

Flat 2, 15 Rosslyn Hill,  
London, NW3 5UJ

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12727-61  
Revision: F1

June 2018

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### Document Details

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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 Flat 2, 15 Rosslyn Hill, NW3 5UJ (planning reference 2017/4507/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 individuals involved in the BIA broadly meet Camden Planning Guidance Basements requirements.
- 1.5. The depths of the neighbouring basements should be confirmed prior to construction.
- 1.1. Appropriate temporary works details for the proposed construction methodology have been included together with outline calculations.
- 1.2. Category 0 (Negligible) damage is predicted for the existing building and the neighbouring properties.
- 1.3. A proposed monitoring strategy with trigger values is included in the Croft report. These should be agreed with the relevant parties prior to construction.
- 1.4. An indicative works programme is included. A detailed programme should be provided by the appointed Contractor at a later date.
- 1.5. It is accepted that there are no slope stability or wider hydrogeological concerns regarding the proposed development and it is not in an area prone to other flooding issues.
- 1.6. On the basis of the additional information presented, the BIA meets the requirements of Camden Planning Basements.

## 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 9 March 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Flat 2, 15 Rosslyn Hill, NW3 5UJ (Camden planning reference 2017/4507/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.
  - 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 *"Excavation works to rear of the site in association with erection of two-storey rear extension at ground and lower ground floor level."*
- 2.6. The Audit Instruction confirmed 15 Rosslyn Hill is not listed, nor is it a neighbour to listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 26 March 2018 and gained access to the following relevant documents for audit purposes:

- BIA Impact Screening Assessment, Croft Structural Engineers, dated 14 February 2018.
- Basement Impact Screening Assessment - Hydrogeology, Land Stability and Ground Movement Assessment, Maund Consulting, dated 22 December 2018.
- Ground Investigation Report, Ground & Water, dated January 2018.
- Design and Access Statement, Beachams Ltd, dated August 2017.
- Beachams Architects planning application drawings, dated 22 June 2017 comprising:
  - Location plan (E000)
  - Existing plans (E100)
  - Existing long and short sections (E103)
  - Existing front and rear elevations (E101)
  - Existing long section and side fence elevation (E102)
  - Proposed floor plans (P100)
  - Proposed front and rear elevation (P101)
  - Proposed long and short sections (P103)
  - Proposed long section and rear elevation (P102)

2.8. Responses to queries on the initial audit were sent via email (see Appendix 3) by the planning officer on 11 May 2018. Further queries were raised on this and the updated Hydrogeology, Land Stability and Ground Movement Assessment by Maund Consulting was received on 13 June 2018. This document is available on the planning portal and has therefore not been included on Appendix 3.

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	Yes	BIA and supporting documents
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	As above.
Are suitable plan/maps included?	No	Maps with site location indicated not included to support screening responses, however, assessment largely valid as stated below.
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	Justification not provided for all of the 'No' answers and some of relevant maps with the site location referenced but none provided with site location indicated (see Audit paragraph 4.7). Responses largely valid however.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	As above (see Audit paragraph 4.7).
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 1 of the Croft BIA makes reference to the relevant maps but none provided with the site location indicated (see Audit paragraph 4.7).
Is a conceptual model presented?	Yes	Section 7 of the Maund BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Provided but Q10 was not carried forward from the screening despite a 'Yes' response (see Audit paragraph 4.8).
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 7.1 of Maund Consulting BIA.

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 2 of Croft BIA.
Is factual ground investigation data provided?	Yes	Ground & Water GI report.
Is monitoring data presented?	Yes	Section 4.4 of the GI report.
Is the ground investigation informed by a desk study?	No	Some desk study information is included as part of one of the BIA reports however this does not appear to have informed the ground investigation (see Audit paragraph 4.2).
Has a site walkover been undertaken?	Yes	Section 3 of the Croft BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Maund Consulting and Croft BIAs although no depths are indicated (see Audit paragraph 4.9).
Is a geotechnical interpretation presented?	Yes	Section 5 of the Maund Consulting BIA, however, there are queries on this (see Audit paragraph 4.13).
Does the geotechnical interpretation include information on retaining wall design?	Yes	As above (see Audit paragraph 4.13).
Are reports on other investigations required by screening and scoping presented?	N/A	Screening and scoping appears to have been undertaken following GI (see Audit paragraph 4.2).
Are the baseline conditions described, based on the GSD?	No	Maund Consulting and Croft BIAs provides most of the information although this is considered disjointed. Utility search not undertaken (see Audit paragraphs 4.2, 4.8, 4.9 and 4.18).
Do the base line conditions consider adjacent or nearby basements?	Yes	As above (see Audit paragraph 4.9)
Is an Impact Assessment provided?	Yes	Section 8 of the Maund Consulting BIA.
Are estimates of ground movement and structural impact presented?	Yes	Maund Consulting BIA (see Audit paragraphs 4.15 and 4.16).
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Although contradictory information given with respect to aquifer status (see Audit paragraphs 4.8).



