CampbellReith
consulting engineers

13 Regents Park Road
London NW1 7TL

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 13693-03
Revision: F1

December 2021

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Project Number	13693-03
Project Name	13 Regents Park Road
Planning Reference	2021/1586/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 13 Regents Park Road London NW1 7TL (planning reference 2021/1586/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 and supporting information have been prepared by individuals who possess the qualifications required by LBC.

1.5. The BIA has confirmed that the proposed basement will be founded within the London Clay and it is unlikely that groundwater will be encountered during basement construction.

1.6. The proposed basement consists of a single storey construction approximately 4.5m deep over the majority of the existing building footprint. The existing front lightwell will also be lowered by around 1.5m and extended to the boundary with the pavement.

1.7. The proposed basement construction is reinforced concrete underpinned walls to the front and rear of the property, and mass concrete underpinning with a reinforced concrete liner wall to the party wall.

1.8. A ground investigation has been carried out and recommendations for the design of foundations and retaining walls are contained in the ground investigation report.

1.9. The screening and scoping sections required by CPG: Basements have been presented along with potential impacts identified including mitigation measures where appropriate.

1.10. A ground movement assessment has been carried out to demonstrate that the effect of calculated movements during the construction on the adjacent structures will be no worse than Burland Category 1.

1.11. The original BIA audit identified a number of queries that required further clarification. In the updated submissions, these queries have been addressed.

1.12. Considering the updated submissions received, as discussed in Section 4 and summarised in Appendix 2, the BIA complies with the requirements of CPG: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 02/06/2021 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 13 Regents Park Road, London NW1 7TL, Planning Reference 2021/1586/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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance (CPG): Basements. January 2021.
- 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 of single storey basement, erection of front extension at lower ground level, recladding of existing ground floor extension and other facade alterations including new windows, doors and roof lights."

The Audit Instruction confirmed neither 13 Regents Park Road nor its neighbours are listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 17/06/2021 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Morph Structures, rev P1 dated March 2021, and associated Appendices
  - Appendix A Structural Drawings by Morph Structures
  - Appendix B Geotechnical Investigation by GEA
  - Appendix C Arboricultural Survey by Southern Beeches

- Appendix D Architectural Drawings by Peter Mikic Interiors
- Planning Statement by Boyer dated March 2021.

2.7. Further to the issue of the initial audit report, CampbellReith was provided with the following further/revised information in October 2021:

- Basement Impact Assessment by Morph Structures, rev P2 dated October 2021 with associated Appendices
  - Appendix A- Structural Drawings
  - Appendix B - Scope of Investigation Works
  - Appendix C – GEA Basement Impact, Ground Movement Assessment, Damage Impact Assessment, Site Investigation Data
  - Appendix D - Existing Survey
  - Appendix E - Retaining Wall Calculations
  - Appendix F - Arboriculturist Report

2.8. CampbellReith was provided with the following revised information in November and December 2021:

- Email of 26th November 2021 (presented in Appendix 3) from Boyer with additional query responses and GMA model outputs and calculations.
- Email of 15th December 2021 (presented in Appendix 3) from Boyer regarding removal of tree.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Suitable qualifications for Authors are confirmed for the BIA and the Screening and Scoping Documents.
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?	No	Maps and plans are generally not included however screening is in accordance with GSD recommendations.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	N/A	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appendix C of BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appendix C of BIA
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appendix C of BIA.
Is a conceptual model presented?	Yes	

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Scoping concluded in section 5 of BIA and supported by Appendix C
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Scoping concluded in section 5 of BIA and supported by Appendix C
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Scoping concluded in section 5 of BIA and supported by Appendix C
Is factual ground investigation data provided?	Yes	Appendix B of BIA
Is monitoring data presented?	Yes	Appendix B of BIA
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	BIA assumes no adjacent basement.
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?	Yes	
Are the baseline conditions described, based on the GSD?	Yes	
Do the baseline conditions consider adjacent or nearby basements?	N/A	No adjacent basements identified
Is an Impact Assessment provided?	Yes	

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	Appendix C of BIA
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	
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	
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 engineering consultants Morph Structures. The supporting Desk Study, Screening and Scoping, Ground Investigation Report and Ground Movement Assessment has been carried out by Geotechnical & Environmental Associates (GEA); the updated BIA provides a list of Authors and relevant qualifications which are in accordance with CPG requirements.

