Town Road.



Plan showing theoretical approximate post-construction heave (mm) due to basement excavation (orange colour)

7.4.1 Cumulative Post Construction Movements

Given the recent basement excavation at No. 8 Kentish Town Road and Nos. 10-12 Kentish Town Road, as well as the proposed basement excavations at No. 5 Camden Road and No. 6 Kentish Town Road, consideration has been given to the potential cumulative movements.

A cumulative impact assessment, to be provided separately, suggests that less than 20mm of potential post-construction heave could theoretically occur at the boundary between No. 8 Kentish Town Road, No. 3a and 5 Camden Road.

The analyses also predict that less than 15mm of overall heave could theoretically occur at the party walls shared with the neighbouring properties, although this may theoretically reach 20mm between No. 5 and No. 5a Camden Road.

The cumulative impact assessment concludes that the damage to properties neighbouring the area of the basement developments, as a result of the cumulative heave movements, will not exceed Category 0 – “Negligible”.

7.5 Horizontal Movements

Horizontal soil movements are expected to occur due to yielding of the soil behind the underpinned wall during the basement excavation. For embedded retaining walls, this yielding has been found to extend to a distance approximately equivalent to four times the depth of excavation in front of the wall.

As a first approximation, the magnitude of the horizontal movement at the basement perimeter is assumed to be 5mm, which is equal to the vertical movement at the underpinned wall

This horizontal movement is assumed to reduce to zero at a maximum distance of 4 x 5.5m(excavation depth) = 22m behind the wall.

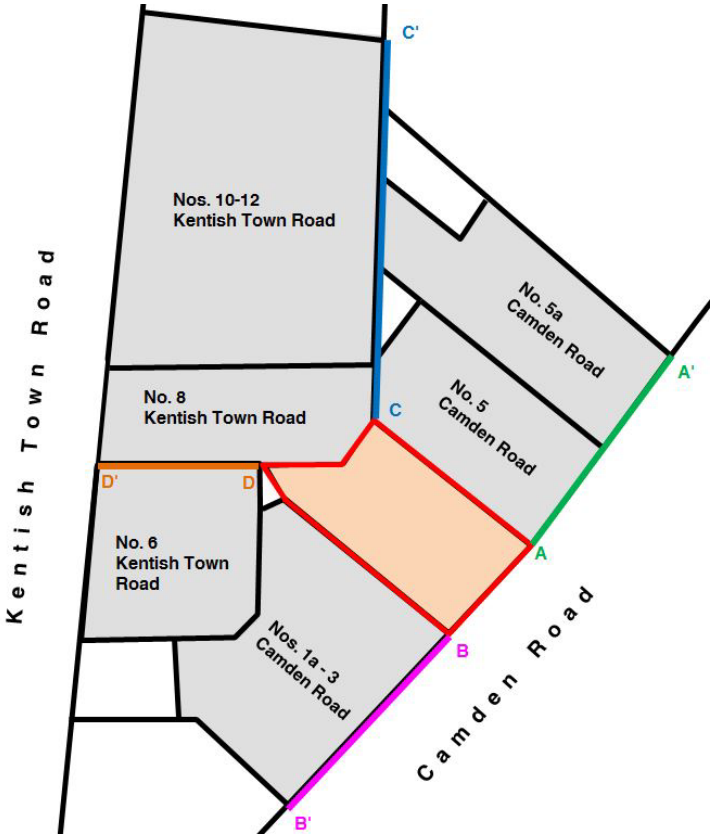
7.6 Impact on Neighbouring Structures

In practice, although the various movements described above will interact so that the soil basement heave effects will tend to counteract the underpinning wall settlement movements, it is considered prudent to ignore this counteraction for the assessment of building damage.

The effect of the predicted vertical and horizontal deflections have been assessed using the Burland damage category assessment process, which is based upon consideration of a theoretical masonry panel of a given length (L) and height (H).

The potential degree of the predicted ground movements on the assessed structures can be estimated by the correlation of maximum horizontal strain, εh, with the maximum deflection ratio, Δ/L, where Δ is the vertical distortion over the wall length under assessment (where the wall length L is actually less than the distance to the point at which zero vertical movement is assumed, a minimum distortion of 1mm is assumed).

The potential degree of damage due to the proposed basement construction has been assessed and a summary is shown below.



Plan showing line of sections used for damage category assessment

(orange colour indicates proposed basement extent)

7.6.1 No. 5 Camden Road – Section A-A'

The length of section (L) is taken as 14m and the wall height (H) as 10m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.045%, producing a maximum deflection ratio Δ / L = -0.031, within a limiting tensile strain of 0.075%, for a Burland Category 1 "Very Slight" condition.

7.6.2 Nos. 1a - 3 Camden Road – Section B-B'

The length of section (L) is taken as 12m and the wall height (H) as 10m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.045%, producing a maximum deflection ratio Δ / L = -0.033, within a limiting tensile strain of 0.070%, for a Burland Category 1 "Very Slight" condition.

7.6.3 No. 8 & Nos. 10-12 Kentish Town Road – Section C-C'

The length of section (L) is taken as 21m and the wall height (H) as 14m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.024%, producing a maximum deflection ratio Δ / L = -0.015, within a limiting tensile strain of 0.040%, for a Burland Category 0 "Negligible" condition.

7.6.4 No. 6 Kentish Town Road – Section D-D'

The length of section (L) is taken as 8m and the wall height (H) as 14m.

The maximum horizontal strain, εh (Δh / L) is assessed as 0.042%, producing a maximum deflection ratio Δ / L = -0.027, within a limiting tensile strain of 0.055%, for a Burland Category 1 "Very Slight" condition.

7.6.5 Public Highway

The proposed basement lies directly adjacent to the pavement, where there is expected to be various buried utilities located.

Given reasonable standards of workmanship during the underpinning works, negligible movement (<5mm settlement) is anticipated and this may be counteracted in practice by some small amounts of heave.

There is hence negligible impact expected on any potential utilities present beneath the highway.

Nevertheless, a full utility survey will be undertaken and utility asset owners contacted where necessary.

8. Impact Assessment

The screening and scoping stages identified potential aspects of the geological, hydrogeological and hydrological environment that could lead to the development having an unacceptable impact.

This stage is concerned with evaluating the direct and indirect implications of each of these potential impacts.

8.1 Hydrogeological Impact Assessment

The site is underlain by clay soils and there is consequently no shallow groundwater table at this site.

It is therefore considered that the development will not have any impact upon groundwater flow and there is additionally no scope for any cumulative impact.

8.2 Hydrological Impact Assessment

There will be no change to the flood risk at the site or neighbouring sites.

Nevertheless, there will be a need to maintain the present water discharge regime and provide Sustainable Drainage Systems (SuDS) to meet the planning policy requirements.

An Outline SuDS Strategy is presented as a separate report (LBH4571suds).

Although the site is at a very low risk of sewer flooding, in order to ensure the basement is protected from sewer flooding, the basement drainage design will include a positive pumped chamber and non-return valve. As a result, any flood water will be directed away from the basement and will prevent the possibility of basement flooding through the drainage system.

8.3 Potential Stability Impacts

8.3.1 London Clay

The London Clay soils are of high volume change potential.

However, the depth of the proposed construction will obviate any concerns regarding potential seasonal movement.

8.3.2 Ground Movements

The Local Plan states that proposed basements should pose a risk of damage to neighbouring properties no higher than Burland scale Category 1 ‘Very Slight’, and mitigation measures should be incorporated if the assessed damage is not acceptable.

The predicted building damage levels due to ground movements associated with the proposed development have been analysed in section 7 and found to be acceptable.

In addition, negligible movement to the public highway due to the proposed basement development is predicted.

8.4 Residual Impacts

The proposed basement will have no residual unacceptable impacts upon the surrounding structures, infrastructure and environment. The cumulative impact of this development, in conjunction with the recent and proposed basement developments was analysed and is provided separately.

9. Outline Structural Monitoring Plan

The ground movement assessment suggests Burland Scale Category 0 (negligible) damage may be expected to the neighbouring properties.

Nevertheless, structural monitoring should be undertaken to ensure the movements remain within acceptable limits and to enable mitigation to be effectively implemented in the event of agreed trigger values for movement being exceeded.

Monitoring positions should be located along all the perimeter party walls.

Before any excavation or construction works commence, monitoring is to be undertaken in order to establish a baseline situation.

During all underpinning works and basement excavation works, monitoring should be undertaken daily at the start and end of every work shift. At other times monitoring should be undertaken weekly to cover a period prior to commencement of any works and ceasing after completion of the works, by agreement of all interested parties.

Precise survey equipment should be used to record all vertical and horizontal components of movement (in three perpendicular directions) to a minimum accuracy of 1mm.

9.1 Criteria for assessment of Monitoring data and Comparison with Predicted Movements

The cumulative movements in any direction of any monitoring point are to be compared with the predicted movements at any stage and using the following decision table:

MONITORING CRITERIA		
Total movement less than 5mm in any direction		Green
Total movement in excess of 5mm in any direction or additional movement of 5mm in any direction	Notify Structural Engineer and Party Wall Surveyor	Red

9.2 Contingent Actions

Contingency actions should be undertaken using the following decision table:

CONTINGENT ACTIONS	
Green	None
Red	Cease work and Notify Structural Engineer and Party Wall Surveyor immediately. Commence backfilling / installation of additional propping. Undertake repeated monitoring as necessary to ensure that movement has ceased. Works to commence only once a revised construction methodology has been agreed with the Structural Engineer

10. Conclusion

The assessment has demonstrated that no adverse residual or cumulative stability, hydrological or hydrogeological impacts are expected to either neighbouring structures or the wider environment as a result of this development.

