

10 Downside Crescent,
London NW3 2AP

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 12727-92

Revision: D2

November 2018

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Contents

1.0	Non-technical summary	1
2.0	introduction.....	3
3.0	Basement Impact Assessment Audit Check List.....	5
4.0	Discussion	9
5.0	Conclusions	12

Appendix

- Appendix 1: Residents’ Consultation Comments
- Appendix 2: Audit Query Tracker
- Appendix 3: Supplementary Supporting Documents

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 10 Downside Crescent, London NW3 2AP (planning reference 2018/2615/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 has been prepared by Geotechnical and Environmental Associates Ltd (GEA) with structural calculations and drawings by Rodrigues Associates. The qualifications of the authors are in accordance with LBC guidance.
- 1.5. The application property forms one half of a pair of three-storey properties located on the eastern side of Downside Crescent. The proposed basement will be 3.50m deep under the full footprint of the house and extend 5m into the rear garden. Two new lightwells will be created at the rear of the property.
- 1.6. The BIA includes the majority of the information required from a desk study in accordance with LBC guidance. In the revised submission, an outline construction programme has been presented.
- 1.7. The current BIA references geotechnical interpretation from the previously submitted BIA. This is inconsistent with the structural calculations presented. The geotechnical parameters should be confirmed.
- 1.8. The proposed basement will be founded in the London Clay Formation. Groundwater was not encountered during the investigation although subsequent monitoring recorded groundwater at approximately 2m below ground level. The basement will be formed by underpinning techniques beneath the current building footprint. Contingency measures to control groundwater and maintain stability during construction should be confirmed.
- 1.9. For the basement retaining walls to be constructed beyond the exiting building footprint, construction methodology and temporary works information is inconsistent between the various documents and should be clarified.

- 1.10. A revised Ground Movement Assessment (GMA) is presented, indicating impacts of Category 0 (Negligible) to neighbouring structures. The GMA is not accepted as detailed in Section 4.
- 1.11. Although the site is within 5m of the highway and impact is accepted to be minimal. Protection of any utility assets within the highway should be agreed with asset owners, as applicable.
- 1.12. The site is understood to be 35m northeast of the Northern Line tunnels. The BIA states the site is outside the exclusion zone and will not impact TFL assets.
- 1.13. The structural calculations reference a Movement Monitoring Specification (Appendix B) that is provided for review in the revised submissions.
- 1.14. The BIA states the property is at low risk of surface water flooding.
- 1.15. The revised BIA indicates that off-site discharge flow rates will be attenuated to meet policy criteria. The final drainage scheme should be agreed with Thames Water and LBC.
- 1.16. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2. Until the additional information requested is presented, the BIA does not meet the criteria of CPG Basements.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 19th July 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 10 Downside Crescent, London NW3 2AP, Camden Reference 2018/2615/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): Basements.
 - Camden Development Policy (DP) 27: Basements and Lightwells.
 - Camden Development Policy (DP) 23: Water.
 - The Local Plan (2017): 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; 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 planning portal describes the proposal as: "*subterranean excavation to create a new basement level, supplied by two enclosed lightwells located to the rear of the dwelling*". Also proposed is the erection of a single storey rear extension with a flat roof, removal of a rear

chimney breast and alterations to front driveway and increased height of an existing boundary wall to the front of the property.

The planning portal confirmed the site lies within the Parkhill and Upper Park Conservation Area but the site and neighbouring properties are not listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal in July 2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (ref J1719A) dated June 2018 by GEA.
- Structural Calculations and Structural Drawings (Job No. 1411 First Issue) dated 01.05 2018 by Rodrigues Associates.
- Existing and proposed elevations and plans dated April 2018 by Rodrigues Associates.
- Arboricultural Impact Assessment (ref 10 Downside Crescent) dated 27th July 2016 by Southern Ecological Solutions (SES).
- Design and Access Statement (May 2018) original by Bow Tie Construction and updated by XUL Architecture.

2.7. CampbellReith were provided with the following relevant documents for audit purposes in August and September 2018:

- Basement Impact Assessment (ref J1719A rev 3) dated 27 September 2018 by GEA.
- Structural Calculations and Structural Drawings (Job No. 1411 First Issue) including Appendix B dated 01.05 2018 by Rodrigues Associates.
- Outline Construction Programme.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
Is data required by Cl.233 of the GSD presented?	Yes	However, BIA should consider the sheet piling proposed within the structural report.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Perched water may be present within the Head Deposits – groundwater control contingencies to be outlined to mitigate construction impacts. Attenuation of off-site discharge flows in accordance with the guidance to be assessed.
Are suitable plans/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	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	No	BIA not consistent with SI regarding Head Deposits

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Perched water may be present - details required to mitigate construction impacts.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Attenuated drainage proposed.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	
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?	Yes	The adjoining property 8 Downside Crescent has an existing single level basement assumed depth 2.2m.
Is a geotechnical interpretation presented?	No	Previous BIA referenced; parameters inconsistent with those adopted in structural calculations; Head Deposits not referenced; stiffness of Made Ground not considered conservative.
Does the geotechnical interpretation include information on retaining wall design?	Yes	To be confirmed once geotechnical parameters presented.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Assessment.