4.2. The LBC Instruction to proceed with the audit confirmed the proposed basement or neighbouring properties are not listed buildings. The Planning Statement identified that Regents Park Road is located in the Primrose Hill Conservation Area.

4.3. The property is a four storey semi-detached Victorian Villa. The construction is understood to be traditional timber floors supported on loadbearing walls. The occupier/developer owns the ground and lower ground floors. The upper floors are under separate ownership.

4.4. The property is semi-detached, with the wall to No 15 Regents Park Road being a Party Wall.

4.5. The proposed basement consists of a single storey construction approximately 4.5m deep over the majority of the existing building footprint. The existing front lightwell will also be lowered by around 1.5m and extended to the boundary with the pavement to form a basement extension. Existing and proposed FFLs for the proposal are indicated on the Architect's section drawings.

4.6. The construction sequence described in the BIA indicates reinforced concrete underpinning to existing external walls. The Party Wall will be deepened using mass concrete underpins with a reinforced concrete liner wall. The internal central loadbearing wall is to be supported temporarily via steel framing. All underpins will be temporarily propped until permanent restraints are installed.

4.7. The Ground Investigation has identified the ground conditions locally as 1.2m of Made Ground over London Clay. Groundwater is not anticipated to be present in the clay; however, local perched water may be present in the Made Ground. A total of 10 trial pits were excavated to check existing foundations and local ground conditions, although the two trial pits constructed on the Party Wall with No 15 Regents Park Road were obstructed by concrete and did not find the level of the party wall foundation.

4.8. Recommendations for the design of foundations and retaining walls are contained in the ground investigation report. Structural calculations for the retaining wall are contained in Appendix E of the updated BIA.

4.9. The screening and scoping exercises are contained in Appendix C of the updated BIA, which are generally accepted.

4.10. A tree that is located in the existing lightwell is to be removed and the indicated Root Protection Area of a London Plane tree within the public footpath coincides with the new extended lightwell foundations. It has been confirmed (Appendix 3) that the tree within the lightwell is in fact potted, and therefore the removal of the tree will not impact neighbouring foundations. The requirements for the protection of the London Plane tree in the public footpath are beyond the scope of the BIA audit and should be agreed with LBC's Trees and Landscape Officer.

4.11. Appendix C of the BIA contains a ground movement assessment (GMA) produced by GEA using OASYS ground modelling software. The GMA is based upon anticipated movements during

excavation and construction and indicates that the underpinning and below ground walls are to be propped in the temporary design case. It was requested that a sensitivity analysis be undertaken to demonstrate a robust and reasonably conservative assessment had been undertaken, and further calculations were presented (as indicated in Appendix 3).

4.12. The GMA considers the effect of the calculated movements on the adjacent structures, 11 Regents Park Road, 15 Regents Park Road, the properties above and the adjoining highway and concludes that damage to surrounding properties will be no worse than Burland Category 1 (Very Slight).

4.13. The BIA recommends a movement monitoring strategy during excavation and construction and provides outline advice for monitoring.

4.14. The potential impacts have been addressed in the investigations and proposals and the resultant impacts are identified in section 8 of the BIA which confirms:

- There are no impacts to the hydrological environment, including any increased risk of flooding to neighbouring properties.
- Flood risk mitigation will be employed for the basement, including maintaining positive pumped drainage as a contingency.
- There are no impacts to slope stability.
- There are no impacts to the wider hydrogeological environment.

