CampbellReith
consulting engineers

# 56 Croftdown Road
# London, NW5 1EN

## Basement Impact Assessment
## Audit

For

London Borough of Camden

Project Number: 12466-29

Revision: F1

March 2018

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## Document Details

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## Appendix

## 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 56 Croftdown Road, London NW5 1EN (planning reference 2016/3698/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. Subsequent to the issue of the initial audits, revised and updated BIA documents have been issued by Geotechnical & Environmental Associates Ltd and Price & Myers, dated September 2017 and February 2018.

1.3. 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.

1.4. 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.

1.5. The proposed development involves the deepening of the lower ground floor and the construction of a new lightwell. The revised BIA documents confirm the development proposals (dimensions, depth, construction methodology etc) and include a conceptual site model for clarity.

1.6. The authors of the revised BIA submissions hold qualifications that are in accordance with the requirements of CPG4.

1.7. A desk study has been presented, broadly in accordance with aspects recommended by LBC guidance. The revised BIA includes correspondence with utilities suppliers regarding underground infrastructure within the vicinity of the site.

1.8. The original BIA identified that the assumed course of the "lost" River Fleet runs within 100m of the site. A ground investigation (GI) was undertaken at the site in June 2017 by GEA. Ground conditions were found to comprise Made Ground overlying London Clay, which extended to the full depth of the investigation to 3.0m. Alluvial soils were not encountered.

1.9. Groundwater was not encountered during the investigation but has been monitored at shallow depth within standpipes during a single monitoring visit. The BIA recommends further monitoring of the standpipes to confirm groundwater levels prior to construction. It is accepted that there will be no impact to the hydrogeological environment.

1.10. The original BIA stated that the site had not been identified as having the potential for flooding and is outside of a Local Flood Risk Zone. However, the site is located within the York Rise Local Flood Risk Zone, as defined by LBC and therefore, in line with CPG4, a detailed Flood Risk Assessment (FRA) was requested. The revised submissions include an FRA that concludes there is no additional risk of flooding to the basement from the prosed deepening and lightwell amendments.

1.11. The site area is currently 100% impermeable and there will be no change under the proposed development. There will be no adverse impacts on the hydrological environment.

1.12. A Ground Movement Assessment (GMA) is presented that considers the movements related to excavation and construction of the basement retaining walls in relation to 56 Croftdown Road and the adjacent properties at 54 and 58 Croftdown Road. Burland Category 0 (Negligible) damage is predicted, assuming good workmanship.

1.13. The revised submissions include a structural movement monitoring strategy to control construction and maintain damage impacts to within Category 1 (Very Slight).

1.14. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. Considering the revised submissions, the BIA meets the requirements of CPG4.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 4 November 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 56 Croftdown Road, London NW5 1EN, Camden Reference 2016/3698/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. Subsequent to the issue of the above initial audit, a revised and updated BIA was issued (dated September 2017) which required a revision to the initial CampbellReith audit to accommodate the clarifications and confirmations incorporated within the revised BIA and associated documentation.

2.4. 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.
- The Local Plan (A5 Basements) 2017.

2.5. 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.

2.6. LBC's Audit Instruction described the planning proposal as: "Excavation of lower ground floor, erection of new lightwell, and alterations to front garden, main entry and windows at front and rear elevations".

2.7. CampbellReith accessed LBC's Planning Portal on 17 November 2016 and gained access to the following relevant documents for audit purposes:

- Structural Engineer's report and Basement Impact Assessment – Scoping and Screening Study dated June 2016 by Price Myers.
- Design and Access statement dated 4th July 2016 by Sceales Gunn Design.
- Drawings by Sceales Gunn Design: Plans for existing upper ground floor, lower ground floor, section, elevations and a site location plan dated 29th February 2016; Plans for proposed upper ground floor, lower ground floor, section, elevations and front garden elevations dated 10th June 2016.
- An Arboricultural Report on 56 Croftdown Road dated 21st June by Frank Parsons Arboriculturalist.
- Photos of existing light wells on the street dated 5th October 2016 by Sceales Gunn Design.
- Comments and objections to the proposed development from local residents.

