CampbellReith
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17 Croftdown Road, London NW5 1EL

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12336-21
Revision: D2

June 2016

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Project Name	17 Croftdown Road, NW5 1EL
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Contents

Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 17 Croftdown Road, London, NW5 1EL (planning reference 2015/6086/P). The basement was initially considered to fall within Category A as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability, subterranean, and surface flow 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. Subsequent to the initial audit, a BIA prepared by Soiltechnics Ltd and reviewed by Chord Environmental Ltd, has been submitted. It is confirmed that the credentials of the various authors comply with the requirements of CPG4..

1.5. The proposed development constitutes excavations to deepen the existing partial basement to create a single level basement, in addition to the creation of lightwells at the front and rear of the building.

1.6. A ground investigation has shown the site to be underlain by Made Ground and London Clay, with an apparent intermediate layer of Head Deposits. Shallow perched water was encountered in foundation inspection pits with other water strikes made in a gravel layer below the proposed basement level.

1.7. It is accepted that the impacts to and from the surface water are negligible.

1.8. It is accepted that the proposed construction will not significantly impact the subterranean flow regime of the area.

1.9. The possibility of heave resulting from the removal of a 12m high Pine tree from the rear garden has been considered and it is accepted there is no likely impact on the foundations of No. 15 Croftdown Road.

1.10. A ground movement assessment has suggested no greater that Burland Category 1 damage to neighbouring properties and a negligible impact on the public highway. Although appropriate mitigation measures, and a temporary and permanent works methodology with outline calculations for the slabs, foundations and retaining walls have been provided, further assessment that considers the effects of the horizontal movement is required and this should

include the structural movement due to the replacement of the spine wall with buttressing columns.

1.11. Monitoring of the ground movements is likely to be required by the Party Wall Awards. This has been accepted by the applicant. It should be noted that condition surveys should be carrued out, especially to No 15 which is reported to have suffered subsidence.

1.12. It is accepted that the revised BIA and supporting documents adequately identify the potential impacts arising out of the basement proposals and describe suitable mitigation.

1.13. It is noted from the structural drawings that special foundation is proposed for underpinning the party wall. This type of construction should be agreed as part of party wall award.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 1 January 2016 to carry out a Category A Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 17 Croftdown Road, London, NW5 1EL, Camden Reference 2015/6086/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 "*Excavation to extend basement at front, new front lightwell, alteration to bay window, conversion of basement into habitable room, replacement of basement window with French doors, re-landscaping of garden.*

The Audit Instruction also confirmed that the proposed development is in the Conservation Area of Dartmouth Park, but does not involve any listed building.

2.6. CampbellReith accessed LBC's Planning Portal on 29/02/2016 and gained access to the following relevant documents for audit purposes:

- Building Impact Assessment (BIA) report;
- Existing and Proposed Structural Drawings;
- Design Statement.

2.7. Subsequent to the issue of the initial audit report, further information was provided by the architect as detailed below. This revised audit report considers that later information and the architect's covering letter is presented in Appendix 3.

- Basement Impact Assessment (BIA) report by Soiltechnics Ltd (including a ground investigation);
- Review of BIA by Chord Environmental Ltd;
- Construction Method Statement by Price & Myers;
- Structural Calculations by Price & Myers.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See section 4.1
Is data required by Cl.233 of the GSD presented?	Yes	Although no programme provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	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	Provided in Soiltechnics BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided in Soiltechnics BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided in Soiltechnics BIA.
Is a conceptual model presented?	Yes	SI report included in Soiltechnics BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	A single groundwater monitoring visit is reported in the Soiltechnics BIA.
Is the ground investigation informed by a desk study?	Yes	No formal desk study report is provided; however, the body of the BIA refers to BGS boreholes and historical and geological maps.
Has a site walkover been undertaken?	Yes	As part of GI.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA advises that there is a basement to No 19 similar to that proposed for No 17.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	NA	None required.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	BIA advises that there is a basement to No 19 similar to that proposed for No 17.
Is an Impact Assessment provided?	Yes	Soiltechnics BIA.
Are estimates of ground movement and structural impact presented?	Yes	Soiltechnics BIA.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Soiltechnics BIA.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Proposals for propping, condition surveys and monitoring are provided.
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Soiltechnics BIA Section 5.2 and Price & Myers Construction Methodology. Effects of horizontal movement to be considered in the ground movement assessment.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Soiltechnics BIA and Price & Myers Construction Methodology. Effects of horizontal movement to be considered in the ground movement assessment.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	The Soiltechnics BIA indicates that damage will not exceed Category 1 on the Burland Scale.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. An initial Basement Impact Assessment was carried out by Price and Myers structural consultants. There was no evidence of the involvement of a Chartered Geologist and a specialist in flood risk assessment as required by CPG4 and queries were raised with respect to the screening assessment. Subsequent to the initial audit, a second BIA, prepared by Soiltechnics Ltd and reviewed by Chord Environmental Ltd, has been submitted. It is confirmed that the credentials of the various authors comply with the requirements of CPG4.

