

38 Regents Park Road
London, NW1 7SX

Basement Impact Assessment
Audit

For
London Borough of Camden

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June 2016

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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 38 Regents Park Road, London NW1 7SX (planning reference 2016/0279/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 carried out by Geotechnical and Environmental Associates (GEA) and a Structural Report and Construction Method Statement was prepared by Elliot Wood Partnership LLP. The individuals concerned in the production of both documents have suitable qualifications.
- 1.5. The proposal involves refurbishment and extension of the existing building, to include deepening of the existing lower ground floor, extending the sunken courtyard to the front of the building and the construction of a new sunken garden room.
- 1.6. The BIA confirmed the basement is to be founded within the London Clay and that the water table is considered to be perched water. Sump pumping is proposed to deal with the anticipated perched water inflows.
- 1.7. A screening section has been provided in the BIA, however, no written justification has been provided for the "No" responses as per paragraph 3.11 of the CPG4 report. Justifications have been provided in the Non-technical Summary section and it is accepted that they are correct.
- 1.8. The BIA states that there are no adjacent basements to the site. This has not been confirmed, however, conservative assumptions have been made in respect of construction and ground movement.
- 1.9. Clarification is requested on the site levels.
- 1.10. The baseline conditions do not describe the neighbouring properties and this is requested in accordance with the GSD.
- 1.11. No works programme has been provided and this is requested in accordance with the GSD clause 233.

- 1.12. No construction sequence sketches have been provided and this is requested to better illustrate the proposed sequence.
- 1.13. The BIA states the predicted damage to the adjacent buildings would be Category 0 (negligible) or Category 1 (very slight). However, a number of queries have been raised with respect to the Ground Movement Assessment which require clarification.
- 1.14. Clarification is requested on the number of trees to be removed and the impact of tree removal on nearby shallow foundations.
- 1.15. Details and trigger levels will need to be agreed as part of the wall awards. However, the movements are subject to a review when the GMA is corrected and resubmitted.
- 1.16. Outline calculations and design assumptions for the retaining walls and slabs should be provided for the sunken courtyard to the front and the new sunken garden room at the end of the rear garden.
- 1.17. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding or slope stability.
- 1.18. Queries and results for clarification or more information are discussed in section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 4th May 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 38 Regents Park Road, London NW1 7SX, Camden Reference 2016/0279/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; and,
 - 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 front, side and rear extensions with rear 1st floor roof terrace, including basement excavation and various external alterations, and conversion of two flats at lower ground, ground and first floor levels to one maisonette; and excavation to create sunken garden room at basement level with roof terrace above at north end of rear garden to provide ancillary accommodation to existing residential dwelling (Class C3)"*

The Audit Instruction also confirmed 38 Regents Park Road was a neighbour to a Grade II listed building at 36 Regents Park Road.

2.6. CampbellReith accessed LBC's Planning Portal on 23rd May 2016 and gained access to the following relevant documents for audit purposes:

- Design Study & Basement Impact Assessment Report (BIA)
- Structural Strategy Report (SSR)
- Planning Application Drawings consisting of
 - Location Plan
 - Existing Plans
 - Proposed Plans
- Planning Response
- Design & Access Statement
- Arboricultural impact appraisal

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The author's qualifications are in accordance with CPG4 guidelines for all sections. BIA section 1.3.2.
Is data required by Cl.233 of the GSD presented?	No	Although most information is provided in GEA Site Investigation & BIA, Elliot Wood Structural Engineering Report, Construction Method Statement and appendices, a works programme has not been included.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	GEA BIA, Elliot Wood Structural Engineering Report, Construction Method Statement. BIA section 9.1.
Are suitable plan/maps included?	No	Arup GSD maps indicating site location not provided (see Audit paragraph 4.6).
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?	No	Relevant Arup GSD maps referenced in the "Non-technical" Summary section of the BIA, but maps not provided (see Audit paragraph 4.5 and 4.6). Discrepancy on trees to be removed (see Audit paragraph 4.19).
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Relevant Arup GSD maps referenced in the "Non-technical" Summary section of the BIA, but maps not provided. (see Audit paragraph 4.5 and 4.6).
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Relevant Arup GSD maps referenced in the "Non-technical" Summary section of the BIA, but maps not provided. (see Audit paragraph 4.5 and 4.6).

