soiltechnics

environmental and geotechnical consultants

Proposed basement extension
15 Cleve Road
London, NW6

Basement Impact Assessment Report
Stage 1 Screening

Cedar Barn, White Lodge, Walgrave, Northamptonshire NN6 9PY

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Proposed basement extension at 15 Cleve Road Hampstead London NW6

BASEMENT IMPACT ASSESSMENT REPORT Stage1 -Screening

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Report originators

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Aerial photograph of site

Report status and format

Report section	Principal coverage	Report status	
		Revision	Comments
1	Introduction and brief		
2	Description of the property and project proposals		
3	Desk study information and site observations		
4	Subterranean (Groundwater flow) screening		
5	Stability impact identification		
6	Surface flow and flooding impact identification		

List of appendices

Appendix	Content
A	Copy of Structural Engineer's drawings illustrating proposals (R9730-1 and 2)

1 Introduction and brief

1.1 Objectives

1.1.1 This report presents a basement impact assessment for a proposed basement extension at 15 Cleve Road, Hampstead, London NW6.

1.1.2 The principal objective of the assessment is to present evidence to support a planning application for the project as required by Camden Planning Guidance (CPG4) '*Basements and lightwells'*. Following CPG4 we are of the opinion, based on available information, that the impact assessment needs only to be taken to stage 1 –'screening'.

1.2 Client instructions and confidentiality

1.2.1 This report has been produced following instructions received through Jampel Davison and Bell on behalf of David Joseph.

1.2.2 This report has been prepared for the sole benefit of our above named instructing client, but this report, and its contents, remains the property of Soiltechnics Limited until payment in full of our invoices in connection with production of this report.

1.3 Author qualifications

1.3.1 This report has been prepared by a chartered Civil Engineer, (C.Eng., M.I.C.E) who is also a Fellow of the Geological Society (FGS). The Author is a practising Civil Engineer with specialist experience (exceeding 25 years) in geotechnical engineering, flood risk and drainage.

1.4 Guidance used for scoping exercise

1.4.1 As described in paragraph 1.1.2 above we have followed Camden Planning Guidance (CPG4) '*Basements and lightwells'*, and Camden geological, hydrogeological and hydrological study report '*Guidance for subterranean development,*' produced by Arup on behalf of the London Borough of Camden. We have also referred to the '*Strategic Flood Risk Assessment Report for North London*' dated August 2008 prepared by Mouchel, as well as other readily available information on websites.

2 Description of the property and project proposals

2.1 Description of the property

The property comprises a detached five storey building which includes a single storey basement and loft accommodation. A single storey conservatory is attached to the south facing elevation of the main house with floor levels (lower ground floor) extending approximately 1.2m below garden level. A garden area is located to the south, which is generally laid to grass with some mature trees within the southern extremity of the garden.

An inspection of drainage systems serving the property has been undertaken. The main sewer follows a route along the eastern property boundary with the invert located about 1m below lower ground floor level. The drain operates under gravity and is free flowing (no observed blockages). As there is only one drain the likelihood is that this serves both foul and stormwater. The drain follows a route towards Cleve Road and most probably outfalls into sewers maintained by Thames Water in Cleve Road.

2.2 Project proposals

The project comprises demolition of the existing single storey conservatory to the south of the property followed by construction of the following

- A three storey extension to the rear south facing wall of the existing building within the foot print of the existing conservatory.
- Reduction in the level of the lower ground floor by approximately 320mm.
- Construction of an approximate 2m deep light well adjacent to the nort facing elevation. Copies of our Client's Engineers (Jampel Davison and Bell) drawings outlining construction proposals are presented in Appendix A, which details the project proposals.

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3 Desk study information and site observations

3.1 Site history

3.1.1 Review of Ordnance Survey and London town maps dating back to 1871 indicate the site was open fields until 1895 when the current footprint of the property and surrounding buildings is recorded.

3.2 Geology and geohydrology of the area

3.2.1 Geology

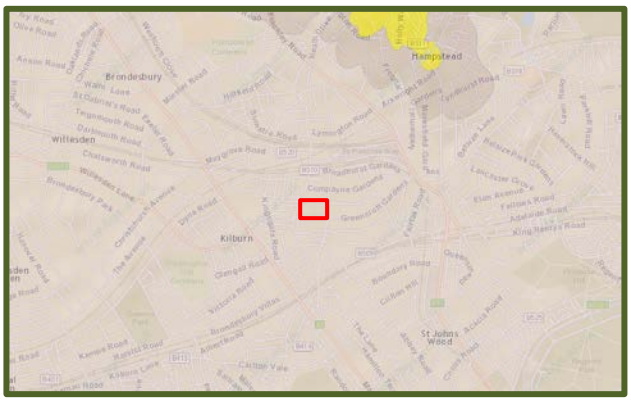
3.2.1.1 Inspection of the geological map of the area published by the British Geological Survey (BGS) indicates the following sequence of strata. The thickness of the strata has been obtained from a combination borehole record data formed within 500m of the property available on the BGS website, and geological sections shown on the BGS map.