4.2. The existing Victorian style building is a 3 storey semi-detached residential dwelling above ground with a partial basement. It is part of a terrace on the north of Croftdown Road, built in 1899-1900 and located within the Dartmouth Park Conservation Area. The site is bounded by Croftdown Road to the south, La Sainte Catholic School to the north, and Nos. 19 & 15 to the east and west of the site.

4.3. The site is gently sloping down towards the north. At ground floor level, it stands at about 0.6m and 1.5m above the natural ground level at the front and rear respectively. This raised level of the ground floor has allowed a small window at the basement level to open to the paved part of rear garden which is proposed to be replaced with a French door. The proposal description in the application form does not state the construction of a lightwell at the rear, but the body of the BIA document and the structural drawings provided indicate that one is proposed. Some alterations to the superstructure to the rear, and the removal of a 12m high Pine tree from the rear garden in the vicinity of the proposed rear lightwells, were previously permitted under other applications.

4.4. It is also proposed that a new lightwell will be constructed at front, and this will accommodate a new bay window at the basement level, new drainage channel, and an inclined plant bed. It is acknowledged that the aim of the proposed development is to convert the existing basement into habitable rooms with a guest bedroom and an en-suite.

4.5. In addition to excavation of the front and rear lightwells, the existing basement will also be deepened to reach a single level, since the existing basement constitutes different elevations. The maximum depth of basement deepening, and the lightwell excavation, reaches about 2m and 3m respectively.

4.6. It is understood that the rear basement walls will be underpinned in a hit-and-miss sequence and backfilled at each stage, and the rest of the perimeter will be retained with RC lining walls. Further information was requested in the initial audit report and this has been received as described below.

4.7. Once all underpins are complete, temporary props will be installed so that the basement can be excavated to the required depth. The basement slab will then be cast and once it has reached sufficient strength, the temporary props can be removed. In response to the initial audit, a construction method statement has been provided with structural drawings and a non-technical summary. This has clarified how the front lightwell excavation will be permanently supported and that temporary propping will be used to support the underpins and the RC concrete retailing walls.

4.8. It is acknowledged that London Clay is the shallowest stratum on the site. The nearby BGS borehole logs consulted in the BIA indicate perched groundwater at about 2m below ground level. A subsequent site investigation has been undertaken on the site, and a conceptual ground model is presented in Soiltechnics' BIA which indicates the presence of London Clay beneath approximately 1m of Made Ground. However, the two exploratory holes both encountered a gravel layer at 2.70m suggesting the upper clay layer to comprise Head Deposits. This is not significant in terms of the impact assessment. Perched water was encountered at shallow depth in the foundation inspection pits. Further water strikes were made in the gravel layer. It is accepted that if the gravel layer is continuous, it is below the proposed basement level.

4.9. As recommended in the initial audit report, the investigation considered the influence of the tress on the site and has provided information on the extent of tree roots, the depths of the existing foundations, and design soil properties. It also included a site walkover survey and monitoring of the groundwater levels on the site.

4.10. It is understood that a 12m high Pine tree in the vicinity of the rear excavation will be removed, permitted under another application. The surficial soil layer of the site is known to be of high potential for shrink/swell. A desiccation assessment has been carried out which has concluded there is no strong evidence of desiccation which could result in heave occurring following tree removal; this is accepted.

4.11. Review of Environment Agency (EA) and Arup Maps reveals a low to moderate risk of flooding from reservoirs, and the presence of a small local pond to the north east of the site which is not properly addressed in the BIA. Tributaries of the River Fleet, one of the lost rivers of London, are also found to be in the proximity of the site. It is accepted that the risk of surface flooding is not of a great concern on the site. Further information has been provided in this respect to confirm the earlier conclusions. The possible presence of the former river has been addressed in the Soiltechnics BIA and it is accepted that there are no potential impacts.

