

193 Leighton Road
London, NW5 2RD

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 12336-76
Revision: D1

July 2016

Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
London
SE1 8NZ

T: +44 (0)20 7340 1700
F: +44 (0)20 7340 1777
E: london@campbellreith.com
W: www.campbellreith.com

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| Author | F Drammeh, MEng (Hons) |
| Project Partner | E M Brown, BSc MSc CGeol FGS |
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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 193 Leighton Road, NW5 2RD (Camden Planning reference 2016/2175/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 reviewed it against an agreed audit check list.
- 1.4. The BIA was undertaken by Geotechnical & Environmental Associates (GEA) and the individuals involved have suitable qualifications.
- 1.5. The proposal is for the demolition of the existing garage and the construction of a two storey extension, which is indicated to have planning permission, over a basement.
- 1.6. A construction sequence is not included in the text for the proposed underpinning and this is requested. An underpinning bay sequence drawing and sketches to indicate each stage of the excavation and construction including any temporary propping are also requested. Details on how the remaining walls are to be formed are requested.
- 1.7. No site specific ground investigation has been undertaken to determine the sequence and depth of strata and the groundwater level. It is not accepted as suggested in the BIA that this may be dealt with as part of a conditional planning consent and it is requested that a ground investigation with groundwater monitoring is undertaken.
- 1.8. The presence or absence of basements beneath the neighbouring properties has not been confirmed and this is requested. The foundation depths have been assumed and unless this information is forthcoming, the greatest differential depth should be presumed.
- 1.9. The response to Question 1b of the Hydrogeology screening ignores the potential for perched water to exist within the Made Ground which may require mitigation measures such as dewatering during construction.
- 1.10. The screening exercise did not identify that the site is in an area which flooded previously. The BIA should be updated to consider this potential impact.
- 1.11. Contradictory information is given on the distance to the roadway and clarification is requested.

- 1.12. It is requested that the anticipated movements (vertical and horizontal movements from the excavation and construction of the retaining walls and heave movements from the excavation) be clearly indicated with predicted damage categories for the neighbouring properties included.
- 1.13. An outline monitoring proposal has not been provided and this is requested. Details and trigger levels may be agreed as part of the Party Wall award.
- 1.14. A works programme is not included and this is requested.
- 1.15. It is accepted that there are no slope stability concerns regarding the proposed development.
- 1.16. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 27 June 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 193 Leighton Road, NW5 2RD (Camden Planning reference 2016/2175/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;
 - 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 "*Construction of basement underneath the side extension.*"
- 2.6. The Audit Instruction also confirmed 193 Leighton Road is not listed, nor is it a neighbour to a listed building.
- 2.7. CampbellReith accessed LBC's Planning Portal on 8 July 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA): Geotechnical & Environmental Associates (GEA) dated April 2016
- Design and Access statement: undated
- Sam Stork Associates Planning Application Drawings consisting of
 - Location Plan
 - Existing Plans
 - Proposed Plans
 - Existing Sections
 - Proposed Sections
 - Existing Elevations
 - Proposed Elevations

2.8. Consultation comments were forwarded to CampbellReith by the Planning Officer. Four out of these are pertinent to the BIA and are addressed in Appendix 1.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|--|-----------|--|
| Are BIA Author(s) credentials satisfactory? | Yes | See Audit paragraph 4.1. |
| Is data required by Cl.233 of the GSD presented? | No | Proposal not sufficiently detailed and works programme not included (see Audit paragraph 4.3). |
| Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology? | No | Proposal not sufficiently detailed (see Audit paragraph 4.3). |
| Are suitable plan/maps included? | No | Scheme drawings provided but inadequate. Arup GSD map extracts not included (see Audit paragraph 4.4). |
| Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail? | No | As above. |
| Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers? | No | Relevant Arup GSD map extracts referenced but not included (see Audit paragraph 4.4). |
| Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers? | No | Justification not given for all the 'No' answers and relevant Arup GSD map extracts not referenced or included (see Audit paragraph 4.4). |
| Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers? | No | Relevant Arup GSD maps, EA and Camden SFRA maps referenced but not included. Response to Q6 is incorrect (see Audit paragraphs 4.4 and 4.6). |
| Is a conceptual model presented? | No | Sequence and depth of anticipated strata from a site located at c.50m away, however, depths could vary significantly on site. Groundwater level not established (see Audit paragraph 4.7). |