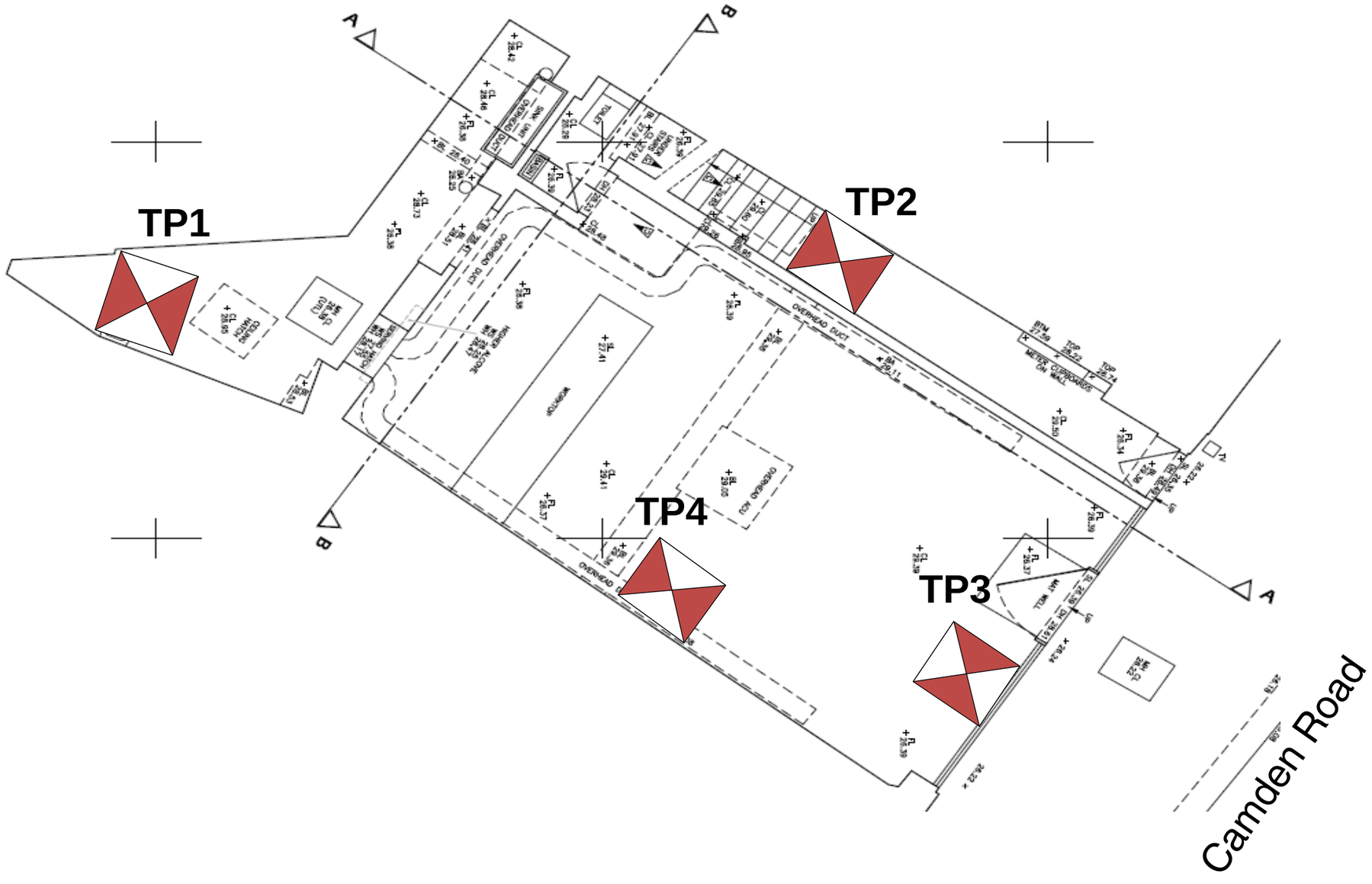
Appendix

Exploratory Logs

Factual Ground investigation Report

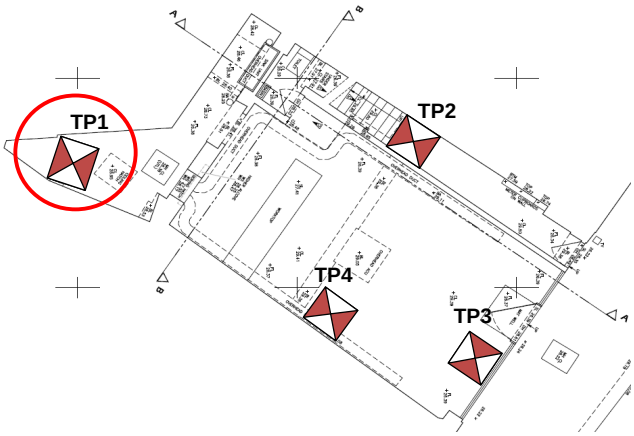
Outline Construction Programme

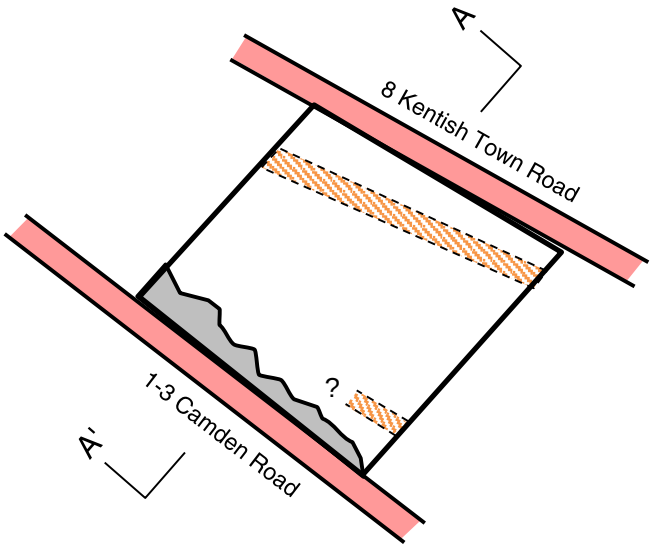
Structural Drawings

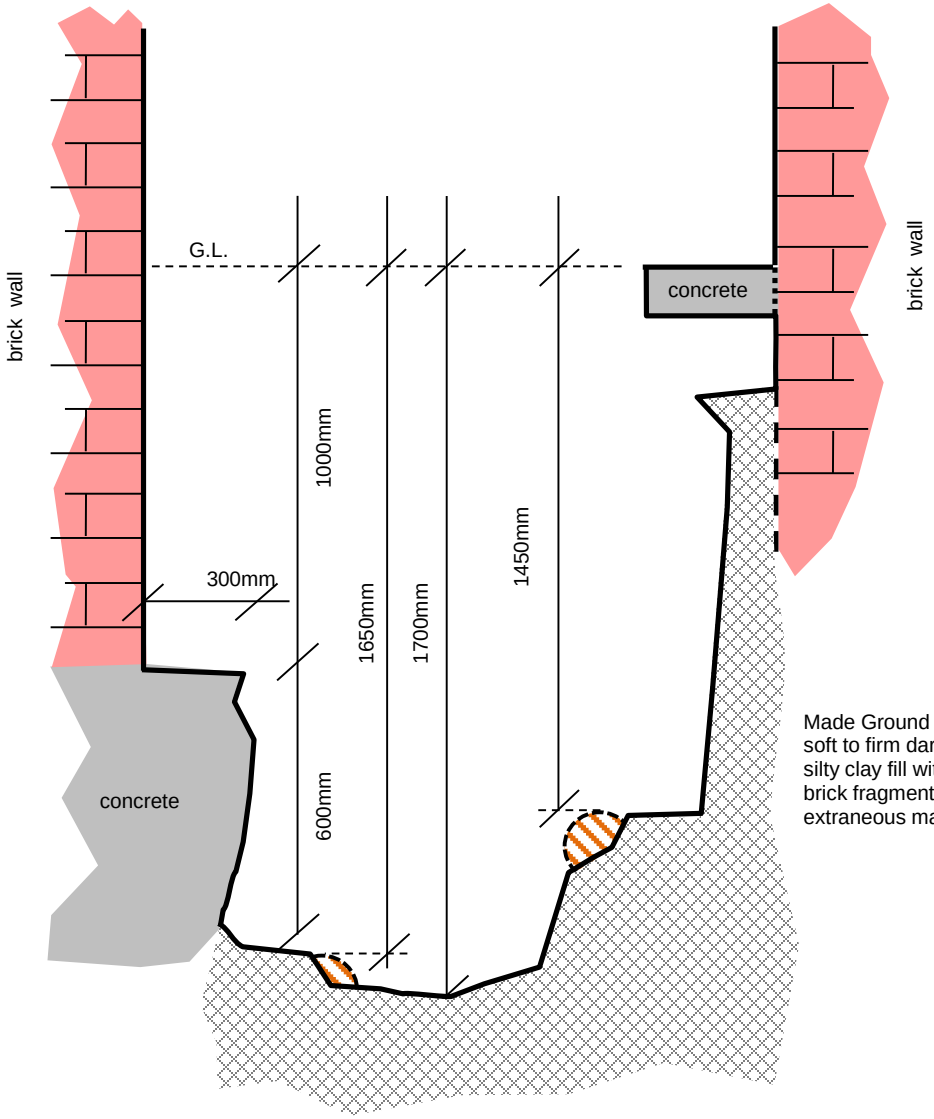

TP1
TP2
TP3
TP4
A
B
B
A
OVERHEAD DUCT
Camden Road

SITE: 3a Camden Road

TRIAL PIT 1







Made Ground (concrete slab over soft to firm dark brown very sandy silty clay fill with scattered stones, brick fragments and various extraneous material)

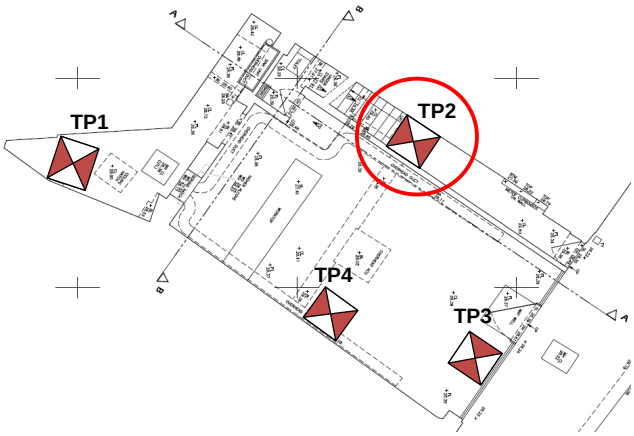
SECTION A - A'

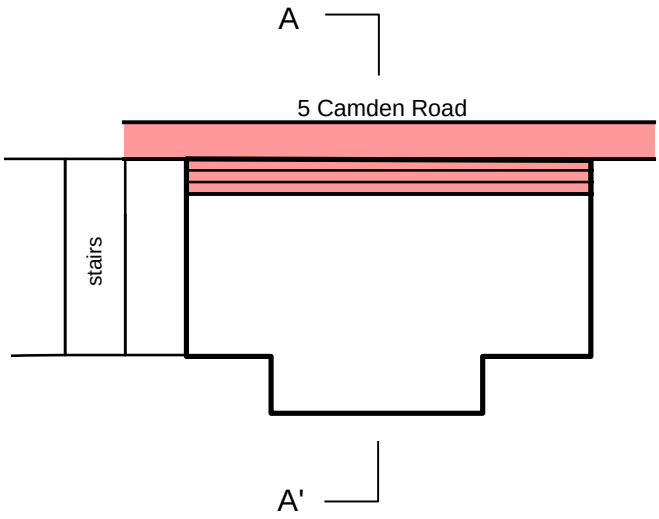
No groundwater encountered. Water observed in the base of the pit resulting from leaking drain.