Item	Yes/No/NA	Comment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Section 4 of the Croft BIA.
Has the need for monitoring during construction been considered?	Yes	As above (see Audit paragraph 4.17).
Have the residual (after mitigation) impacts been clearly identified?	N/A	None identified.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Maund Consulting email (see Appendix 3) and revised GMA (see Audit paragraphs 4.13 to 4.17).
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Croft BIA (see Audit paragraphs 4.10).
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Category 0 indicated (see Audit paragraph 4.16).
Are non-technical summaries provided?	No	Croft BIA (see Audit paragraph 4.2) only.

## 4.0 DISCUSSION

- 4.1. The main BIA which includes a hydrology screening and scoping assessment was undertaken by Croft Structural Engineers. The structural design was undertaken by an individual with a CEng IStructE qualification. Whilst it does not appear the hydrological assessment was undertaken by an individual with qualifications was per CPG4 requirements, it is acknowledged no adverse surface water and flooding issues have not been identified. A separate hydrogeology and land stability assessment was undertaken by Maund Consulting and the individual holds CGeol and CEng qualifications.
- 4.2. A ground investigation report is provided separately. This appears to have been undertaken prior to the land stability and hydrogeology screening assessments and was therefore not informed by these or a desk study. Where a number of supporting documents are provided, it is beneficial to provide a summary of the findings/conclusions of the other documents in the main BIA. The Croft BIA which appears to be the main document, makes reference to these reports but does not provide a summary of the findings making the overall BIA disjointed. A number of queries were raised following the initial audit which mainly related to stability and these have now been addressed as discussed below.
- 4.3. The Croft BIA makes reference to CPG4 and the Arup GSD. Together with the other current guidance documents, the 2017 Camden Local Plan should also be referenced.
- 4.4. The site comprises a four storey semi-detached building over a '*lower ground floor*'. The building is separated into flats and the subject site, Flat 2 occupies the ground and lower ground floors. The property is not listed but it is located within the Fitzjohn's and Netherall Conservation area.
- 4.5. It is proposed to extend the existing ground floor and lower ground/basement into the rear garden. This depth of excavation is indicated to be 2m to match the existing basement level.
- 4.6. It is stated in Croft's report that the basement is to be formed by reinforced concrete cantilever retaining walls. Section 9 of the Maund Consulting report states the '*side walls*' will be propped as the excavation progresses. The construction sequence sketches in Croft's report indicate a raking prop supported on a thrust block at the base of the excavation, along with the walls formed in a 'hit and miss' sequence. Outline retaining wall calculations for a cantilever wall (permanent condition) and a propped cantilever (temporary condition) are included the Croft report.
- 4.7. Although some of the relevant figures/maps from the Arup GSD and other guidance documents are referenced, these are not included with the site location indicated to support the statements made in the screening assessments. Additionally, justification is not given for most of the 'No'

responses in the Maund Consulting report. Nevertheless, the responses are considered to be largely valid.

- 4.8. Contradictory information is given in the Maund Consulting report with regards to groundwater. It is stated in the hydrogeology screening that the site is underlain by a Secondary A aquifer, the Claygate Member, however, the impact assessment states this is not classified as an aquifer. It is stated on Table 7.1 (hydrogeology screening), that further groundwater monitoring is not considered necessary due to the depth below the proposed basement depth it was recorded at during monitoring. Further groundwater monitoring is however recommended elsewhere in the report and the Croft BIA recommends groundwater monitoring prior to and during construction.
- 4.9. It is stated in the BIA reports that the neighbouring properties, Nos 13 and 17 Rosslyn Hill comprise basements although the depths of these together with the foundations have not been indicated. It is stated in the Maund report that the depths to the basements are anticipated to be similar to the basement beneath the site. The Croft reports recommends the depths to these to be confirmed prior to detailed design and this is considered prudent.
- 4.10. It is stated on the hydrology assessment that there will be no increase in the hardstanding area as the proposed area of extension already paved. The volume of surface water run-off will therefore remain unchanged. The BIA highlights a potential for sewer flooding and proposes suitable mitigation.
- 4.11. As stated above, a site specific ground investigation was undertaken, however, this does not appear to have been informed by a desk study or the land stability and hydrogeology screening. The investigation comprised a windowless sampler hole at the front of the property, a handheld window sampler hole at the rear and three foundation inspection pits four to investigate the existing foundations.
- 4.12. The ground investigation report indicates Made Ground to 0.90m and 2.50m in the two exploratory holes at the rear and front of the property respectively. The Made Ground was underlain by the Claygate Member which was proven to 8.45m bgl. A single monitoring visit indicates a groundwater depth of c.4m bgl.
- 4.13. Geotechnical interpretation with retaining wall parameters were included in the Maund Consulting report. Following the initial audit, queries were raised on the stiffness values (Young's Modulus) for the Made Ground which were considered to be too high. Justification was also requested for the 2.50m thick layer of Made Ground encountered in BH1, which was described as possible weathered Claygate Member in the report with parameters relating to this stratum assigned.