| Item | Yes/No/NA | Comment |
|--|-----------|--|
| Land Stability Scoping Provided? Is scoping consistent with screening outcome? | No | Provided however contradictory information is given on the distance to the highway (see Audit paragraph 4.9). |
| Hydrogeology Scoping Provided? Is scoping consistent with screening outcome? | N/A | No issues identified. |
| Hydrology Scoping Provided? Is scoping consistent with screening outcome? | No | No issues identified although one issue should have been carried forward from the screening. |
| Is factual ground investigation data provided? | No | Site specific ground investigation not undertaken (see Audit paragraph 4.7). |
| Is monitoring data presented? | No | As above. |
| Is the ground investigation informed by a desk study? | N/A | Desk study information included in BIA, however, ground investigation not undertaken. |
| Has a site walkover been undertaken? | No | No reference to a site walkover. |
| Is the presence/absence of adjacent or nearby basements confirmed? | No | States in Section 4.1 of the BIA that no information was available. |
| Is a geotechnical interpretation presented? | N/A | Ground investigation not undertaken. |
| Does the geotechnical interpretation include information on retaining wall design? | N/A | Ground investigation not undertaken. |
| Are reports on other investigations required by screening and scoping presented? | No | Scoping indicates a ground investigation and a ground movement assessment likely to be required but states this could be provided as part of a planning condition (see Audit paragraphs 4.7 and 4.12). |
| Are the baseline conditions described, based on the GSD? | No | Incomplete as ground investigation not undertaken and presence of basements beneath the neighbouring properties not confirmed. |

| Item | Yes/No/NA | Comment |
|--|-----------|---|
| Do the base line conditions consider adjacent or nearby basements? | Yes | Considered but presence or absence not confirmed. |
| Is an Impact Assessment provided? | No | Not provided in accordance with Arup GSD, however, some potential impacts discussed within the scoping. |
| Are estimates of ground movement and structural impact presented? | No | Incomplete. Stated in scoping section however it is unclear if these are vertical or horizontal movements and heave movements from excavation not indicated (see Audit paragraphs 4.9 to 4.11). |
| Is the Impact Assessment appropriate to the matters identified by the screening and scoping? | N/A | Not undertaken. |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | No | Only in relation to limiting impacts on the roadway. |
| Has the need for monitoring during construction been considered? | No | Not considered . |
| Have the residual (after mitigation) impacts been clearly identified? | N/A | Not possible to determine if these are required or not. |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained? | No | Ground investigation not undertaken and proposal not sufficiently detailed (see Audit paragraph 4.10 to 4.12) |
| 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 | Structural stability not demonstrated. |
| Does report state that damage to surrounding buildings will be no worse than Burland Category 2? | No | Although it is stated in Section 4.1 of the BIA that ' <i>movements likely to fall within acceptable limits as defined by CPG4</i> ' based on experience (see Audit paragraph 4.12) |

| Item | Yes/No/NA | Comment |
|---------------------------------------|-----------|--------------|
| Are non-technical summaries provided? | No | Not provided |

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Geotechnical & Environmental Associates (GEA) and the individuals concerned in its production have CEng MICE, CGeol FGS and CEnv CWEM qualifications.
- 4.2. The site comprises a two storey semi-detached building with a single storey garage to the rear of the front driveway in the northeastern corner of the site. The proposal is for the demolition of the existing garage and the construction of a two storey extension over a basement. It is indicated in the Design and Access statement and Architects' drawings that a planning permission has already been obtained for the extension and the current application is for the inclusion of a basement beneath this extension.
- 4.3. The basement is indicated to be constructed by mass concrete underpinning to a depth of about 3m, however, there is no construction sequence in the text. An underpinning bay sequence is not presented nor are there sketches to indicate each stage of the construction including any temporary propping. Additionally, the remaining walls to the basement other than the flank wall to the house cannot be underpinned and will need to have some other form of retaining wall.
- 4.4. Although it is evident that a thorough screening process has been undertaken, it would be beneficial if the relevant map extracts from the Arup GSD and Camden Strategic Flood Risk Management Assessment identifying the site location on each map are included. These extracts would help to support statements made in the BIA screening process. Additionally, justification or reference to the Arup GSD data was not given for two of the 'No' responses to the Hydrogeology screening questions.
- 4.5. A 'No' response is given to Question 1b of the Hydrogeology screening which relates to whether or not the basement will extend beneath the water table. Whilst it is accepted that the London Clay is an unproductive stratum, the justification ignores the potential for perched water to exist within the Made Ground which may require mitigation measures such as dewatering during construction.
- 4.6. A 'No' response is given to Question 6 of the Hydrology screening which relates to whether or not the site is in an area at risk from flooding. The justification includes a reference to Figure 3ii of the Camden SFRA, however, this figure shows that Leighton Road flooded in 1975 and this is also indicated on Figure 15 of the Arup GSD.
- 4.7. The sequence of strata presented has been established from a previous investigation undertaken by GEA at c.50m away. Made Ground was encountered to a maximum depth of 1m bgl underlain by London Clay. It is stated in Section 4.1 of the BIA that a ground investigation is