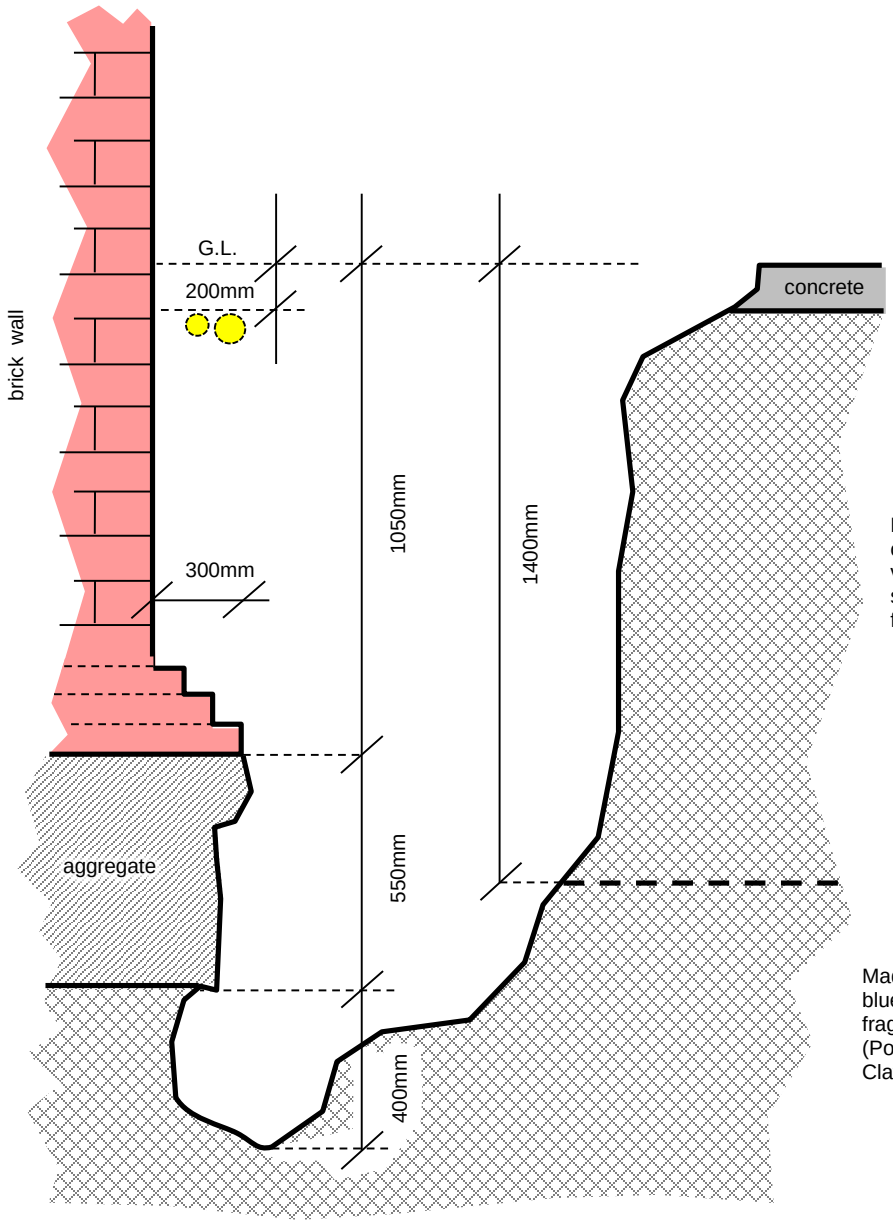
Pit Constructed 13/06/19
G.L Approx. +26.4m OD
All Dimensions in mm
Do Not Scale

SITE: 3a Camden Road

TRIAL PIT 2







Made Ground (concrete slab over soft to firm dark brown very sandy silty clay fill with scattered stones and brick fragments)

Made Ground (firm dark greyish blue silty clay with occasional fragments of brick and coal) (Potential re-worked London Clay)

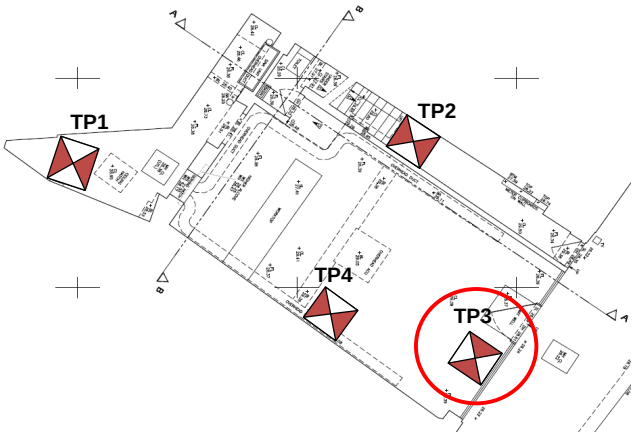
SECTION A - A'

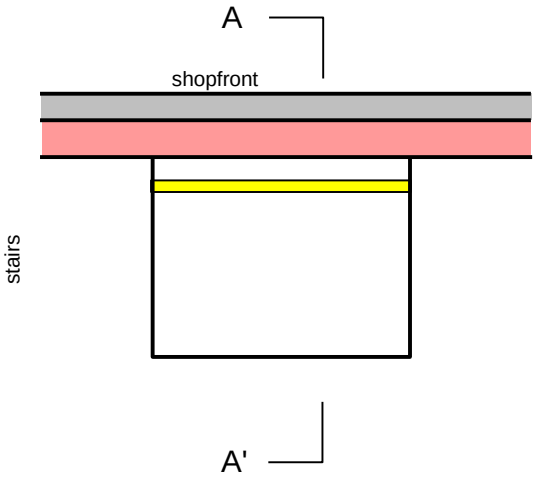
No water encountered

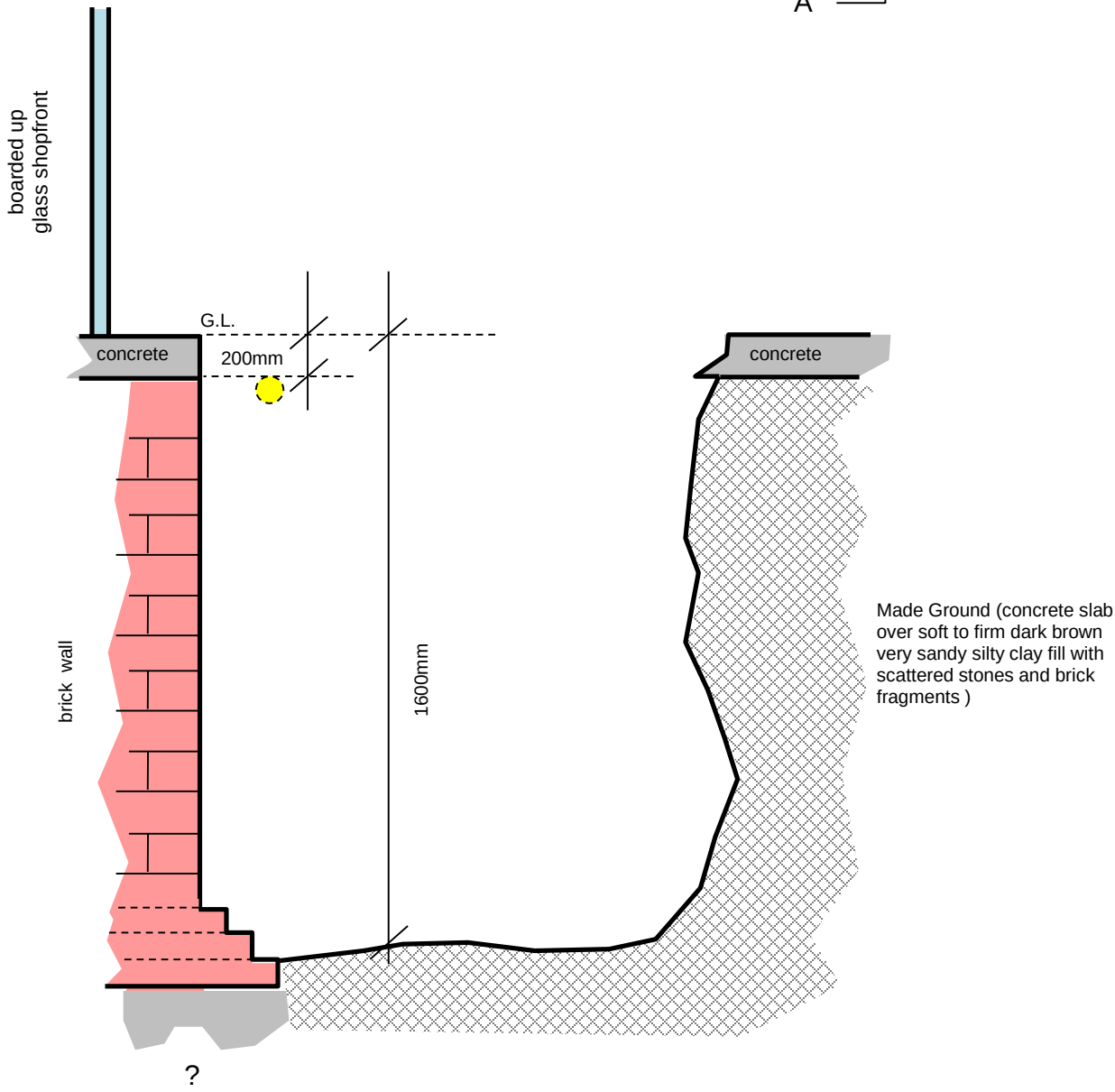
Pit Constructed 14/06/19
G.L Approx. +26.4m OD
All Dimensions in mm
Do Not Scale