- 4.14. Justification is provided on the email response (Appendix 3) and although this does not fully address the queries, it is acknowledged that due to the relatively limited thickness of the Made Ground in the exploratory hole located in the area of the proposed extension, this is unlikely to have a significant effect on the ground movements.
- 4.15. Following the initial audit, queries were raised on the ground movement assessment which predicted Category 0 damage for the property itself and the neighbouring properties Nos 13 and 17. It appeared only vertical movements due to excavation and construction of the retaining walls had been considered in the damage assessment. It was stated in the ground movement assessment (Section 9 of the Maund report) that vertical and horizontal movements due to underpinning and horizontal movements due to excavation have not been included in the damage assessment as these are not considered significant due to the proposed extension being located at the rear of the property. Queries were also raised on the soil profile used in the Pdisp tabular input as this differed from Table 4.3 of the Maund Consulting report.
- 4.16. Anticipated vertical and horizontal movements due to excavation and construction have been included in the revised submission. The email response (see Appendix 3) states that these movements will *'only act out into the garden of 15 Rosslyn Hill and to a lesser extent the gardens of 13 and 17 Rosslyn Hill therefore there can be no impact on these building structures'*. The calculations indicate Category 0 (Negligible) damage for the existing building on site and the neighbouring properties.
- 4.17. A structural monitoring strategy with proposed trigger levels is included in Croft's report.
- 4.18. It is stated in the Croft Report that the nearest Network Rail and LUL assets are greater than 30m away, however it is stated both asset owners have been contacted. The report recommends liaison with the asset owners to be continued at detailed design stage. A Thames Water sewer is indicated to be located beneath the roadway along the front of the property.
- 4.19. The BIA recommends a detailed utility search prior to construction. Whilst this is considered prudent, it is acknowledged the proposed construction is located to the rear of the property at some distance away from the main road.
- 4.20. It is accepted that there are no slope stability concerns regarding the proposed development. The site is not in an area prone to other flooding issues and the wider hydrogeology of the area is unlikely to be affected.
- 4.21. An outline works programme is included in the Croft BIA as required by the LBC guidance documents.

## 5.0 CONCLUSIONS

- 5.1. The qualifications of the individuals involved in the BIA broadly meet the CPG4 requirements.
- 5.2. The 2017 Camden Local Plan together with the other current guidance documents should be referenced in future revisions.
- 5.3. The depths of the neighbouring basements and foundations should be confirmed prior to construction.
- 5.4. Appropriate temporary works details for the proposed hit and miss sequence have been provided. Outline calculations are also included.
- 5.5. Category 0 (Negligible) damage is predicted for the existing building and the neighbouring properties. Queries on the ground retaining wall parameters and ground movement assessment have now been addressed as discussed on Section 4.
- 5.6. A proposed monitoring strategy with trigger values is included in the Croft report. These should be agreed with the relevant parties prior to construction.
- 5.7. An indicative works programme is included. A detailed programme may be provided by the appointed Contractor at a later date.
- 5.8. It is accepted that there are no slope stability or wider hydrogeological concerns regarding the proposed development and it is not in an area prone to other flooding issues.
- 5.9. Additional information has now been presented as requested and on this basis the BIA meets the requirements of Camden Planning Guidance 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 format/Stability	Retaining wall design parameters	Closed – see Audit paragraphs 4.13 and 4.14.	14/06/2018
2	Stability	Ground movement assessment (GMA)	Closed – see Audit paragraphs 4.15 and 4.16.	14/06/2018
3	Stability	Movement monitoring proposal.	Closed – see Audit paragraph 4.17.	14/06/2018



## **Appendix 3: Supplementary Supporting Documents**

Email response to queries (dated 11 May 2018).



**RE: 12727-61 Flat 2, 15 Rosslyn Hill BIA Audit**  
**Marfleet, Patrick** to: GraceWhite@campbellreith.com  
Cc: "RobertMorley@campbellreith.com", "camdenaudit@campbellreith.com"

11/05/2018 10:42

Hi Grace,

Please see attached an email from the applicant containing the additional information requested in the initial BIA audit.

Any questions, let me know.

