CampbellReith
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63 Rosslyn Hill, London NW3 5UQ

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13398-21
Revision: F1

July 2020

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	May 2020	Draft	KBemb-13398-21-280520 63 Rosslyn Hill D1.doc	KB	EMB	EMB
F1	July 2020	For Planning	KBemb-13398-21-280720 63 Rosslyn Hill F1.doc	KB	EMB	EMB

Document Details

Last saved	28/07/2020 16:40
Path	KBemb-13398-21-280720 63 Rosslyn Hill F1.doc
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Project Number	13398-21
Project Name	63 Rosslyn Hill
Planning Reference	2020/1182/P

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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 63 Rosslyn Hill, London NW3 5UQ (planning reference 2020/1182/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 has been carried out by individuals who possess suitable qualifications.

1.5. The BIA has confirmed that the proposed basement will be founded within the Claygate Member, and the maximum excavation depth is 4m. It has been confirmed that the neighbouring property at No. 61 includes a basement that extends to 4m depth.

1.6. It is accepted that the development will not impact the hydrology and hydrogeology of the area.

1.7. The revised ground movement assessment takes into consideration the queries raised in Appendix 2 of the initial BIA audit. The revised submission indicates damage will not exceed Burland Category 1 (Very Slight).

1.8. Clarification of the underpinning layout and temporary propping scheme has been provided. A Structural Design Philosophy Report has been provided which details the construction sequence and provides outline structural calculations for the proposed development.

1.9. Further consideration of an existing retaining wall located in the rear garden of the property will be undertaken at detailed design stage.

1.10. Based on the revised submission, the BIA meets the criteria of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28 April 2020 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 63 Rosslyn Hill, London NW3 5UQ.

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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance: Basements. March 2018
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

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 and extension of the existing basement; installation of lightwells to front, rear and side elevations".*

2.6. The Audit Instruction also confirmed the property and neighbouring buildings are not listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 4 May 2020 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Card Geotechnics Ltd, ref. CGE/16435, revision 1, dated March 2020.

- Construction Method Statement by Horwitz Associates, dated 22 January 2020, under cover letter ref. RHH/hok/7922, dated 21 February 2020.
- Planning Application Drawings by Cranbrook Basements consisting of a Location Plan, Existing and Proposed Plans and Sections, Proposed Temporary Works Layout and Proposed Underpinning Layout.
- Design & Access Statement and Heritage Statement by Horwitz Associates, dated 22 January 2020.

2.8. The following additional documents were provided to CampbellReith in July 2020 in response to the initial audit report and the queries summarised in Appendix 2:

- Basement Impact Assessment (BIA) by Card Geotechnics Ltd, ref. CGE/16435, revision 3, dated July 2020.
- Structural Design Philosophy Report (SDPR) by Horwitz Associates, ref. 7922, dated 20 February 2020.
- Proposed Temporary Works Layout (ref. 2313-700, rev A, dated 29.05.20) and Proposed Underpinning Layout (ref. 2313-219, rev A, dated 29.05.20) drawings by Cranbrook.
- Interim Utility Search results.

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	
Are suitable plan/maps included?	Yes	No maps provided to support the screening exercise.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	However, screening identifies actions required.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	However, screening identifies actions required.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	Not provided, however, no items were identified to carry forward.
Is factual ground investigation data provided?	Yes	Borehole log only.
Is monitoring data presented?	No	No standpipe was installed. No groundwater monitoring was carried out.
Is the ground investigation informed by a desk study?	Unknown	The ground investigation, comprising one borehole, was completed prior to the BIA.
Has a site walkover been undertaken?	Unknown	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The applicant has confirmed the adjoining property has a basement extending to 4.0m depth.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	Unknown	Scoping not carried out.
Are the 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	However further assessment is required.

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	
Has the need for monitoring during construction been considered?	Yes	Discussed in Section 8 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Provided in revised submission.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Provided in revised submission.
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?	Yes	Presented in revised BIA submission.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Card Geotechnics Limited and the individuals concerned in its production have suitable qualifications as required by CPG4.

