CampbellReith
consulting engineers

59 Solent Road
London, NW6 1TY

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12066-23
Revision: D1

November 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

Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	November 2016	Comment	RMam12466-23-22112016-59 Solent Road-D1.doc	R Morley	A Marlow	A Marlow

Document Details

Last saved	22/11/2016 09:19
Path	RMam12466-23-22112016-59 Solent Road-D1.doc
Author	Robert Morley MEng
Project Partner	E M Brown, BSc MSc CGeol FGS
Project Number	12066-23
Project Name	59 Solent Road, London NW6 1TY
Planning Reference	2016/4460/P

Contents

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 59 Solent Road, NW6 1TY (planning reference 2016/4460/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 Author of the BIA does not hold the required accreditation with respect to ground water flows.

1.5. The proposal involves the formation of a single basement level to the entire plan area of the existing terrace property and to the rear, along with a light well to the front. One neighbouring property contains an existing basement level.

1.6. Appropriate site investigations have been carried out to identify geology and existing structure.

1.7. The geology has been identified as a shallow depth of made ground overlaying London Clay.

1.8. Appropriate structural drawings and calculations have been produced, with the proposal involving typical construction techniques for a retrofit basement. However discrepancies exist with regards to some aspects of the basement construction which should be clarified.

1.9. Appropriate outline temporary works and a construction sequence have been proposed, however clarification is required given the above discrepancy.

1.10. Details of existing and proposed drainage routes are required to demonstrate that the sewer system and ground water is not adversely effected.

1.11. It has been confirmed that there are no slope stability concerns related to the proposed development, this is accepted.

1.12. It has been demonstrated that the basement will not impact the wider ground water flows, however flows within the made ground have not been discussed and local flows may be present.

1.13. A flood risk assessment has been identified as being required, but has not been provided.

1.14. A ground movement assessment is required to determine the impact on the neighbouring properties and the public highway.

1.15. An appropriate movement monitoring strategy has been provided, however this should be reviewed following a ground movement assessment.

1.16. Details of local trees and their root protection areas is required in order to assess impact from the proposed basement.

1.17. An outline works programme is required.

1.18. Due to a number of queries raised it is recommended that the BIA be revised and resubmitted. These are discussed in Section 4 and a summary of queries raised can be found in appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 3/11/16 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 59 Solent Road, NW6 1TY, planning reference 2016/4460/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 "Excavation of basement level with front lightwell and erection of a single storey rear extension following the demolition of the existing rear additions to dwelling (Class C3)."

The Audit Instruction also confirmed 59 Solent Road, neither involved, nor was a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 15/11/16 and gained access to the following relevant documents for audit purposes:

- Basement Impact assessment - Hardman Structural Engineers, October 2016
- Basement Structural Calculations – MMP Design, March 2016
- Structural Drawings – MMP Design
    - 01 – Structural Details Sheet 1
    - 02 – Structural Details Sheet 2
    - 03 - Structural Details Sheet 3
    - 04 – Structural Details Sheet 4
- Planning Drawings – Paul Archer Design
    - 700.000 – Site location plan
    - 700.201 – Existing ground and first floor plans
    - 700.202 – Existing sections A-A & B-B
    - 700.203 – Existing section C-C & D-D
    - 700.204 – Existing front and rear elevations
    - 700.210 – Proposed basement plan
    - 700.211 – Proposed ground floor & first floor plans
    - 700.212 – Proposed section A-A
    - 700.213 – Proposed section B-B
    - 700.214 – Proposed sections C-C & D-D
- Planning Comments and Response

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	The author of the BIA holds qualifications suitable for the ground stability and surface water flow aspects of the BIA, however a Chartered Geologist as required for the ground water flow aspect of the report.
Is data required by Cl.233 of the GSD presented?	No	A works programme is not provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Appropriate drawings and explanations of the permanent and temporary works are provided.
Are suitable plan/maps included?	Partially	Site and location plans only have been provided. Other sources are referenced to support screening, although they are not provided in the BIA.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Architectural and structural plans that have been provided provide adequate detail.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	The screening incorrectly indicates that the basement is more than 5m from a highway or pedestrian right of way. Justification is not provided that the works will not affect nearby trees.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Generally data sources have been referenced. However details of the drainage of the new roof areas to the rear extension are not provided.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Generally data sources have been referenced with a factual statement to justify no answers.
Is a conceptual model presented?	Yes	Basement impact assessment