Item	Yes/No/NA	Comment
Is a conceptual model presented?	Yes	GEA Site Investigation and BIA Section 5.1, 5.2 and 5.3.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA section 13.0 Scoping is consistent with screening outcome.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA section 13.0.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA section 13.0.
Is factual ground investigation data provided?	Yes	Geotechnical and Environmental Associates (GEA) BIA.
Is monitoring data presented?	Yes	BIA section 5.3.
Is the ground investigation informed by a desk study?	Yes	Geotechnical and Environmental Associates (GEA) BIA.
Has a site walkover been undertaken?	Yes	BIA section 1.3.
Is the presence/absence of adjacent or nearby basements confirmed?	No	BIA states that basements are not present but this is not confirmed.
Is a geotechnical interpretation presented?	Yes	BIA Section 7.0.
Does the geotechnical interpretation include information on retaining wall design?	Yes	BIA section 8.0.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural impact appraisal report provided.
Are the baseline conditions described, based on the GSD?	No	Neighbouring properties not described.
Do the base line conditions consider adjacent or nearby basements?	Yes	BIA states no nearby basements, although this is not confirmed (see Audit paragraph 4.10)

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	BIA section 13.0.
Are estimates of ground movement and structural impact presented?	Yes	BIA section 10.0.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Impact Assessment is appropriate to the matters identified by screening and scoping.
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	BIA section 11.2 and SR section 8.0.
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?	No	See audit paragraph 4.14.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	GEA BIA.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	See Audit paragraph 4.14.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	BIA section 12.0. See Audit paragraph 4.16.
Are non-technical summaries provided?	Yes	Although a "Non-Technical summary" section has been provided, it does not comply with paragraph 3.5 of the CPG4 report.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Geotechnical & Environmental Associates (GEA) and the individuals concerned have CEng MICE FGS, CGeol FGS and C.WEM qualifications, which are in accordance with the requirements of CPG 4.
- 4.2. A Structural Engineering Report was prepared by Elliot Wood Partnership LLP and the reviewer is a Chartered Structural Engineer.
- 4.3. The site comprises a five storey terraced house with a semi-basement (referred to as lower ground floor level in the BIA). There is a small garden area to the rear of the building with concrete steps leading down to lower ground level.
- 4.4. The proposed development comprises the refurbishment and extension of the existing lower ground floor at the rear and lowering of the lower ground floor level by approximately 1m. In addition, the sunken courtyard to the front of the house is to be extended and a new sunken garden room is to be built at the end of the rear garden.
- 4.5. A screening section has been provided in the BIA, however, no written justification has been provided for the “No” responses as per paragraph 3.11 of the CPG4 report. Justifications have been provided in the Non-technical Summary section and it is accepted that they are correct.
- 4.6. No Arup GSD map extracts have been included. It would be beneficial if all the relevant map extracts from the Arup GSD and Camden Strategic Flood Risk Assessment identifying the site location on each map are included. These extracts would help to support statements made in the BIA screening process.
- 4.7. The “Non-Technical summary” section of the BIA report does not comply with paragraph 3.5 of the CPG4 report.
- 4.8. The ground investigation revealed Made Ground between 0.70m and 0.90m below lower ground floor level over London Clay which was proven to 6m below lower ground level. The BIA confirmed the basement is to be founded within the London Clay and that the water table is considered to be perched water. Sump pumping is indicated to be able to deal with perched water inflows during construction.
- 4.9. Two trial pits were undertaken to investigate the existing building foundations. The trial pits indicate that the existing foundations comprise brick and concrete footings bearing on weathered firm London Clay at depths of between 0.8m and 0.9m below the existing lower ground floor level.

- 4.10. The BIA states that there are no adjacent basements to the site and the neighbouring foundations are likely to be similar to the foundations to No 38. Unless further information is forthcoming or an investigation undertaken to determine these, the maximum differential depth should be assumed.
- 4.11. The baseline conditions do not describe the neighbouring properties and this is requested according to the GSD.
- 4.12. It is understood that the deepening of the existing structure will be undertaken by underpinning of the existing foundations and construction of the sunken rooms by RC retaining walls in panels in a similar way to underpinning beneath the existing perimeter walls. The construction method and sequence for the proposed basement works are not clear and a construction sequence should be provided. Outline calculations and design assumptions for the retaining walls and slabs should be provided for the sunken courtyard to the front and the new sunken garden room at the end of the rear garden.
- 4.13. No construction sequence sketches have been provided and these are requested to better illustrate the proposed sequence.
- 4.14. The ground movement assessment is not considered appropriate and is requested to be resubmitted because of the following:
- The ground movement assessment does not consider the full dimensions of the new courtyard room at the front and the dimension of No 38 from front to back does not reflect the layout of the property.
 - The effect of the induced ground movements on No. 3 and 5 Kingstown Street is not considered.
 - The Xdisp input for the damage assessment is not provided. By looking at the output figures, it appears that No. 36 Regent's Park Road has been assumed to be detached from No. 38 whilst the drawings indicate the opposite. Additionally, the width of No 38 is greater than the drawings suggest. Full input and output data for the Xdisp analysis are required.
 - Whilst modelling of the proposed sunken garden room and its entrance staircase at the rear as a trapezoid is accepted, the model has assumed the ground movements arising from excavation along the south boundary are zero which is an underestimation of the movements, and has a stiffening effect on the south east corner of the excavation.
 - Soil properties assumed in the Pdisp analyses are not proved by the submitted ground investigation report, and the drained parameters assumed for Made Ground are not considered appropriate, nevertheless, it is noted that the need for design of the slabs to resist the possible uplift forces has been considered in the BIA.
- 4.15. It is noted that the GMA must reflect the construction sequence of the development and as noted in 4.14 further information should be provided.