4.2. The property is not a listed building and is identified to be within the Fitzjohns/Netherhall Conservation Area.

4.3. The existing property has a partial basement underlying a small area of the property in the centre of the building's footprint. The proposed development comprises the lowering and extension of the existing basement to underlie the full footprint of the building, with additional lightwells extending beyond the building footprint to the front, side and rear of the property. The proposed excavation depth is given as 4m.

4.4. Section 2.2 of the BIA identifies the adjoining property at No. 61 as having an existing single-storey basement based on planning application documents. The applicant has confirmed that the neighbouring basement was constructed in accordance with the planning application drawings.

4.5. The proposed development will extend beyond the footprint of the existing building, however the areas outside the building footprint are already laid to hardstanding. It is therefore accepted that the development will cause no change to the hydrology of the site and surrounding area.

4.6. Screening exercises have been undertaken and relevant issues have been assigned a required action. Although a separate Scoping section is not provided, the actions identified in the Screening stage are considered to adequately cover the requirements of the Scoping stage.

4.7. A site investigation has been carried out. Interpretation of the data in the BIA identifies ground conditions to comprise Made Ground to 1.6m depth, over Claygate Member extending to at least 8m depth.

4.8. In Section 5.5 of the BIA, a presumed bearing capacity of 200kN/m^2 is given for the Claygate Member soils at 4m depth. Soil parameters for retaining wall design are provided in Table 7. Although not stated in the report text, it is noted that the increase in undrained cohesion and Young's modulus with depth is only applied to a depth of 7m in the subsequent ground movement assessment, which reflects the site investigation data.

4.9. The Claygate Member is identified as a Secondary A Aquifer. The site investigation did not record a water strike, which the BIA has interpreted as the absence of groundwater. No standpipe was installed in the borehole and no groundwater monitoring was carried out. Based on the soil description on the site investigation borehole log and the absence of groundwater, the BIA considered the proposed basement extension to have negligible significant impact on

groundwater flow and levels in the vicinity of the site. It is accepted that the development will not have a significant impact on the hydrogeology of the area.

4.10. Section 6.3 of the BIA gives recommendations for dealing with groundwater ingress from localised or perched sources within the Made Ground or Claygate Member during construction. Section 7 of the Construction Method Statement (CMS) provides details for dewatering the excavation if groundwater is encountered. The proposed method comprises the excavation of a local sump pit which will be supported by a timber frame and removed with a pump. It is indicated that the water will be discharged to the nearest manhole. The necessary discharge permits will need to be agreed with LBC and put in place prior to discharging any groundwater. An assessment of the impact of dewatering on surrounding properties will also be required.

4.11. Section 7.1 of the BIA states that the party wall between No.s 61 and 63 will not be underpinned due to an existing basement in the adjacent property, which is reflected in the proposed underpinning layout drawing. The excavation depth given for this development is 4m, which is also indicated to be the depth of the existing basement for No. 61.

4.12. Section 7 of the BIA presents a Ground Movement Assessment (GMA) for the site. PDisp software has been used to calculate the short term and long term vertical movements resulting from construction of the basement. Section 7.5 of the BIA states that an additional component of vertical movement has been added to the results of the PDisp analysis to account for ground movements caused by construction of the underpins. This component is taken as 5mm and assumes a high quality of workmanship is adopted and underpinning is undertaken in a single lift.

4.13. Appendix C of the revised BIA presents the structural loading data used in the PDisp assessment. The PDisp load input data is presented in Appendix D, and now reflects the structural loading data accurately.

4.14. The BIA calculates the maximum amount of horizontal movement that can occur to keep the development within the Burland Scale Damage Category 1 for movement. This is an accepted approach.

4.15. The graph presented as Figure 6 shows the short term and long term vertical ground movements from PDisp. The lines are indicated to include the 5mm movement due to construction of the underpins. The revised BIA submission indicates that this movement is added to the PDisp results as a parabolic curve acting over a distance of 5m.

