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Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13398-24
Revision: D1

June 2020

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	June 2020	For comment	KBemb-13398-24-030620 8 Fawley Road D1.doc	KB	EMB	EMB

Document Details

Last saved	03/06/2020 10:13
Path	KBemb-13398-24-030620 8 Fawley Road D1.doc
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Project Number	13398-24
Project Name	8 Fawley Road, London NW6 1SH
Planning Reference	2020/0455/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 8 Fawley Road, London NW6 1SH (planning reference 2020/0455/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 Basement Impact Assessment (BIA) has been undertaken by Site Analytical Services Limited and the Ground Movement Assessment (GMA) has been carried out by Fairhurst. No qualifications have been provided for the authors of either document.

1.5. The proposed basement construction will extend below Flat A, which occupies the front half of the building, and into the front garden area. The maximum excavation depth is given as 3.5m and the proposed basement will be formed using underpinning techniques, founded within London Clay.

1.6. It is accepted that the development will not impact on the wider hydrogeology of the area.

1.7. Further consideration of the hydrological impact of the increase in impermeable surfacing is required.

1.8. Further justification is required for the soil parameters used in the GMA and the bearing capacity given in the BIA.

1.9. Structural drawings and proposed plans should be consistent. The BIA and GMA should be updated to reflect the correct development scheme. The Construction Management Plan should be updated to reflect the correct construction method.

1.10. Outline structural calculations should be presented to confirm the suitability of the structural proposals.

1.11. Further clarification regarding the results of the PDisp and XDisp analysis is required, as per the discussion in Section 4.

1.12. Utility information should be provided and an assessment of the impact to the public highway Fawley Road should be undertaken.

1.13. A number of queries have been raised and are summarised in Appendix 2. Until these are addressed it cannot be confirmed that the proposal adheres to the requirements 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 8 Fawley Road, London NW6 1SH.

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 Basements. March 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan Policy A5 Basements.

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 *"Erection of single storey basement and 2x front lightwells".*

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) report by Site Analytical Services Ltd, ref. 19/30896-2, dated November 2019.
- Ground Movement Assessment (GMA) by Fairhurst, ref 134910/R0, dated January 2020, including preliminary structural engineering drawings by Martin Redston Associates.
- BIA Assessment letter by Martin Redston Associates, dated April 2020.
- Planning Application Drawings consisting of a Site Location Plan, Existing Plans and elevations, Proposed Plans and Elevations, Existing Neighbours Foundations Plan.
- Draft Construction Management Plan by MattFinished Limited, version 0.1, dated December 2019.
- Design & Access Statement by DS Design Solutions, dated January 2020.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	No information provided.
Is data required by Cl.233 of the GSD presented?	No	Consistent plans of the development should be 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	
Are suitable plan/maps included?	No	Utility information should be provided.
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	Question 3 from the CGHHS Screening Flow Chart is missing. However, the same question forms part of the Hydrology screening and is answered satisfactorily.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	Presented textually in BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	Two groundwater monitoring visits undertaken.
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?	No	It is assumed no basements are present.
Is a geotechnical interpretation presented?	Yes	However, parameters do not reflect the site investigation data.
Does the geotechnical interpretation include information on retaining wall design?	Yes	An effective angle of internal friction is provided only.
Are reports on other investigations required by screening and scoping presented?	No	None required.
Are the baseline conditions described, based on the GSD?	Yes	Section 2 of GMA.
Do the base line conditions consider adjacent or nearby basements?	Yes	Assumed no basements are present.
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Further consideration of the change in impermeable area is required.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Further consideration of the change in impermeable area is required.
Has the need for monitoring during construction been considered?	Yes	Structural monitoring recommended in BIA and GMA
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Proposed scheme to be confirmed and stability assessment reviewed.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Further assessment of impact to surface water due to increased impermeable area is required.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Further assessment required.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Cannot be confirmed until the queries in section 4 have been addressed.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out Site Analytical Services Limited, however details of the author(s) of the report, and their qualifications, are not provided. A Ground Movement Assessment (GMA) has been carried out by Fairhurst, however details of the qualifications of the people involved in its preparation are not provided.

