



Consulting Engineers



12 Provost Road, NW3 4ST  
Basement Impact Assessment Statement

A1338/20 July 2012

## Document Status and Signatures

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## **Basement Impact Assessment (BIA) Statement for 12 Provost Road, NW3 4ST**

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## 1.0 Introduction

- 1.1 CTP have been appointed by the owner of 12 Provost Road as their consulting Civil and Structural Engineers for the proposed refurbishment works of this semi-detached house, which is situated within the Eton Conservation area, within the Haverstock Ward in the London Borough of Camden (refer to appendix Fig. 1 for location plan).
- 1.2 The proposed alterations include the deepening of the existing basement beneath the property by approximately 500mm. Not creating an entire new basement. The outline proposals are shown on Paul McAnearly Architect's drawings PMA161/GA00 to GA12.
- 1.3 This BIA (Basement Impact Assessment) statement has been produced in accordance with Camden Council's guidelines set out within Development Policy 27 and the "Camden geological, hydrogeological and hydrological study – Guidance for subterranean development" produced by ARUP (November 2010).

## 2.0 Notes on Construction of the Deepened Basement

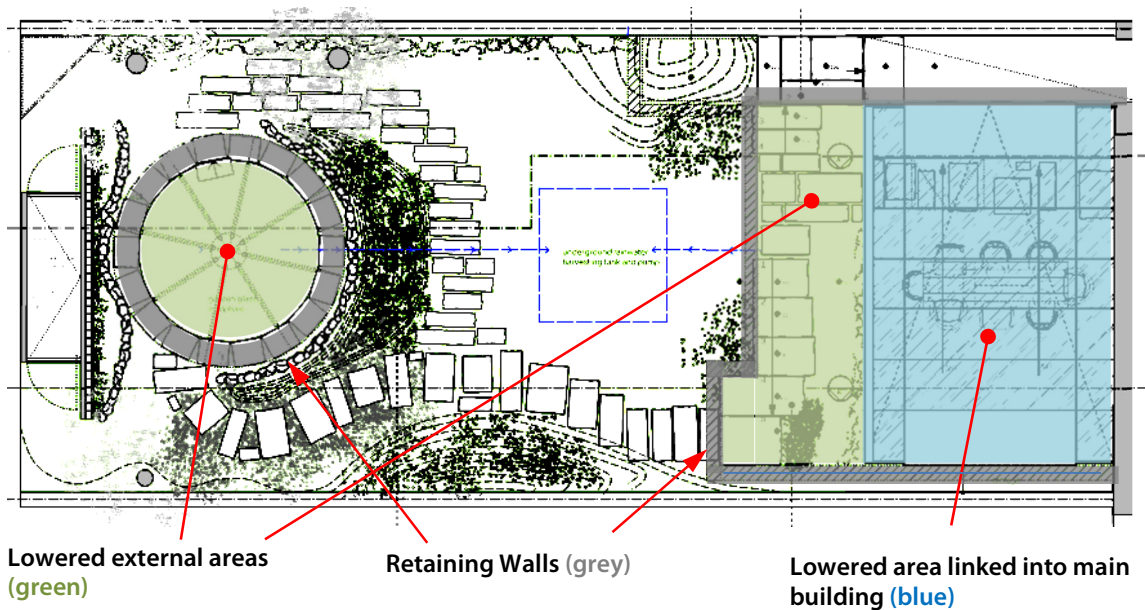
- 2.1 The existing basement has a headroom of approximately 2.3m. It is proposed to increase this depth by approximately 500mm to provide a new headroom of 2.8m.



### Lowered Basement (Sections NTS)

- 2.2 A site investigation has been carried out and confirmed that the existing corbel brick footings are approximately 400mm deep below the existing internal basement floor level. Therefore, it is proposed that mass concrete underpinning is used to lower the existing foundations.
- 2.3 To allow for safe working and redistribution of foundation loads, the depth of the proposed underpins will be approximately 800mm deep. These will be laterally restrained by a new RC basement slab. The lowered depth is not great enough to require the need for reinforced retaining walls, the building dead load and mass of the proposed new foundations will be sufficient.

- 2.4 In addition to the lowered internal basement, it is proposed to lower areas of the external garden / existing patio area. Part of the lowered patio area (where a glass conservatory is currently sited) will form part of the extended internal basement space – refer to plan below. These areas will be lowered to the same level as the lowered internal basement. The lowered areas are away from the existing garden walls and it is intended that they are created using reinforced concrete or reinforced masonry retaining walls.



