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19-37 Highgate Road & 19 Greenwood Place, London

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-37
Revision: F1

April 2017

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	February 2017	Comment	MLml-12466-37-230117-19 Greenwood Place-D1.doc	ML	GK	GK
F1	April 2017	Planning	MLml-12466-37-040417-19 Greenwood Place-F1.doc	ML	GK	GK

Document Details

Last saved	04/04/2017 16:25
Path	MLml-12466-37-040417-19 Greenwood Place-F1.doc
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Project Number	12466-37
Project Name	19 – 37 Highgate Road & 19 Greenwood Place
Planning Reference	2016/5372/P

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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 19-37 Highgate Road & 19 Greenwood Place (planning reference 2016/5372/P). The basement is considered to fall within Category C 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 a well-known firm of consultants who possess relevant qualifications and experience.

1.5. A double storey basement is proposed within the redevelopment scheme, which utilises secant piled retaining walls installed from existing ground level.

1.6. The ground conditions described in the BIA are accepted for the purposes of outline design and planning. In accordance with the BIA's recommendations, further ground investigation will be required to inform detailed temporary and permanent works design and groundwater control measures. This should be undertaken and presented within a Basement Construction Plan (BCP).

1.7. The BIA indicates that a historic tributary of the River Fleet ran through the site and as such Alluvial deposits and groundwater are likely to be encountered. Suitable outline mitigation to potential hydrogeological impacts has been presented. However, assessment should be confirmed following further investigation and monitoring, and should be presented within a BCP.

1.8. The BIA refers to The Hilson Moran Flood Risk Assessment (FRA) and Environment Agency Data indicating that the site and surrounding streets are at medium risk of surface water flooding and at low risk from reservoir flooding. The BIA proposes suitable mitigation measures.

1.9. The proposed development is located within a Critical Drainage Area (Group 3_003). The BIA has presented appropriate attenuation SUDS proposals. It is noted that discussions with Thames Water have commenced.

1.10. Assumptions have been made in the BIA on the outline retaining wall design, construction sequences and temporary support systems required to safely excavate and construct the two

storey basement. Following further investigation the temporary and permanent structural scheme should be confirmed and presented within a BCP.

1.11. The ground movement and building damage assessment predicts damage no greater than Burland Category 1 (Very Slight) to neighbouring buildings. These assessments should be reconsidered once the site specific ground conditions and structural scheme are clarified and presented within a BCP.

1.12. The BIA indicates that an outline monitoring strategy will be proposed for all structures and assets within the development's zone of influence, to include appropriate trigger values and contingency action plans. This should be provided within a BCP.

1.13. It is accepted that there are no slope stability concerns associated with the proposed development.

1.14. Considering the revisions submitted, and the requirement for a BCP, the BIA meets the criteria of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15 December 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 19-37 Highgate Road & 19 Greenwood Place, NW5 1JY, Camden Reference 2016/5372/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 *"Demolition of existing buildings (D1, B1a and B8 uses) and redevelopment of the site to provide two buildings containing a 2 storey basement (Building 1: 7 storeys and Building 2: 6 storeys) with 4,312m² of self-storage (B8); 1,803m² of office (B1a) and 60 self-contained residential flats (C3) including 52 market units (16x1 bed, 29x2 bed, 7x3 bed) and 8 social rented units (8x1 bed) along with the creation of a pedestrian walkway running east to west linking Highgate Road with Greenwood Place; the*

creation of a vehicular access from Greenwood Place and loading bay; provision of green/brown roofs and plant equipment; roof terraces and balconies and other associated works"

The Audit Instruction also confirmed 19-37 Highgate Road & 19 Greenwood Place is a neighbour to a grade II listed building, Christ Apostolic Church.

