

**156 Goldhurst Terrace
London NW6 3HP**

**Basement Impact Assessment
Audit**

For
London Borough of Camden

Project Number: 12066-20
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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 156 Goldhurst Terrace, London NW6 3HP (planning reference 2014/6787/P). The basement is considered to fall within Category B 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. The qualifications of the authors of the BSMS and BIA (Surface Water and Groundwater) comply with the requirements of CPG4.
- 1.5. The proposed basement will generally be excavated in sequenced panels underpinning to form cantilever L-retaining walls. It should be demonstrated that ground movement and building damage can be restricted to acceptable limits without the use of temporary props. Furthermore the construction methodology should describe how 'hit and miss' underpinning can be achieved with the floor slab left in place, how a safe environment for man entry will be provided in potentially water bearing soils and how water will be excluded from the excavation.
- 1.6. The basement will be founded within Head Deposits overlying the London Clay and will not have a significant impact on groundwater flows. The BIA has shown that the surrounding slopes to the development are stable.
- 1.7. The BIA states that there is a low risk of surface water flooding and that the previous flooding events were associated with sewer flooding. Thames Water have confirmed that there have been no sewer related flooding events at the site. The BIA – Surface Water and Groundwater – states that the peak run off from the site will remain unchanged.
- 1.8. The revised BSMS contains a Ground Movement Assessment however, it is not clear how the building damage assessment has been carried out and the predicted category of damage derived. It is also not clear whether the effects of heave have been considered on the floor slab and neighbouring properties. Some damage to the neighbouring properties is anticipated and it is considered necessary to instigate a movement monitoring regime on the adjacent properties during construction.
- 1.9. A summary of the issues to be resolved is presented in Appendix 2.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 8th July 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 156 Goldhurst Terrace, Camden Reference 2014/6787/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. The planning proposal is for a 3.3m deep basement beneath a terraced building for domestic use.
- 2.6. It is not thought that the basement proposal involves a listed building or that the site neighbours listed buildings.
- 2.7. CampbellReith accessed LBC's Planning Portal on 8th July 2015 and gained access to the following relevant documents for audit purposes:

- Basement Construction Methodology by Croft Structural Engineers
- Thames Water sewer flooding enquiry
- Basement Impact Assessment – surface water and groundwater by ESI
- Ground Investigation Report by Ground and Water
- Drawings;
 - Existing site plan
 - Existing location plan
 - Existing basement plan
 - Existing ground floor plan
 - Existing section A-A
 - Existing section B-B
 - Proposed basement plan
 - Proposed ground floor plan
 - Proposed section A-A
 - Proposed section B-B.

2.8. A revision to the Basement Construction Methodology was uploaded to the planning portal in July 2015 (Rev 1), and a further revision in September 2015 (Rev 2). This second draft report considers the Rev 2 document, entitled Basement Structural Method Statement and dated 28.8.15. It also considers a review of the BIA documentation by Ground and Project Consultants Ltd.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|--|-----------|--|
| Are BIA Author(s) credentials satisfactory? | Yes | The authors of the BSMS and the ESI Ground and Water BIA reports are suitably qualified. |
| Is data required by Cl.233 of the GSD presented? | Yes | Basement Structural Method Statement. |
| Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology? | Yes | BSMS. |
| Are suitable plan/maps included? | Yes | BSMS and supplementary drawings. |
| Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail? | Yes | |
| Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers? | Yes | BSMS Section 2 and Ground and Project Consultants Ltd's review. |
| Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers? | Yes | BIA Surface Water and Groundwater Section 2. |
| Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers? | Yes | BIA Surface Water and Groundwater Section 2. |

| Item | Yes/No/NA | Comment |
|--|-----------|---|
| Is a conceptual model presented? | Yes | For flooding and groundwater: BIA Surface Water and Groundwater Section 4. For basement design: Basement Construction Methodology Appendix E. |
| Land Stability Scoping Provided? Is scoping consistent with screening outcome? | Yes | BSMS Section 4 and Ground and Project Consultants Ltd's review. |
| Hydrogeology Scoping Provided? Is scoping consistent with screening outcome? | Yes | BIA Surface Water and Groundwater Section 3. |
| Hydrology Scoping Provided? Is scoping consistent with screening outcome? | Yes | BIA Surface Water and Groundwater Section 3. |
| Is factual ground investigation data provided? | Yes | Ground investigation report (Appendix E of BSMS). |
| Is monitoring data presented? | Yes | Groundwater monitoring in the Ground Investigation report. |
| Is the ground investigation informed by a desk study? | Yes | |
| Has a site walkover been undertaken? | Yes | BSMS Section 5. Ground Investigation Report Section 3. |
| Is the presence/absence of adjacent or nearby basements confirmed? | No | |
| Is a geotechnical interpretation presented? | Yes | Ground investigation report. |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | Ground investigation report Section 6.5. |

| Item | Yes/No/NA | Comment |
|---|-----------|---|
| Are reports on other investigations required by screening and scoping presented? | Yes | BIA Surface water and groundwater. Thames Water Sewer Flooding enquiry. |
| Are baseline conditions described, based on the GSD? | Yes | |
| Do the base line conditions consider adjacent or nearby basements? | No | |
| Is an Impact Assessment provided? | Yes | BSMS Section 10 for land stability and subterranean flow. BIA Surface and Groundwater section 5 for subterranean and surface water. |
| Are estimates of ground movement and structural impact presented? | Yes | Not considered to be complete. Refer to audit report section 4. |
| Is the Impact Assessment appropriate to the matters identified by screen and scoping? | Yes | |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | No | Suggested methodology contains no proposals for excluding water from excavation. |
| Has the need for monitoring during construction been considered? | Yes | BSMS Section 10. |
| Have the residual (after mitigation) impacts been clearly identified? | Yes | Potential groundwater inflow in to the excavations for underpinning. |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure been maintained? | No | |

| Item | Yes/No/NA | Comment |
|---|-----------|---|
| Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment? | Yes | |
| Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area? | No | Not demonstrated |
| Does report state that damage to surrounding buildings will be no worse than Burland Category 2? | Yes | Not considered to be complete. Refer to audit report Section 4. |
| Are non-technical summaries provided? | Yes | |

