CampbellReith
consulting engineers

# 73-75 Avenue Road
# London NW8 6JD

## Basement Impact Assessment
## Audit

For

London Borough of Camden

Project Number: 12066-30

Rev: F1

December 2015

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## Document History and Status

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## Document Details

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## Contents



## Appendices

## 1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 73-75 Avenue Road, London NW8 6JD (planning reference 2015/1928/P). The basement is considered to fall within Category C as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and review it against an agreed audit check list.

1.4. It has been confirmed that the development site does not involve a listed building, nor is it in the neighbourhood of listed buildings.

1.5. The screening stage of the original BIA did not provide answers in respect to question 6 for subterranean water flow and question 4 for surface water flow. Revision C of the BIA contains adequate responses to all screening questions.

1.6. The BIA has confirmed that the proposed basement will be founded on the London Clay and that the surrounding slopes are stable.

1.7. It was reported that the River Tyburn may have formerly crossed the site, however no evidence was found during the ground investigations. Localised perched groundwater may be encountered in the Made Ground above the London Clay and this will need to be controlled to permit excavation of the basement.

1.8. The proposed basement will be excavated and constructed utilising a combination of bored piles to form the temporary excavation then permanent support transferred to reinforced concrete walls constructed within the line of the piles.

1.9. The risk of surface water flooding has been addressed in the Flood Risk Assessment and appropriate SUDS measures proposed.

1.10. A ground movement assessment has been presented to indicate that damage to the adjacent properties will be Burland Category 0 (negligible). Although the assumed length of the pile may be an under estimate, the level of damage to affected buildings should not exceed Category 1 on the Burland scale assuming good control of workmanship and that the buildings are in sound condition.

1.11. Detailed proposals for the temporary propping and calculations for the piled foundations are to be agreed with the party wall consultants.

1.12. It is accepted that the BIA has identified the potential impacts from the basement construction and proposes sufficient mitigation.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 8th July 2015 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 73-75 Avenue Road, Camden Reference 2015/1928/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment; and,

c) avoid cumulative impacts upon structural stability or the water environment in the local area.

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. LBC's Audit Instruction described the planning proposal as the "Demolition of existing building and pool house to provide two new detached single-family dwelling houses with 2x basement storeys, formation of new access and hard and soft landscaping."

The Audit Instruction also confirmed that the basement proposals did not involve a listed building nor does the site neighbour listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 25th August 2015 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Parts 1 to 7 and Appendices (Heyne Tillett Steel)
- Structural Method Statement Parts 1 to 7 and Appendices (Heyne Tillett Steel)
- Flood Risk Assessment (Heyne Tillet Steel)

- Structural Plans and Sections 1247/110 P3, 120 P3, 125 P3.

2.7. The BIA has been updated to revision C and accessed on the planning portal on 16/11/15. Additional ground movement data on the portal is superseded by xdisp 1 & 2 received direct from GEA by email dated 08/15/15.

## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are BIA Author(s) credentials satisfactory? | Yes | The authors of the BIA and the Ground Investigation report both have suitable credentials. The qualifications of the author of the FRA have been confirmed within the updated BIA. |
| Is data required by Cl.233 of the GSD presented? | Yes | BIA and SMS |
| Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology? | Yes | BIA Section 3. |
| Are suitable plan/maps included? | Yes | No drawing indicating basement on existing site survey is contained in original BIA or SMS, drawing 206 removed 07/12/15. |
| Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail? | Yes | BIA Appendix A |
| Land Stability Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | BIA Section 4.4 |
| Hydrogeology Screening: Groundwater<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | BIA Section 4.2<br>Q6 to be addressed in original BIA, now included in revision C. |
| Hydrology Screening: Surface<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | BIA Section 4.3<br>Q4 not included in original BIA, now included in revision C. |
| Is a conceptual model presented? | Yes | Ground model in Ground investigation report, BIA Appendix C |
| Land Stability Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | BIA Section 5.0 |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Hydrogeology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | BIA Section 5.0 |
| Hydrology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | BIA Section 5.0 |
| Is factual ground investigation data provided? | Yes | Ground investigation report, BIA Appendix C |
| Is monitoring data presented? | Yes | Ground investigation report, BIA Appendix C |
| Is the ground investigation informed by a desk study? | Yes | Desk study and ground investigation report, BIA Appendix C |
| Has a site walkover been undertaken? | Yes | Ground investigation report Appendix C |
| Is the presence/absence of adjacent or nearby basements confirmed? | Yes | No adjacent basements identified, assumed absent |
| Is a geotechnical interpretation presented? | Yes | Ground investigation report, BIA Appendix C |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | Ground investigation report Section 7.12 |
| Are reports on other investigations required by screening and scoping presented? | Yes | Arboriculture Impact, Flood Risk Assessment and River Tyburn investigation reports included |
| Are baseline conditions described, based on the GSD? | Yes | |
| Do the base line conditions consider adjacent or nearby basements? | No | No adjacent basements identified, assumed absent |
| Is an Impact Assessment provided? | Yes | BIA Section 7.0 |
| Are estimates of ground movement and structural impact presented? | Yes | Ground movement assessment in Structural Method Statement, Appendix F |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Is the Impact Assessment appropriate to the matters identified by screen and scoping? | Yes | BIA Section 7.0 |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | Yes | Measures to reduce and monitor ground movements are provided together with heave protection and SUDS |
| Has the need for monitoring during construction been considered? | Yes | Section 6.2 Ground Movement Assessment |
| Have the residual (after mitigation) impacts been clearly identified? | Yes | |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure been maintained? | Yes | BIA and SMS |
| Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment? | Yes | Flood Risk Assessment |
| Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area? | Yes | Structural Method Statement, Flood Risk Assessment and SUDS |
| Does report state that damage to surrounding buildings will be no worse than Burland Category 2? | Yes | Burland Category 0 noted in BIA |
| Are non-technical summaries provided? | Yes | |

## 4.0 DISCUSSION

4.1. The current scheme includes demolition of the existing property and detached swimming pool, and replacement with a large double storey basement circa 8m deep formed in the ground which is to be sub-divided into two dwellings by a reinforced concrete wall from lower basement to ground floor level. The form of construction is a propped bored pile contiguous wall to act as the temporary support and a reinforced concrete lining/permanent wall propped by the insitu concrete floor slabs at lower basement, basement and ground floor level.