SITE: 3a Camden Road

TRIAL PIT 3







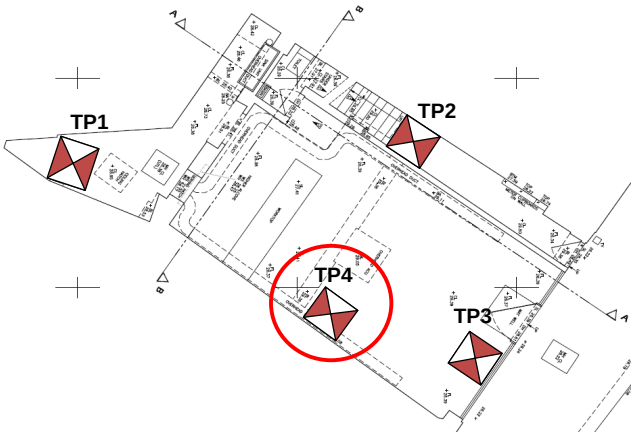
No groundwater encountered. Water observed in the base of the pit resulting from leaking drain.

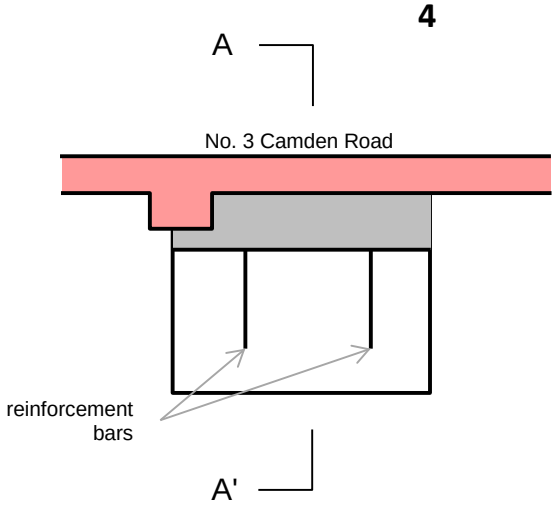
SECTION A - A'

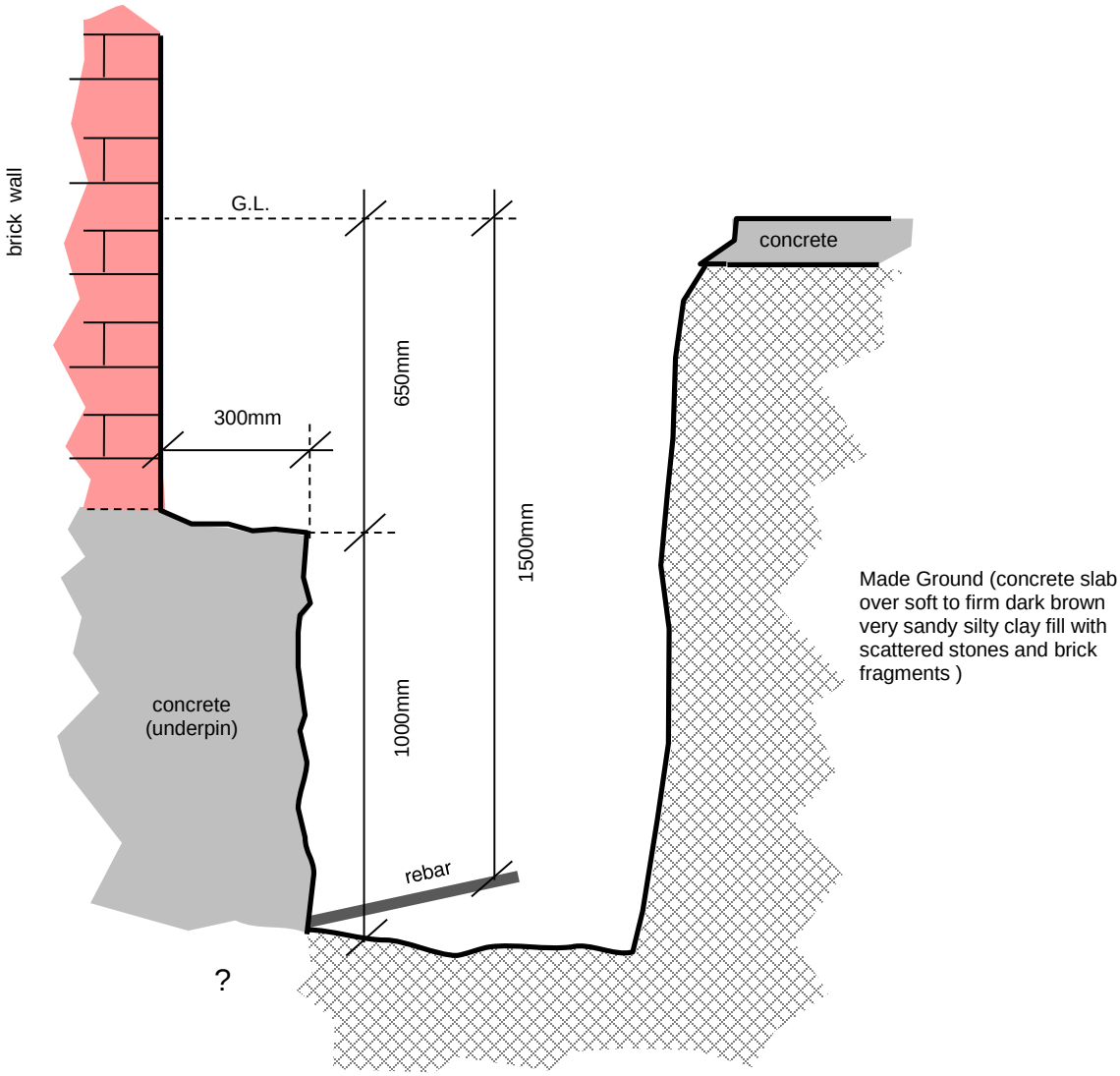
Pit Constructed 14/06/19
G.L Approx. +26.4m OD
All Dimensions in mm
Do Not Scale

SITE: 3a Camden Road

TRIAL PIT 4







SECTION A - A'

No groundwater encountered. Water observed in the base of the pit resulting from leaking drain.

Pit Constructed 14/06/19
G.L Approx. +26.4m OD
All Dimensions in mm
Do Not Scale

Geotechnical Survey Report

FSI Ref:	13358
Issue Date:	August 2019
Risk Address:	3a Camden Road Camden Town NW1 9LG
Company:	TUR Building and Construction Ltd

Managing Director:	Martin Rush MSc FGS
Finance Director:	Louise Ayres BSc (Hons)
Geotechnical Compliance & Logistics Supervisor:	Perry Martin MCIHT
Laboratory Supervisor:	Jade McLellan
Assistant Geologists:	George Baron BSc (Hons) FGS Scott Parker BSc (Hons) FGS

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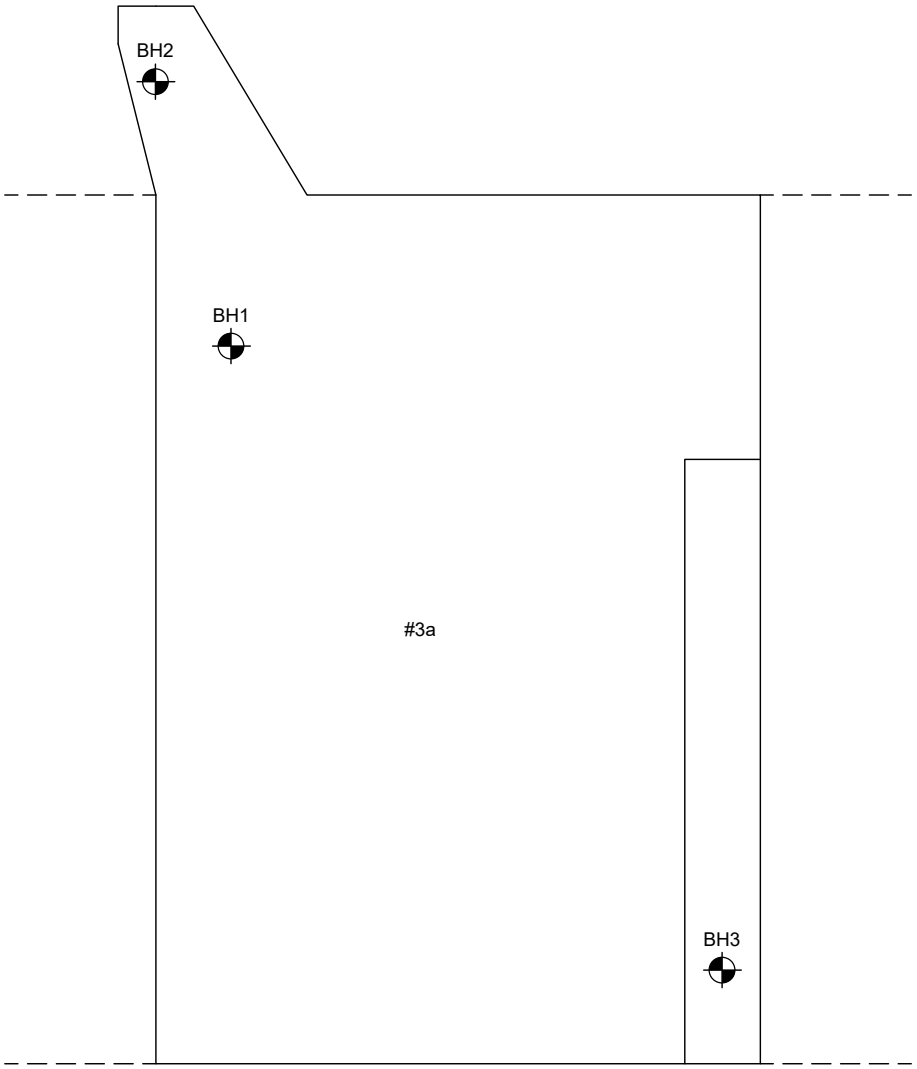
Appendix No: 1
FSI Ref: 13358