Summary of Geology and likely aquifer containing strata					
Strata	**Bedrock or drift**	**Approximate thickness**	**Typical soil type**	**Likely permeability**	**Likely aquifer designation**
London Clay Formation	Bedrock	80	Clays	Low	Unproductive
Woolwich and Reading Beds	Bedrock	15	Clays and sands	Low/moderate	Unproductive
Thanet sands	Bedrock	10	Fine sands	Low/moderate	Unproductive
Chalk	Bedrock	200	Chalk	High	Principal

Table 3.2

The soil types and assessments of permeability are based on geological memoirs, in combination with our experience of investigations in these soil types.

An extract copy of the geological map is presented below, with brown shading representing the outcrop of the London Clay Formation. The dark brown represents the Claygate Member and the yellow shading represents the Bagshot Formation. These deposits overlie the London Clay Formation. The property is located within the red box.



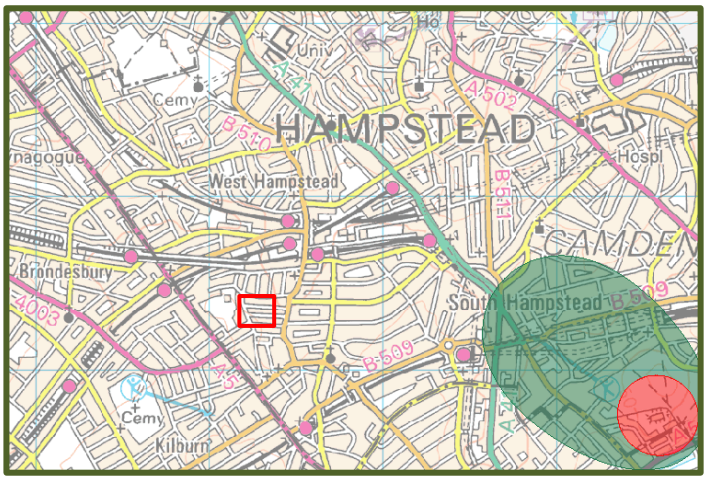
3.2.2 Geohydrology

Strata overlying the Chalk are considered unproductive strata, which are defined as deposits exhibiting low permeability with negligible significance for water supply or river base flow. An unproductive strata is generally regarded as not containing groundwater in exploitable quantities.

Chalk is a principal aquifer. Principal aquifers are defined as deposits exhibiting high permeability capable of high levels of groundwater storage. Such deposits are able to support water supply and river base flows on a strategic scale.

3.2.3 Source protection zone

The site is not recorded as being located within or close to a zone protecting a potable water supply abstracting from a principle aquifer (i.e. a source protection zone). An extract of the plan recording source protection zones is presented below with green shading representing outer zone and red inner zone. The abstraction points within the red (inner zones) are probably within the chalk aquifer. The property is located within the red square.



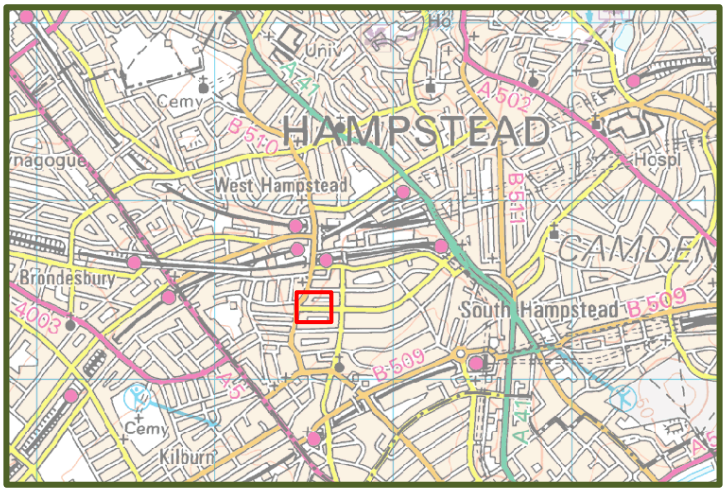
3.3 Quarrying/mining

3.3.1 With reference to the coal mining and brine subsidence claims gazetteer for England and Wales, available on the Coal Authority web site, the area has not been subject to exploitation of coal or brine. Inspection of old Ordnance Survey maps dating back to the first editions (late 1800s) do not record any quarrying activities within 250m of the property.