4.2. The property at No. 8 is not identified as being listed and has been split into a number of flats. The basement development relates to Flat A only, which occupies the front half of the ground floor of the property. A partial basement level currently exists within the communal stairwell of the property. The proposed basement development comprises the lowering of the existing partial basement by 0.5m, and the construction of a basement below the front half of the property, extending into the front garden to form lightwells. The maximum excavation depth is given as 3.50m.

4.3. Structural drawings and temporary works sketches for the development by Martin Redston Associates are presented in Appendix A of the GMA. These drawings indicate underpinning will be undertaken in bays not exceeding 1m wide. The underpins will be formed directly as a reinforced concrete retaining wall. The Construction Management Plan describes the basement construction to comprise piling. This should be revised to reflect the construction sequence presented in the GMA and the structural drawings appended therein. Outline structural calculations should be presented to confirm the suitability of the structural proposals.

4.4. The site investigation described in the BIA has identified that the site is underlain by Made Ground to a maximum depth of 1.60m, below which lies London Clay Formation.

4.5. London Clay is identified as the shallowest stratum underlying the site and is an unproductive aquifer. As such it is accepted that the development will not impact the hydrogeology of the area.

4.6. The BIA identifies an increase in impermeable surfacing of 14m^2. The values presented in Table 1 appear to consider the surfacings for the whole property at No. 8, however the application relates only to Flat A, which owns the front garden area only. Further assessment should be provided and the impact assessment updated as necessary. The BIA also does not consider the implications of the site falling within a critical drainage area.

4.7. Section 6.5 of the BIA gives an allowable net bearing pressure of 200kN/m^2 at a depth of 3m, using a factor of safety of 2.5. It should be confirmed that this is a cautious or moderately conservative estimate based on the data available from the site investigation. Basic soil parameters are presented in Section 6.7 of the BIA, although effective cohesion values are not given.

4.8. Soil parameters presented in the GMA are derived from the site investigation. The design lines shown in Figure 3 of the GMA are not supported by the hand vane data, and the correlation between Cu and the undrained and drained Young's modulus', stated in Section 4.3, is not reflected in the parameters presented in Table 4-1. Further justification should be provided to support the soil parameters used in the ground model.

4.9. The GMA uses PDisp software to estimate the vertical ground movements inside the property, and XDisp software to estimate the vertical and lateral ground movements affecting the area around the site, including adjacent structures. The PDisp analysis adopts a three-stage approach to the analysis. The first stage comprises short-term movement caused by the unloading due to excavation, the second stage comprises short-term movement resulting from construction of the basement and the third stage comprises the long-term movements resulting from the proposed development. PDisp predicts 16mm settlement of the underpinned party wall at the rear corner of the basement, adjacent to No 6 Fawley Road. The BIA states that "movements predicted at or just beyond the boundaries are unlikely to be realised". This suggests that 16mm differential settlement would occur between the party wall and any walls that abut it. Clarification is required as to how this has been taken into account in the damage assessment.

4.10. The results of the PDisp analysis have not been used in the XDisp analysis. Instead, the XDisp analysis approximates the ground movements from the underpinning to that of a contiguous pile wall and assumes high support stiffness during construction. The analysis considers the stiffening effect of corners and uses CIRIA C580, which the GMA correctly identifies as now having been superseded by CIRIA C760. The results of the XDisp analysis indicate a maximum damage category of 1 'very slight' on the Burland scale. Maximum settlement of around 4mm is predicted. It is not clear how movement associated with the settlement described above, and the settlement due to underpin construction, have been considered in the damage assessment.

4.11. The structural drawings presented in Appendix A of the GMA contradict some of the details presented on the Planning Application drawings for the proposed development, as follows:

- The lightwells are shown as two individual extensions in the structural drawings, but form a single continuous extension area in the Planning Application drawing 'Proposed Basement Floor Plan'. The geometry used in the GMA XDisp analysis reflects the layout in the Planning Application drawings. The geometry and loading used in the PDisp analysis reflect the layout presented in the structural drawings.
- In the Planning Application drawing 'Proposed Sections', section A-A suggests the existing basement within the stairwell will not be lowered, contradicting the BIA, GMA and underpinning sequencing drawing.
- The structural drawings section for the retaining wall shows the inclusion of a 200mm long heel in the retaining wall construction. A heel is not indicated in the planning

application drawings and may not be acceptable to neighbours, therefore further clarification regarding the use of a heel is required.

