CampbellReith
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13 Downshire Hill
London
NW3 1NR

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12466-08
Revision: D1

October 2016

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Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 13 Downshire Hill, NW3 1NR (planning reference 2016/4511/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 those holding the required accreditation.

1.5. Structural drawings and calculations have not been submitted and are required.

1.6. Both neighbouring properties have been identified as Grade II listed, however the property itself is not listed.

1.7. The proposal consists of forming a single storey basement beneath the rear of the property that extends into the garden. An existing single storey rear extension is also to be extended towards to the rear.

1.8. Both neighbouring properties contain partial basement levels.

1.9. Appropriate site investigations have been carried out, apart from trial pits which are required.

1.10. The site is underlain generally by London Clay, with a narrow band of superficial deposits above the clay. It has been concluded that ground water flows will not be disrupted.

1.11. Further details of proposals to limit surface water runoff are required.

1.12. It is anticipated that the basement is to be constructed using commonly used construction methods, however further structural details are required.

1.13. It is accepted that there are no slope stability issues.

1.14. The ground movement assessment has made assumptions that are not acceptable given the proximity of listed buildings. This should be updated and resubmitted.

1.15. A movement monitoring strategy has been outlined, this requires updating following the results of the amended ground movement assessment.

1.16. A construction management plan is required due to the proximity to listed buildings, and an outline construction programme is required.

1.17. Given the above discussion a number of additional items have been requested or amendments required. These have been summarised in the audit query tracker in appendix 2 of this audit. Until these issues are clarified the criteria outlined in CPG4 have not been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 15/09/2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 13 Downshire Hill, London, NW3 1NR, planning reference 2016/4511/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.

2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.

2.4. The BIA should demonstrate that schemes:

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run off or causing other damage to the water environment;

c) avoid cumulative impacts upon structural stability or the water environment in the local area, and;

evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.5. LBC's Audit Instruction described the planning proposal as "Excavation of single storey basement and erection of a single storey rear extension."

The Audit Instruction also indicated that 13 Downshire Hill does not involve, nor is a neighbour to, listed buildings. However this is incorrect as both neighbouring properties, No13a and No12, are grade II listed.

2.6. CampbellReith accessed LBC's Planning Portal on 18/10/2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) Parts 1 – 6, Gabriel GeoConsulting, 10th July 2016
- Ground Investigation Report, Ian Farmer Associates, 28th April 2016
- Aboricultural Report, Challice Consulting Ltd, 18th July 2016
- Planning Application Drawings consisting of the following Ne/AR Architects London General Arrangement Plans and Sections, Existing and Proposed:

0116/DH/001	Location Plan	July 2016
0016/DH/002	Site Plan & Section	July 2016
0016/DH/101	Existing Ground Floor Plan	July 2016
0016/DH/110	Proposed Basement Plan	July 2016
0016/DH/111	Proposed Ground Floor Plan	July 2016
0016/DH/200	Existing Rear Elevation	July 2016
0016/DH/201	Existing North-East Elevation	July 2016
0016/DH/202	Existing South-West Elevation	July 2016
0016/DH/210	Proposed Rear Elevation	July 2016
0016/DH/211	Proposed North-East Elevation	July 2016
0016/DH/212	Proposed South-West Elevation	July 2016
0016/DH/300	Existing Section AA	July 2016
0016/DH/310	Proposed Section AA	July 2016
0016/DH/311	Proposed Section BB	July 2016
0016/DH/312	Proposed Section CC	July 2016