3.4 Flood risk

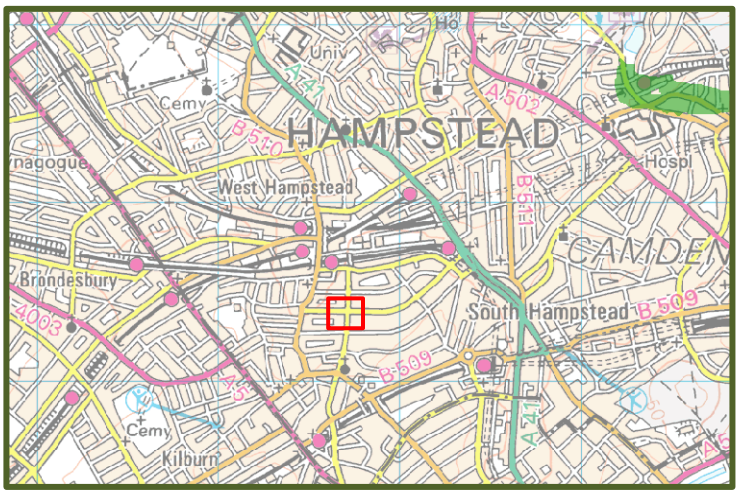
3.4.1 Fluvial/tidal flooding

The Environment Agency Web site indicates the site is not located within a fluvial or tidal flood plain. An extract copy of the flood risk map is presented below which shows no blue shading representative of flooding. The property is located within the red box.



3.4.2 Flooding from Reservoirs, Canals and other Artificial Sources

The Environment Agency website indicates the site is not located within an area considered at risk of flooding from beach of reservoir containment systems. An extract copy of the flood risk map is presented below. The green shading represents areas at risk of flooding as a result of failure of containment systems on Hampstead Heath. The property is located within the red box.



The property is located about 1500m to the north-west of Regents canal on higher topographical levels, thus any breach or flooding associated with the canal will not cause flooding of the property..

There are likely to be below ground water supply pipes operated by Thames water in public highways around the property. These are generally relatively small diameter pipes. It is considered that the property is unlikely to be at enhanced risk of flooding due to ruptures in the potable water supply system in the area.

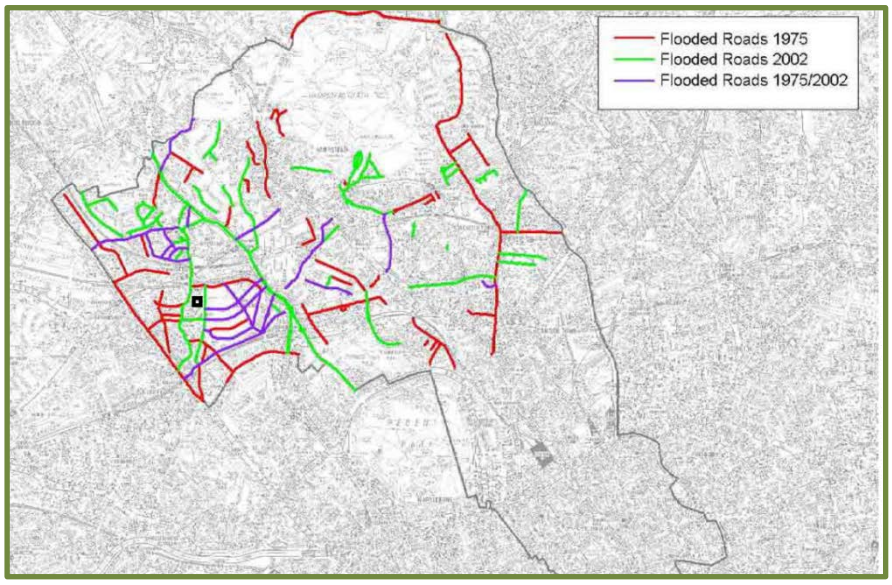
With reference to internet information the site is located midway between two tributaries of the former watercourse, the River Westbourne. The site is located approximately 200m from the tributaries. The tributaries, along with the Westbourne, have probably been culverted to allow urban development of London.

3.4.3 Flooding from Groundwater

The site is underlain with a substantial thickness (80m) of relatively impermeable London Clays. On this basis groundwater is not likely to be available at the site and thus is unlikely to present a risk of causing groundwater flooding.

3.4.4 Flooding from sewers

We have viewed the London Borough of Camden's report of the floods scrutiny panel dated June 2003. This identifies flooding which has occurred in the past. The map below provides a summary of flooded roads between 1975 and 2003. The property is shown edged in black and located remote from roads which are subject to historical flooding due to sewers becoming overwhelmed in severe storm events.



4 Subterranean (Ground water) flow screening

4.1 General overview.

The property is located towards the floor of the Thames valley, to the north-west of central London. The property is outside areas considered to be at risk of being affected by tidal and fluvial flooding associated with the Thames or its tributaries, or artificial water sources (canals/reservoirs). In addition the property is not considered to be at enhanced risk of flooding from sewers or water supply pipes

Geological records indicate the site is underlain by deposits of London Clay Formation extending to depths of approximately 80m. There is likely to be a thin spread of Made Ground overlying the London clay Formation as a result of development in the area. The property (being underlain with a substantial thickness of London Clay Formation) is not considered to be at risk of flooding from groundwater.

