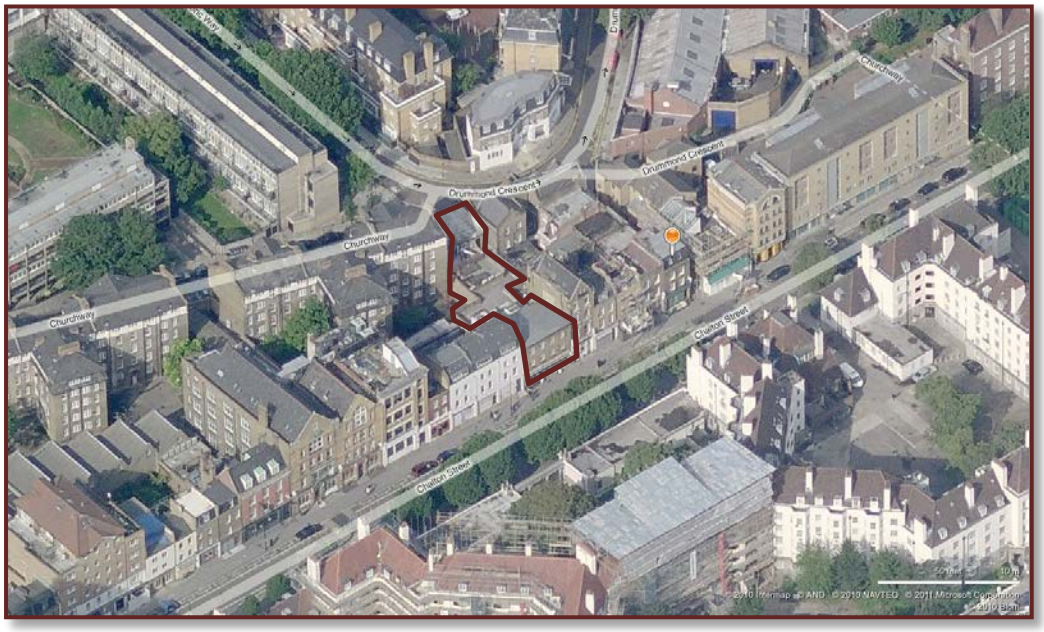
SCREENING AND SCOPING REPORT: 'LAND STABILITY'

Proposed development:

53-55, CHALTON STREET, LONDON, NW1 1HY



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PROPOSED REDEVELOPMENT:

53-55, CHALTON STREET, LONDON, NW1 1HY

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Rev 0	**28 June 2016**	**First issue**	**Stuart Wagstaff** BSc [Hons], MSc, CGeol, FGS, RoGEP	**Terry Rickeard** BSc, MSc, CEng, CGeol, MICE, MIMMM, FGS
Rev 1	**15th June 2017**	**Revision to include tunnel information**	**Stuart Wagstaff** BSc [Hons], MSc, CGeol, FGS, RoGEP	**Terry Rickeard** BSc, MSc, CEng, CGeol, MICE, MIMMM, FGS
Rev2	**19th June 2017**	**Revision to include tunnel level**	**Stuart Wagstaff** BSc [Hons], MSc, CGeol, FGS, RoGEP	**Terry Rickeard** BSc, MSc, CEng, CGeol, MICE, MIMMM, FGS
Rev3	**29th October 2018**	**Revision to Scheme details and basement excavation**	**Stuart Wagstaff** BSc [Hons], MSc, CGeol, FGS, RoGEP	**Terry Rickeard** BSc, MSc, CEng, CGeol, MICE, MIMMM, FGS

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1.0 INTRODUCTION

Consideration is being given to redevelopment of the site which will involve demolition of the existing two to three storey building which has a basement throughout and the construction of a new five storey hotel building.

This report presents the potential impact relating to the proposed subterranean development in terms of 'land stability' as presented in the guidance documents published by Arup 2010: 'Camden geological, hydrogeological and hydrological study: Guidance for subterranean development', Issue01 dated November 2010 and CPG4, 'Basements and Lightwells', published by Camden Council.

The Land stability report is addition to the report by Steve Buss Environmental Consulting Ltd, 'Surface Water and Subsurface Flow Basement impact assessment: screening stage" [Ref. 2016-003-025-002 dated 24 October 2018].

This Report has been prepared for the benefit of the Client and associated parties directly involved with the design and construction of the project under direction of the Client. No reliance can be assumed by others without written agreement from Soil Consultants Limited.

2.0 SITE DESCRIPTION AND PROPOSED BASEMENT

The site of our investigation comprises the existing terraced property, No 53-55, Chalton Street in the Euston district of the London Borough of Camden, at postcode NW1 1HY [OS Grid Ref. TQ 29753 82813] as shown on the Location Plans below..