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	A scoping statement has been provided for each no answer, however no exploration of the consequence of constructing on London clay has been discussed.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No hydrogeological questions were carried forward from screening
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No hydrological questions were carried forward from screening
Is factual ground investigation data provided?	Yes	Factual ground investigations report by Chelmer.
Is monitoring data presented?	No	No mention of repeated visits to monitor ground water levels was discussed.
Is the ground investigation informed by a desk study?	Partially	A full desktop study has not been carried out, however some discussion of anticipated geology taken from geotechnical maps, and the history of the site, has been undertaken.
Has a site walkover been undertaken?	Yes	It is mentioned in the land stability screening that a site walkover has been undertaken.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	It is confirmed that one of the adjoining properties contains a basement level
Is a geotechnical interpretation presented?	Yes	Bearing pressures and plasticity of clay is described in section 3.2.1 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	No	No engineering parameters have been obtained from the site investigations with relation to retaining wall design.
Are reports on other investigations required by screening and scoping presented?	No	A flood risk assessment has been deemed necessary by screening, but has not been provided.
Are the baseline conditions described, based on the GSD?	Yes	Suitable plans and discussion has been provided to provide information regarding the baseline conditions.
Do the base line conditions consider adjacent or nearby basements?	Yes	The presence of a basement to No 57 has been discussed.
Is an Impact Assessment provided?	Yes	Section 4 of the BIA.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	No	A ground movement assessment has not been carried out.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	The two items raised from scoping were adequately discussed in the impact assessment.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	The requirement for mitigation measures has not been discussed.
Has the need for monitoring during construction been considered?	Yes	An appropriate monitoring strategy has been proposed that incorporates the neighbouring properties.
Have the residual (after mitigation) impacts been clearly identified?	No	Residual impacts have not been discussed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	A ground movement assessment is required to demonstrate the structural stability due to the increased depth in foundation levels and the proximity to the highway.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Unclear	It has not been demonstrated that surface water runoff will not be increased.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Unclear	A ground movement assessment is required.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	A ground movement assessment has not been carried out.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by an established firm of civil and structural engineering consultants, Hardman Structural Engineers. The individuals concerned in its production have suitable qualifications for slope stability and hydrology, however a Chartered Geologist has not been involved as required for the hydrogeological aspect of the BIA.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal neither involved a listed building, nor was adjacent to listed buildings. The property is also not within a conservation area.

4.3. The proposal involves the formation of a single basement level to the entire plan area of the existing building, to the rear beneath the existing garden, and including a light well to the front. The ground floor is also being extended to the rear which will be constructed over the new basement level.

4.4. Intrusive site investigations have been carried out with a factual report produced by Chelmer, a well-known site investigations firm. Site investigations have comprised of a boreholes in both the front and rear garden, and trial pits to the front wall and the internal party wall with No 61 Solent Road. Soil testing was carried out both in situ and in the lab to determine soil properties.

4.5. The geology was identified as being made ground to a depth of 0.7m, underlain by London Clay proved to a depth of 8m.

4.6. The BIA is appended by a set of structural drawings by Hardman that detail an outline structural scheme, along with demolition and sequence drawings. A separate set of detailed structural drawings have been produced by MMP Design. These two sets of drawings are broadly in agreement with regards to the basement permanent works.

4.7. The proposed basement walls are to be reinforced concrete underpinning where beneath existing walls, and reinforced concrete retaining walls to the front lightwell and rear basement wall beneath the garden. Underpinning is to incorporate a toe to transfer loads to the ground, with a portion of compressible material beneath the internal areas of the basement slab to protect again ground heave. Steel columns that support the internal structure above bear onto the basement ground slab and onto thickenings within the basement slab.

4.8. Demolition and sequence drawings have been appended to the BIA. These indicate an outline method of construction showing indicative temporary works required at each stage. The sequence drawings appear to indicate the demolition of the existing ground floor structure with the excavation of the basement area being carried out internally. This is in contradiction to the detailed structural drawings and calculations that indicate the retention of the ground floor

structure by providing supporting steel beams to concrete slabs and timber floors, potentially indicating a different construction methodology. The retained structure and construction method should be clarified, with agreement between the detailed drawings and the sequence drawings.

4.9. It has been stated that discharge of surface water into both the sewer system and run off to the ground will not increase. As the area of roof is increasing details are required of the existing and proposed drainage of hardstanding and roof areas to demonstrate that drainage volumes are not increasing.

4.10. It has been confirmed that the basement will not extend below the ground water level, and that the site is not above an aquifer. Therefore no further discussion has been carried out with regards to the impact on ground water flows or hydrogeology. It is accepted that this risk of either individual or cumulative impact on strategic groundwater flows, however care should be taken during construction as local ground water flows within the made ground made still be present.

4.11. It has been confirmed that there are no slope stability concerns related to the proposed development, this is accepted.

4.12. While the surface water flow screening did not identify the site as being at risk of flooding, it did identify that adjacent roads were and therefore recommended that a flood risk assessment be carried out. However a flood risk assessment has not been provided. The conclusions and recommendations of screening and scoping should be consistent with the investigations and reports carried out.

4.13. The slope stability screening indicates that the basement is not within 5m of a highway or pedestrian right of way. However by inspection in appears that the front wall of the basement, or the front lightwell, is within 5m of the pavement and possibly the highway. The screening, scoping, and impact assessment should be updated to reflect this.

4.14. While it has been identified that the differential foundation depth with neighbouring properties will be increased, the impact of this has been inadequately assessed as a ground movement assessment, in order to identify the Burland damage category, is generally required to fulfil the requirements of CPG4. This should include a damage assessment of the public highway if found to be within the zone of influence.