5.0 CONCLUSIONS

5.1. It is accepted that the BIA Authors hold suitable qualifications.

5.2. The screening and scoping exercises have been carried out in accordance with CPG guidelines and the potential impacts on the development have been considered in the BIA.

5.3. Appropriate site investigation, geotechnical information and structural information has been provided in support of the BIA.

5.4. The GMA considers the effect of the calculated movements on the adjacent structures and properties above, and concludes that damage will be no worse than Burland Category 1.

5.5. The BIA recommends a movement monitoring strategy is employed during excavation and construction.

5.6. It is accepted that there are no impacts to the hydrological or hydrogeological environments.

5.7. It is accepted that there are no impacts to slope stability.

5.8. Considering the updated submissions, including those presented in Appendix 3, the BIA meets the requirements 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	BIA	BIA to be completed by individuals with professional qualifications in accordance with GSD and CPG: Basements.	Closed Qualification provided	November 2021
2	BIA	Screening and scoping to be completed as required by GSD and CPG: Basements.	Closed Screening and Scoping provided	November 2021
3	BIA	Conceptual model to be presented and baseline conditions confirmed.	Closed Model provided	November 2021
4	BIA	Investigations, impact assessments and any necessary mitigation to be presented with sufficient supporting information to justify conclusions.	Closed	December 2021
5	BIA	Outline structural engineering information, including drawings and calculations, to be presented as required by CPG.	Closed	November 2021

Appendix 3: Supplementary Supporting Documents

Email 26th November 2021 from Boyer

Email 15th December 2021 from Boyer

RE: 13693-03: 13 Regent's Park Road BIA Audit <2021/1586/P>Alexandra Bamford to GrahamKite@campbellreith.com 26/11/2021 16:34
Cc "camdenaudit@campbellreith.com", "Grant Leggett", "Zoe Curran", "Patrick Marfleet"

4 Attachments

J21011 - PDisp - Stage 4.pdf J21011 - PDisp - Stage 1.pdf J21011 - PDisp - Stage 2.pdf J21011 - PDisp - Stage 3.pdf

Hi Graham,

Thanks your email – please see responses below and attached.

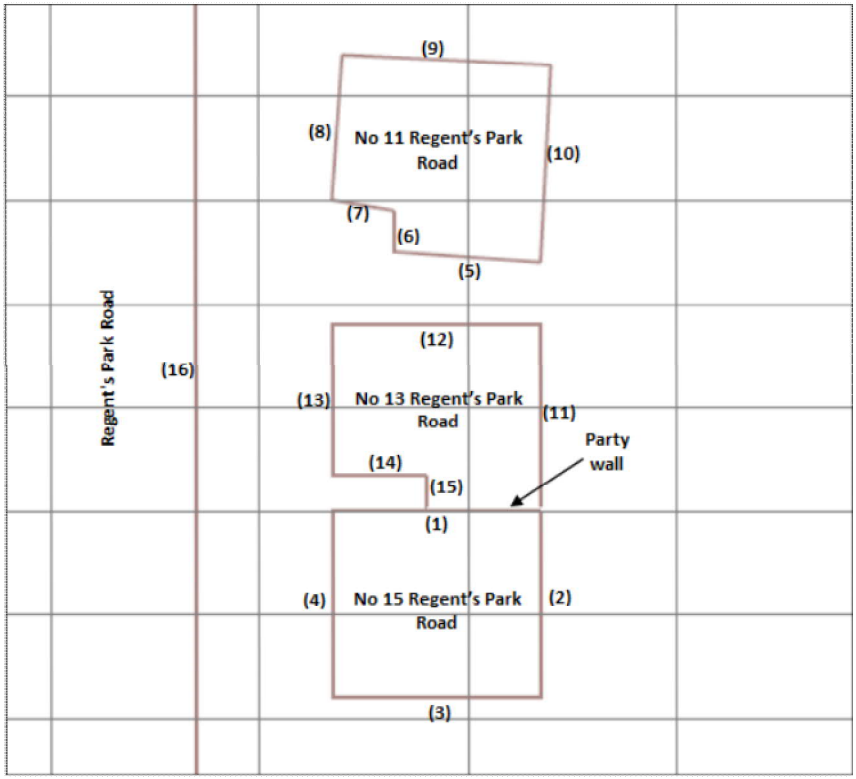
1. The relationship of Eu = 750C_u is well established in current literature for the London Clay, which is referenced in our report. This value has been used on numerous projects within Camden and Campbell Reith has accepted it previously, so perhaps the auditor could provide some comment on why this has been raised on this project. However, we have undertaken a sensitivity analysis as requested with a lower relationship of 600C_u and attach inputs and contour outputs for each of the four P-Disp Stages. As per our previous assessment, the movements predicted in the revised P-Disp models have then been imported into the corresponding X-Disp model and combined with the movements predicted within that software to update the damage assessment for each stage – see response to 3 below for further details.