SITE PLAN

Property Address: 3a Camden Road, Camden Town NW1 9LG

Survey date: 28/06/2019 **Operative:** SE1



Scale:	Drawn by:	Key:
NTS	GB	Trial Pit, Borehole, Manholes, Rain Water Pipe, Soil & Vent Pipe, Surface Water Gully, Foul Water Gully, Shrub, Tree (Conifer), Tree (Deciduous)

FASTRACK	Fastrack Site Investigations Ltd Unit 9, Tyndales Farm Southend Road Maldon CM9 6TQ	Borehole Log	Borehole No. **BH1** Sheet 1 of 1

Project Name:	3a Camden Road	Project No. 13358	Site Date: 28/06/2019	Hole Type BH
Location:	Camden Town NW1 9LG			Scale 1:35
Client:	TUR Building and Construction Ltd			Logged By SE1

Water Strikes	Sample and In Situ Testing			Depth (m)	Legend	Stratum Description	
	Depth (m)	Type	Results				
						Previously excavated area. Ground level to top of borehole - 1.30m	1
	1.30	D	V (kPa) = 78 V (kPa) = 80	1.30		Mid Brown/Green-Grey Silty Sandy Clayey MADE GROUND containing Brick and Gravel	
	2.00	D	V (kPa) = 100 V (kPa) = 104	1.80		Mid Brown/Grey Silty CLAY *Colour change to Mid Brown noted at 2.30m.* *Grey Mottling noted from 2.30m.*	2
	3.00	D	V (kPa) = 126 V (kPa) = 126			*Gypsum noted from 3.00m*	3
	4.00	D	V (kPa) = 140				4
	5.00	D	V (kPa) = 140	4.70		Mid Brown CLAY	5
	6.00	D	V (kPa) = 140	6.00		End of Borehole at 6.000m	6
							7

Key: D - Disturbed Sample V - Insitu Vane Test MP - Mackintosh Probe Test

Remarks: Borehole closed at 6.00m.
Borehole noted to be dry on completion. No Roots noted.

AGS

FASTRACK	Fastrack Site Investigations Ltd Unit 9, Tyndales Farm Southend Road Maldon CM9 6TQ	Borehole Log	Borehole No. **BH2** Sheet 1 of 1

Project Name:	3a Camden Road	Project No. 13358	Site Date: 28/06/2019	Hole Type BH
Location:	Camden Town NW1 9LG			Scale 1:30
Client:	TUR Building and Construction Ltd			Logged By SE1

Water Strikes	Sample and In Situ Testing			Depth (m)	Legend	Stratum Description	
	Depth (m)	Type	Results				
						Previously excavated area. Ground level to top of borehole - 1.00m	
	1.00	D	V (kPa) = 44 V (kPa) = 46	1.00		Mid Brown Silty Sandy Clayey MADE GROUND containing Brick and Gravel	1
				1.60		Mid Brown/Green-Grey Silty CLAY	
	2.00	D	V (kPa) = 100 V (kPa) = 94			*Colour change to Mid Brown noted at 2.10m.* *Grey Mottling noted from 2.10m.*	2
	3.00	D	V (kPa) = 140				3
	4.00	D	V (kPa) = 140				4
				4.60		Mid Brown CLAY	
	5.00	D	V (kPa) = 140	5.00		End of Borehole at 5.000m	5
							6

Key: D - Disturbed Sample V - Insitu Vane Test MP - Mackintosh Probe Test

Remarks: Borehole closed at 5.00m due to access restriction.
Borehole noted to contain standing water at 4.60m below ground level. No Roots noted.

AGS

FASTRACK	Fastrack Site Investigations Ltd Unit 9, Tyndales Farm Southend Road Maldon CM9 6TQ	Borehole Log	Borehole No. **BH3** Sheet 1 of 1

Project Name:	3a Camden Road	Project No. 13358	Site Date:	28/06/2019	Hole Type BH
Location:	Camden Town NW1 9LG				Scale 1:35
Client:	TUR Building and Construction Ltd				Logged By SE1

Water Strikes	Sample and In Situ Testing			Depth (m)	Legend	Stratum Description	
	Depth (m)	Type	Results				
						Previously excavated area. Ground level to top of borehole - 1.70m	1
	1.70	D	V (kPa) = 82 V (kPa) = 84	1.70		Mid Brown/Orange Silty Sandy Clayey MADE GROUND containing Brick	
	2.00	D	V (kPa) = 102 V (kPa) = 98	2.00		Mid Brown/Green-Grey Silty CLAY	2
						Colour change to Mid Brown noted at 2.40m. *Grey Mottling noted from 2.40m.*	
	3.00	D	V (kPa) = 120 V (kPa) = 124			*Gypsum noted from 3.10m*	3
	4.00	D	V (kPa) = 140				4
				4.80		Mid Brown CLAY	
	5.00	D	V (kPa) = 140				5
	6.00	D	V (kPa) = 140	6.00		End of Borehole at 6.000m	6
							7

Key: D - Disturbed Sample V - Insitu Vane Test MP - Mackintosh Probe Test

Remarks: Borehole closed at 6.00m.
Borehole noted to be dry on completion. No Roots noted.

AGS

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Tyndales Farm, Southend Road, Woodham Mortimer,
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Appendix No: 3
FSI Ref: 13358

LABORATORY RESULTS

Property Address: 3a Camden Road, Camden Town, NW1 9LG

Client: TUR Building and Construction Ltd.

SAMPLE DETAILS

Investigation date:	**28/06/2019**
Sample details:	**Bags as received**
Samples received:	**28/06/2019**
Schedule recieved:	**28/06/2019**
Samples tested:	**28/06/2019 - 19/07/2019**
Results reported:	**19/07/2019**

ANALYSIS REQUESTED

Moisture Content	☑	PSD	☐
Liquid Limit	☑	Soil Suction	☐
Plastic Limit	☑	Shear Strength	☐
Plasticity Index	☑	Contamination	☐
Root ID	☐	Root/Tree DNA	☐
Other (please state)		SO4 +pH	☑

TEST DETAILS

General

Sample descriptions were written in accordance with BS 5930:1999.

Samples were prepared in accordance with BS 1377: Part 1: 1990, section 7

Samples from this contract will be retained for 1 calender month following the issue of this report unless otherwise notified

Written approval is required from Fastrack Site Investigations Limited to reproduce report in full. The results shown within this report only relate to the samples tested

Moisture Content

Samples were tested in accordance with BS 1377: Part 2: 1990, section 3.2 (Oven drying method)

In accordance with Note 1 to paragraph 3.2.4 of BS 1377 Part 2 1990; these moisture contents have been corrected to give the equivalent moisture content of the fraction passing the 425µm sieve, to enable comparison with the liquid & plastic limits. (If condition of test is 'natural' the retained percentage is an estimated value, if condition is 'washed' the percentage is a measured value).

Samples are dried at 105-110^{o}C unless otherwise stated.

Atterberg Limits

Samples were tested in accordance with BS 1377: Part 2: 1990, section 4.3 (4 drop LL), 4.4 (1 drop LL), 5.3 (PL) and 5.4 (PI)
Test results on samples with a sand content, may show less accurate results. If condition of test is 'washed' results relate to the fraction passing the 425µm sieve only.

* *Driscoll's rules deem the soil to be desicated where the moisture content is less than the value calculated using driscoll's rule 1 and/or 2*

Particle Size Distribution

Samples were tested in accordance with BS 1377: Part 2: 1990 section 9.2 (Wet sieving method)

Undrained Shear Stength

Samples were prepared in accordance with BS 1377: Part 7: 1990 section 8.3 and testing in accordance with BS 1377: Part 7: 1990: section 8.4 (undrained shear strength in triaxial compression without measurement of pore pressure (UU))

Soil Suction

Samples were prepared and tested based on the BRE digest No:IP4/93 (Corrected). 'A method of determining the state of desiccation in clay soils.' (Filter paper method).

Test results on samples with a sand or silt content, may show less accurate results. Deviation to standard procedure - Polythene bags are not used from weighing filter papers.