4.16. The CMS presents a construction sequence for the work. It is proposed to form the basement using a traditional hit and miss underpinning sequence in bays not exceeding 1.2m wide. The

central spoil mound will be retained during excavation to provide resistance for temporary lateral propping. The use of a ground bearing floor slab is indicated.

4.17. The revised Proposed Temporary Works drawing and the Proposed Underpinning Layout drawings have been updated to provide additional detail regarding the underpinning and support of the existing building.

4.18. Section 7.9 of the revised BIA discusses the proximity of the basement lightwell to an existing retaining wall within the garden of the property. The BIA identifies ground movements to be negligible in the vicinity of the retaining wall, and indicates that further consideration will be given during detailed design. It is noted that the retaining wall supports part of the applicant's rear garden.

4.19. Outline structural calculations to demonstrate the adequacy of the proposed basement design have been provided as part of the Structural Design Philosophy Report (SDPR). In Appendix C of the SDPR a structural design for the retaining wall is provided. The parameters used generally correlate with those given in the BIA, however some assumptions do not reflect the proposed scheme. It has been proposed that a granular backfill will be used behind the retaining walls. This is unlikely to be possible as the walls will be formed as underpins. The assumption of a granular backfill is reflected in the soil parameters by reducing the cohesion value to 0kN/m^2. The angle of internal friction has been taken as 21°, which is the value given to the cohesive Claygate soils. The use of these parameters is considered to represent a more conservative ground model of the site.

4.20. A retaining wall height of 3.5m has been assumed in the structural design. Section 2 of the SDPR indicates that, at the front of the property, the excavation depth will be between 3.0m and 3.5m below existing ground level due to the slope of the site. The maximum excavation depth for the basement is given in the BIA as 4.0m, and the retaining wall height may exceed this adjacent to the retaining wall. An appropriate retaining wall height should be used at detailed design stage.

4.21. The BIA identifies tunnels belonging to the Transport for London (TfL) Northern Line below Rosslyn Hill. The depth of these tunnels is not given and no correspondence with TfL has been undertaken to date. Based on the measured distance of the tunnels from the existing building (not from the proposed basement lightwells), which is given as 17m, ground movements associated with the basement construction are considered in the BIA to be negligible. Utility data for the property has been provided.

4.22. Section 8 of the BIA presents a movement monitoring strategy for the site before and during construction.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by individuals who possess suitable qualifications.

5.2. The BIA has confirmed that the proposed basement will be founded within the Claygate Member, and the maximum excavation depth is 4m. It has been confirmed that the neighbouring property at No. 61 includes a basement that extends to 4m depth.

5.3. It is accepted that the development will not impact the hydrology or hydrogeology of the area.

5.4. The revised BIA submission provides clarification of the soil parameters used and retaining wall parameters are provided.

5.5. The revised ground movement assessment takes into consideration the queries raised in Appendix 2 of the initial BIA audit. The revised submission indicates damage will not exceed Burland Category 1 (Very Slight).

5.6. The revised submission provides updated drawings for the underpinning layout and temporary propping arrangement.

5.7. A Structural Design Philosophy Report has been provided which details the construction sequence and provides outline structural calculations for the proposed development. Further consideration of an existing retaining wall located in the rear garden of the property will be undertaken at detailed design stage.

5.8. Based on the revised submission, the BIA meets the criteria of CPG Basements.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Confirmation of the presence of a basement below No. 61 is required.	Closed	14/07/2020
2	Stability	Retaining wall parameters should be presented and further justification for the proposed presumed bearing value should be provided.	Closed	03/07/2020
3	Stability	The Proposed Underpinning and Temporary Works drawings should be revised to accurately represent the proposed development.	Closed	16/07/2020
4	Stability	Outline structural calculations should be provided.	Closed	16/07/2020
5	Stability	The Ground Movement Assessment should be updated in line with the comments presented in Section 4.	Closed	03/07/2020
6	Stability	Further consideration of the slopes on site and in the surrounding area is required.	Closed	03/07/2020
7	Utilities	Utility records should be provided.	Closed	03/07/2020

Appendix 3: Supplementary Supporting Documents

None

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