**Lowered External Areas – Rear Garden Plan (Plan NTS)**

- 2.5 A geological site investigation has been carried out and confirmed that the geology beneath the building foundations is London Clay. Although there was a water strike in the shallow layer of silty clay top soil above the London Clay, no further water table was encountered in the 6.0 metre deep window sample boreholes.
- 2.6 A survey has confirmed that the existing underground drainage is above the proposed new lowered basement level. Therefore, all foul water generated within the internal basement area will be drained to a internal sealed sump and pumped up to the last manhole in the property boundary. The lowered external areas will be drained into a rainwater harvesting tank below the garden and excess water pumped back up to the last manhole.
- 2.7 Copies of the site investigation information and underground drainage survey are included in the appendix along with initial proposed structural drawings which show the proposed basement underpinning.

### 3.0 BIA Screening Process

This section provides the answers to the questions contained within the BIA Screening Process flowchart contained within Appendix E "of the "Camden geological, hydrogeological and hydrological study – Guidance for subterranean development"

#### 3.1 Surface Flow and Flooding

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

**No** – approx. 1.5 km south of nearest edge – see Appendix B (ARUP Fig. 14)

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

**No** – although a rainwater harvesting tank is being incorporated in the new scheme the total external hard surface area is approximately the same as the existing. Therefore, there will no change to the volume of rainfall and peak run-off.

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

**No** – although the hard landscaping layout has changed, the areas are approximately like for like.

**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 watercourses?

**No** – the proposed lowered basement and base of underpinned footings will be above the water table.

**Question 5:** Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?

**No** – no change of use, the basement is above the water table. External lowered hard landscaped areas will be drained back into the existing combined surface water sewer as per the existing drainage strategy.

**Question 6:** Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, 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** – see Appendix B (ARUP Figures 11, 12 & 15)

#### 3.2 Subterranean (Groundwater) Flow

**Question 1a:** Is the site located directly above an aquifer?

**No** – The site is located above the London Clay. See Appendix B (ARUP fig.8)

**Question 1b:** Will the proposed basement extend beneath the water table surface?

**No** – Refer to SI information in Appendix A.

**Question 2:** Is the site within 100m of a watercourse, well (used/disused) or potential spring line?

**No** – A site visit and walk around the local area was carried out in conjunction with a desk top study review of aerial photos, Ordnance Survey and British Geological Maps. No used/disused wells or potential springs were discovered (see appendix for further info). Also refer to appendix Fig. 11 and 11a.

**Question 3:** Is the site within the catchment of the pond chains on Hampstead Heath?

**No** – approx. 1.5 km south of nearest edge – see appendix (ARUP Fig. 14)

**Question 4:** Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?

**No** – although the hard landscaping layout has changed, the areas are approximately like for like. Refer to architects existing and proposed drawings.

**Question 5:** As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?

**No** – the external hard landscaping will discharge into the existing combined sewer as per existing.

**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.

**No** – no local ponds to site or water features (refer to appendix Fig. 12)

### 3.3 Land Stability

**Question 1:** Does the existing site include slopes, natural or manmade, greater than 7°? (approximately 1 in 8)

**No** – Refer to existing section in the Appendix B figures 16, 16a and 16b.

**Question 2:** Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°? (approximately 1 in 8)

**No** – Refer to proposed section in the Appendix B Figure 16c.

**Question 3:** Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°? (approximately 1 in 8)

**No** – refer to Appendix B figure 16. Also site visit and walkaround local area confirmed no neighbouring land slope is greater than 7°.

**Question 4:** Is the site within a wider hillside setting in which the general slope is greater than 7°? (approximately 1 in 8)

**No** – refer to 1:25,000 OS Map in the Appendix B Fig 16 and 16a.

**Question 5:** Is the London Clay the shallowest strata at the site?

**Yes** – Refer to section 4.1 for further response.

**Question 6:** Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained? (Note that consent is required from LB Camden to undertake work to any tree/s protected by a Tree Protection Order or to tree/s in a Conservation Area if the tree is over certain dimensions).

**Yes** – Refer to section 4.1 for further response.

**Question 7:** Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?

**No** – There are no obvious signs of subsidence in the local area. The age and type of the property mean that they have relatively shallow foundations compared with current NHBC guidance, however, in general the windows appear to be plumb and level on the property and adjacent properties. The properties in the street are rendered and all in a good level of maintenance, this may disguise any underlying signs of settlement.

**Question 8:** Is the site within 100m of a watercourse or a potential spring line?

**No** – A site visit and walk around the local area was carried out in conjunction with a desk top study review of aerial photos, Ordnance Survey and British Geological Maps. No used/disused wells or potential springs were discovered (see appendix for further info). Also refer to Fig. 11 & 11a in appendix B.

**Question 9:** Is the site within an area of previously worked ground?

**No** – a review of historic maps has revealed no former industrial type works on the site. Refer to historic maps in Appendix B – Figs 17a & 17b.