Site Location Plans

The site extends from Chalton Street to Churchway at the rear (south-west) and is very approximately rectangular on plan, with the existing two to three storey buildings occupying the whole of the property. The site is about 10m wide at the Chalton Street frontage and measures about 40m to the rear boundary. A Nisa food retail store occupies the ground floor and there are residential flats above. The property is surrounded by further residential / office and commercial properties.

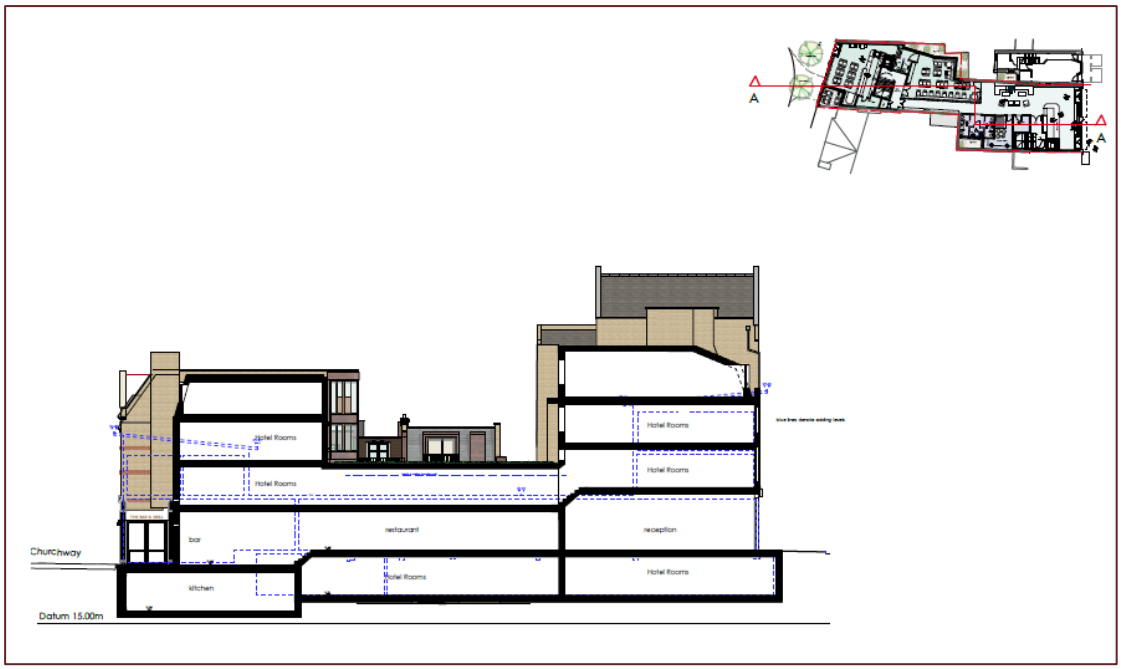
The site is on ground that is generally level and lies at an approximate elevation of +19.5mOD. There are no significant/mature trees within a relevant distance of the site, although there is a small ornamental tree within the pavement several metres beyond the Churchway boundary.

As part of the scheme the existing single level basement is to be extended so that it is beneath the full footprint of the new building. An earlier proposed basement scheme is shown on the appended drawing [Ref 1103/200 dated August 2015]; this scheme is due to be updated but the new revised scheme will have the same size proposed basement. The existing basement and proposed scheme are shown below:

Existing Basement Plan

Proposed Basement Plan

Proposed Cross Section



3.0 STAGE 1 - SCREENING

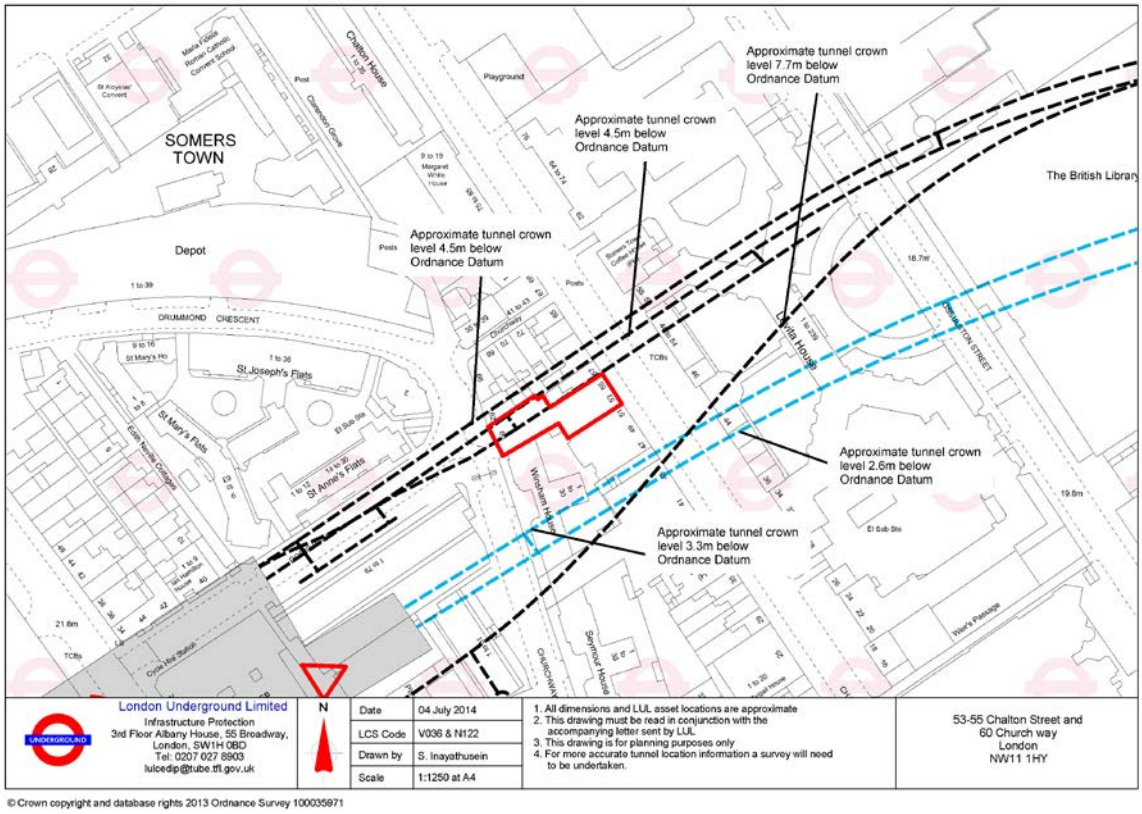
The purpose of the screening stage is to determine whether a full Basement Impact Assessment is required and CPG4 provides flowcharts for each of the three disciplines [Groundwater Flow, Land Stability and Surface Flow/Flooding] for this purpose, identifying a series of questions. An answer of 'Yes' or 'Unknown' will require progression to Stage 2 of the CPG4 categories. Answers of 'No' indicate that no further investigation is generally required - these answers require written justification. The purpose of this section is to present the screening stage for the Land Stability discipline.

The screening stage for land stability has been considered as set out in Figure 2 of CPG4 Camden Council, 2010 [land stability screening flowchart] and the results have been tabulated in Table 1 below. Responses of note are as follows:

- Question 7 [shrink/swell] is answered 'Unknown'. Although the London Clay is expected to be the shallowest strata present [Question 5 – yes]. Notwithstanding the 'normal' seasonal movement of the soils, the absence of any significant nearby trees would suggest that related shrink/swell concerns should not be an issue and the answer would likely be 'No'. However, this cannot be fully addressed without an intrusive ground investigation and this question is considered further in Stage 2.

- Question 9 [historical workings] and Question 10 [aquifer depth], are answered 'Unknown'. These cannot be fully addressed without an intrusive ground investigation and desk study. This question is considered further in Stage 2.
- Question 12 [adjacent to highway and pedestrian right of way],
- Question 13 [differential foundation depths] are answered 'Yes' and are considered further in Stage 2.

- Question 14 Is the site over [or within] the exclusion zone of any tunnels, e.g. railway lines? Answered Yes. Information provided by LUL suggests a tunnel lies below the northern part of the site



All other questions are answered 'No' and supporting evidence supplied as required.

Table 1: Impact of proposed basement works on Land Stability

Impact question	Answer	Justification	Reference
1] Does the existing site include slopes, natural or man-made greater than 7 degrees [approximately 1 in 8]?	No	No significant apparent slope indicated by survey plans/online data	Slope angle map Arup Figure 16
2] Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees?	No	There are no plans to alter these site levels	Site plans / proposed development plans
3] Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees?	No	Available survey information shows no other slopes greater than 7 degrees within a relevant distance	Slope angle map Arup Figure 16
4] Is the site within a wider hillside setting in which the general slope is greater than 7 degrees?	No	Map review and assessment of slope angles from survey data.	Slope angle map Arup 2010 Figure 16
5] Is the London Clay the shallowest stratum at the site?	Yes	Available data shows the London Clay to be the shallowest strata, though some made ground and unmapped superficial soils may also be present.	BGS Published Geology
6] Will any trees be felled as part of the proposed development and/or any works proposed within any tree protection zones where trees are to be retained?	No	Significant/mature trees are not present on [or within an influencing distance from] the site. A small ornamental tree is present in the pavement several metres beyond the Churchway boundary.	Site plans and public domain photographs
7] Is there a history of seasonal shrinkage/swelling subsidence to the local area, and or evidence of such effects at the site?	Unknown	The London Clay is generally classified as a soil with a high shrinkage/volume change potential. However, this stratum may not have been adversely affected because significant trees are not present with an influencing radius of the site. Notwithstanding the effects of root growth, clay soils could be affected seasonally and affect foundations if these are very shallow.	Previous ground investigations in the London Clay Public domain photographs and survey plans
8] Is the site within 100m of a watercourse or a potential spring line?	No	See comments in report presented by Steve Buss Environmental Reporting Ltd	Report by Steve Buss Environmental Reporting Ltd
9] Is the site within an area of previously worked ground?	Unknown	Published geological data suggests worked ground nearby to the W/SW but not beneath the site, so confirmation will be required by intrusive investigation and desk study.	BGS Published Geology and Arup 2010 Figure 16