- Design & Access Statement
- Planning Comments and Responses

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The authors of the BIA have been provided and are satisfactory.
Is data required by Cl.233 of the GSD presented?	No	No construction work programme has been included. It has not been mentioned if other permits are required for the project or not.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Yes. The BIA provides a description of the proposed below ground basement structure and the temporary works required for its formation.
Are suitable plan/maps included?	Yes	Suitable plans and maps are included. When maps are referenced within the BIA in the majority of cases the site location has also been indicated.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	The plans and maps show the site central to the page and it is shown in sufficient detail. Location and site plans have been provided.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Screening refers to Arup maps and to independent Groundsure reports (seen in Appendix E and F) undertaken for the site. Appropriate justification has been provided for 'No' answers as referred to in section 7.3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appropriate data sources have been consulted and justification is provided for all other 'No' answers.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Screening refers to the Camden SFRA and surface water flood modelling by the Environment Agency. Appropriate justification has been provided for 'No' answers as referred to in section 7.4.
Is a conceptual model presented?	Yes	A conceptual model is presented in section 10.1.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Land stability scoping is provided in section 8.3 and is consistent with the screening outcome.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Hydrogeology scoping provided in section 8.2 is consistent with the screening outcome.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Hydrology scoping is provided in section 8.4 and is consistent with the screening outcome.
Is factual ground investigation data provided?	Yes	Factual ground investigation data is provided in 'Report on Ground Investigations' by Ian Farmer Associates.
Is monitoring data presented?	Yes	As stated in section 9.5 ground water levels were monitored on installation of the standpipes and approximately three weeks post installation.
Is the ground investigation informed by a desk study?	Yes	The ground investigation is informed by a desk study, with data provided in Appendix B, E, F and G.
Has a site walkover been undertaken?	Yes	Section 1.3 states a site walkover was undertaken in May 2016. Photographs from the walkover are shown in Appendix A.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The presence of neighbouring basements/lower ground floors is discussed throughout the BIA.
Is a geotechnical interpretation presented?	Yes	Engineering properties of the soil have been provided in 'Report on Ground Investigations' by Ian Farmer Associates.
Does the geotechnical interpretation include information on retaining wall design?	Yes	A section discussing retaining wall design is provided in 'Report on Ground Investigations' by Ian Farmer Associates.
Are reports on other investigations required by screening and scoping presented?	Yes	An arboricultural report and heave assessment.
Are the baseline conditions described, based on the GSD?	Yes	The baseline conditions described are based on the GSD.

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	The assessment considers adjacent basements.
Is an Impact Assessment provided?	Yes	An impact assessment is provided in section 10.0.
Are estimates of ground movement and structural impact presented?	No	A heave/settlement assessment, along with a ground movement assessment due to wall deflection has been produced. However the ground movement assessment requires assumptions to be confirmed and the assessment reviewed.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	The impact of the items identified via screening and scoping have been appropriately discussed.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	SUDs and transitional underpinning has been proposed as mitigation measures to be considered. However details of which methods are to be adopted have not been incorporated in the technical drawings or details.
Has the need for monitoring during construction been considered?	Yes	Outline monitoring during construction has been considered and is detailed in section 10.7. However this requires updating to relate trigger values to calculated ground movements.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Section 10.9 describes mitigation measures that are to be undertaken.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	The ground movement assessment is to be amended
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	However further details of SUDs are required.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	However the Ground movement assessment is to be amended.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	The report states the worst case damage to surrounding buildings will be of category 1. However the ground movement assessment requires amending.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by an established firm of Geotechnical and Geological engineering consultants, Gabriel GeoConsulting. The accreditation and experience of those responsible for the production of the report has been confirmed as being in accordance with the requirements of CPG4.

4.2. Reference is made to Train & Kemp's drawings in sections 1.4, 3.2 and 10.4.2, who are consulting structural engineers, however no structural drawings or calculations have been submitted with the application. Outline structural details including calculations and temporary works are required to be submitted.

4.3. The existing building is of three storeys, likely of traditional load bearing masonry construction. A single storey extension is present to the rear that was likely constructed in the early 1990's given the timing of the planning consent.

4.4. While the audit instruction identifies that the site does not involve, or is neighbouring, listed buildings, it has been identified that both neighbouring properties, No 13a and 12, are Grade II listed.

4.5. The proposal consists of forming a single storey basement beneath the rear of the property and into the rear garden. The existing single storey rear extension is to be extended to the rear, however the proposed basement will project further beyond this new rear wall line.

4.6. The neighbouring properties have been confirmed to contain basement levels, with No 12 detached from No 13 and separated by 2.9m, and No 13a attached to No 13. The basement to No 12 covers the full plan of the property apart from the rear bay window and orangery, with the floor level being 1.35m below the floor level to the ground floor of number 13. The basement to No 12 does not cover the full plan of the property, but will abut the proposed basement along the eastern corner.

4.7. A ground investigation has been carried out by Ian Farmer Associates and involved taking two boreholes; one at the front of the property and one at the rear. No trial pits to identify the depth and construction of foundations have been carried out. It is required that trial pits are carried out at in order to determine the suitability of the proposed underpinning, and to inform the structural design of the basement walls.

