CampbellReith
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3 Belsize Crescent
London, NW3 5QY

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12336-94

Revision: D1

September 2016

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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 3 Belsize Crescent (planning reference 2016/1815/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 qualifications of the BIA author should be confirmed to ensure it is in accordance with CPG4. CPG4 also requires the input of individuals with relevant qualifications for each aspect of the BIA and this does not appear to be the case.

1.5. The proposal is to change the use of the building to residential, and to lower the existing basement slab by 1m, which currently stands 2.10m below ground level, in order to increase the floor to ceiling height and accommodate an additional window to the front and rear.

1.6. It is indicated in the provided structural drawings and the geotechnical assessment report that the construction method would be traditional mass concrete underpinning, however, this has not been discussed in any detail. A construction method statement, including indicative drawings and non-technical summary should be provided to confirm the sequence and methodology of the proposed construction and any temporary/permanent mitigation measures that are required to ensure maintaining the stability of the nearby assets and structures.

1.7. Anticipated movements due to underpinning and excavation and the resulting damage to the neighbouring properties should be indicated.

1.8. Heave parameters are not included and this is requested.

1.9. The BIA did not address the level difference across the side and the potential issue of subsidence which was highlighted on one of the consultation comments.

1.10. The proposed basement extends beneath the perched groundwater table, and it is within the vicinity of tributaries of the River Tyburn, one of the Lost Rivers of London, which it is likely to have been culverted and incorporated into the public sewer network system.

1.11. The BIA concludes that there is no concern with respect to the proposed development and the assessment does not need to be investigated at an impact assessment stage. However, based on the comments raised above and the information identified by other submitted reports incorporated in the application, the BIA has to be revised and resubmitted to include all the baseline conditions associated with the application in order to enable a comprehensive appraisal of the likely impacts of the proposal on the neighbouring properties.

1.12. A works programme has not been included. Outline works duration is requested with details to be provided by the appointed contractor at a later date.

1.13. Outline proposals for movement monitoring are not included and this is requested.

1.14. Queries and requests for further information are described in Section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 3rd August 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 3 Belsize Crescent, London NW3 5QY, Camden reference 2016/1815/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 "Change of use of basement, ground and first floors from office (B1) to residential (C3) to create 2x 1-bed flats, including excavation at basement level to increase ceiling height, additional window on front elevation and enlarged window on rear elevation."

2.6. The Audit Instruction also confirmed that the basement proposals did not involve any listed buildings. However, the site is located in the conservation area of Belsize Park.

2.7. CampbellReith accessed LBC's Planning Portal on 18th August 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Report - dated December 2015 by Concept Consultancy;
- Phase I and Phase II Geotechnical Assessment - dated February 2016 by Land Science;
- Surface Water Flow and Flood Risk Assessment - dated March 2016 by Water Environment Limited;
- Planning, Design & Access & Heritage Impact Statement - dated March 2016 by Hedley Clark;
- Planning application drawings - dated March 2016 by XUL Architecture; consisting of:
  - Location plan, no LP-01
  - Existing and proposed plans, nos. EX-01 to EX-02, & PA-01 to PA-02
  - Existing and proposed sections, nos. EX-03 to EX-05, & PA-03 to PA-05
  - Planning Consultation Response – dated June 2016

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	No	Construction Method Statement, associated drawings and works programme not included.
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.
Are suitable plan/maps included?	No	Although some maps have been provided, not all of the relevant maps have been provided.
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 maps not referenced. Response to Q4 is not accepted as the provided cross sections indicates a considerable slope which is not mentioned in the BIA. Response to Q8 is not accepted as the site is found to be in close proximity to tributaries of Lost Rivers of London.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Relevant maps not referenced. Response to Q1 and Q2 are considered incorrect (See Audit paragraph 4.7 to 4.9)
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Response to Q6 is not accepted as the principles outlined in PPS25 have not been followed to ensure that flood risk is not increased. A flood risk assessment is however provided to support the application.
Is a conceptual model presented?	Yes	Included in the Phase I and II Geotechnical Assessment Report.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Not all of the issues identified from screening carried forward. The possible seasonal shrink-swell issues with London Clay on site, as identified in the screening stage. Besides, the provided justification for the scoping provided are not considered appropriate.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Issues not carried forward from screening.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	As above.
Is factual ground investigation data provided?	Yes	Included in the Phase I and II Geotechnical Assessment Report
Is monitoring data presented?	Yes	Appendix C of geotechnical report includes a groundwater monitoring from a single visit.
Is the ground investigation informed by a desk study?	Yes	Phase I and Phase II Geotechnical Assessment Report, Section 2.0.
Has a site walkover been undertaken?	Yes	Phase I and Phase II Geotechnical Assessment Report, Section 3.0;
Is the presence/absence of adjacent or nearby basements confirmed?	No	No confirmation in reports are mentioned, however drawings do not indicate a basement in the adjacent properties.
Is a geotechnical interpretation presented?	Yes	Allowable bearing capacities and heave assessments have been made.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Retaining wall design parameters are available; however considered incomplete as stiffness values not given.
Are reports on other investigations required by screening and scoping presented?	Yes	FRA has been carried out as a result of screening.
Are the baseline conditions described, based on the GSD?	No	See various comments raised above related to the screening