2.8. The audit was subsequently updated based on a review of the following documents provided in September 2017, namely:

a) Basement Impact Assessment (BIA) Report prepared by Geotechnical & Environmental Associates Ltd (ref J17123) dated September 2017.

b) Structural calculations – retaining wall and underpins and Construction methodology and temporary works sequencing and propping prepared (Ref 25293) by Price & Myers dated September 2017.

2.9. The following documents were provided in December 2017 and February 2018, namely:

c) Basement Impact Assessment (BIA) Report prepared by Geotechnical & Environmental Associates Ltd (ref J17123 Rev 2) dated 19 December 2017.

d) Site investigation exploratory hole plan.

e) Response to Campbell Reith Audit Tracker prepared by Price & Myers dated December 2017 (Version 2) including Flood Risk Assessment, Structural Calculations and Movement Monitoring Strategy.

f) Conceptual Site Model by Price & Myers.

g) Revised Drawings dated February 2016 (received February 2018).

h) Revised Movement Monitoring Plan (received February 2018).

## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are BIA Author(s) credentials satisfactory? | Yes | |
| Is data required by Cl.233 of the GSD presented? | Yes | |
| Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology? | Yes | Outline structural information including retaining wall design and temporary works information have been provided. Depth / dimensions of basement should be confirmed. |
| Are suitable plans/maps included? | Yes | |
| 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:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | |
| Hydrogeology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | |
| Hydrology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | The proposed development is located within LBC's defined 'York Rise' Local Flood Risk Zone (Critical Drainage Area Group 3-001). FRA provided in updated submissions. |
| Is a conceptual model presented? | Yes | A dimensioned conceptual site model should be provided for clarity. Provided in updated submissions. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Land Stability Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | |
| Hydrogeology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | Accepted that the impermeable site areas will not increase. |
| Hydrology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | FRA provided in updated submissions. |
| Is factual ground investigation data provided? | Yes | BIA Report, Section 4 and 5. |
| Is monitoring data presented? | Yes | BIA Report, Section 5.3. One groundwater monitoring visit on 12th July 2017. |
| Is the ground investigation informed by a desk study? | Yes | |
| Has a site walkover been undertaken? | Yes | |
| Is the presence/absence of adjacent or nearby basements confirmed? | Yes | BIA Report, Section 9.1. All of the houses on the road have lower ground floor levels, extending to a similar depth as the existing lower ground floor level at the site. |
| Is a geotechnical interpretation presented? | Yes | BIA Report, Section 8. |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | Provided within BIA dated September 2017. |
| Are reports on other investigations required by screening and scoping presented? | Yes | FRA provided in updated submissions. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are baseline conditions described, based on the GSD? | Yes | |
| Do the base line conditions consider adjacent or nearby basements? | Yes | |
| Is an Impact Assessment provided? | Yes | BIA Report, Section 11. |
| Are estimates of ground movement and structural impact presented? | Yes | BIA Report, Sections 9 and 10. However, queries exist over assumptions made and depth of basement and methodology to be confirmed. |
| Is the Impact Assessment appropriate to the matters identified by screen and scoping? | Yes | Updated in revised submissions. |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | Yes | Updated in revised submissions. |
| Has the need for monitoring during construction been considered? | Yes | Updated in revised submissions. |
| Have the residual (after mitigation) impacts been clearly identified? | Yes | Updated in revised submissions. |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained? | Yes | Updated in revised submissions. |
| Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment? | Yes | The proposed scheme has 100% impermeable site area, as per the current site condition. |
| Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area? | Yes | Updated in revised submissions. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Does report state that damage to surrounding buildings will be no worse than Burland Category 2? | Yes | Updated in revised submissions. |
| Are non-technical summaries provided? | Yes | BIA Report, Section 11.2. |

## 4.0 DISCUSSION

4.1. The BIA has been prepared by Geotechnical & Environmental Associates with supporting documents prepared by Price & Myers. The revised BIA (dated September 2017) confirms that the authors of the BIA and various supporting documents are qualified in accordance with the requirements of CPG4.