required, however, *'this could be dealt with by way of a conditional planning consent'*. It is considered that a suitable ground investigation establishing the sequence and depth of strata and groundwater levels is required to establish the potential impacts arising out of the basement proposals and allow appropriate mitigation to be proposed.

- 4.8. The presence or absence of basements beneath the neighbouring properties has not been confirmed. It is stated in Section 4.1 that no information was available at the time of writing of the report and it is assumed basements are not present with the likely foundation depths assumed.
- 4.9. The table within Section 4.1 of the BIA indicates that the proposed basement is over 5m away from the roadway, however, it is stated in another part of the report that the excavation will extend to within 5m of the pathways and highways. Whilst this is contradictory, the BIA recommends that a retention system needs to be adopted to maintain the stability of the excavation throughout.
- 4.10. It is stated in the Design and Access statement that the basement will have minimal impact on the house or on its neighbours, however, no supporting information is included or referenced.
- 4.11. Section 4.1 of the BIA states that *'ground movements should typically remain within the range of 2 to 5mm following completion of the works and provided that they are installed by a reputable and experienced contractor'*. It is unclear if these relate to vertical or horizontal movements. Anticipated damage categories for the neighbouring properties are not given although it is stated that *'a basement the size of that proposed is likely to result in movements that fall within acceptable limits as defined by CPG4'*. It is further stated that a ground investigation and ground movement assessment is likely to be required to confirm this assumption *'although it may be that this could be dealt with by way of conditional planning consent'*.
- 4.12. Movement resulting from underpinning is largely due to workmanship and whilst it may be possible to limit damage to Category 1 provided the works are properly controlled and the affected structures are in sound condition, stability of the neighbouring properties and infrastructure still needs to be demonstrated by indicating anticipated movements (vertical and horizontal movements from the underpinning and heave movements from the excavation) and anticipated damage category for the neighbouring properties. This is an integral part of the impact assessment and needs to be completed at this stage.
- 4.13. The BIA does consider movement monitoring of the neighbouring properties.
- 4.14. A works programme has not been submitted as required by Cl.233 of the GSD.

- 4.15. It is stated in the BIA that there will be no increase in impermeable area therefore the surface water flow regime and volume will be unchanged.
- 4.16. It is accepted that there are no slope stability concerns regarding the proposed development.

5.0 CONCLUSIONS

- 5.1. The BIA was undertaken by Geotechnical & Environmental Associates (GEA) and the individuals involved have suitable qualifications.
- 5.2. The proposal is for the demolition of the existing garage and the construction of a two storey extension, which is indicated to have planning permission, over a basement.
- 5.3. A construction sequence is not included in the text for the proposed underpinning and this is requested. An underpinning bay sequence and sketches to indicate each stage of the construction including any temporary propping are also requested. Details on how the remaining walls are to be formed are requested.
- 5.4. No site specific ground investigation has been undertaken to determine the sequence and depth of strata and the groundwater level. It is not accepted as suggested in the BIA that this may be dealt with as part of a conditional planning consent and it is requested that a ground investigation with groundwater monitoring is undertaken.
- 5.5. The presence or absence of basements beneath the neighbouring properties has not been confirmed and this is requested. The foundation depths have been assumed and unless this information is forthcoming, the greatest differential depth should be presumed.
- 5.6. The response to Question 1b of the Hydrogeology screening ignores the potential for perched water to exist within the Made Ground which may require mitigation measures such as dewatering during construction.
- 5.7. The screening exercise did not identify that the site is in an area which previously flooded. The BIA should be updated to consider this potential impact.
- 5.8. Contradictory information is given on the distance to the roadway and clarification is requested.
- 5.9. It is requested that the anticipated movements (vertical and horizontal movements from the excavation and construction of the retaining walls and heave movements from the excavation) be clearly indicated with predicted damage categories for the neighbouring properties included.
- 5.10. An outline monitoring proposal has not been provided and this is requested. Details and trigger levels may be agreed as part of the Party Wall award.
- 5.11. A works programme is not included and this is requested.
- 5.12. It is accepted that there are no slope stability concerns regarding the proposed development.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