4.2 Responses to flow chart questions

The following provides site specific responses to questions posed in figure 1 of CPG4

Question 1a	Is the site located directly above an aquifer?
Response.	The property is directly constructed above some 80m thickness of London Clays. It is therefore not located directly above an aquifer.
Question 1b	Will the proposed basement extend beneath the water table surface?
Response	As the London Clay comprises reasonably homogenous relatively impermeable clays, such soils do not contain groundwater and thus the proposed basement extension will not penetrate any water tables.
Question 2	Is the site within 100m of a watercourse, well or potential spring line?
Response.	The site is remote (in excess of 100m) of any known watercourses (including old water courses such as the Westbourne, Fleet and Tyburn). The geology of the area is not conducive to spring lines or wells for extraction of water.

Question 3	Is the site within the catchment of the pond chains on Hampstead Heath?
Response	The property is located about 2.2km to the south-west (and downslope) of the pond chain on Hampstead Heath and indicative flood mapping shown on the EA web site resulting from breach of the bond chain containment system indicates the property is remote from such a flood event.
Question 4	Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?
Response	The basement extension to the rear will be undertaken within the footprint of the existing single storey extension and therefore no significant change in the proportion of hard surfaced/paved areas will be created. The extension of the basement to the front of the building to allow the construction of lightwells will be undertaken within an existing area of hardstanding and again, there will be no additional change in the proportion of hard surfaced/paved areas.
Question 5	As part of the site drainage, will more surface water (e.g. rainfall and run off) than present be discharged to the ground (e.g. via soakaways/SUDS)?
Response	Proposals will not significantly change the proportion of soft landscaping and hardstanding/building cover. Rainwater falling onto the garden area will be disposed of using natural absorption and natural run off (which is currently the case). No additional surface water will be discharged to the ground.
Question 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?
Response	The site is remote (in excess of 100m) of any known watercourses or ponds. The geology of the area is not conducive to spring lines or retention of groundwater as a water table.

5 Stability impact identification

5.1 General overview.

The property is located towards the floor of the Thames valley to the north-west of central London. There are no significant changes in ground levels within or indeed within a considerable distance of the property.

No trees are to be felled as part of the development. The footprint of the proposed basement extension is outside root protection zones of trees which will remain in the northern part of gardens. The nearest tree is a Sycamore located 18m from the building.

Where the basement to the front of the property is to be lowered, proposals are to underpin the existing load bearing walls using the traditional "hit and miss" method. Lightwells will be constructed adjacent to the northern elevation of the property using reinforced concrete perimeter retaining walls. In addition, it is proposed to underpin (and provide a reinforced concrete retaining wall where necessary) an existing garden (boundary) wall to the west of the property to allow localised lowering of ground levels for pedestrian access to the lower ground floor in this area (refer section 4-4 on drawings in appendix A).

With regard to the rear extension to the property, it is proposed to use 1m deep traditional spread type foundations.

5.2 Responses to flow chart questions

The following provides site specific responses to questions posed in figure 2 of CPG4

Question 1	Does the existing site include slopes, natural or manmade greater than 7°(approximately 1 in 8)
Response.	The topography of the area is reasonably flat and there are no slopes in the general area greater than7°
Question 2	Will the proposed profiling of landscaping at the site change slopes at the property boundary to more than 7°?
Response	No. Proposals are to reinstate garden areas to their current topographical condition, with no slopes exceeding 7°
Question 3	Does the development neighbour land including railway cuttings and the like with slopes greater than 7°(approximately 1 in 8)?
Response.	No. The topography of the area is reasonably flat and there are no slopes in the general area greater than7°

Question 4	Is the site within a wider hillside setting in which the slope is greater than 7^{O}?
Response	The topography of the area is reasonably flat and there are no slopes in the general area greater than7^{o}
Question 5	Is the London Clay the shallowest strata at the site?
Response	The London Clay Formation is at crop at the site. Given the topography of the area (being reasonably flat) the consequence of the geology is not conducive to slope instability.
Question 6	Will any trees be felled as part of the development and/or are there any works proposed within any tree protection zones where trees are to be retained?
Response	No trees are to be felled as part of the development. The footprint of the proposed basement extensions is outside root protection zones of trees which will remain in the southern part of the gardens.
Question 7	Is there a history of any seasonal shrink swell subsidence in the local area and/or evidence of such effects on site?
Response	The London Clay Formation soils are shrinkable. We are not however aware of any evidence of damage attributable to subsidence either on the subject property or on adjacent properties.
Question 8	Is the site within 100m of a watercourse, well or potential spring line.
Response	No. The site is remote (in excess of 100m) of any known water courses (including old water courses such as the Westbourne, Fleet and Tyburn). The geology of the area is not conducive to spring lines or wells for extraction of water.
Question 9	Is the site within an area of previously worked ground?
Response	No. There is no evidence to indicate the site is within an area of previously worked ground.
Question 10	Is the site located above an aquifer? If so will the proposed basement extend beneath the water table such that dewatering may be required during construction?
Response	No. The property is directly constructed above some 80m thickness of London Clays. It is therefore not located directly above an aquifer. As the London Clays comprise reasonably homogenous relatively impermeable clays, such soils do not contain groundwater and thus the proposed basement extension will not penetrate any water tables.