**Question 10:** Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?

**No** – See Appendix B (ARUP fig.8)

**Question 11:** Is the site within 50m of the Hampstead Heath ponds?

**No** – See Appendix B (ARUP figs. 12 & 14)

**Question 12:** Is the site within 5m of a highway or pedestrian right of way?

**No** – The front of the lowered basement is just over 5m from the edge of the footpath running in front of the building on Provost Road.

**Question 13:** Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?

**No** – The adjacent properties are of a similar age and type and therefore will have a similar depth of footings. The existing basement depth is only being lowered by approximately 500mm. This will therefore not lead to a significant differential depth of foundations to the neighbouring properties.



**Question 14:** Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?

**No** – the closest underground tunnel is approx. 200metres north-east (London Underground Northern Line). Refer to subterranean information plan in the appendix B Fig. 18.

#### 4.0 BIA Scoping Process

- 4.1 The following questions within the screening process were answered "Yes". Therefore please find below further responses to the further scoping process elements:

##### Section 3.3

**Question 5:** Is the London Clay the shallowest strata at the site? - **YES**

Potential impact noted in Appendix A - Table F3 of ARUP's Guidance for subterranean development:

*"London-Clay is the most prone to seasonal shrink-swell (subsidence & heave)"*

**Response:**

The underpinned foundations will extend approximately 1250mm below the external garden level. This is below the level where seasonal variation is considered to affect the moisture content of the clay and in accordance with influence depths stated in the for NHBC standards.

**Question 6:** Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained? (Note that consent is required from LB Camden to undertake work to any tree/s protected by a Tree Protection Order or to tree/s in a Conservation Area if the tree is over certain dimensions).

**YES** – two trees (one ash and one pear) are proposed to be removed from the rear garden. An Arboricultural Impact Assessment has been carried out by D F Clark Bionomique Ltd and copies of their relevant drawings are contained within the Appendix B Figs 19a & 19b.

Potential impact noted in Appendix A - Table F3 of ARUP's Guidance for subterranean development:

*"The soil moisture deficit associated with felled tree will gradually recover. In high plasticity clay soils (such as London Clay) this will lead to gradual swelling of the ground until it reaches a new value. This may reduce the soil strength which could affect the slope stability. Additionally the binding effect of tree roots can have a beneficial effect on stability and the loss of stab a tree may cause loss of stability."*

**Response:**

The underpinned foundations at the rear of the building will be approximately 1500mm below the ground level where the trees are currently sited. In accordance with NHBC regulations a minimum depth of footing of 1.0m is required. Refer Appendix B Figs. 20a and 20b. This has been conservatively based on the clay having a worst case high volume change (which is yet to be confirmed). The new footings will therefore be deeper than the required depth.

## **5.0 Conclusion**

This BIA (Basement Impact Assessment) statement provides answers to the Screening and appropriate Scoping Processes set out within the "Camden geological, hydrogeological and hydrological study – Guidance for subterranean development".

This document will be submitted in conjunction for Paul McAneary Architect's planning permission submission for consideration by Camden Council.

## Appendices

### Appendix A – Surveys and proposed structure

A1 – Proposed Structure  
A2 – Site Investigation  
A3 – Underground Drainage Survey

### Appendix B – documentation directly associated with BIA screening process questions

Fig. 1 – Camden Geological, Hydrogeological, and Hydrological Study – Camden Administrative Boundaries  
Fig. 3 – Camden Geological, Hydrogeological, and Hydrological Study – Camden Geological Map  
Fig. 8 – Camden Geological, Hydrogeological, and Hydrological Study – Camden Aquifer Designation Map  
Fig. 11 – Camden Geological, Hydrogeological, and Hydrological Study – Watercourses  
Fig. 11a – Arial Photo showing 100m site radius  
Fig. 12 – Camden Geological, Hydrogeological, and Hydrological Study – Camden Surface Water Features  
Fig.14 – Camden Geological, Hydrogeological, and Hydrological Study – Hampstead Heath Surface Water Catchments and Drainage  
Fig. 15 – Camden Geological, Hydrogeological, and Hydrological Study – Flood Map  
Fig. 16 – Camden Geological, Hydrogeological, and Hydrological Study – Slope Angle Map  
Fig. 16a – Ordnance Survey Map 1:25,000 – site contours  
Fig. 16b – Existing Site section showing site slope  
Fig. 16c – Proposed Site section showing site slope  
Fig. 17a – 1862 site map  
Fig. 17b – 1832 site map  
Fig. 18 – Subterranean Information  
Fig. 19a – Bionomique Ltd - Tree Protection plan showing proximity of trees  
Fig. 19b – Bionomique Ltd - Tree Survey Plan  
Fig. 20a – NHBC extract – Chapter 4.2 – Building Near Trees (1 of 2)  
Fig. 20b – NHBC extract – Chapter 4.2 – Building Near Trees (2 of 2)