| Surname | Address | Date | Issue raised | Response |
|---------------------------------------|------------------------------------|----------|--|--|
| Shaw | 57 Brecknock Road N7 0BX | undated | <p>Damage to trees within garden which is adjacent to rear of 193 Leighton Road</p> <p>Concerns about water table</p> <p>Drainage and sewage and concerns about flooding</p> | <p>BIA Section 3.1.2 states proposed basement depth will be beyond zone which trees could be affected.</p> <p>Site underlain by London Clay which is an unproductive stratum, however, ground investigation requested with groundwater monitoring to establish depth of any perched water (see Audit paragraphs 5.4 and 5.6)</p> <p>See Audit paragraphs 4.15 and 4.16</p> |
| Tucker (owners of 55B Brecknock Road) | 107 Gillespie Road N5 1LR | 21/06/16 | Queries Design and Access statement conclusion that proposal will have no impact on the neighbouring properties. | See Audit paragraphs 4.10 to 4.12 |
| Walker | 55A Brecknock Road Tufnell Park | 20/06/16 | No ground investigation or ground movement assessment to determine impacts on neighbouring properties. | See Audit paragraphs 4.7 and 4.12 |
| Corbello | 55D Brecknock Place | 22/06/16 | Assurance through risk assessments to ensure construction will not cause damage to neighbouring properties. | See Audit paragraphs 4.10 to 4.12 |

Appendix 2: Audit Query Tracker

Audit Query Tracker

| Query No | Subject | Query | Status | Date closed out |
|----------|---------------------------------------|---|---|-----------------|
| 1 | BIA format | Works programme not included. | Open – Outline programme to be provided. | |
| 2 | BIA format/ Stability/Hydrogeology | No site specific ground investigation to confirm sequence of strata and groundwater level. | Open – site specific ground investigation with groundwater monitoring to be undertaken. | |
| 3 | Hydrogeology/Stability | Temporary dewatering measures not considered | Open – to be considered once ground investigation is undertaken and groundwater level is established. | |
| 4 | Hydrology | Screening did not identify that the site is located in an area which previously flooded | Open – to be considered and addressed as necessary. | |
| 5 | Stability | Presence or absence of basement beneath neighbouring properties not confirmed and foundations depths not determined. | Open – Presence or absence of basements to be confirmed. Foundations to be investigated or maximum differential depths assumed. | |
| 6 | Stability | Proposed construction methodology and sequence not sufficiently detailed. No construction sequence sketches, underpinning bay sequence or temporary works proposal. | Open – to be provided | |
| 7 | Stability | Ground movement assessment (GMA) insufficient. | Open – Sufficient GMA as discussed in Section 5.8 to be undertaken. | |
| 8 | Stability | Contradictory information on the distance to roadway. | Open – clarification requested. | |
| 9 | Stability | Movement monitoring proposal not provided. | Open – Outline proposal to be provided. Details and trigger levels to be agreed as part of Party Wall award. | |

Appendix 3: Supplementary Supporting Documents

None

London

Friars Bridge Court
41- 45 Blackfriars Road
London, SE1 8NZ

T: +44 (0)20 7340 1700
E: london@campbellreith.com

Birmingham

Chantry House
High Street, Coleshill
Birmingham B46 3BP

T: +44 (0)1675 467 484
E: birmingham@campbellreith.com

Surrey

Raven House
29 Linkfield Lane, Redhill
Surrey RH1 1SS

T: +44 (0)1737 784 500
E: surrey@campbellreith.com

Manchester

No. 1 Marsden Street
Manchester
M2 1HW

T: +44 (0)161 819 3060
E: manchester@campbellreith.com

Bristol

Wessex House
Pixash Lane, Keynsham
Bristol BS31 1TP

T: +44 (0)117 916 1066
E: bristol@campbellreith.com

UAE

Office 705, Warsan Building
Hessa Street (East)
PO Box 28064, Dubai, UAE

T: +971 4 453 4735
E: uae@campbellreith.com

Campbell Reith Hill LLP. Registered in England & Wales. Limited Liability Partnership No OC300082
A list of Members is available at our Registered Office at: Friars Bridge Court, 41- 45 Blackfriars Road, London SE1 8NZ
VAT No 974 8892 43