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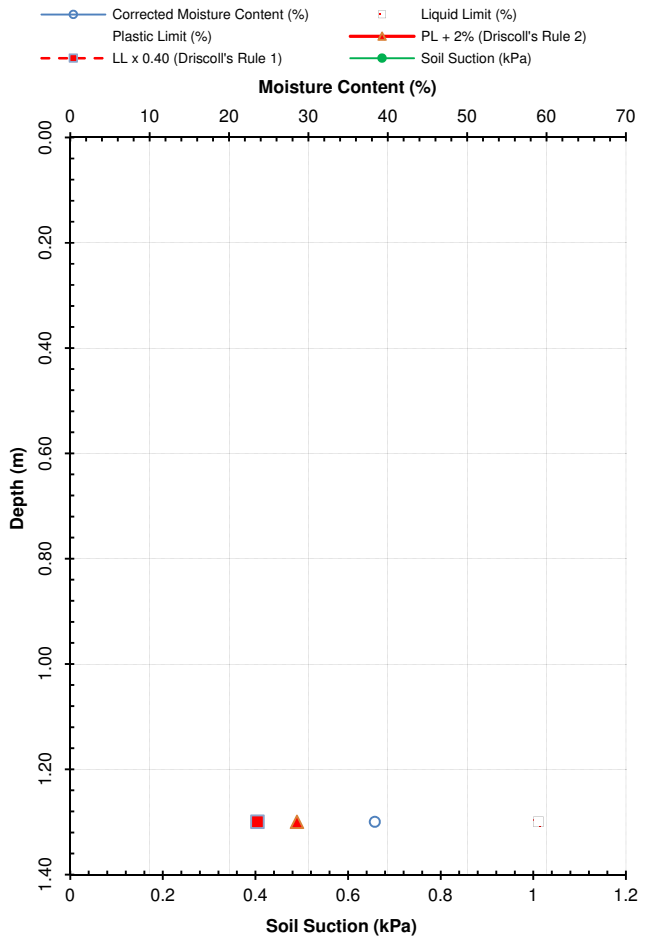
Appendix No: 3
FSI Ref: 13358

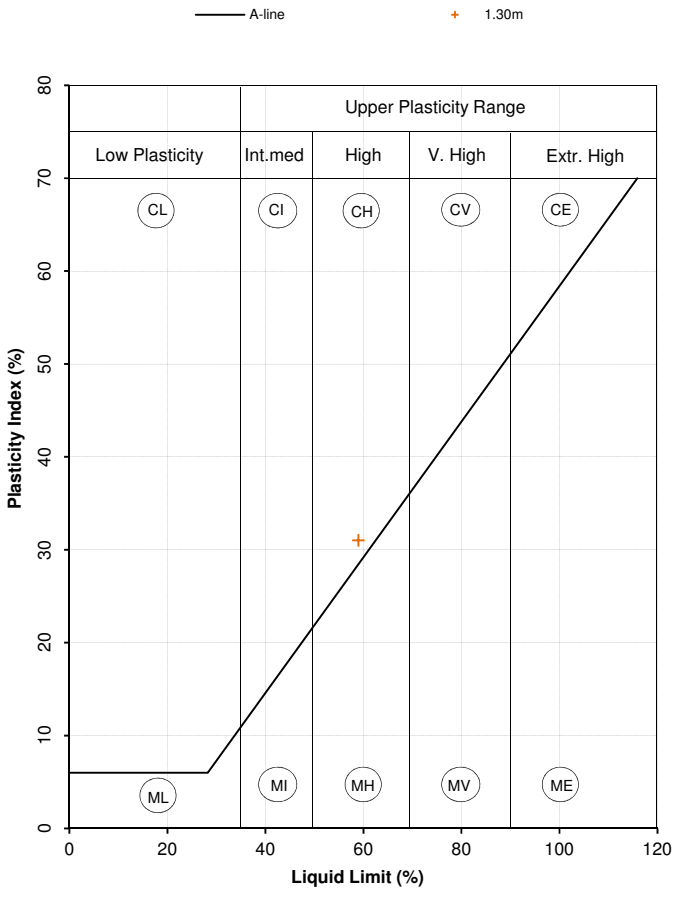
LABORATORY RESULTS

Property Address: 3a Camden Road, Camden Town, NW1 9LG

BOREHOLE 1

Depth (m)	MC (%)	Corr. MC (%)	LL (%)	PL (%)	PI (%)	Class	% Retained (425µm)	Soil Suction (kPa)	Condition of test	Soil Description
1.30	37	38.39	59	28	31	CH	3.61		Natural	Brown sandy, silty, clayey MADEGROUND containing brick and gravel.





Comments:

Issued by:

☐ Jade McLellan (Laboratory Manager)

☑ L Appleby-Bowers (Laboratory Technician)

Signed: L Appleby-Bowers

FASTRACK
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Email: enquiries@fastrackgroup.co.uk

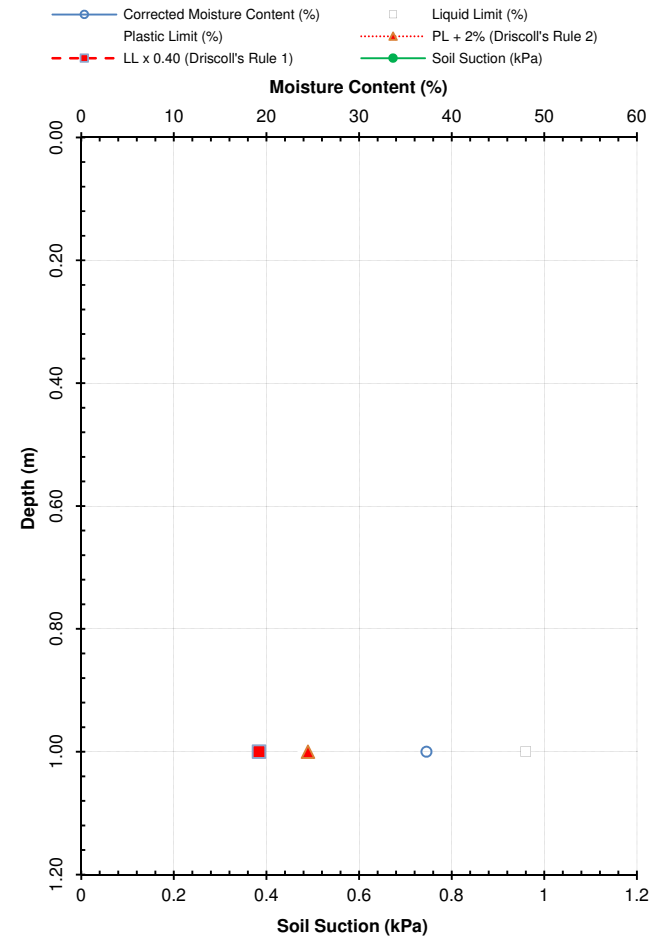
Appendix No: 3
FSI Ref: 13358

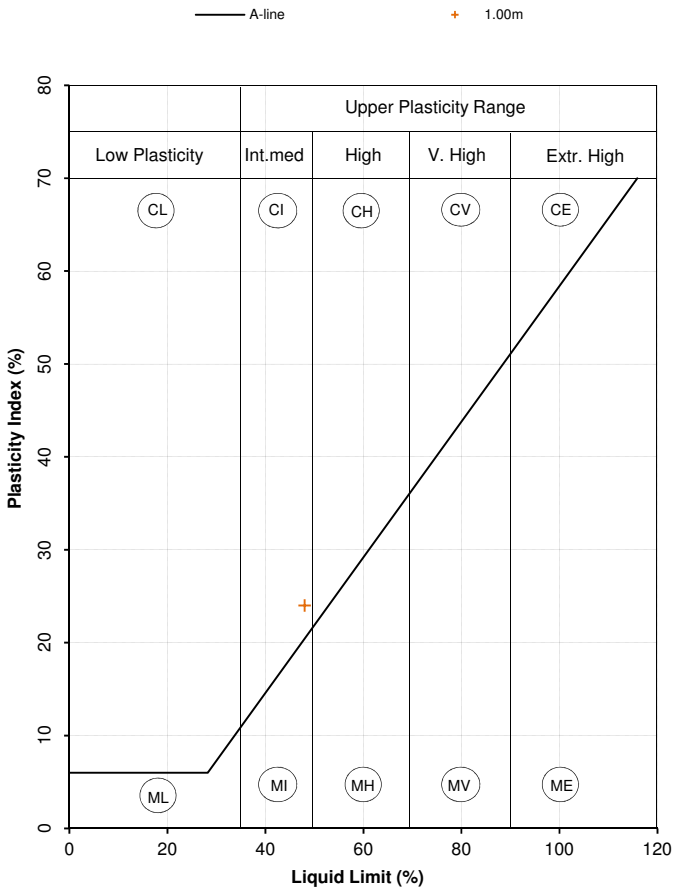
LABORATORY RESULTS

Property Address: 3a Camden Road, Camden Town, NW1 9LG

BOREHOLE 2

Depth (m)	MC (%)	Corr. MC (%)	LL (%)	PL (%)	PI (%)	Class	% Retained (425µm)	Soil Suction (kPa)	Condition of test	Soil Description
1.00	35	37.28	48	24	24	CI	6.11		Natural	Brown sandy, silty, clayey MADEGROUND containing brick and gravel..





Comments:

Issued by:

☐ Jade McLellan (Laboratory Manager)

☑ L Appleby-Bowers (Laboratory Technician)