2.6. CampbellReith accessed LBC's Planning Portal on 27 March 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) – Revision 3, March 2017 by Card Geotechnics Limited (CGL)
- Basement Impact Assessment

  Appendix A: Proposed development plans

  Appendix B: Historical Maps

  Appendix C: BGS Borehole Logs

  Appendix D: Groundsure Report

  Appendix E: Camden Planning Guidance Screening Flowchart

  Appendix F: Wallap Output
- Civil & Structural Concept Report – Issue P2, September 2016 by Meinhardt
- Flood Risk Assessment – Revision 3, Final, September 2016 by Hilson Moran.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See page 1 Issue Sheet of BIA.
Is data required by Cl.233 of the GSD presented?	No	Construction programme to 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	See BIA Section 2.
Are suitable plan/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	Various maps and plans throughout BIA and appendices.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 7.2.3
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 7.2.2
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 7.2.4.
Is a conceptual model presented?	Yes	See BIA Section 9 and Figures 2 and 3.
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	See BIA Section 9.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 9.
Is factual ground investigation data provided?	Yes	Data of the previous site investigation is provided (see BIA Section 4.4). The BIA recommends that additional site investigation is carried out (see BIA section 14).
Is monitoring data presented?	Yes	See BIA Section 4.4. The BIA recommends that additional site investigation is carried out (see BIA section 14).
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Unknown	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	See BIA Figure 2.
Is a geotechnical interpretation presented?	Yes	See BIA Section 9.2.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See BIA Section 10.
Are reports on other investigations required by screening and scoping presented?	Yes	FRA and drainage assessment available.
Are the baseline conditions described, based on the GSD?	Yes	Assumes that further groundwater monitoring will be undertaken.

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	Conservative assumptions adopted for GMA. Cumulative hydrogeological impacts unlikely.
Is an Impact Assessment provided?	Yes	See BIA Section 10.
Are estimates of ground movement and structural impact presented?	Yes	See BIA Section 10 and Figure 5,6,7,8. Requires updating following site investigation to validate geotechnical parameters presented in section 9 and confirmation of temporary works proposals.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	See BIA section 10.2.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	See BIA section 12 and 13.
Has the need for monitoring during construction been considered?	Yes	See BIA section 14.
Have the residual (after mitigation) impacts been clearly identified?	Yes	See BIA section 12 and 13.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	See BIA section 10 and Appendix F. Requires updating following site investigation to validate geotechnical parameters presented in section 9 and confirmation of retaining wall design and temporary works proposals.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	See BIA section 7.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	
Are non-technical summaries provided?	Yes	See BIA section 15

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been produced by a well-known firm of consultants, Card Geotechnics Limited (CGL) and has been reviewed and approved for issue by individuals who possess relevant qualifications and experience.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal either involved a listed building or was adjacent to listed buildings but gave no details. The Design & Access Statement identified that 19-37 Highgate Road & 19 Greenwood Place is adjacent to a Grade II listed property, Christ Apostolic Church.

4.3. The proposed basement comprises a two storey construction formed after the demolition of the existing Highgate Day Centre and Lensham House, utilising secant piled retaining walls installed from existing ground level. A temporary works scheme, involving a single level of temporary props has been assumed in the BIA.

4.4. The ground conditions described in the BIA are based on previous investigations from nearby developments within the general site boundary. It is accepted that access to the proposed basement site area is limited and that further investigation to confirm ground and groundwater conditions will be undertaken in due course. This should be presented in a Basement Construction Plan (BCP).

4.5. The BIA indicates that a historic tributary of the River Fleet ran through the site and as such Alluvial deposits are likely to be encountered. These deposits are likely to be more permeable than the underlying London Clay and therefore present the potential for hydrogeological impacts, instability during construction and long term groundwater issues that need to be assessed. Alluvial deposits are likely to be softer than the underlying London Clay and may present stability impacts, especially in the temporary case.

4.6. A site specific ground investigation is recommended in the BIA, to identify the presence of the Alluvial deposits. The BIA states that the proposed basement is expected to be founded within the London Clay Formation with between 1.2 metres and 2.25 metres of Made Ground above it. Additional soils investigation should be tailored to confirm suitable geotechnical design parameters, including consideration of potential heave movements below the basement slab, and the thickness and extent of Alluvial deposits. These should be confirmed within a BCP.

4.7. As stated in the BIA, the proposed basement excavation is expected to encounter groundwater. Additional ground investigation with an appropriate period of subsequent groundwater monitoring is recommended in the BIA to inform both the temporary and permanent works design, including waterproofing and flood risk protection measures. A groundwater drain is proposed to mitigate against any rise in groundwater levels due to construction of the

basement. This would be positioned at a suitable level above normal groundwater level, currently proposed to be 300mm, that would divert groundwater into the drainage flowing to Thames Water combined sewers.

4.8. Outline retaining wall design, construction sequence and temporary support systems required to maintain stability have been assumed, and are described within the Ground Movement Assessment (GMA) and used within the outline calculations.

