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# 18 Lyndhurst Road, London, NW3.

# Basement Impact Assessment – Screening and Scoping Report.

**Ref:** 150369/TWL

**Date:** 19 May 2015

**Rev No:** Planning Rev A

## 1.0 INTRODUCTION

1.1 It is proposed to construct new two storey rear and side extensions to the lower ground and ground floors of this existing Victorian four storey end of terrace property. The size of these extensions is limited to 2m from the outer face of the walls and projects from the southern elevation into the rear garden across a lower stepped area, and infill an existing side projection up to the the boundary wall on the western elevation.

1.2 This report should be read in conjunction with the full set of Architect's Planning Status plans, sections and elevations.

1.3 This report is in response to The Camden Development Policy DP27' Basements and Light wells', with reference to para. 27.3., although the proposed extension does marginally increase the overall footprint, this is predominantly into existing lower level areas and is not more than 1 storey (3m) below ground level.

1.4 Following the format guidance in The Camden Planning Guidance PG4, the stages for a Basement Impact Assessment are:

- Stage 1 - Screening; •
- Stage 2 - Scoping; •
- Stage 3 - Site investigation and study;
- Stage 4 - Impact assessment; and
- Stage 5 - Review and decision making.

This report follows the Flow Charts in PG4 and uses the Figurative information given in the 'Camden Geological, Hydro-geological and Hydrological Study – Guidance for subterranean development' (Issue -1 November 2010, ARUP) to submit data with relevance to the scale of this project to address stages 1 and 2.

1.5 The Flowcharts are completed in table format in section 3 of this report and form the screening element of this report, including:

- Surface Flow and Flooding
- Subterranean (groundwater) Flow
- Slope Stability

1.6 18 Lyndhurst Road is located as shown with the arrows on the relevant Figures from the 'Camden Geological, Hydro-geological and Hydrological Study', appended to this report.

1.7 Again reflecting the size of the scheme, a brief scoping report is provided in section 4, to be commented upon by the London Borough of Camden Planning Department. It is intended that this will satisfy the requirement of DP27 in terms of consideration to the Geological, Hydro-geological and Hydrological effects of the development.

## 2.0 SITE INFORMATION

2.1 18 Lyndhurst Road is an early Victorian end of terrace property (build circa 1850) with four storeys including a lower ground floor /basement. This report relates to proposals for the flat occupying the lower two floors. The construction is typical for buildings of this period with load bearing brickwork masonry walls and timber floors.

2.2 18 Lyndhurst Road lies on the corner of Lyndhurst Road and Lyndhurst Gardens. Both roads fall away to the east and south respectively from the property and Lyndhust road continues to climb a short way to the west. There is a 400mm fall (approximately) from the frontage to the end of the rear garden where there is an existing double garage and a 3rd party electricity substation. There are no plans to change the existing levels in the rear garden or to the floors inside the building. The total plot size is 9m wide by 30m long (approximately).

2.3 The Neighbouring property (to the east) No.17 appears to be of similar construction and forms a twin semi detached arrangement with No. 18. To the west on the other side of the property lies a paved pedestrian footpath and roadway.

2.4 According to the London Borough of Camden's planning portal Nos 29-30 and 7 Lyndhurst road were both granted planning permission for basement modifications in 2011 and 2008 respectively.

2.5 Geological maps of the area show the site to be within the boundary where the upper stratum is Claygate Member, overlying deeper London Clay. This is further confirmed by record boreholes and trial pits, (as attached in the Appendix) which show clay directly under the Made Ground.

2.6 Recent boreholes taken as part of another separate private project at 39 Rosslyn Hill (not included for confidentiality reasons) confirm Claygate at approximately 0.7m and 0.8m below ground level (10.10m and 12.75m AOD respectively). No water ingress was noted in the exploratory holes and trial pits remained dry.

2.7 Further soils investigation is intended later as part of the main works to validate the abundant record data in this area and the design conclusions reached.

Reference to the Environment Agency maps, as well as the maps appended, locate the site away from the ground source protection zones , however just within a secondary aquifer as seen on the Environment Agency Map, below and Figure 8, appended. See Figs 1 & 2 below. It is noted the secondary aquifer relates to the solid bedrock geology.