Item	Yes/No/NA	Comment
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	However, to be revised as Section 4.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Groundwater control not specified.
Has the need for monitoring during construction been considered?	Yes	Appendix B Structural Report presented with details.
Have the residual (after mitigation) impacts been clearly identified?	No	GMA to be revised.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	To be confirmed: geotechnical parameters; use of sheet piling; GMA; groundwater control mitigation measures.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Drainage assessment provided.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	However, to be confirmed following review of GMA.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

- 4.1. The BIA has been prepared by GEA with structural calculations and structural drawings by Rodrigues Associates. The qualifications of the authors are in accordance with LBC guidance.
- 4.2. As stated in the BIA presented by GEA, a BIA by others was previously submitted relating to the previous planning application for the property. The scheme has subsequently been revised but no further ground investigation has been undertaken.
- 4.3. The site comprises a three storey terraced residential building located on the eastern side of Downside Crescent which is understood to have been constructed between 1915 and 1934. The proposal is to excavate the existing cellar to 3.50m below ground level (bgl) / 61.90m AOD to create a single storey basement beneath the property. Two new lightwells will be created at the rear of the property in addition to an extension of the ground floor at the rear of the property. The proposed basement will extend around 5m beyond the rear principal elevation of the building.
- 4.4. The BIA includes the majority of the information required from a desk study in accordance with the GSD Appendix G1.
- 4.5. In the revised submission, an outline construction programme has been presented.
- 4.6. A site investigation was undertaken by SAS in March 2017 comprising one rotary percussive borehole (BH1) and one continuous flight auger borehole (BH2). No groundwater was encountered during the investigation. The ground conditions comprise Made Ground over Head Deposits which in turn overlie London Clay.
- 4.7. Groundwater was not encountered during drilling but was identified during subsequent monitoring. The BIA identifies that there is potential for perched groundwater within the Head Deposits to collect around the basement during construction and in the long term and therefore the basement should be fully waterproofed and designed to withstand hydrostatic pressures. Levels should be confirmed in advance of excavation to inform temporary works contingency planning and control of construction.
- 4.8. Considering the underlying unproductive strata, the proposed development will not impact the wider hydrogeological environment.
- 4.9. In the revised BIA, bearing pressures have been provided and are less than the allowable net bearing pressure given in the ground investigation report. However, the referenced ground model is inconsistent, with Head Deposits not considered within the Ground Movement Assessment (GMA). The stiffness of the Made Ground is not considered to be conservative although it is accepted that it has little bearing on the impact assessment at this stage. The ground model and

geotechnical parameters should be consistently presented across the assessments, with reasonably conservative parameters adopted.

- 4.10. The basement will be founded in the London Clay Formation. The basement will be formed by underpinning techniques beneath the current building footprint. Contingency measures to control groundwater and maintain stability during construction should be confirmed. Sequencing and propping proposals are accepted.
- 4.11. The construction methodology and temporary works information for the basement retaining walls to be constructed beyond the existing building footprint are not consistent. The structural report indicates that sheet piling will be utilised, although this has not been considered within the BIA. The sheet piling methodology and pile toe depths should be confirmed and assessments updated to consider potential impacts.
- 4.12. The BIA notes the potential for shrink / swell movements in shallow soils due to changes in soil moisture conditions due to nearby trees. No removal of trees during construction is proposed within the development's footprint and there are therefore no impacts to any surrounding shallow foundations. It is also noted that proposed foundation depths are beyond the likely zone of shrink / swell influence.
- 4.13. The BIA notes that 8 Downside Crescent has a rear extension basement which is assumed to be 2.2m below existing ground level. Shallow foundations have been assumed for the other surrounding structures.
- 4.14. A revised GMA is presented which has been undertaken using software programs PDisp and XDisp. The impact assessment indicates Category 0 (Negligible) damage to neighbouring structures. However, the GMA is not accepted for the following reasons:
- It does not consider the impact of sheet piling;
 - Section 5.2 notes that vertical ground movements are derived from PDisp, yet the subsequent table includes vertical movements derived from XDisp. This requires clarification;
 - Text refers to 'horizontal settlement' and states 'the results are presented below and in subsequent tables to the degree of accuracy required to allow predicted variations in ground movements around the structure to be illustrated, but may not reflect the anticipated accuracy of the predictions'. These require clarification;
 - The assessment suggests that settlement due to the combined effects of construction of underpinning and the revised loading arrangement will be limited to 2-3mm. This is considered an underestimate and not reasonably conservative.
 - The stiffness of the Made Ground is not considered reasonably conservative and the ground model adopted does not consider Head Deposits, although it is accepted that this will not alter the impact assessment at this stage.