Question 11	Is the site within 50m of Hampstead Heath ponds?
Response	No. The property is located about 2.2km to the south-west of the pond chain on Hampstead Heath.
Question 12	Is the site within 5m of a public highway or pedestrian right of way?
Response.	All but the lightwell works will be in excess of 5m from a public highway / footway. The extremity of the lightwell will be some 4m from the back of the public footway running along the southern edge of Cleve Road. Proposals will be to provide temporary steel sheet pile support to the excavation for construction of the lightwell. This will provide robust support to the sides of the exaction with minimal risk of affecting the public footway, highway and any services within the Cleve Road corridor. In addition the permanent lightwell structure will comprise a reinforced concrete 'box' thus providing a robust support structure to soils surrounding the lightwell. Any retaining structure in close proximity to the highway / pedestrian right of way will be submitted for approval to the local highway authority for approval prior to commencement of works.
Question 13	Will the proposed basement significantly increase the differential depth of foundations relative to adjacent properties?
Response	As proposals are to lower the lower ground floor of the existing basement by some 320mm, this will not generate any significant differential depth variations in foundations.
Question 14	Is the site over (or within the exclusion zone of) any tunnels eg Railway lines.
Response	Although we have not directly contacted London Underground, based on Figure 18 of the Camden geological, hydrogeological and hydrological study, the site is not located within 50m of an underground railway.

6 Surface flow and flooding impact identification

6.1 General overview.

Proposals will not significantly change the amount of hardstanding and soft landscaping on site as the extensions are located within an area of hardstanding and within the footprint of an existing extension to the property. Rainwater falling onto the proposed extension to the rear will collect in the current drainage system as is the case for the existing extension. No additional surface water will be discharged to the ground. On this basis surface water flows will not materially change as a result of the development.

6.2 Responses to flow chart questions

The following provides site specific responses to questions posed in figure 3 of CPG4

Question 1 Is the site within the catchment of the pond chains on Hampstead Heath?

Response. The property is located about 2.2km to the south-west (and downslope) of the pond chain on Hampstead Heath and thus is not within their catchment.

Question 2 As part of the site drainage, will surface water flows (e.g rainfall and run off) be materially changed from the existing route?

Response The proposed basement extension to the rear is within the footprint of an existing extension to the property (to be demolished) and the lightwells to the front of the property will be located within an area of existing hardstanding. Rainwater falling onto the proposed extension to the rear will collect in the current drainage system as is the case for the existing extension. No additional surface water will be discharged to the ground. On this basis surface water flows will not materially change as a result of the development.