Thanks,

Patrick Marfleet  
Planning Officer

Telephone: 020 7974 1222

From: GraceWhite@campbellreith.com [mailto:GraceWhite@campbellreith.com]  
Sent: 16 April 2018 17:05  
To: Marfleet, Patrick <Patrick.Marfleet@camden.gov.uk>  
Cc: RobertMorley@campbellreith.com; camdenaudit@campbellreith.com  
Subject: 12727-61 Flat 2, 15 Rosslyn Hill BIA Audit

Good Afternoon

Please find attached a copy of our BIA Audit for the above property.

Should you have any queries, please do not hesitate to contact us.

**Grace White**  
Receptionist | Administrator

**CampbellReith**  
consulting engineers

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----- Message from Mike Beacham <mike@beacham.co.uk> on Wed, 9 May 2018 08:18:15 +0000 -----

**To:** "Marfleet, Patrick" <Patrick.Marfleet@camden.gov.uk>

**cc:** Geoffrey Ho <lurkee@hotmail.com>, Toby Crane  
<tobycrane@yahoo.com>

**Subject** FW: 15RH - BIA Update [ Camden Ref 2017/4507/P ; CR Ref 12727-61  
:]

Hi Patrick,

I hope you are well, we have the responses to the 3 BIA Audit queries below; our team have been in discussions directly with Campbell Reith so we are confident this should be everything required.

The revised Hydrology and Land Stability BIA Report for submission is downloadable from the following link (24MB): [\[Suspicious URL detected\]](#)

Please will you let us know the anticipated timescale for Campbell Reith to confirm responses are adequate?

We are keen to progress as quickly as possible towards approval.

Kind regards,  
Mike

Our responses to the audit queries are below:

1	BIA format/Stability	Retaining wall design parameters	Open - see Audit paragraphs 4.13 and 5.4
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#### Paragraph 4.13

*Although some interpretation is included in the Maund Consulting report, the retaining wall parameters provided are not considered conservative. The stiffness values (Young's Modulus) for the Made Ground are considered to be too high and the 2.50m thick layer of Made Ground encountered in BH1 is described as possible weathered Claygate Member and the parameters given relate to this stratum. Although this should be reconsidered, it is however acknowledged the basement extension will be located to the rear.*

#### Response

The BIA did provide interpretation and justification (section 4.3) to indicate that the lower part of the made ground had all the properties (grading, description plasticity and soil shear strength) comparable to or is indeed the Claygate formation. It can be deducted that if all these parameters show similarity with the Claygate formation then so too should the soil stiffness. The design line actually shows that the made ground (interpreted as Claygate Formation) referred to was stiffer than the Claygate formation, (see figure 4.1 of BIA) so this does not mean that the parameters are not conservative. This was explained by the Chartered Geologist with the auditor by phone on 26/04/18.

2	Stability	Ground movement assessment (GMA)	Open - to be reconsidered as per Audit paragraph 4.14
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#### Paragraph 4.14 -1

*It is stated in the ground movement assessment (Section 9 of the Maund report) that vertical and horizontal movements due to underpinning and horizontal movements due to excavation have not been included in the damage assessment as these are not considered significant due to the proposed extension being located at the rear of the property. Only vertical movements due to excavation and construction estimated using Oasys Pdisp appear to have been considered.*

#### Response

It was stated in the BIA (Section 9.1) that vertical and horizontal movements in relation to the retaining wall will only act out into the garden of 15 Rosslyn Hill and to a lesser extent into the gardens of 13 and 17 Rosslyn Hill. The movements do not act out to houses themselves of 13, 15 and 17 therefore there can be no impact on these building structures.

For information the horizontal movement calculated from reference to CIRIA 760 is circa 5.7 mm (excavation and installation) decreasing to 0mm at 4 x wall depth i.e. 4 x 3m = 12m. Vertical movement with reference to CIRIA 760 will be 0.04% of wall depth or circa 1.2 mm at the wall decreasing to 0mm at 4 x wall depth. To reiterate these are acting into gardens and not buildings.

#### Paragraph 4.14 -2

*The soil profile in the tabular input differs from Table 4.3 of the Maund Consulting report. Category 0 damage is indicated for the property itself and the neighboring properties Nos 13 and 17.*

### Response

We assume this refers to the level of the strata. This has been amended in the PDISP output so the made ground/ probable Claygate is at 79.0 and the Claygate at 77.5 m AOD. The analysis has been rerun and there is no significant change to the output (0.1mm and 0.2mm of additional settlement for undrained and drained conditions respectively) the graphical output remains the same. The revised tabular output has been replaced in Appendix E.

3	Stability	Movement monitoring proposal.	Open - Trigger levels to be reconsidered following GMA update.
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### Response

For the reasons described in the response of the previous queries trigger levels do not need to be reconsidered.

Please note that the revised BIA Report from Maund Geo-Consulting will be sent using WeTransfer. See link at beginning of e-mail.

Please forward the attachment and this message to the Council for review.

Kind regards

Concetta Cosenza

Structural Engineer

MSc, BEng



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