4.15. Structural calculations have been provided for the basement walls, and internal steel framing. The structural calculations do not appear to have relied upon the site investigations that were carried out in order to obtain soil engineering properties, and have instead used generic values

for design purposes. These generic values appear to be reasonable and are within conservative estimates for London Clay.

4.16. A movement monitoring strategy has been proposed, with details of fixing targets to the rear and front elevations of No 59 Solent Road, the neighbouring properties, and the property to the rear in the parallel road. Generic trigger values of 3mm for the first warning, and 5mm for ceasing work have been proposed. These values should be reviewed once the ground movement assessment has been carried out to assess their suitability.

4.17. It has been stated that the proposed basement does not fall within the root protection area of any trees, however it has been stated that trees are present in the rear garden of No 16 Samatra Road. Details of these trees, any other local trees, and their root protection areas are required with respect to the proposed basement.

4.18. A works programme has not been provided as requested by clause 233 in the GSD. An outline works programme indicating approximate construction dates, key works stages, and durations is required.

4.19. Due to the number of queries raised it is recommended that the BIA be revised and resubmitted. A summary of queries raised can be found in appendix 2.

5.0 CONCLUSIONS

5.1. The author of the BIA, Hardman Engineers, lack a Chartered Geologist as required to assess the ground water flows aspect of the BIA.

5.2. The proposal involves the formation of a single basement level to the entire plan area of the existing building and to the rear, along with a light well to the front.

5.3. Appropriate site investigations have been carried out comprising of boreholes and trial pits to identify soil conditions and depths of existing foundations.

5.4. The geology has been identified as a shallow depth of made ground overlaying London Clay.

5.5. Appropriate structural drawings and calculations have been produced, with the basement being designed as reinforced concrete unpropped L-shaped retaining walls. Heave protection measures have been incorporated below the basement slab by use of compressible void formers.

5.6. Outline temporary works and sequence details have been provided, however the construction method does not match that of the structural drawings which potentially indicate a tunnelling method. This is to be clarified with the various documents to be in agreement with respect to the construction method.

5.7. It has been stated that surface water flows into the sewer system and the ground will not increase. Details of existing and proposed drainage routes are required to demonstrate this.

5.8. It has been confirmed that there are no slope stability concerns related to the proposed development, this is accepted.

5.9. It has been confirmed that the basement will not extend below the ground water level, and is therefore implied that ground water flows will not be disrupted. This conclusion is accepted, however local ground water flows within the made ground may still be present.

5.10. The screening identifies the requirement for a flood risk assessment due to the proximity to historically flood areas, however this has not been produced. This is required, or the screening is to be amended with revised conclusions as to the necessity of this.

5.11. The screening incorrectly identified that the proposal is not within 5m of a highway or pedestrian right of way, this is to be amended with the rest of the BIA amended accordingly.

5.12. It has been identified by screening that the differential depth of foundations is increasing, however a ground movement assessment has not been proposed. A ground movement

assessment should be produced taking into account all neighbouring buildings within the influence zone, along with the highway.

5.13. A movement monitoring strategy has been proposed that includes generic trigger values. These values should be reviewed once the ground movement assessment has been carried out to assess their suitability.

5.14. Details of local trees and their root protection areas is required in order to assess impact from the proposed basement.

5.15. An outline works programme is required.

5.16. Due to a number of queries raised it is recommended that the BIA be revised and resubmitted. A summary of queries raised can be found in appendix 2.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Simpson	14 Sumatra Road	23/10/16	Disruption to the local water course	The applicant has demonstrated that the basement will be founded in impermeable soils. However a flood risk assessment has been requested.
Doran	16 Sumatra Road	2/10/16	Proximity of foundations to No 16 Sumatra Road	A ground movement assessment has been requested.
Doran	16 Sumatra Road	2/10/16	Disruption to ground water flows/flooding	The applicant has demonstrated that the basement will be founded in impermeable soils. However a flood risk assessment has been requested.
Doran	16 Sumatra Road	2/10/16	Root damage to trees in the garden of No 16 Sumatra Road	Clarification has been requested from the applicant regarding the impact on nearby trees.
Rees and Davies	61 Solent Road	26/09/16	Impact of basement excavation on foundations to No 57 Solent Road.	A ground movement assessment has been requested. Further details of the construction method have been requested.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Flooding	A flood risk assessment has been identified by screening as being required, however this has not been produced. A flood risk assessment is required, or screening is to be revised to provide a consistent conclusion.	Open	
2	Stability	Screening has identified that the differential foundation level with the neighbouring properties is increasing. A ground movement assessment is therefore required for affected properties, including the public highway if within the influence zone.	Open	
3	Surface water	Details of existing and proposed surface water drainage is required to support the screening conclusion that surface water flows to the sewer and run off will not increase, including calculations if appropriate.	Open	
4	Trees	Details of trees in the rear garden to No 16 Sumatra Road, and any other local trees, along with root protection areas is required, in order to assess impact of the proposed basement on retained trees.	Open	
5	Construction	An outline works programme is required.	Open	
6	Accreditation	A Chartered Geologist (CGeol) is required to author/review the hydrogeology aspects of the BIA.	Open	

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