2. The analysis already considers the fact that the movements due to loading of the underpinning and excavation of the proposed basement will occur at different times, which is why the analysis has been divided into distinct stages to reflect how the movements will manifest over the course of the construction process. We would also note that, in addition to the vertical movements imported from P-Disp, our analysis also includes both vertical and horizontal movements predicted in X-Disp due to installation and potential deflection of the underpinning during excavation, such that our analysis provides a highly conservative, but ultimately more realistic, assessment of how the ground around the proposed basement structure will respond as the construction proceeds through the various key stages that have been identified.

3. As it is understood that ownership of the property on site is shared, with the upper part of the building belonging to another individual, we have updated our models to include this structure within the analysis and subsequent damage assessment. The inputs, contour outputs and damage assessment tables are included in the link below, with an amended plan of sensitive structures and an updated table of results included below.

Link to X-Disp modelling inputs and outputs – https://we.tl/t-piTsKIfcMS

Plan of Sensitive Structures



Sensitive Structure	Ref No / Elevation	Max Tensile Strain (%) Stage 1	Stage 2	Stage 3	Stage 4	Maximum Category of Damage*

Sensitive Structure	Ref No / Elevation	Max Tensile Strain (%) Stage 1	Stage 2	Stage 3	Stage 4	Maximum Category of Damage*
	1	<0.01	<0.01	<0.01	0.01	Category 0 – Negligible
No 15 Regent's Park Road	2	0.04	0.04	0.05	0.05	Category 1 – Very Slight
	3	-	-	<0.01	<0.01	Category 0 – Negligible
	4	0.04	0.04	0.06	0.06	Category 1 – Very Slight
	5	-	<0.01	0.02	0.02	Category 0 – Negligible
	6	-	0.03	0.07	0.07	Category 1 – Very Slight
No 11 Regent's Park Road	7	-	<0.01	<0.01	<0.01	Category 0 – Negligible
	8	-	<0.01	0.04	0.04	Category 0 – Negligible
	9	-	-	<0.01	<0.01	Category 0 – Negligible
	10	-	0.02	0.04	0.05	Category 1 – Very Slight
	11	0.01	0.03	0.06	0.06	Category 1 – Very Slight
	12	-	0.01	0.01	0.02	Category 0 – Negligible
No 13 Regent's Park Road	13	<0.01	0.01	0.01	0.02	Category 0 – Negligible
	14	<0.01	<0.01	<0.01	0.01	Category 0 – Negligible
	15	0.02	0.02	0.02	0.02	Category 0 – Negligible
Regent's Park Road	16	-	-	0.01	0.01	Category 0 – Negligible

*From Table 6.4 of C760: Classification of visible damage to walls.

The building damage reports for sensitive structures highlighted in the above table predict that the damage to the adjoining and nearby structures would generally be Category 0 (negligible), with Category 1 (very slight) damage to the front and rear elevations of No 15 Regent's Park Road (Ref Nos 2 and 4), the rear elevation of No 13 Regent's Park Road (Ref No 11) and the side and rear elevations of No 11 Regent's Park Road (Ref Nos 6 and 10).