Impact question	Answer	Justification	Reference
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?	Unknown	The BGS map shows the site be underlain by the London Clay which is normally classified as "Unproductive". A perched water table may be present in any permeable layers of made ground or other superficial soils. The Steve Buss Environmental Consulting Ltd report concludes that there is no permeable aquifer beneath the site that is capable of maintaining a significant water table. A determination of whether ground water will be encountered during the basement excavation can only be confirmed following intrusive investigations.	BGS Published Geology Arup 2010 Figure 16
11] Is the site within 50m of the Hampstead Heath Ponds?	No	See comments in report presented by Steve Buss Environmental Reporting Ltd	Ref Arup 2010 Figure 14
12] Is the site within 5m of a highway or pedestrian right of way?	Yes	Chalton Street pavement along north-eastern boundary and Churchway pavement along south-western boundary.	Site plans
13] Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Yes	Basement retaining walls are likely to extend below founding levels to adjacent properties. The movement expected from a properly constructed and supported wall should be relatively small.	Proposed development plans
14] Is the site over [or within] the exclusion zone of any tunnels, e.g. railway lines?	Yes	Site lies above Northern Line underground tunnel [map shows level at -4.50mOD which equates to about 25m below ground level], additional tunnels located about 25m to south and run in an approximate SW to NE direction. Nearest over ground railway lines are about 200m to the west and east.	Site location maps

4.0 STAGE 2 - SCOPING

The purpose of Stage 2 is to assess the potential impacts of the proposed scheme that Stage 1 has indicated require further consideration.

These are addressed below for each of the relevant questions.

As discussed in Section 3.1 soil volume change [Question 7] is unlikely to be a significant issue as there are no significant nearby trees and the new founding depth for the proposed basement will be about 3.0m to 3.5m below ground level so well below the influence of vegetation and seasonal variations.

The matter of previously worked ground [Question 9] presents a potential impact as there may be Made Ground below the existing building footprint. The presence of such soils and any dewatering of any contained ground water will need to be addressed by a later intrusive investigation.

The depth of the aquifer in relation to the basement [Question 10] is assessed further in the report by Steve Buss Environmental Reporting Ltd which concludes that there is no permeable aquifer beneath the site that is capable of maintaining a significant water table. This aspect will also need to be addressed by a later intrusive investigation.

With regard to the impact on adjacent highways / pedestrian right of way [Question 12], the proposed basement extension will abut the front of the site along Chalton Street and along Churchway. This means that there will be a new excavation within influencing distance of these two footpaths which should be considered during the design of future intrusive ground investigation and during design and construction of the basement structure.

The differential depth of the proposed foundations in relation to neighbouring properties [Question 13] is such that underpinning of party wall foundations may be required and this will need to be discussed as part of a later ground investigation report.

Underground rail lines are shown below/within close proximity to the site; the depth of which has been shown on the LUL map to be about -4.50mOD [appx 25m below ground level]. The detailed location and depth of these tunnels should be ascertained as these may influence the construction of foundations and stress changes within the ground would need to be modelled to ensure adverse effects are not experienced by the tunnels. All works would require approval from LUL / rail operators.

5.0 CONCLUSIONS

From the available information we consider that the impact on baseline conditions from the proposed development would be low to moderate, but that this should be supported by implementation of a ground investigation and an appropriate construction methodology and action plan of measurement, monitoring and response and confirmation that the construction would not influence rail infrastructure. The works must be undertaken by reputable specialists, potential movements due to construction must be assessed, and the temporary and permanent works must be adequately designed, with due consideration to the geology and hydrogeology of the site and surrounding areas.

We conclude that for the proposed basement construction, it could be possible to design the construction methods to ensure that ground movements do not adversely affect either adjacent properties or infrastructure. This would of course depend on the magnitude of stress change within the ground and associated movement and approval from the rail operators. A detailed ground movement analysis would be required.