4.0 DISCUSSION

- 4.1. The BIA has been carried out by Croft Structural Engineers; the author's details and qualifications are not provided. A further BIA considering hydrogeology and hydrology has been prepared by specialists with suitable qualifications.
- 4.2. The BIA appears to be contradictory stating that the basement will be within London Clay and also stating that the basement will be within the Claygate Beds. With reference to the ground investigation report it is acknowledged that the basement will be founded within Head Deposits overlying the London Clay.
- 4.3. Other discrepancies existing in the BSMS too such as the address being given as Pandora Road in Section 1 and reference to repeat visits to monitor groundwater not encountering any water (Section 1). Only one monitoring visit is recorded and groundwater was encountered at approximately 2m depth.
- 4.4. It is accepted that the groundwater detected during monitoring may represent a perched groundwater table. Suitable mitigation measures should be implemented if groundwater ingress is encountered and these should be detailed in the suggested construction methodology. No reference has been made to nearby basements, however, in the absence of significant groundwater flows, the assumption of the absence of basements is conservative.
- 4.5. The BIA has shown that the surrounding slopes to the development are stable and the basement structure will be sufficiently remote from existing trees to be unaffected by shrink-swell. However, the BSMS makes reference to evidence of subsidence at the front of the property. This should be considered in any building damage assessment together with the condition of neighbouring properties.
- 4.6. The BIA includes an assessment of whether the development is likely to be affected by surface water flooding, given that the area was previously flooded in 1975 and 2002. The BIA states that there is a low risk of surface water flooding and that the previous flooding events were associated with sewer flooding. Thames Water have confirmed that there have been no sewer related flooding events at the site. The flooding risk is accepted as being low.
- 4.7. The proposed basement will generally be excavated in sequenced underpinning panels to a depth of 3m to form L- shaped retaining walls. Section 10 of the BIA notes that wall deflections are presented in Appendix C but these have not been located. A ground movement assessment has been provided in Appendix F, however it is not possible to confirm the damage category that has been derived because the calculations are either incomplete or not clearly laid out. Reference should be made to the methodology described in CIRIA C580 for determining vertical and horizontal strain in neighbouring properties.

- 4.8. In addition to the building damage assessment being unclear, it is not possible to determine whether heave on the underside of the slab has been considered. Some damage to the neighbouring properties is anticipated and it is considered necessary to instigate a movement monitoring regime on the adjacent properties during construction.
- 4.9. The construction methodology refers to the floor slab being left in place. It is not clear how 'hit and miss' underpinning can be achieved without excavating in front of as yet unconstructed underpins. There are also implications for health and safety with man entry into excavations in potentially water bearing soils.

5.0 CONCLUSIONS

- 5.1. The qualifications of the authors of the BSMS and BIA (Surface Water and Groundwater) comply with the requirements of CPG4.
- 5.2. The proposed basement will generally be excavated in sequenced panels underpinning to form cantilever L-retaining walls. It should be demonstrated that ground movement and building damage can be restricted to acceptable limits without the use of temporary props. Furthermore the construction methodology should describe how 'hit and miss' underpinning can be achieved with the floor slab left in place, how a safe environment for man entry will be provided in potentially water bearing soils and how water will be excluded from the excavation.
- 5.3. The basement will be founded within Head Deposits overlying the London Clay and will not have a significant impact on groundwater flows. The BIA has shown that the surrounding slopes to the development are stable.
- 5.4. The BIA states that there is a low risk of surface water flooding and that the previous flooding events were associated with sewer flooding. Thames Water have confirmed that there have been no sewer related flooding events at the site. The BIA – Surface Water and Groundwater – states that the peak run off from the site will remain unchanged.
- 5.5. The revised BSMS contains a Ground Movement Assessment, however it is not clear how the building damage assessment has been carried out and the predicted category of damage derived. It is also not clear whether the effects of heave have been considered on the floor slab and neighbouring properties. Some damage to the neighbouring properties is anticipated and it is considered necessary to instigate a movement monitoring regime on the adjacent properties during construction.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

| Surname | Address | Date | Issue raised | Response |
|---------|---------------------|----------|------------------|--|
| Papp | 26 Aberdare Gardens | 20/01/15 | Risk of flooding | See BIA Surface and Groundwater report and Thames Water response which conclude there is a low risk of surface water flooding. |
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Appendix 2: Audit Query Tracker

Audit Query Tracker

| Query No | Subject | Query | Status | Date closed out |
|----------|------------------|--|---|-----------------|
| 1 | BIA requirements | There are numerous contradictions in the BSMS. | To be resolved in the revised BSMS. | |
| 2 | Stability | Ground movement and building damage assessment not clear and cannot be verified. | To be updated and provided in revised BSMS. | |
| 3 | Stability | Construction methodology to be expanded to include water exclusion from excavation, how 'hit and miss' underpinning will be achieved while ground floor remains in place and how a safe working environment will be provided in potentially water bearing soils. | To be provided. | |

Appendix 3: Supplementary Supporting Documents

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