Signed: L Appleby-Bowers

FASTRACK
Tel: 0844 3358908
Email: enquiries@fastrackgroup.co.uk

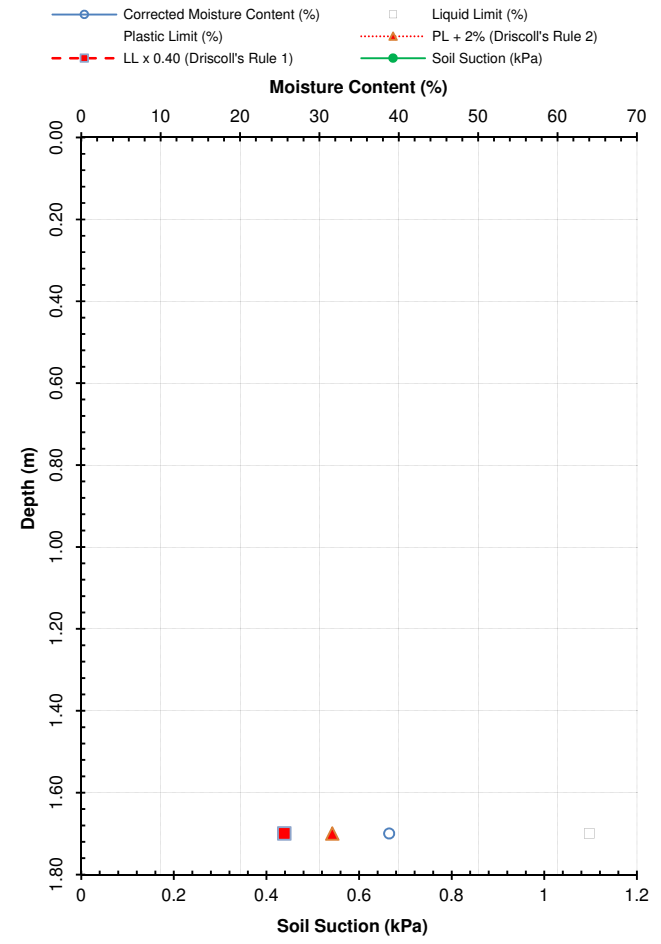
Appendix No: 3
FSI Ref: 13358

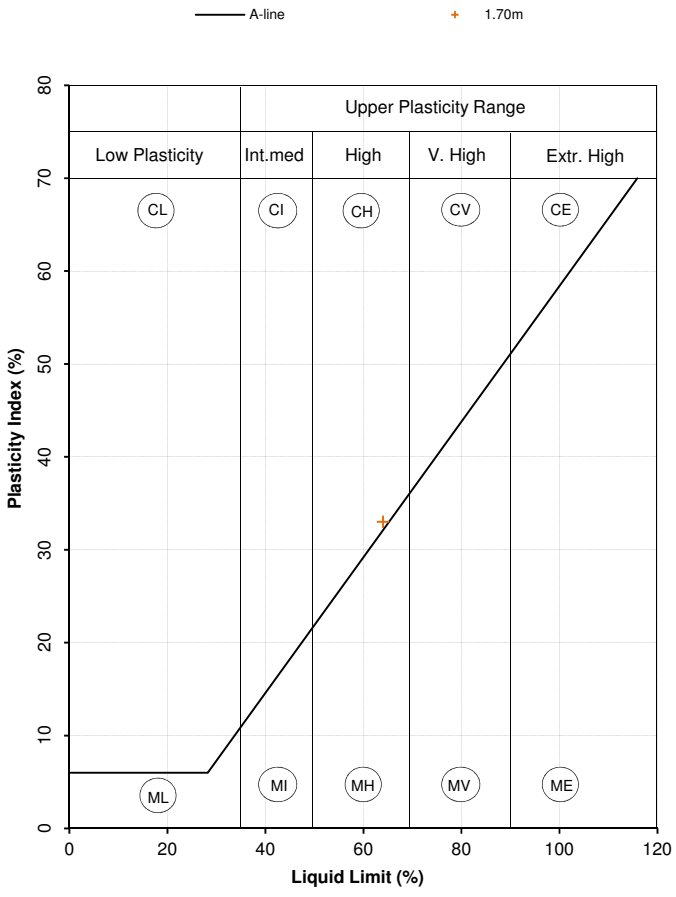
LABORATORY RESULTS

Property Address: 3a Camden Road, Camden Town, NW1 9LG

BOREHOLE 3

Depth (m)	MC (%)	Corr. MC (%)	LL (%)	PL (%)	PI (%)	Class	% Retained (425µm)	Soil Suction (kPa)	Condition of test	Soil Description
1.70	38.8	38.8	64	31	33	CH	0		Natural	Brown sandy, silty, clayey MADEGROUND containing brick.





Comments:

Issued by:

☐ Jade McLellan (Laboratory Manager)

☑ L Appleby-Bowers (Laboratory Technician)

Signed: L Appleby-Bowers

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: 831860-1

Date of Report: 15-Jul-2019

Customer: Fastrack Site Investigations Limited
Tyndales Farm
Southend Road
Woodham Mortimer
Maldon
Essex
CM9 6TQ

Customer Contact: Mr Martin Rush

Customer Job Reference: 5000/13358
Customer Site Reference: 3a Camden Road
Date Job Received at Concept: 02-Jul-2019
Date Analysis Started: 03-Jul-2019
Date Analysis Completed: 12-Jul-2019

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Customers are responsible for information provided where, if incorrect, it could affect the validity of the results.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with QMSection 15 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Mr James Taylor
Inorganic Section Manager

Issued by :
Thomas Handrahan
Customer Service Manager

Concept Reference: 831860
Project Site: 3a Camden Road
Customer Reference: 5000/13358

Soil Analysed as Soil
Miscellaneous

Concept Reference	**831860 001**	**831860 002**	**831860 003**
Customer Sample Reference	**BH1 @ 1.30m**	**BH2 @ 1.00m**	**BH3 @ 1.70m**
Date Sampled	**28-JUN-2019**	**28-JUN-2019**	**28-JUN-2019**

Determinand	Method	Test Sample	LOD	Units			
pH	T7	A40			**7.8**	**7.9**	**8.0**
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	**0.78**	**0.52**	**0.23**

Index to symbols used in 831860-1

Value	Description
A40	Assisted dried < 40C
U	Analysis is UKAS accredited

Method Index

Value	Description
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T7	Probe

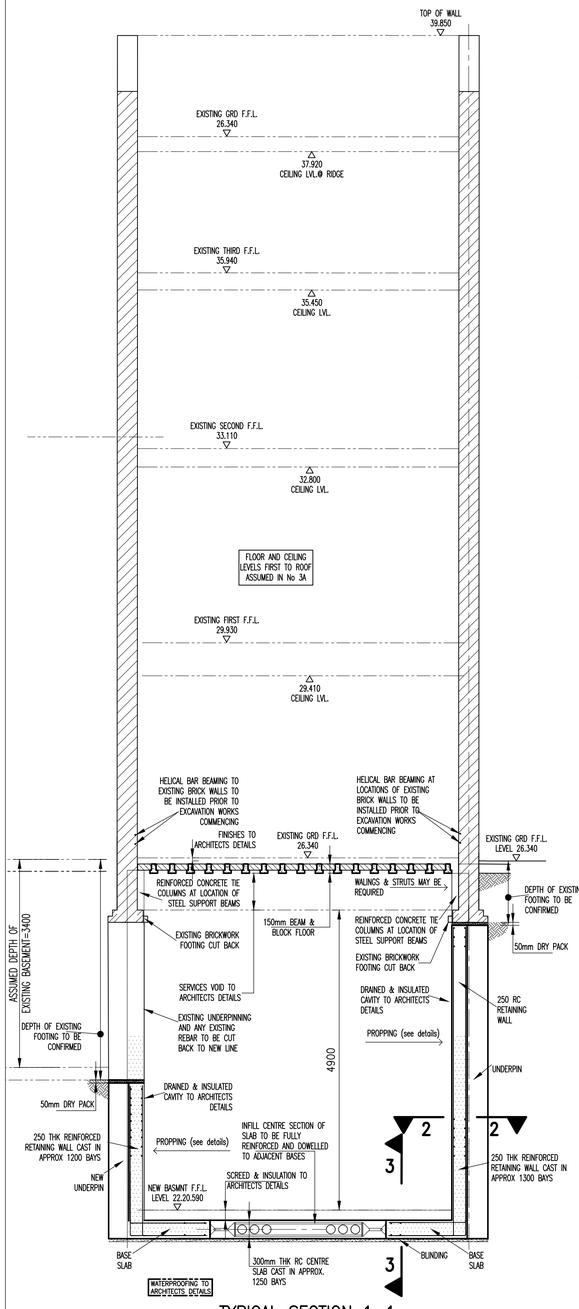
Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
pH	T7	A40			U	001-003
(Water Soluble) SO4-- expressed as SO4	T242	A40	0.01	g/l	U	001-003

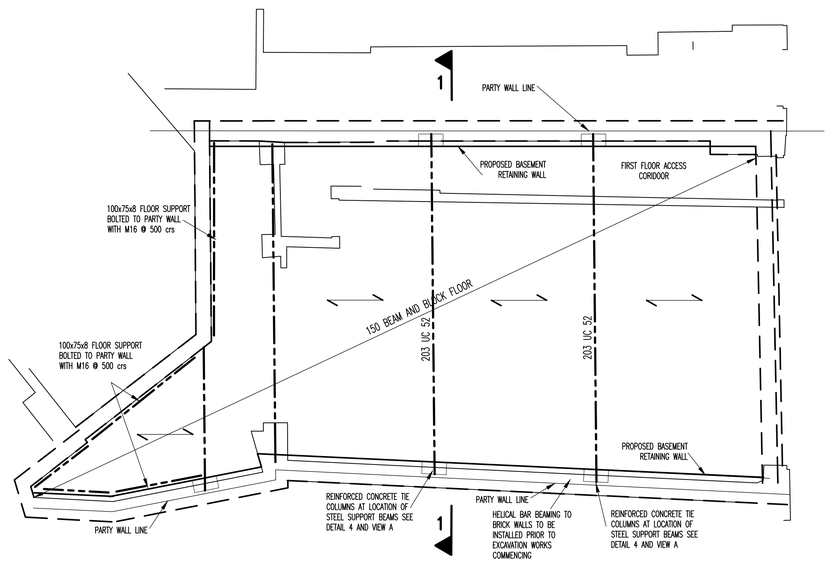
Proposed Programme
Main contract works: First floor and roof extension
Commencing: 14/10/19
Duration: approx. 5 months
Completion Target Date: 01/03/20

Construction will begin immediately on receipt of planning permission -
This is estimated at approximately no later than October 2019.