4.9. A GMA was undertaken using geotechnical modelling software, adopting the interpreted ground properties and temporary works construction sequence assumed. The GMA has assumed a single level of temporary propping but considers that this is a conservative assumption since two levels of propping are likely to be adopted in the final design, which should further reduce ground movements.

4.10. The resultant damage assessment predicts damage no greater than Burland Category 1 (Very Slight) to neighbouring buildings. These assessments should be reconsidered once site specific ground conditions and the temporary works scheme are confirmed, and presented in the BCP. It is accepted that neighbouring foundation depths have been conservatively assessed for the purposes of the GMA. An impact assessment of the nearby Thames Water assets should also be undertaken, in consultation with Thames Water, and impact to the highways and pavements assessed, in consultation with the relevant authority (The Highways Agency, TFL and LBC).

4.11. An outline monitoring strategy is discussed but not presented in detail. The BIA recommends that a formal monitoring strategy should be adopted. This should be proposed for all structures and assets within the development's zone of influence, to include appropriate trigger values and contingency action plans, and be in accordance with the asset owners' requirements. Monitoring proposals for buildings should ensure movements are controlled to create no greater than Category 1 damage impacts. It is recommended this is secured within a BCP.

4.12. The BIA references the Hilson Moran Flood Risk Assessment (FRA) and Environment Agency Data, which indicates the site and surrounding streets to be at medium risk of surface water flooding and at risk from reservoir flooding. The BIA includes proposed mitigation measures, such as a manually operated flood barrier and groundwater drainage scheme, which are considered satisfactory.

4.13. The proposed development is located within a Critical Drainage Area (Group 3_003). The BIA has presented appropriate attenuation SUDS proposals, in accordance with CPG4 Section 3.51.. It is noted that discussions with Thames Water have commenced.

4.14. It is accepted that there are no slope stability concerns regarding the proposed development.

4.15. An outline construction programme should be provided within the BCP.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by a well-known firm of consultants who possess relevant qualifications and experience.

5.2. The proposed two storey basement utilises secant piled retaining walls installed from existing ground level.

5.3. The development site is surrounded by potentially sensitive structures, including buildings, utility assets and highways.

5.4. The BIA addresses flood risk and potential hydrological impacts with reference to the Hilson Moran report, with suitable mitigation and drainage proposed.

5.5. A site specific ground investigation is recommended in the BIA to establish the ground and groundwater conditions. This should be undertaken and presented in a BCP.

5.6. Suitable outline mitigation to potential hydrogeological impacts has been presented. However, assessment should be confirmed following further investigation and monitoring, and should be presented within a BCP.

5.7. For the purposes of the BIA, reasonable assumptions have been made in regards to retaining walls and temporary works. Following additional site investigation, the permanent and temporary structural scheme should be confirmed and presented in a BCP.

5.8. The ground movement and building damage assessment predicts damage no greater than Burland Category 1 (Very Slight) to neighbouring buildings. These assessments should be reconsidered once the site specific ground conditions and structural scheme are clarified and presented within a BCP.

5.9. The BIA indicates that an outline monitoring strategy will be proposed for all structures and assets within the development's zone of influence, to include appropriate trigger values and contingency action plans. This should be provided within a BCP.

5.10. It is accepted that there are no slope stability concerns associated with the proposed development.

5.11. Considering the revisions submitted, and the requirement for a BCP, the BIA meets the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	Site Investigation / Geotechnical Interpretation	Additional information provided. However, BIA recommends further investigation as access becomes available.	To be provided in BCP
2	BIA	Impact Assessments and mitigation proposals – Stability, Hydrology, Hydrogeology	Additional assessment and mitigation presented. These should be confirmed as appropriate following additional site investigation.	To be provided in BCP
3	Surface Water Flow	Flood risk mitigation and drainage proposals	Closed	March 2017
4	Stability	Construction methodology and programme, retaining wall design, temporary works	Additional information presented. Permanent and temporary proposals, including propping, sequencing and programme, to be confirmed.	To be provided in BCP
5	Stability	Ground movement and damage impact assessments, structural monitoring	Additional information presented. Assessments to be repeated / confirmed (as required) following confirmation of site ground / groundwater conditions and structural methodology.	To be provided in BCP

Appendix 3: Supplementary Supporting Documents

None

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