4.12. The proposed development should be presented consistently in the planning and structural drawings, the BIA and the GMA.

4.13. The Planning Application drawing sections indicate the existing ground floor is suspended. The proposed basement is shown as including a ground bearing floor slab.

4.14. The Existing Basement Floor Plan 012 shows the boundary wall between Flat A and the flat occupying the rear half of the ground floor to be on a different line to that shown in the Proposed Basement Floor Plan 112. The proposed basement appears to extend under the footprint of the adjoining ground floor flat.

4.15. The BIA identifies the public highway of Fawley Road is within 5m of the development and therefore requires further consideration in the stability assessment. The proximity of Fawley Road to the basement is confirmed in the Planning Application drawings. The GMA does not specifically identify Fawley road as likely to be affected by ground movements resulting from the development, and states that only the properties at No.s 6 and 10 Fawley Road are considered to be within an affected area (specified as being 'less than 10m away'). Further assessment of the impact of the basement development on Fawley Road is required.

4.16. Table 2-1 of the GMA suggests Flat A occupies the entire ground floor of the property, with two other flats occupying the above floors. Table 2-1 and section 4.2 of the GMA should be updated to include the rear half of the ground floor, which is a separate flat. It is noted that the subsequent analyses include consideration of the walls to the rear of No. 8.

4.17. Utility information should be provided.

4.18. The GMA indicates that the potential risk of groundwater ingress should be considered and adequately managed if encountered during excavation works. The Foundation Plan drawing, presented in Appendix A of the GMA, describes pumping and shoring requirements should groundwater be encountered during excavation.

4.19. The BIA and GMA both recommend a system of movement monitoring for adjacent structures prior to and during construction.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been undertaken by Site Analytical Services Limited and the Ground Movement Assessment (GMA) has been carried out by Fairhurst. No qualifications have been provided for the authors of either document.

5.2. The proposed basement construction will extend below Flat A, which occupies the front half of the building, and into the front garden area. The maximum excavation depth is given as 3.5m and the proposed basement will be founded within London Clay.

5.3. It is accepted that the development will not impact on the wider hydrogeology of the area.

5.4. Further consideration of the hydrological impact of the increase in impermeable surfacing is required.

5.5. Further justification is required for the soil parameters used in the GMA and the bearing capacity given in the BIA.

5.6. The structural and Planning Application drawings should be consistent. The BIA and GMA should be updated to reflect the correct development scheme. The Construction Management Plan should be updated to reflect the correct construction method. Outline structural calculations should be presented to confirm the suitability of the structural proposals.

5.7. Further clarification regarding the results of the PDisp and XDisp analysis is required, as per the discussion in Section 4.

5.8. Utility information should be provided and an assessment of the impact to the public highway Fawley Road should be undertaken.

5.9. A number of queries have been raised and are summarised in Appendix 2. Until these are addressed it cannot be confirmed that the proposal adheres to the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Croft	Unknown	18/03/20	Visibility of lightwells	This issue does not fall within the remit of the BIA

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Qualifications	Authors' qualifications are not given.	Open	
2	Hydrology	Further consideration of the increase in impermeable area is required.	Open	
3	Stability	Further justification is required for the soil parameters used.	Open	
4	Stability	The structural and planning application drawings should be consistent. The BIA and GMA should be updated to present and assess the correct scheme. Outline structural calculations are required to support the scheme.	Open	
5	Stability	Further clarification of the results of the PDisp and XDisp analysis is required as per the comments in Section 4.	Open	
6	Stability	The Construction Management plan should be amended to reflect the use of underpinning	Open	

Appendix 3: Supplementary Supporting Documents

None

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