	2019																							
Month	October				November				December					January				February				March		
Day	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	2	9	
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Soft Strip																								
Temporary works																								
Demolition																								
Structural																								
Forming internal layouts and services																								
Fit out																								

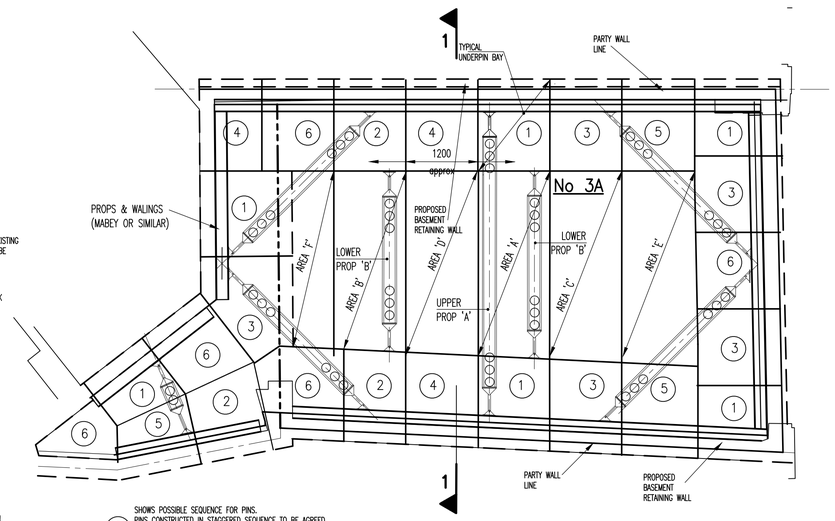


TYPICAL SECTION 1–1
SCALE 1:50



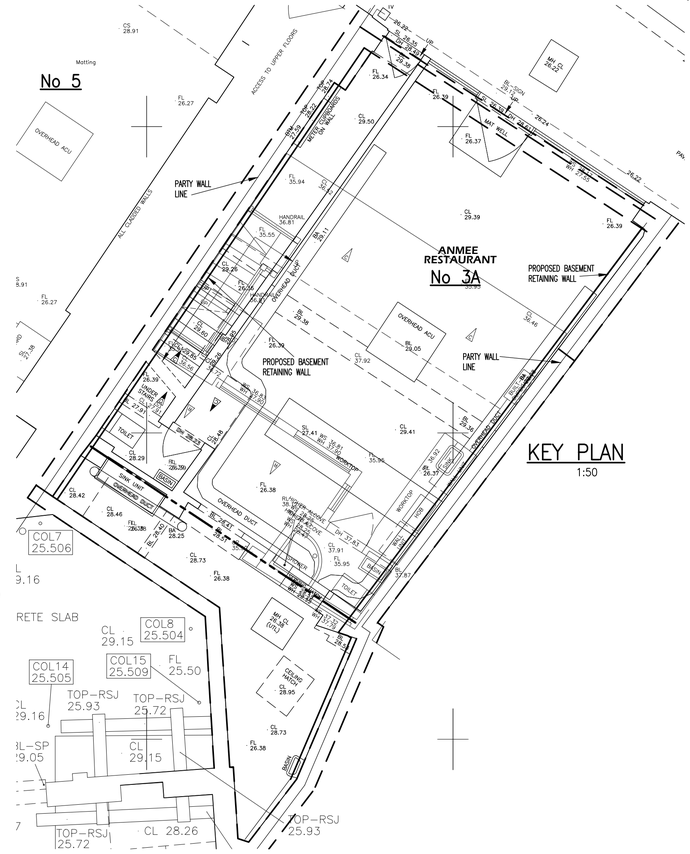
GROUND FLOOR PLAN
SCALE 1:50

(2) SHOWS POSSIBLE SEQUENCE FOR PINS. PINS CONSTRUCTED IN STAGGERED SEQUENCE TO BE AGREED. NUMBERED PINS WITH 1 MUST BE CONSTRUCTED FIRST TO ALLOW PROPS TO BASE SLAB TO BE INSERTED BEFORE ADJACENT EXCAVATIONS CARRIED OUT.



(2) SHOWS POSSIBLE SEQUENCE FOR PINS. PINS CONSTRUCTED IN STAGGERED SEQUENCE TO BE AGREED. NUMBERED PINS WITH 1 MUST BE CONSTRUCTED FIRST TO ALLOW PROPS TO BASE SLAB TO BE INSERTED BEFORE ADJACENT EXCAVATIONS CARRIED OUT.

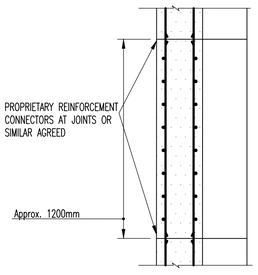
UNDERPINNING PLAN
SCALE 1:50



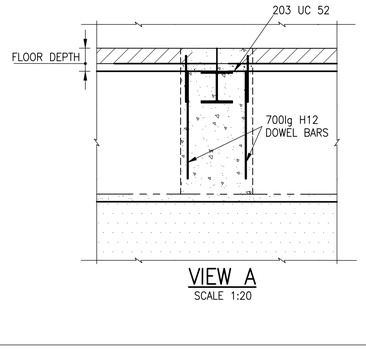
KEY PLAN
1:50

NOTES

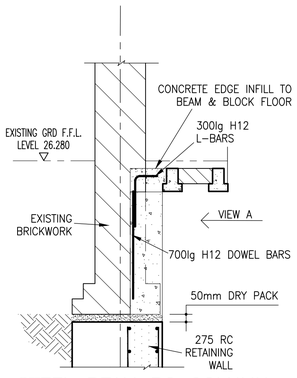
1. THE ORIGINAL SIZE OF THIS DRAWING IS A1.
   0 1 2 3 4 5 CM
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS, SERVICES ENGINEERS AND ANY OTHER SPECIALISTS DETAILS/DRAWINGS AND THE SPECIFICATION.
3. ALL DIMENSIONS ARE IN MILLIMETRES.
4. ALL LEVELS ARE IN METRES.
5. ALL DIMENSIONS ARE TO BE CONFIRMED AND CHECKED ON SITE PRIOR TO COMMENCEMENT OF FABRICATION DRAWINGS AND/OR SITE WORKS.
6. REACTIONS AND MOMENTS FOR THE DESIGN OF CONNECTIONS FOR STEEL BEAMS/STANCHIONS AND BRACING etc. WILL BE GIVEN BY THE ENGINEER TO ENABLE THE STEELWORK CONTRACTOR TO DESIGN THE CONNECTIONS. IF NOT GIVEN PLEASE ASK. DO NOT MAKE ASSUMPTIONS.
7. ALL WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH ALL RELEVANT BRITISH STANDARDS, CODES OF PRACTICE, BUILDING REGULATIONS, HEALTH AND SAFETY REQUIREMENTS AND MANUFACTURERS RECOMMENDATIONS.
8. DO NOT SCALE FROM THIS DRAWING.



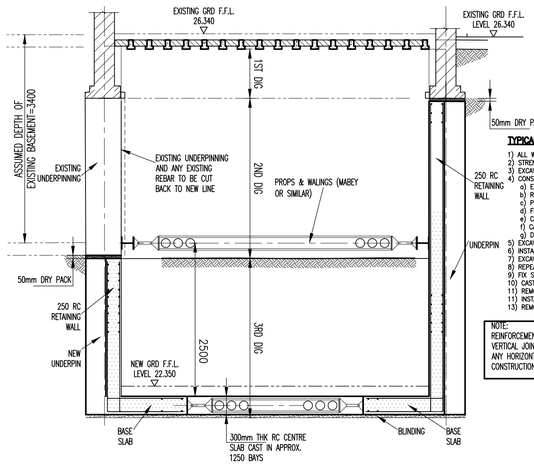
PLAN VIEW SECTION 2–2
SCALE 1:20



VIEW A
SCALE 1:20



STEEL BEAM RC COLUMN SUPPORT DETAIL 4
SCALE 1:20

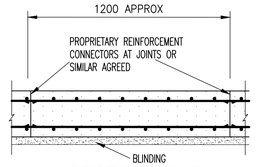


TYPICAL UNDERPIN SEQUENCE SECTION
SCALE 1:50

TYPICAL SECTION NOTES

1) ALL WORKS TO COMPLY WITH THE LATEST HEALTH & SAFETY REGULATIONS
2) STRENGTHEN EXISTING WALLS WITH MASONRY REINFORCEMENT AS SHOWN
3) EXCAVATE TO UNDERSIDE OF EXISTING FOUNDATIONS
4) CONSTRUCTION SEQUENCE FOR UNDERPIN 1 AS FOLLOWS:
   a) EXCAVATE TO LOWEST LEVEL ENSURING SIDES ARE ADEQUATELY SUPPORTED
   b) REMOVE ALL SOIL AND LOOSE MATERIAL FROM UNDERSIDE OF EXISTING FOUNDATION
   c) PLACE BLINDING
   d) FIX REINFORCEMENT
   e) CAST BASE SLAB
   f) CAST WALL ALLOWING 50mm FOR DRY PACK
   g) DRY PACK WITH 1:3 DRY MIX RAMMED IN
5) EXCAVATE CENTRAL AREA BETWEEN UNDERPINNINGS 1 TO UNDERSIDE OF PROPPING (2nd DIG)
6) INSTALL UPPER PROPPING A SYSTEM
7) EXCAVATE AREA 'A' TO UNDERSIDE SLAB (3rd DIG) AND INSTALL LOWER PROP B
8) REPEAT (4–7) FOR AREAS "B" "C" & "D"
9) FIX SLAB REINFORCEMENT AREAS C AND D
10) CAST CENTRAL SLAB C AND D
11) REMOVE LOWER PROPS AREAS A AND B FIX REINFORCEMENT AND CAST SLAB AND B
11) INSTALL BEAM & BLOCK FLOOR AT GROUND FLOOR
13) REMOVE PROPS

NOTE:
REINFORCEMENT TO HAVE MINIMUM 50 MM COVER AT VERTICAL JOINTS BETWEEN SECTIONS.
ANY HORIZONTAL JOINTS REQUIRED IN CONCRETE CONSTRUCTION TO HAVE WATERSTOP ON OUTSIDE FACE.



SECTION 3–3
SCALE 1:20

PRELIMINARY FOR APPROVAL

REV		DATE	CHKD
P2	AMENDED TO ARCHITECTS COMMENTS	15/07/19	
P1	ISSUED FOR COMMENT & APPROVAL	12/07/19	

Gledsdale Associates
Consulting Structural Engineers
40A Dartford Road
Sevenoaks, Kent TN13 3TQ.
E-mail <name>@gledsdale.co.uk
Tel: 01732 456531

PROJECT TITLE:
3A KENTISH TOWN ROAD

DRAWING TITLE:
PARTY WALL DETAILS
BETWEEN 3A AND 3&5 CAMDEN RD

CLIENT:

ARCHITECT:

DATE:	DRAWN	
11/07/19	K.G.A.	
SCALE (@ A1):	DRAWING No:	REV:
1:20 1:50	3640/651	P2