

Basement Impact Assessment for Basement and Associated Lightwells

23 Howitt Road, London, NW3 4LT
June 2013 – Ref 726g6

1. Introduction

Mulberry Slip Engineers (CEng MIEI) has been commissioned by Talk Architecture to provide a Basement Impact Assessment for the basement and associated lightwells.

The following report has been prepared in support of a planning application for the above works and its purpose is to assess the potential impacts that the proposed structure will have on the ground stability, hydrology and hydrogeology in the vicinity of the property. The purpose of a BIA is to enable the Council to 'assess whether any predicted damage to neighbouring properties and the water environment is acceptable or can be satisfactorily ameliorated by the developer.

The approach we have adopted for this limited Basement Impact Assessment follows the five stages recommended by the Camden Guidance documents (Arup 2010). The first four stages are undertaken by the developer and include: screening, scoping, site investigation and impact assessment. Information to assist with answering these screening questions has been obtained from various sources including the Camden geological, hydro geological and hydrological study (Arup, 2010) and historic maps.

The ground conditions encountered in the site investigations were broadly as expected from the geological records, topography and site history.

Stage 1 - Screening

The purpose of "screening" is to identify matters of concern that may require investigation.

In accordance with the guidance we have answered the series of flow chart questions that cover the three main issues:

- A. *Groundwater flow*
- B. *Land stability*
- C. *Surface flow and flooding*

A. Subterranean (groundwater) flow screening flowchart:

Question		Response, with justification of 'No' answers	Clauses where considered further
1a	Is the site located directly above an aquifer?	No	

1b	Will the proposed basement extend beneath the water table surface?	No	
2	Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	No	
3	Is the site within the catchment of the pond chains on Hampstead Heath?	No	
4	Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No, existing hard standing/paving to rear garden will be removed and replaced with a lawn/permeable landscaping.	
5	As part of the site drainage, will more surface water (e.g. rainfall and runoff) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No, this will be reduced see point above. All run-off water or less will discharge to the nearby public sewer as per current use.	
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	

B. Land stability screening flowchart:

Question		Response, with justification of 'No' answers	Clauses where considered further
1	Does the existing site include slopes, natural or manmade, greater than 7°?	No	
2	Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°?	No	
3	Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No	
4	Is the site within a wider hillside setting in which the general slope is greater than 7°?	No	
5	Is the London Clay the shallowest strata at the site?	No	
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).	No	
7	Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	No	
8	Is the site within 100m of a watercourse or a potential spring line?	No	
9	Is the site within an area of previously worked ground?	No	
10	Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that de-watering may be required during construction?	No	
11	Is the site within 50m of the Hampstead Heath ponds?	No	
12	Is the site within 5m of a highway or pedestrian right of way?	Yes	However given the small size of the frontage this is not seen as a concern.
13	Will the proposed basement significantly increase the differential depth of	Yes.	All the existing properties along

	foundations relative to neighbouring properties?		Howitt Road already have partial basement excavations dating back to when originally constructed. This differential depth of foundations is addressed within the structural design of the proposed basement.
14	Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No	

C. Surface flow and flooding screening flowchart:

Question		Response, with justification of 'No' answers	Clauses where considered further
1	Is the site within the catchment of the pond chains on Hampstead Heath?	No	
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	
3	Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	
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	
5	Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	

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	
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2 – Scoping:

All of the potential issues identified in the screening process have been investigated thoroughly. From the above screening, it can be seen that the questions giving a positive answer are the two within the slope stability section relating to the adjacent Highway and adjacent foundations. The screening shows that in relation to surface flow and flooding and groundwater flow the proposed basement poses no potential risks. The location of the basement is such that it is not within an area of geological, hydrogeological or hydrological concern and that the water table is below that of the basement excavation. The proposed development also reduces the overall impermeable area on the site and hence no change in the surface water runoff or flood risk from this cause.

Stage 3 – Site Investigation & Study:

- A. Groundwater flow:

As highlighted before there is no requirement to carry the scoping stage further regarding this point.

- B. Land stability:

An examination of the existing structure and the adjacent properties will take place before the works commence as part of the party wall inspections. This will provide a record of the current state of the structures. As the basement is close to the public highway a design loading surcharge pressure of 10kN/m² will be incorporated into the retaining wall design. All temporary works will be designed to limit any local movements that may impact on the existing highway. All works will be monitored for movement accordingly with all temporary works agreed prior to construction in accordance with Building Control requirements and approval. The proposed construction method for the basement takes full account of the structural transfer of loads and load bearing capacity of both the existing and proposed foundations. The use of underpinning procedures is to be utilised which as stated in the Camden study is a technique widely and successfully used. Careful construction planning will address the issue of temporary localised reduction in bearing pressure, although this will not be a significant issue in this case due to the nature of the clay soils already identified as being present.

At all stages of the temporary works; a detailed system of both vertical and lateral propping shall be installed to maintain stability in the interim period. The type of props and the loading requirements will be shown on the Construction drawings and

monitored by the Contractor throughout the construction period. Details of transferring the loading in the props to the new permanent works shall also be indicated on the structural drawings.

It is anticipated movements would not exceed 5mm, thereby within the 'Slight' category, namely:

"Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks are visible externally and some repointing may be required externally to ensure weathertightness. Doors and windows may stick slightly."

Trial pit investigations: Prior to commencement of construction; adequate trial pits will be carried out along the perimeter of the existing property to confirm the depth and extent of existing foundations.

- C. Surface flow and flooding:

Due to the presence of London Clay, which limits the presence of ground water, and the distances to the nearest open water course the risk of contamination of ground water or surface watercourses is considered to be 'low'. No signs of perched water levels for the site are evident but the Basement Construction will be designed accordingly based on the results of any further investigations. The introduction of a permeable landscape to the rear garden will improve the current condition and it is also suggested that a rainwater harvesting tank is connected to the single storey extension's roof. As highlighted before there is no requirement to carry the scoping stage further regarding this point.

Stage 4 – Impact Assessment

For all the above reasons we consider that the proposed planning application for the new structure pose negligible risk to the surrounding properties and further assessment is not required.