Item	Yes/No/NA	Comment
		stages.
Do the base line conditions consider adjacent or nearby basements?	No	No confirmation within the report.
Is an Impact Assessment provided?	No	A FRA provided only with regards to flooding (See Audit paragraph 4.8 to 4.10).
Are estimates of ground movement and structural impact presented?	No	Not provided.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	No land stability impact assessment provided and not all other issues considered.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Scoping assessment inadequate. Not all of the issues have been identified.
Has the need for monitoring during construction been considered?	Yes	Briefly mentioned within the Phase I and II report however no outline proposals.
Have the residual (after mitigation) impacts been clearly identified?	No	No mitigation identified.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	No assessment on structural stability has been provided.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	See FRA Section 4.10.
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	No structural assessment on surrounding buildings has been provided.

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

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) was undertaken by Concept Consultancy and the author is a Chartered Engineer although it is not stated from which institution. CPG4 requires the input of suitably qualified individuals with respect to the different aspects of the BIA and this does not appear to be the case. Also, more detail is required for qualifications of the authors of Flood Risk Assessment (FRA).

4.2. The site is located within the conservation area of Belsize Park. The existing building is a 3 storey commercial building with a basement that extends beneath the entire footprint of the structure. The site is bounded by Belsize Crescent to the north which slopes down gently towards the south east, and to the east, Burdutt Mews. The site is attached to a double-storey building of a similar height that overhangs the entrance to the Mews and thus is not expected to have a basement as suggested by the provided photos. The satellite images depict that the site is also attached to low-rise buildings of the Mews to the south which has a raised ground level relative to Belsize Crescent. It also has a partial link to No. 5 Belsize Crescent to the south west which is also a 3 storey building with basement.

4.3. Whilst some of the relevant Arup extracts have been included with the site location indicated in the FRA, these maps are not referenced in the screening. It would be beneficial if the relevant maps are referenced and included in the screening as this would help support the statements made.

4.4. The proposal is to change the use of the building to residential and to lower the existing basement slab by 1m which currently stands 2.10m below the ground level, in order to increase the floor to ceiling height and accommodate an additional window to the front and rear.

4.5. The site investigation undertaken by Land Science has identified that the existing reinforced concrete basement slab is underlain by Made Ground to a depth of 0.75m beneath which lies the London Clay Formation. Whilst some groundwater seepage was encountered at shallow depth (0.73m bgl) within TP2, in the rear raised level, further monitoring confirmed that the perched water to be present at 1.88m below ground in WS1, located in front of the site. The proposed slab level will be founded at 3.10m below the ground level which extends beneath the local groundwater level.

4.6. Reference to the provided north-south cross section drawings by XUL Architecture (EX-05), identify that there is about 5m difference in elevation of the immediate neighbouring ground level of the site over a distance of 6.50m from rear of the property. Also, one of the consultation comments indicates that the site is built on a hillside and a known area of subsidence. Neither of these issues have been addressed in the BIA.

4.7. The desk study within the Geotechnical Assessment Report identifies that an underground train tunnel is located at about 75m to the north of the site with a historical pond indicated at about 100m to the north east. The London Clay is indicated to have high volume change potential. The report recommends that the future slabs and foundations of the basement should be designed to consider the soil shrink-swell potential due to the removal of overburden pressures and gives an estimation of the likely heave/uplift movements. It further states approval from London Underground Ltd is to be obtained to confirm any restriction on the proposed scheme and the proposed basement should be designed/ constructed to be waterproof, given the presence of shallow groundwater table on site. Consideration is given to controlling the occurrence of ground movements due to the proposed construction works, to ensure that the adjacent properties are not affected under the requirements of the Party Wall Act. Recommendations on soil bearing capacity and retaining wall design are given however stiffness values (E) are not included.

4.8. A Flood Risk Assessment (FRA) has been prepared by a well-known firm of engineering consultants, Water Environment Limited; to consider the likely impacts of the proposal on the Surface Flow and Flooding of the area. The report repeats the preliminary stages of the BIA and correctly identifies the likely impacts according to CPG4 and the principles outlined by PPS25. It is confirmed that the site is not in an area at risk of flooding from surface water/ groundwater/ rivers or sea/ tidal and fluvial/ and internal sewers, or located in the chains of Hampstead Heath. It also indicates the site was not affected by the 1975 or 2002 flood incidents, however, it is located in close proximity to Belsize Lane which flooded in the 1975 event.

4.9. The FRA identifies that the site is located within close proximity to the original route of a tributary of the River Tyburn, one of the Lost Rivers of London, however, this has now been culverted and incorporated into the local underground sewer network. The SFRA indicates that there has been one incident of a property flooding from an external sewer within the area. The Thames Water asset plans have been obtained which confirm that the site is connected directly to the combined public sewer located underneath Belsize Crescent. It is stated in the report that any excess overload flow is likely to be intercepted by the combined sewer system, reducing the likely risk of surface water flooding to the site.