On this basis, the damage that has been predicted to occur as a result of the construction of the proposed basement falls within the acceptable limits, although careful construction, including the careful control of the proposed piling, and monitoring will be required to ensure that no excessive movements occur that would lead to damage in excess of these limits.

Kind regards,

Alex

Alexandra Bamford
Planner

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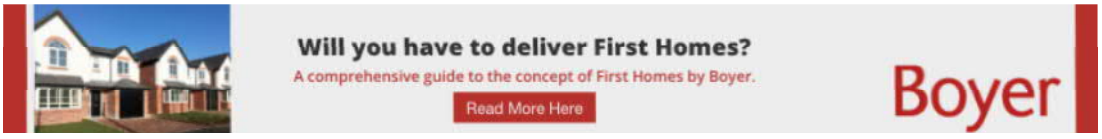

From: GrahamKite@campbellreith.com <GrahamKite@campbellreith.com>
Sent: 19 November 2021 11:50
To: Alexandra Bamford <AlexandraBamford@boyerplanning.co.uk>
Cc: camdenaudit@campbellreith.com; Grant Leggett <grantleggett@boyerplanning.co.uk>; Zoe Curran <ZoeCurran@BoyerPlanning.co.uk>; Patrick Marfleet <patrick.marfleet@camden.gov.uk>
Subject: 13693-03: 13 Regent's Park Road BIA Audit <2021/1586/P>

Dear Alex

We have now completed our audit of the revised BIA and can confirm that the bulk of the queries are closed out. We have just the following questions outstanding:

1). The GMA uses a ratio of undrained shear strength to stiffness of 750 for the London Clay. This is higher than usually assumed for these types of analyses and requires further justification. Noting the requirement for assessments to be reasonably conservative, and the methodology of utilising PDisp for predicting vertical movements, a sensitivity analysis with a more conservative stiffness profile should be undertaken to demonstrate that resulting movements will not adversely impact neighbouring structures.

2). Vertical movements calculated from a PDisp model which considers both settlements and heave generated by changes in vertical loading (note also comments above (1) re stiffness profile) may not be conservative, with settlement combined with heave, as movements are likely to occur over different timescales. The settlement and heave calculations should be indicated graphically separately to demonstrate that a reasonably conservative change in vertical deflection ratio ('delta') has been adopted for the assessment.

3). The GMA should consider also the properties above, with damage level explicitly stated.

4). The BIA by Morph and the screening exercise by GEA are contradictory regarding the removal of trees. The screening does not identify that a tree in the lightwell is to be removed. Section 6.2 of the BIA does not explain how the influence of the boundary wall reduces the impact of the roots on the basement and it does not consider the impacts of tree removal and incursion into root zones on surrounding shallower foundations (ie foundations of the neighbouring structures).

Regards

Graham Kite

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To

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Subject 13693-03: 13 Regent's Park Road BIA Audit <2021/1586/P>

From:	"Alexandra Bamford" <AlexandraBamford@boyerplanning.co.uk>
To:	"LizBrown@campbellreith.com" <LizBrown@campbellreith.com>, "GrahamKite@campbellreith.com" <GrahamKite@campbellreith.com>
Cc:	"camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>, "Grant Leggett" <grantleggett@boyerplanning.co.uk>, "Patrick Marfleet" <patrick.marfleet@camden.gov.uk>
Date:	15/12/2021 12:06
Subject:	RE: 13693-03: 13 Regent's Park Road BIA Audit <2021/1586/P>

Hi Graham,

Thanks for your call just then.

Just to confirm, the tree in front of the building was in a pot and therefore will not have any impact on the proposal.

We look forward to receiving the final report Thursday/Friday.

Kind regards,

Alex

Kind regards,

Alex

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