4.8. The borehole taken in the front garden has identified 0.9 metres of made ground overlying the Claygate Member to 2.1mbgl, overlaying London Clay to depth. The borehole taken in the rear garden identified hardstanding overlying the Claygate Member to 3.45mbgl, overlaying London Clay to depth.

4.9. An Arboricultural report has been produced that confirms that the root protection areas of all retained trees are not adversely affected.

4.10. Due to an increase in the paved area the use of SUDs to attenuate and reduce surface water run off flows has been discussed in the BIA. The proposals are agreed with as effective ways to attenuate flows, however details of which SUDs are to be adopted have not been provided. The SUDs proposed for adoption should be confirmed, and if requiring construction (i.e. buried attenuation tank) should be indicated on a plan in relation to the proposed basement.

4.11. Water level monitoring was undertaken in both boreholes, with a return monitoring visit measuring a rise of the water level to 1.30mbgl and 2.33mblg in the front and rear boreholes respectively. It has been suggested that some ground water flows may be present in the Claygate Member, with appropriate outline de-watering measures described should ground water be found during construction.

4.12. It has been determined that there will be no cumulative damming effect to ground water flows caused by the proposed basement in conjunction with existing neighbouring basements. This is due to limited flows within the Claygate member, a 2.9m gap from the basement to No 12, and the assumed existing damming effect by the rear extension foundations not causing any issues. This is accepted subject to additional monitoring prior to construction to ensure that the site conditions are compatible with this conclusion.

4.13. It is not entirely clear what the final basement construction is to be due to the lack of structural drawings and or calculations. However from section 10.4.2 within the BIA indicates that underpinning is proposed towards the front of the extension, with reinforced concrete retaining walls used for the rear of the basement. The use of a high stiffness wall (propped at the head) has been referenced in the BIA. Structural details should include details of any propping structure that is proposed.

4.14. Outline details of the basement construction process have been provided. These are acceptable however drawings by Train and Kemp showing further details have been referenced but have not been provided. These details require submitting and should indicate all outline temporary works required in order to carry out the basement construction.

4.15. Due to the extent of the basement into the rear garden an element of ground re-profiling is proposed. Structural details of retaining walls within the rear garden should be provided.

4.16. It has been determined that the ground slope is less than 7°, and therefore slope stability is not an issue. Figure 16 in the GSD indicates that slopes of between 7° and 10° are present to the front of the property and in Downshire Hill. However it is accepted that the development is to the rear of the property and will be remote of these sloped areas.

4.17. A ground movement assessment has been produced which has calculated vertical movement from a PDISP analysis. These vertical movements have been combined with estimated horizontal movements due to wall installation and excavation to conclude a damage Category of 1 for both neighbouring buildings. Given that both neighbouring properties are grade II listed, please provide evidence for the assumptions made within section 10.6.1. It has been assumed that the rear bay window to No 12 is founded at a depth of 0.9m. Due to the age of the building it is felt that this depth is overly optimistic, and that a shallower foundation depth should be assumed unless this can be proven by investigation or historic records. Given the above, the ground movement assessment should be amended and resubmitted.

4.18. A movement monitoring strategy has been proposed that incorporates vulnerable elements of the neighbouring buildings. The principle of this is agreed with, however trigger levels should be linked to movements as predicted by the amended ground movement assessment.

4.19. Appropriate mitigation measures have been discussed in the BIA. These are agreed with and should be implemented in the construction stage. Should the revised ground movement assessment identify a Burland category of greater than 1 then additional mitigation measures may be required to limit ground movement.

4.20. A construction management plan is required due to the proximity to listed buildings.

4.21. It is stated within sections 8.5 and 10.1.3 that a services search should be undertaken to identify if there are any existing services within the zone of influence of the proposed basement. This BIA does not provide evidence that this services search has been carried out. If the search results in finding infrastructure within the zone of influence then an appropriate assessment must be carried out.

4.22. Given the above discussion a number of additional items have been requested or amendments required. These have been summarised in the audit query tracker in appendix 2 of this audit.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by those holding the required accreditation from the requirements of CPG4.

5.2. Structural drawings and calculations are referred to, however they have not been submitted. Structural details require submission.