4.2. The proposed development involves the deepening of the lower ground floor and the construction of a new lightwell. The revised BIA documents confirm the development proposals (dimensions, depth, construction methodology etc) and include a conceptual site model for clarity.

4.3. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1. The revised BIA includes correspondence with UK Power Networks, Cadent Gas Ltd and National Grid regarding underground infrastructure within the vicinity of the site.

4.4. The original BIA identified that the assumed course of the "lost" River Fleet runs within 100m of the site. A ground investigation (GI) was undertaken at the site in June 2017 by GEA that comprised three window sampler boreholes to a depth of 3.00m and a single hand excavated trial pit to a depth of 0.45m below lower ground level. A groundwater monitoring standpipe was installed in each of the boreholes.

4.5. Ground conditions were found to comprise Made Ground overlying London Clay which extended to the full depth of the investigation of 3.00m. Alluvial soils were not encountered.

4.6. Groundwater was not encountered during the investigation but has been monitored at depths of between 0.57m and 1.85m within standpipes during the single monitoring visit carried out in July 2017. The BIA recommends further monitoring of the standpipes to confirm groundwater levels on the site and notes that the basement design should assume a head of water equivalent to two thirds of the basement depth unless information is obtained to support alternative design parameters. Whilst the statement in the BIA that the London Clay cannot support a piezometric level is not correct, it is accepted that there will be no impact to the hydrogeological environment.

4.7. The original BIA stated that the site 'is not identified as having the potential for flooding' and notes that Croftdown Road did not flood in 1975 or 2002, although a number of surrounding streets flooded in 1975, including Woodsome Road (to the south of the site) and York Rise (to the east of the site). However, the Environment Agency indicates the site to be at a 'medium' risk of surface water flooding and of being at risk from reservoir flooding. The site is also located within the York Rise Local Flood Risk Zone, as defined by LBC and therefore, in line with CPG4 (section 3.48), a detailed Flood Risk Assessment was requested. The revised submissions

include an FRA that concludes there is no additional risk of flooding to the basement from the prosed deepening and lightwell amendments.

4.8. The site area is currently 100% impermeable and there will be no change under the proposed development. It is accepted therefore that there will be no adverse impacts on the hydrological environment.

4.9. Geotechnical interpretation has been undertaken based on site specific investigation and a borehole within 8m of the property.

4.10. The construction methodology indicates that traditional concrete underpinning methods will be used to deepen the existing lower ground floor level. The revised submissions provide outline temporary works and construction sequence / methodology. The lightwell will be formed by L-shaped RC retaining walls with foundations extended to the London Clay by mass concrete trench fill, as required.

4.11. A revised Ground Movement Assessment (GMA) is presented, following previous audit queries, that considers the movements related to excavation and construction of the basement retaining walls in relation to 56 Croftdown Road and the adjacent properties at 54 and 58 Croftdown Road. The revised GMA considers the modest proposed excavation depths and predicts damage impacts to neighbours to be Burland Category 0 (Negligible). The range of movements and damage impact is accepted, assuming good workmanship.

4.12. Structural calculations including retaining wall design are presented. These are updated in the revised submissions. Considering the stiff temporary propping proposed and the modest retained height in the permanent case, the assumptions of the GMA are accepted.

4.13. The revised submissions include a structural movement monitoring strategy to control construction and maintain damage impacts to within Category 1 (Very Slight).