4.2. The basement will be founded in London Clay as confirmed by two boreholes taken to a depth of 25.4m. Made ground was encountered above the London Clay to a depth of 0.9 to 2.3m, no water was encountered during the investigations however standpipe monitoring recorded groundwater at 7.7m in borehole 1. The water strike is anticipated to be from a pocket of perched water from local claystone but will require ongoing monitoring. It is also anticipated some local water may be encountered between the Made Ground and the London Clay that will need to be controlled through the construction phase.

4.3. The screening stage of the original BIA does not provide answers in respect to question 6 for subterranean water flow and question 4 for surface water flow. Revision C of the BIA has been updated to contain adequate responses to the questions noted above.

4.4. A separate investigation was commissioned to investigate the possibility of the River Tyburn passing under the site, however no evidence of the former river was found during the study.

4.5. Geotechnical Consultants GEA have carried out a ground movement assessment in respect to the adjacent properties at 38 Queen's Grove and 77 Avenue Road and the boundary wall. The full input and output data is provided as requested.

4.6. The depth of the piled wall is not indicated on the structural drawings nor is it given in the GEA report. The assumed pile length in the ground movement assessment is 8.50m which is around the depth of the excavation, however, this is considered incorrect as it is expected that the piles will extend to beyond the depth of the basement. The GMA indicates that any expected damage caused from ground movements can be expected to be negligible. Heave movements of up to 15mm has been indicated at the edge of the excavation, however, this has not been included in the damage assessment. Whilst the assumed pile length is not considered correct, the anticipated damage is not anticipated to exceed acceptable limits (Category 1) assuming good workmanship and that the buildings are in sound condition.

4.7. A proposal for monitoring of existing structures is included in the Structural Method Statement.

4.8. Flooding has previously been identified in 2002 caused by excessive rainfall blocking up the public sewer, and the areas of hard surfaced areas and surface water flow are affected by the current proposals. A flood risk assessment was carried out and SUDS design is proposed including attenuation and control of flow from the site into the existing public sewer system limiting flows to greenfield rates.

4.9. Final details of the temporary pile design and detailed temporary works proposals are not included in the documentation and need to be agreed with the party wall consultants. It is also noted that the width of the insitu reinforced concrete lining wall is unclear as either 350 or 400mm wide.

## 5.0 CONCLUSIONS

5.1. The BIA has been carried out by an established firm of Consulting Engineers, Heyne Tillett Steel, who have employed the services of Geotechnical & Environmental Associates Ltd to advise on geotechnical matters. These two reports have been produced and/or reviewed by individuals with suitable qualifications.

5.2. Basement construction is indicated as a temporary propped bored pile wall with permanent support provided in the form of a reinforced concrete retaining wall cast inside the line of the piles. The wall will be propped at the insitu floors and act as both permanent waterproofing.

5.3. The detailed design of the temporary works including struts, props and the piles are not contained in the BIA documentation. This is not critical for the audit but should be presented for review to the party wall consultants.

5.4. A ground movement assessment has been carried out by GEA this indicates wall movements of up to 10mm vertically and 15 to 20mm horizontal movement. Although the assumed length of the pile may be an under estimate, the level of damage to affected buildings should not exceed Category 1 on the Burland Scale assuming good control of workmanship and that the buildings are in sound condition.

5.5. The SMS contains proposals for monitoring any movement in nearby structures and these recommendations should be adopted.

5.6. The screening scope of the original BIA omits to answer question 6 for subterranean water flow and question 4 for surface water flow. The updated revision C of the BIA contains adequate responses to the screening.

5.7. The FRA contains recommendations to limit the surface water run off rates to greenfield rates in order to prevent surcharge to the existing public sewer.

5.8. Ground Investigation was carried out to try to identify whether the River Tyburn formerly crossed the site. No evidence was found. Limited groundwater strikes were observed indicating that these relate to discrete bodies of perched water. Groundwater ingress will have to be prevented during construction and GEA propose further groundwater monitoring to confirm the groundwater regime.

5.9. No site specific plan indicating the proposed works in relation to the existing boundaries and nearby structures was noted in the BIA, an updated site plan was received by email on 07/12/15.

5.10. It is accepted that the BIA has adequately identified the potential impacts from basement construction and proposes sufficient mitigation.

## Appendix 1: Residents' Consultation Comments

None

# Appendix 2: Audit Query Tracker

Audit Query Tracker

| Query No | Subject | Query | Status | Date closed out |
|---|---|---|---|---|
| 1 | Qualifications | Authors qualifications for FRA to be confirmed | Closed. CV for author received. | 16/11/15 |
| 2 | Screening | Not all screening questions are addressed | Closed. Updated screening register included in revised BIA. | 16/11/15 |
| 3 | Stability | Input and Output data for X-Disp and P-Disp required | Closed. Input and output sent by GEA via email | 15/12/15 |
| 4 | Site Plan | Site survey with proposed development required. | Closed. Site plan received – drawing 206 Rev B. | 16/11/15 |

# Appendix 3: Supplementary Supporting Documents

None

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