- 4.16. A damage category of up to 1 (very slight) according to Burland scale is predicted in the GMA, and monitoring of the ground movements are proposed under Party Wall Award; however, the GMA is considered incomplete and should therefore be resubmitted. It should be noted that the building damage assessment is applicable only to properties in sound structural condition. Condition surveys and monitoring should be agreed as part of the party wall award. The GMA should also make reference to the likely impact on the adjacent highway
- 4.17. Outline monitoring proposals are presented in Section 8.0 of Structural report. Details and trigger levels will need to be agreed as part of the wall awards. However, the movements are subject to a review when the GMA is corrected and resubmitted.
- 4.18. A discrepancy is noted between the existing lower ground floor level indicated in the BIA section 2.4 and the Architects drawings. Clarification is requested.
- 4.19. A discrepancy is noted in the various documents on the number of trees to be removed. It is stated in the Arboricultural impact appraisal report that a single tree will be removed but the BIA screening mentions four trees to be removed. Although section 13.0 of the BIA states that the foundation of the basement will extend beyond the zone of tree root activity, clarification is requested, together with a consideration of the impact of tree removal on any nearby shallow foundations. The BIA states that no desiccation was observed, however, it is note that the exploratory holes are remote from the trees and were sunk from a lower level.
- 4.20. It is accepted that the proposed development is not in an area prone to flooding. Whilst it is noted that there is an increase in impermeable areas, the BIA proposes that the surface water is connected to the existing drainage network avoiding any increased flows into the ground.
- 4.21. The screening exercise has confirmed that there is no impact to groundwater flows although paragraph 6.3 of the Structural Report makes an incorrect statement about groundwater flows around the basement. The screening has also shown that there are no impacts related to slope stability.
- 4.22. No works programme has been provided and this is requested in accordance with the GSD clause 233.

5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) has been carried out by Geotechnical & Environmental Associates (GEA) and the qualifications of the individuals concerned in its production are in accordance with the requirements of CPG4.
- 5.2. The BIA confirmed the basement is to be founded within the London Clay and that the water table is considered to be perched water. Sump pumping is proposed to deal with the anticipated perched water inflows.
- 5.3. A screening section has been provided in the BIA, however, no written justification has been provided for the “No” responses as per paragraph 3.11 of the CPG4 report. Justifications have been provided in the Non-technical Summary section and it is accepted that they are correct.
- 5.4. The BIA states that there are no adjacent basements to the site. This has not been confirmed, however, conservative assumptions have been made in respect of construction and ground movement.
- 5.5. Clarification is requested on the site levels. The baseline conditions do not describe the neighbouring properties and this is requested in accordance with the GSD.
- 5.6. No works programme has been provided and this is requested as required by the GSD clause 233.
- 5.7. No construction sequence drawings have been provided and this is requested to better illustrate the proposed sequence.
- 5.8. Clarification is requested on the number of trees to be removed and the impact of tree removal on nearby shallow foundations.
- 5.9. Details and trigger levels will need to be agreed as part of the wall awards. However, the movements are subject to a review when the GMA is corrected and resubmitted.
- 5.10. Outline calculations and design assumptions for the retaining walls and slabs should be provided for the sunken courtyard to the front and the new sunken garden room at the end of the rear garden.
- 5.11. It is accepted that the development will not impact on the wider hydrogeology of the area and is not in an area subject to flooding or slope stability.

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	Works Programme not provided	Open - outline programme to be provided	
2	BIA format	Discrepancy in site levels. See paragraph 4.18	Open - clarification requested	
3	BIA format/ Stability	Construction sequence sketches not provided. See paragraph 4.12	Open - Sketches to provide	
4	BIA format	Neighbouring properties not described. See paragraph 4.16	Open - to be provided	
5	Stability	Ground movement assessment to be resubmitted. See paragraph 4.14	Open - to be provided	
6	Stability	Discrepancy in the various documents on the number of trees to be removed. Clarification requested on the impact of tree removals on the nearby foundations. See paragraph 4.20.	Open - clarification requested	
7	Stability	Structural calculations for the sunken garden room and the front courtyard not provided (see paragraph 4.23)	Open - to be provided	
8	Stability	Monitoring. See paragraph 4.17	Outline proposal presented. Details and trigger levels to be agreed as part of Party Wall Award	N/A

Appendix 3: Supplementary Supporting Documents

None

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