4.14. Queries and matters requiring further information or clarification are summarised in Appendix 2.

## 5.0 CONCLUSIONS

5.1. The authors' qualifications are in accordance with the requirements of CPG4.

5.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.

5.3. Ground conditions were found to comprise Made Ground overlying London Clay. Alluvial soils were not encountered.

5.4. The BIA recommends further monitoring of the standpipes to confirm groundwater levels prior to construction. It is accepted that there will be no impact to the hydrogeological environment.

5.5. The revised submissions include an FRA that concludes there is no additional risk of flooding to the basement from the prosed deepening and lightwell amendments.

5.6. The site area is currently 100% impermeable and there will be no change under the proposed development. It is accepted that there will be no impact to the hydrological environment.

5.7. The revised BIA documents confirm the development proposals (dimensions, depth, construction methodology etc) and include a conceptual site model for clarity.

5.8. A Ground Movement Assessment (GMA) is presented. Burland Category 0 (Negligible) damage is predicted, assuming good workmanship.

5.9. The revised submissions include a structural movement monitoring strategy to control construction and maintain damage impacts to within Category 1 (Very Slight).

5.10. Queries and matters requiring further information or clarification are summarised in Appendix 2. Considering the revised submissions, the BIA meets the requirements of CPG4.

# Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

| Surname | Address | Date | Issue raised | Response |
|---|---|---|---|---|
| Bradfield | 36 Dartmouth Park Road NW5 1SX | 16th August 2016 | Objection and comments from Dartmouth Park Conservation Area Advisory Committee:<br><br>There may be problems with humidity being near to the original course of the River Fleet. There may be a need for tanking and underpinning. | Section 5 |

# Appendix 2: Audit Query Tracker

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Audit Query Tracker

| Query No | Subject | Query | Status/Response | Date closed out |
|---|---|---|---|---|
| 1 | BIA Authors | Evidence of required qualifications and experience in ground engineering, engineering geology and hydrology. | Closed – qualifications of BIA Authors provided. | October 2017 |
| 2 | Site investigation | Site investigation, interpretative geotechnical information, groundwater monitoring. | Closed – provided within new BIA. A final determination of groundwater levels will be made prior to the commencement of construction. | October 2017 |
| 3 | Land Stability | Temporary works / construction management. | Closed - The dimensions, depth, construction methodology (of lightwell) are confirmed. A dimensioned conceptual site model is provided. | February 2018 |
| 4 | Hydrogeology / Land Stability | Presence of lost River Fleet within 100m of the property. | Closed – the site investigation did not establish the presence of alluvial deposits beneath the site. | October 2017 |
| 5 | Hydrology | Location of the site within the York Rise Local Flood Risk Zone as defined by LBC | Closed – Flood Risk Assessment provided. | February 2018 |
| 6 | Surface Water Flow | No change in impermeable site area but assumptions made on drainage design. | Closed – accepted no impact considering no change in impermeable area. | October 2017 |
| 7 | Land Stability | Ground Movement Assessment and Damage Assessment | Closed – structural monitoring plan provided. | February 2018 |
| 8 | BIA Format | Impact Assessment | Closed - Impact Assessment presented. | February 2018 |
| 9 | BIA Format | Impact Mitigation Measures | Closed - structural monitoring. | February 2018 |
| 10 | Desk Study | Underground infrastructure | Closed – new BIA includes correspondence with UK Power Networks, Cadent Gas Ltd and National Grid regarding underground infrastructure within the vicinity of the site. | October 2017 |

## Appendix 3: Supplementary Supporting Documents

Basement Impact Assessment (BIA) Report prepared by Geotechnical & Environmental Associates Ltd (ref J17123 Rev 2) dated 19 December 2017

Site investigation exploratory hole plan

Response to Campbell Reith Audit Tracker prepared by Price & Myers dated December 2017

Conceptual Site Model by Price & Myers

Revised Drawings dated February 2016 (received February 2018)

Revised Movement Monitoring Plan (received February 2018)

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