4.10. The FRA considers the risk of encountering groundwater during excavation, and recommends that the basement extension is designed and constructed with an appropriate 'tanked system' to prevent groundwater ingress into the proposed basement. It also recommends that threshold entrance levels are raised by a minimum of 150mm above surrounding ground levels and/or drains are incorporated into the design to intercept runoff. In addition, it suggests that the basement foul outlets have a non-return valve incorporated into the system to prevent internal flooding of the basement in the event of a blockage in the public sewer. The existing site includes a basement and the proposed scheme involves deepening of the slab by 1m beneath

the footprint of the existing basement therefore it should not significantly change the local subterranean water regime. The site is built on a hillside and Belsize Crescent to the front of the site slopes down towards the south east. To the immediate west of the site (upstream) there is assumed to be no basement. It is considered there would be no significant concern with respect to the potential minor rise in the groundwater level around the future obstruction (proposed deepened basement as a barrier) on the adjacent properties. However, the extent and presence of underground structures for the neighbouring properties to the south and west of the site should be provided to confirm this.

4.11. It is indicated in the provided structural drawings and the geotechnical assessment report that the construction method would be traditional mass concrete underpinning; however, this has not been discussed in any detail. A construction method statement, including indicative drawings and non-technical summary should be provided to confirm the sequence and methodology of the proposed construction and any temporary/permanent mitigation measures that is required to ensure maintaining the stability of the nearby assets and structures.

4.12. Whilst underpinning largely depends on workmanship and it may be possible to limit damage to within acceptable limits provided the properties are in sound condition. The anticipated movements (heave from the excavation and vertical and horizontal movements from the underpinning and excavation should be included. The resulting damage category of the neighbouring properties should also be indicated.

4.13. A works programme has not been included as required by cl.233.

4.14. The Geotechnical Assessment report makes a mention of movement monitoring of the neighbouring properties, however, no outline proposals are included.

4.15. The BIA concludes that there is no concern with respect to the proposed development and the assessment does not need to be investigated at impact assessment stage. However, based on the comments raised above and the information obtained by other submitted reports incorporated in the application, the BIA should be revised and resubmitted to include all the baseline conditions associated with the application, and consider appropriate impact assessment and mitigation measures if required by the outcome of scoping.

5.0 CONCLUSIONS

5.1. The qualifications of the BIA author should be confirmed to ensure it is in accordance with CPG4. CPG4 also requires the input of individuals with relevant qualifications for each aspect of the BIA and this does not appear to be the case.

5.2. The proposal is to change the use of the building to residential, and to lower the existing basement slab by 1m, which currently stands 2.10m below ground level, in order to increase the floor to ceiling height and accommodate an additional window to the front and rear.

5.3. It is indicated in the provided structural drawings and the geotechnical assessment report that the construction method would be traditional mass concrete underpinning however, this has not been discussed in any detail. A construction method statement, including indicative drawings and non-technical summary should be provided to confirm the sequence and methodology of the proposed construction and any temporary/permanent mitigation measures that are required to ensure maintaining the stability of the nearby assets and structures.

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5.5. Heave parameters are not included and this is requested.

5.6. The BIA did not address the level difference across the side and the potential issue of subsidence which was highlighted on one of the consultation comments.

5.7. The proposed basement extends beneath the perched groundwater table, and it is within the vicinity of tributaries of the River Tyburn, one of the Lost Rivers of London, which it is likely to have been culverted and incorporated into the public sewer network system.

5.8. The BIA concludes that there is no concern with respect to the proposed development and the assessment does not need to be investigated at an impact assessment stage. However, based on the comments raised above and the information identified by other submitted reports incorporated in the application, the BIA has to be revised and resubmitted to include all the baseline conditions associated with the application in order to enable a comprehensive appraisal of the likely impacts of the proposal on the neighbouring properties.

5.9. A works programme has not been included. An outline works duration is requested with details to be provided by the appointed contractor at a later date.

5.10. Outline proposals for movement monitoring are not included and this is requested.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Jackson	5A Belsize Crescent	07.06.16	• Subsidence issues in the area • Upset/interference with the water table • Extensions of a building basement for a building built on a hill	See Audit paragraphs 4.6, 4.10, and 4.15.

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	Author qualifications not in accordance with CPG4.	Open – to be provided.	
2	BIA format	BIA to be revised and resubmitted to address the comments raised in Audit section 4.0 of this audit report.	Open – to be provided.	
3	BIA format	Works programme not included.	Open – outline works duration to be provided.	
4	BIA format/stability	Stiffness parameters not provided.	Open – to be provided.	
5	Land stability	Construction method statement, structural drawings, constructed sequence drawings, underpinning bay sequences, and any temporary/permanent propping.	Open – to be provided.	
6	Land stability	Anticipated movements and resulting damage not provided.	Open – to be provided as discussed in Audit paragraph 4.12	
7	Land stability	Consultation comments on land subsidence. See Audit paragraph 3.6.	Open – to be addressed.	
8	Movement monitoring	No proposals.	Open – outline proposals to be provided if required. Details and trigger levels to be agreed as part of the Party Wall award.	

Appendix 3: Supplementary Supporting Documents

None

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