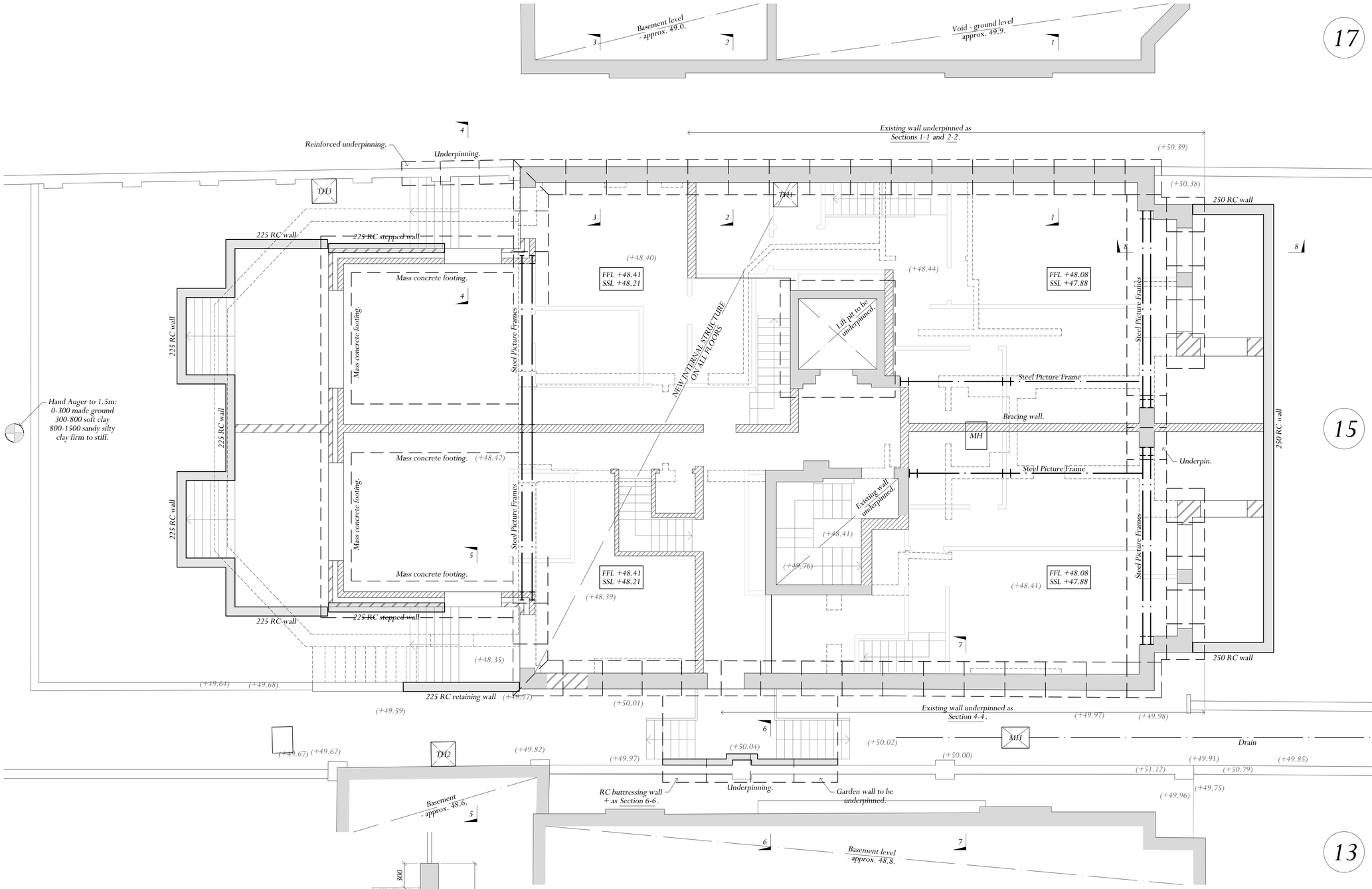
Question 3 Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?

Response. The basement extension to the rear will be constructed within the footprint of the existing single storey extension and therefore no significant change in the proportion of hard surfaced/paved areas will be created. The construction of lightwells to the front of the building will be undertaken within an existing area of hardstanding and again, there will be no additional change in the proportion of hard surfaced/paved areas.

Question 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 water courses?
Response	Proposals will not significantly change the areas of soft/hard landscaping existing on the site and thus the proposed extensions will have no impact on existing surface water flows.
Question 5	Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream water courses?
Response	Proposals will not significantly change the areas of soft/hard landscaping existing on the site and thus the proposed extensions will have no impact on the quality of surface waters.

Appendix A

Copy of Structural Engineer's drawings illustrating proposed basement works



NOTES:

1. This drawing to be read in conjunction with all relevant Architect's, Engineer's and Specialist's drawings and specifications.
2. Underpinning constructed in 1.0m wide sections in traditional hit and miss fashion to specifications.

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BY / DATE:	REVISIONS:	LETTER:

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ARCHITECT:
M R PARTERSHIP

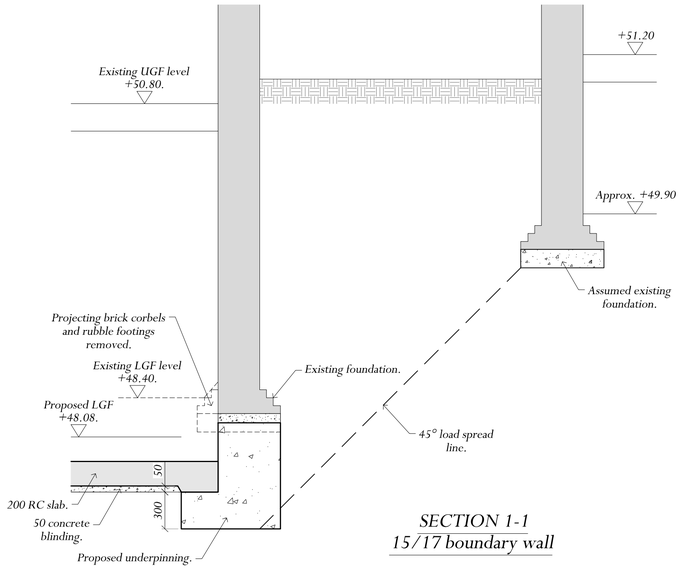
PROJECT:
15 CLEVE ROAD
NW6

TITLE:
PRELIMINARY SUBSTRUCTURE SCHEME
SHEET 1 OF 2

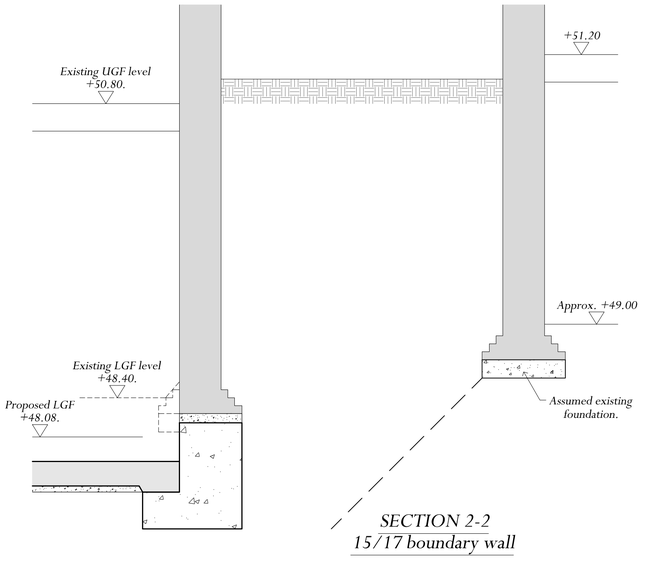
SCALES: *1:50, 1:25 @ A1*

BY:	CHECKED:
DATE: *Jan '13*	DATE:

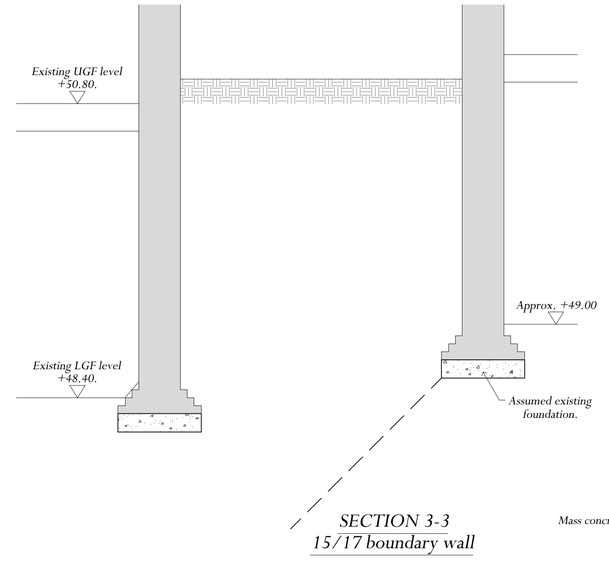
JOB No:	DRAWING No:	REVISION:
R9730	*1*	



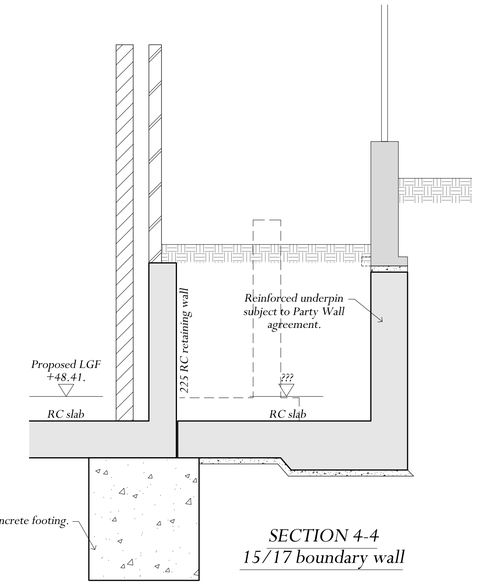
SECTION 1-1
15/17 boundary wall



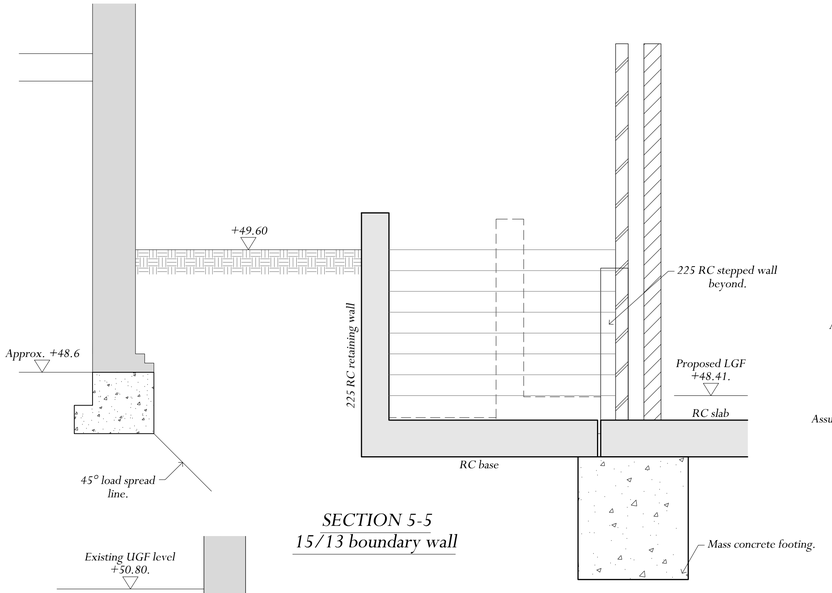
SECTION 2-2
15/17 boundary wall



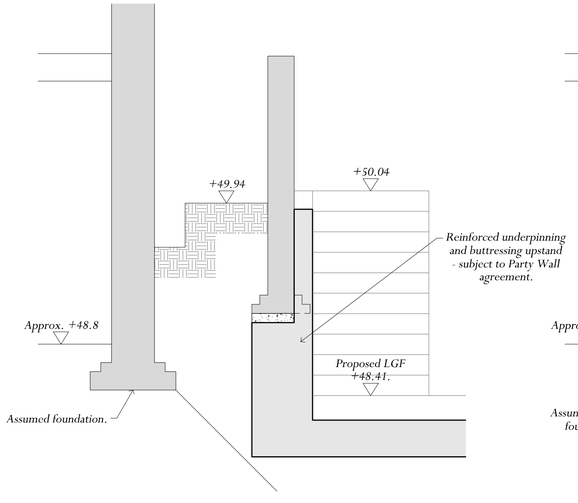
SECTION 3-3
15/17 boundary wall



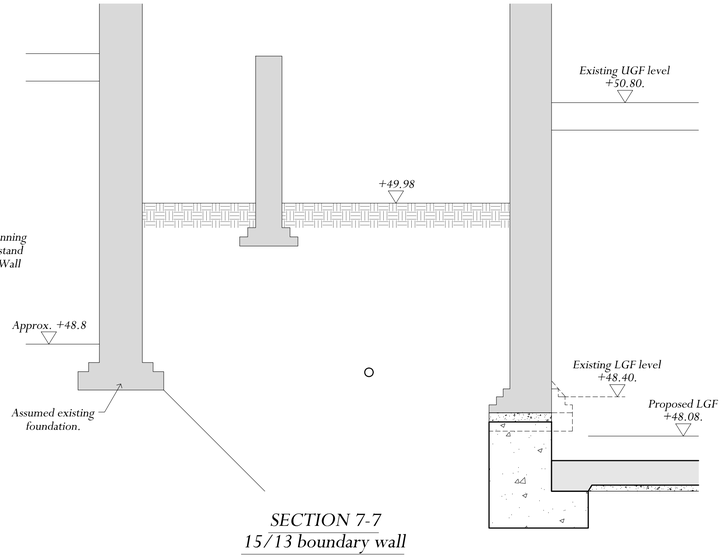
SECTION 4-4
15/17 boundary wall



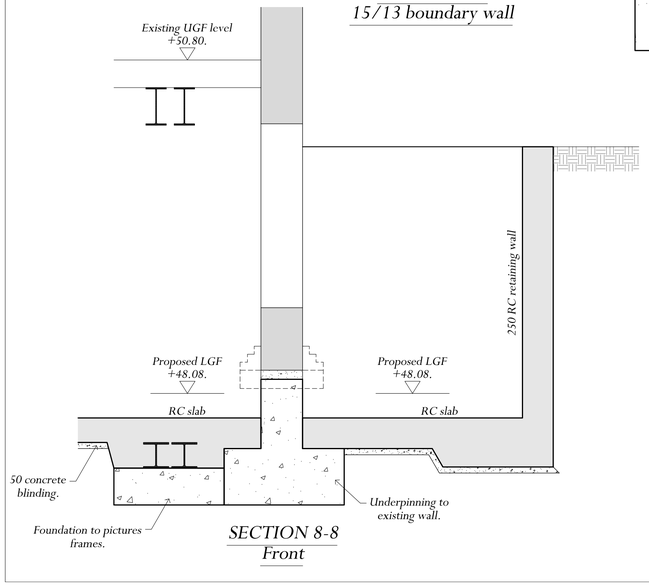
SECTION 5-5
15/13 boundary wall



SECTION 6-6
15/13 boundary wall



SECTION 7-7
15/13 boundary wall



SECTION 8-8
Front

NOTES:

1. For general notes see drawing R9730/1.

-	-	-
BY / DATE:	REVISIONS:	LETTER:

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ARCHITECT:
M R PARTERSHIP

PROJECT:
15 CLEVE ROAD
NW6

TITLE:
PRELIMINARY SUBSTRUCTURE SCHEME
SHEET 2 OF 2

SCALES: 1:50, 1:25 @ A1

BY: DW	CHECKED:
DATE: Jan '13	DATE:

JOB No:	DRAWING No:	REVISION:
R9730	2	