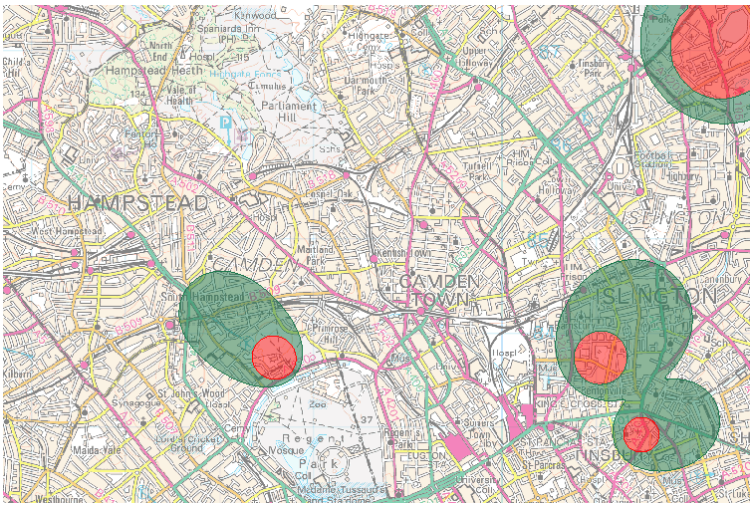


**FIG 1. GROUND SOURCE PROTECTION ZONES**

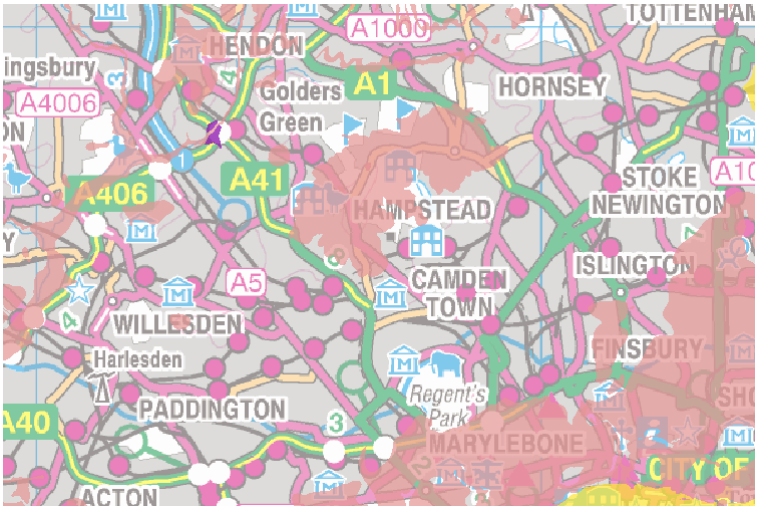


**FIG 2. AQUIFER MAP BEDROCK DESIGNATION – PINK IS SECONDARY 'A'**

## 3.0 RESPONSE TO BIA SCREENING FLOWCHARTS

Appendix E : Camden geological, hydrological and hydrology study: Guidance for subterranean development.

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| **3.1** | **Surface Flow and Flooding Impact Identification** | |
| 3.1.1 | **Is the site within the catchment of the pond chains on Hampstead Heath?** | No, refer to Figures 14 appended. |
| 3.1.2 | **As part of the site drainage, will surface water flows (e.g. rainfall and run-off) be materially changed from the existing one?** | Not significantly, the small extension to the lower ground and ground floor building envelope occurs predominantly within existing hard landscaping. The total area of hard landscaping is increasing however. |
| 3.1.3 | **Will the proposed basement development result in a change in the proportion of hard surface / paved external areas?** | Yes, an increase in paved area corresponds to a reduction of approximately 4m2 (7%) in permeable areas proposed to the rear garden. The basement extension itself does not significantly effect the impermeable area. See 3.1.2 above. |
| 3.1.4 | **Will the proposed basement development 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. A small increase in the peak flow will be addressed at source through SUDS techniques including on-site storage within the new below ground drainage works. |
| 3.1.5 | **Will the proposed basement development result in a change to the quality of surface water being received by adjacent properties or downstream watercourses?** | No change in water quality is expected. |
| 3.1.6 | **Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because** | No. According to Figure 15 the site lies outside the areas 'with the potential to be at risk from surface water flooding'. The site is at the higher end of Lyndhurst Gardens which according to records was a flooded street in 1975. |

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| | **the proposed basement is below the static water level of a nearby** | |