5.3. Both neighbouring properties have been identified as Grade II listed, however the property itself is not listed.

5.4. The proposal consists of forming a single storey basement beneath the rear of the property that extends into the garden. An existing single storey rear extension is also to be extended towards to the rear.

5.5. Both neighbouring properties contain partial basement levels, however these are believed to be founded above the proposed basement level, with some portions of the neighbouring buildings not underlain by a basement.

5.6. A ground investigation has been carried out which included boreholes and soil testing. However trial pits to determine the depth of existing foundations were not carried out and should therefore be undertaken.

5.7. The site investigations revealed London Clay overlain by the Claygate Member and made ground. It has been concluded that a cumulative impact on ground water flows will not occur. This is accepted subject to additional monitoring prior to construction to ensure that the site conditions are compatible with this conclusion.

5.8. SUDs have been identified as being required with a number of options proposed. However details of which SUDs are to be adopted are not provided and require submission.

5.9. An appropriate outline construction method has been proposed, which includes details of dewatering should ground water ingress occur. However structural engineer's drawings that have been referred to are required.

5.10. It is anticipated that reinforced concrete underpinning will form the basement wall beneath the existing property, while L shaped retaining walls will form the basement walls in the garden. However structural details require submission to confirm this.

5.11. It is accepted that there are no slope stability issues.

5.12. The ground movement assessment requires resubmission incorporating evidence for assumed vertical and horizontal movements from the retaining wall/underpinning. Should the Burland

category be found to be greater than 1 mitigation measures to limit ground movements will be required.

5.13. A movement monitoring strategy has been outlined, however this should incorporate trigger values that are linked to the updated ground movement assessment.

5.14. A construction management plan is required due to the proximity to listed buildings.

5.15. A services search must be undertaken to identify if there are any existing services within the zone of influence of the basement. Appropriate assessments must be carried out, if required, in accordance with the findings.

5.16. Given the above discussion a number of additional items have been requested or amendments required. These have been summarised in the audit query tracker in appendix 2 of this audit. Until these issues are clarified the criteria outlined in CPG4 have not been met.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Joel	Not provided	02/10/16	Potential damage to 13A	A ground movement assessment, along with further details of construction have been requested.
Joel	Not provided	02/10/16	Property already contains a basement level	The ground floor level is level at the front of the property, and is no more than half a storey below ground level at the rear of the property. This would not usually be considered as an existing basement level.
Joel	Not provided	02/10/16	'Re-enforcement of basement not considered' with respect of seasonal ground movements.	Further details of the structure of the basement have been requested. Heave and ground movements have been considered in the BIA.
Joel	Not provided	02/10/16	Insufficient details of waterproofing.	Details of waterproofing are not required under the CPG4.
Joel	Not provided	02/10/16	Inadequate site access	A construction management plan has been requested.
Joel	Not provided	02/10/16	Tree damage and retention of consultants during the works.	There is no requirement to retain the services of consultants during construction under CPG4. The tree protection measures proposed are adequate.
Sufit	32 Pilgrims Lane	12/10/16	Impact on surface water run off	Further details have been requested as to mitigation measures to reduce the impact from surface water runoff.

Sufit	32 Pilgrims Lane	12/10/16	Stability of nearby tree	An appropriate Arboricultural report has been produced that confirms that all retained trees will not be adversely affected by the proposal.
Bace	21 Keats Grove	24/09/16	Cause subsidence in the surround area	An updated ground movement assessment has been requested.

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Structural drawings and calculations are required for the proposed basement structure, along with any retaining walls required in the rear garden. These details should also indicate an outline of temporary works that are required.	Open	
2	Stability	Please provide evidence for the assumptions made regarding the ground movement assessment in section 10.6.1.	Open	
3	Surface water	Details of SUDs that are to be incorporated into the proposal are required.	Open	
4	Stability	The movement monitoring strategy is required to be updated to incorporate trigger levels linked with those calculated by the ground movement assessment.	Open	
5	Construction	A construction management plan is required due to the proximity to listed buildings.	Open	
6	Stability	Trial pits are required in order to determine the depth and type of foundations that are to be underpinned	Open	
7	Construction	An outline construction programme is required	Open	
8	Desk Study	A services search must be carried out, as mentioned in sections 8.5 and 10.1.3, and the appropriate assessment made based on the findings.	Open	

Appendix 3: Supplementary Supporting Documents

None

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