- 4.15. The site is within 5m of the highway but it is accepted the impact from the proposed basement is concluded to be minimal. Protection of any utility assets within the highway should be agreed with asset owners, as applicable.
- 4.16. The site is understood to be approximately 35m northeast of the Northern Line underground tunnels. The BIA states the site is outside the exclusion zone and will not impact these assets.
- 4.17. The BIA recommends structural monitoring of the existing building on site and the neighbouring structures during the works, to ensure construction is controlled and to maintain impacts within predicted limits. The structural calculations reference a Movement Monitoring Specification (Appendix B) that are provided for review in the updated submissions. The proposed monitoring is accepted.
- 4.18. The site is not located within a Local Flood Risk Zone and is at very low risk of surface water flooding. Downside Crescent was not flooded during the 1975 and 2002 flood events.
- 4.19. The proposed development will increase the proportion of impermeable site area. The revised BIA indicates that off-site discharge flow rates will be attenuated to meet policy criteria. The final drainage scheme should be agreed with Thames Water and LBC. A non-technical summary is presented with the BIA submission.

5.0 CONCLUSIONS

- 5.1. The qualifications of the authors are in accordance with LBC guidance.
- 5.2. The BIA includes the majority of the information required from a desk study in accordance with LBC guidance.
- 5.3. In the revised submission, an outline construction programme has been presented.
- 5.4. The underlying ground conditions comprise Made Ground over Head Deposits and London Clay. Groundwater is likely to be present within the Head Deposits. The proposed development will not impact the wider hydrogeological environment.
- 5.5. The ground model presented in the GMA is not consistent with the site investigation. The geotechnical parameters are inconsistent with the structural calculations presented. The ground model and geotechnical parameters should be confirmed.
- 5.6. The basement will be formed by underpinning techniques beneath the current building footprint. Contingency measures to control groundwater and maintain stability during construction should be confirmed.
- 5.7. For the basement retaining walls to be constructed beyond the exiting building footprint, construction methodology and temporary works information should be clarified. In the revised submission, reference is made to sheet piling within the structural report, which is not considered within the BIA.
- 5.8. A revised Ground Movement Assessment (GMA) is presented, indicating impacts of Category 0 (Negligible) to neighbouring structures. The revised GMA is not accepted as detailed in Section 4.
- 5.9. It is accepted the impact from the proposed basement to the highway is minimal. Protection of any utility assets within the highway should be agreed with asset owners, as applicable
- 5.10. The structural calculations reference a Movement Monitoring Specification (Appendix B) that is provided for review in the revised submissions.
- 5.11. The site is at very low risk of surface water flooding.
- 5.12. The proposed scheme will increase the proportion of impermeable area. The revised BIA indicates that off-site discharge flow rates will be attenuated to meet policy criteria. The final drainage scheme should be agreed with Thames Water and LBC.
- 5.13. Queries and requests for further information are summarised in Appendix 2. Until the additional information requested is presented, the BIA does not meet the criteria of CPG Basements.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	An outline construction programme should be provided.	Closed	October 2018
2	Hydrology	Increase in impermeable area to be confirmed and attenuation drainage assessment to be provided.	Closed	October 2018
3	Stability	Groundwater control strategy to maintain stability during underpinning to be confirmed.	Open – no details provided in construction sequence (structural report) or BIA main report (conclusions refer to sump pumping).	
4	Stability	Construction methodology and temporary works for retaining walls outside of the existing building footprint to be provided.	Open – the construction sequence provided references sheet piling; installation method / toe depths to be provided. This should also be referenced in the BIA.	
5	Stability	The geotechnical parameters and structural loads to be confirmed. Assessments to be updated as required.	Open – structural loads confirmed; geotechnical parameters not consistent with structural calculations and not referenced in updated GEA BIA; SI indicates Head Deposits which are not referenced within the GMA.	
6	Stability	The current GMA has ignored new foundation loads. The loads and settlements should be considered in relation to the GMA and potential impacts to neighbours.	Open – GMA does consider foundation loads and settlement heave related to foundation loads / excavation; however, GMA does not account for underpinning / sheet piling installation related vertical movements, or vertical movements from excavation in front of the retaining wall; ground model does not consider Head Deposits.	
7	Stability	The referenced Movement Monitoring Specification (Appendix B, Structural Calculations) should be provided for review.	Closed	August 2018

Appendix 3: Supplementary Supporting Documents

None

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