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| 3.2 | **Subterranean (groundwater) Flow Impact Identification** | |
| 3.2.1 | **Is the site located directly above an aquifer?** | Yes. The site is just within the Secondary A Aquifer, however this relates to the solid bedrock geology and not superficial deposits. Refer to Figure 8, Appended. |
| | ○ **Will the proposed basement extend beneath the water table surface?** | No – not expected, however the contractor is to validate this assumption and may need to allow for de-watering in the event of a locally perched water or high rainfall. |
| 3.2.2 | **Is the site within 100m of a watercourse, well (used/disused) or potential spring line?** | No, refer to Figure 11,appended |
| 3.2.3 | **Is the site within the catchment of the pond chains on Hampstead Heath?** | No, refer to Figure 14 appended |
| 3.2.4 | **Will the proposed basement development result in a change in the proportion of hard surface / paved areas?** | Yes, an increase in paved area corresponds to a reduction of approximately 4m2 (7%) in permeable areas proposed to the rear garden. The basement extension itself does not significantly effect the impermeable area |
| 3.2.5 | **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 soak-aways and/or SUDS)** | No, a small reduction in surface water will be discharged directly to the ground. |
| 3.2.6 | **Is the lowest point of the proposed excavation (allowing for any drainage and foundation source under the basement floor) close to, or lower than, the mean water level in any local pond or spring line? (not just the Hampstead ponds).** | No. From examining OS maps, the nearest pond is 600m from the site, to the bottom of Downshire Hill, which lies downhill of the site. From the ESG desk study report, the nearest recorded surface water features are a culvert 450m to the East and the Hampstead ponds 600m to the North East. |

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| 3.3 | **Slope Stability screening flowchart** | |
| 3.3.1 | **Does the existing site include slopes, natural or manmade, greater than 7 degrees (approx. 1 in 8)?** | Yes, the existing access to the lower ground floor includes steps and a short bank (of less than one storey height). |
| 3.3.2 | **Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees (approx. 1 in 8)?** | No, the slopes at the site boundaries are to remain the same. |
| 3.3.3 | **Does the development neighbour land, including railway cutting and the like, with a slope greater than 7 degrees (approx. 1 in 8)?** | No. The neighbouring house is a similar domestic dwelling (semi-detached) with identical floor and threshold levels with similar rear garden. To the west the street level does not vary significantly from that of the rear garden. |
| 3.3.4 | **Is the site within a wider hill setting in which the general slope is greater than 7 degrees (approx. 1 in 8)?** | No. The site lies on Lyndhurst Road which slopes down to the east (towards Rossilyn Hill) and up to the west (towards Fitzjohn's Avenue). The general longitudinal gradient of the road is significantly less (flatter) than 1 in 8. It is approximately 1 in 25. Lyndurst Gardens roadway also slopes down from the site (to the south), however at this location is less of gradient than Lyndhurst Road. |
| 3.3.5 | **Is the London Clay the shallowest strata at the site?** | No – according to the geological maps and long section, and investigation data, a thin band of Claygate member overlying the approx 100m thick London Clay stratum. The site lies just over this Claygate member as it thins out to London Clay. Refer to Fig 7 (note too small a scale to indicate an approximate location of the site). |
| 3.3.6 | **Will any tree/s be felled as part of the proposed development and/or any works proposed within any tree protection zones where trees are to be retained?** | Yes. Refer to the arboriculture (by Ashmore ref. ASH/PW/0428:15) report for response with regarding the felling of, and replacement to trees. |

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| 3.3.7 | **Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects on site?** | The Claygate Member bearing stratum has been recorded as having a high shrinkage potential. Although no evidence of movement has been reported to No 18 Lyndhurst Road the proposed foundations (retaining walls and base slab) will need to be designed to accommodate potential movement. |
| 3.3.8 | **Is the site within 100m of a watercourse or potential spring line?** | No, refer to Figure 11. |
| 3.3.9 | **Is the site within an area of previously worked ground?** | No. |
| 3.3.10 | **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?** | Yes. The site is over the Secondary A Aquifer. Refer to Figure 8, Appended. Encountering the water table above excavation depths is not expected, however the contractor is to validate this assumption and may need to allow for de-watering in the event of a locally perched water or high rainfall. |
| 3.3.11 | **Is the site within 50m of Hampstead Heath?** | No, the site is approximately 600m from Hampstead Heath, Refer to Figure 11 and other maps appended. |
| 3.3.12 | **Is the site within 5m of a Highway or pedestrian right of way?** | Yes. The site lies on a public street corner (Lyndhurst Road/Lyndhurst Gardens). |
| 3.3.13 | **Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.** | No. The proposed works include an extension to the existing basement at the same level. |
| 3.3.14 | **Is the site over (or within the exclusion zone of) any tunnels, e.g. railways lines?** | No. London Underground Northern Line running between Belsize Park and Hampstead runs below ground parallel to Eldon Grove approximately 45m to the east of the site. The London Overground running between Finchley Road & Frognal and |

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| | | Hampstead Heath runs below ground parallel to Lyndhurst Road approximately 70m to the north of the site. |

## 4.0 PROPOSED SCHEME SUMMARY - STRUCTURE

4.1 It is proposed to form a reinforced concrete box type extension to the existing basement.

4.2 To No 17 Lyndhurst Road (and the Lyndhurst Gardens footpath), the garden wall may be underpinned and supported during construction, with a new reinforced concrete retaining formed inside it. This will be propped by the existing ground floor structure, and cast off a new lower ground floor slab.

4.3 The retaining walls and basement slab will be designed to take into account ground water, assuming a worst case scenario of a water to the upper level (although this would be unlikely given the already steeped and sloped nature of the ground), and to accommodate/withstand heave from the removal of a depth of soil.

4.4 A Structural Method Statement for the basement will be developed and issued separately following the initial consultation on this report with the London Borough of Camden.

## 5.0 POTENTIAL METHOD STATEMENT

5.1 Within the design, there are forms of construction which require either a staged form of construction, such as underpinning or building in front of an existing garden wall, or / and temporary works to enable a continuous reinforced retaining wall to be formed.

5.2 What follows is a brief sequence which would appropriate for the variety of situations-boundary conditions – and how a contractor could approach the works. A final method statement will need to be provided by a contractor as it will be their responsibility to ensure the construction is formed as per the design without any detriment to surrounding structures or features. Refer also to the sections in the proposed structural scheme, Appendix B.

***5.3 Underpinning and forming a reinforced concrete retaining wall to the inside face.***

*5.3.1 Dig out section of soil below the garden wall, no longer than 1m wide, ensure flush face with rear of wall and suitable width of footing at base.*

*5.3.2 Pour concrete (with some reinforcement to the inside, if necessary), set, dry pack up to base of garden wall.*

*5.3.3 Prop 1m section of retaining wall back to shear blocks formed in dug out base. (to be left insitu).*

*5.3.4 Continue 5.3.1 to 5.3.3 in sequence to ensure no adjacent pins are undertaken after one another, and a minimum of two metres remains between any pins/gaps being worked on. Shear keys to be provided between pins.*

*5.3.5 Note to the rear elevation (within the garden where there is no adjacent wall) temporary trench sheeting may be used to retain the smaller height of retained soil. Otherwise items 5.3.6 onwards can be carried out as below.*

*5.3.6 Once fully propped & underpinned wall, set up reinforcement cage for base of retaining wall, cast with appropriate starter bars / kicker for remained for wall.*

*5.3.7 Form upright of retaining wall, with water bar in any joints. Remove props (left in situ or wall cast only in 1m sections) and make good any holes.*

*5.3.8 Cast reinforced concrete floor slab infill to act monolithically with the retaining wall bases. Hydrophilic strips/water bars to be used at construction joint locations.*

*5.3.9 NOTE. Throughout the structural works there will be a monitoring regime to check for any unexpected effects on adjacent construction. Adjacent construction includes No.17, public highway and the existing free standing garden wall. Any structural damage will be addressed immediately and measured according to the Burland Category.*

## 6.0 NEXT STEPS

6.1 The screening undertaken as observations in reply to the flowcharts in Section 3 highlights the following items that may impact on the design:

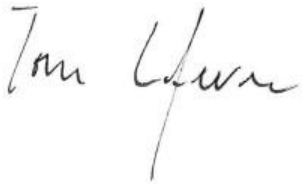
6.1.1 *Proportion of hard surfaces.* A reduction of approximately 4m2 in permeable areas proposed to the rear garden although corresponding to less than 10%, the drainage design will need to ensure that the peak discharge to the receiving sewer is not increased significantly.

6.1.2 *Ground water level and soil properties.* Although the nature of the likely bearing strata and effected soil is well understood in this area, further investigation as part of the main works will need to be carried out to validate assumptions.

6.1.3 *Felling of Trees.* Following on from 6.1.2 above (including the volume change potential of the subsoil), the detailed design of the basement will need to take into account of the potential of the soil to swell after removal of the existing trees. The classification of the trees is identified in the arboriculture report (by Ashmore).

6.2 In conclusion, it is considered that there are no significant negative impacts anticipated in this basement proposal due to hydro-geological, hydrological and geotechnical considerations of the local environment that cannot be suitably addressed in the detailed design stage. This is also in part due to relatively small scale of the intended works. It is reasonable, to expect that a competent contractor with experience in this type of construction will suitably address remaining issues in their final temporary works and construction methods statements.

6.3 It is proposed therefore that a full Basement Impact Assessment is not required as part of the planning application process for this project. A Structural Method Statement will be issued following agreement of this to the London Borough of Camden.



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