4.12. The proposed development involves a reduction in the soft permeable area of the front garden as a result of the construction of the lightwell; compensated by the construction of an inclined plant bed, and a new drainage channel, in addition to the increased green area by local re-landscaping of the rear garden. It was initially stated that there would be no increase in the

overall area of hardstanding on the site. It has since been stated that there will be an increase of less than 10m^2. It is accepted that the site drainage scheme can remain the same.

4.13. It is acknowledged that if pumping is utilised during construction for water collection and it is discharged into the public sewers, Thames Water will be consulted in advance.

4.14. It is indicated in the provided structural drawings that the waterproofing of the basement will include a drained cavity system.

4.15. It is accepted that the site will have no impact on the stability of the neighbourhood with regard to nearby watercourses and aquifers. However, the front lightwell is within 5m of the pedestrian right of way of the Croftdown Road. It is stated in the BIA, section 3.1, that the Highways Department will be consulted on the proposed works. The GMA predicts less than 5mm at the back of the footpath and it is accepted that subject to good control of workmanship, the stability of the road and its infrastructure will be maintained.

4.16. The BIA application form section B states that ground movement monitoring will be undertaken if required by the Party Wall Award and since the site shares a party wall with No. 15 Croftdown Road, it is likely to be a requirement.

4.17. A ground movement and building damage assessment has been presented. The assessment does not consider the settlement of the underpins as a result of the structural loads being imparted to the soil at a greater depth than previously, but rather considers settlement arising from the excavation in front of the pins. In addition, the assessment does not consider the effects of the possible horizontal movement due to the basement excavation and replacement of the spine wall with buttressing columns. It is noted from Price&Myers structural calculation that the structural horizontal movement at the location of the buttressing columns is 4mm at ground level. There is mention of historic subsidence to No 15 which could alter the damage assessment. This should be agreed as part of the party wall award.

4.18. Mitigation measures and a temporary and permanent works methodology with outline calculations for the slab and retaining walls have been provided and confirm the suitability of the proposals.

4.19. It is noted from the structural drawings that special foundation is proposed for underpinning the party wall. This type of construction should be agreed as part of party wall award.

5.0 CONCLUSIONS

5.1. Subsequent to the initial audit, a BIA prepared by Soiltechnics Ltd and reviewed by Chord Environmental Ltd, has been submitted. It is confirmed that the credentials of the various authors comply with the requirements of CPG4.

5.2. The proposed development constitutes excavations to deepen the existing partial basement to create a single level basement, in addition to the creation of lightwells at the front and rear of the building.

5.3. A ground investigation has shown the site to be underlain by Made Ground and London Clay, with an apparent intermediate layer of Head Deposits. Shallow perched water was encountered in foundation inspection pits with other water strikes made in a gravel layer below the proposed basement level.

5.4. The proposed development locates outside the Catchment of Hampstead Heath ponds and the designated zones of at risk from surface flooding. The Soiltechnics BIA considers the presence of a small local pond to the north east of the site, the risk of flooding from reservoirs and the possible proximity of one of the lost rivers of London, are also found to be in the proximity of the site. It is accepted that the impacts to and from the surface water are negligible.

5.5. It is accepted that the proposed construction will not significantly impact the subterranean flow regime of the area.

5.6. The possibility of heave resulting from the removal of a 12m high Pine tree from the rear garden has been considered and it is accepted there is no likely impact on the foundations of No. 15 Croftdown Road.

5.7. A ground movement assessment has suggested no greater that Burland Category 1 damage to neighbouring properties and a negligible impact on the public highway. Although appropriate mitigation measures, and a temporary and permanent works methodology with outline calculations for the slabs, foundations and retaining walls have been provided, further assessment that considers the effects of the horizontal movement is required and this should include the structural movement due to the replacement of the spine wall with buttressing columns.

5.8. Monitoring of the ground movements is likely to be required by the Party Wall Awards. This has been accepted by the applicant. It should be noted that condition surveys should be carried out, especially to No 15 which is reported to have suffered subsidence.

5.9. It is accepted that the revised BIA and supporting documents adequately identify the potential impacts arising out of the basement proposals and describe suitable mitigation.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA - General	BIA has to be reviewed by a Chartered geologist and a specialist in flood risk assessment.	Closed.	16.06.2016
2	Surface flows	BIA should be updated with respect to the local pond and reservoir flood risk identified above.	Closed.	16.06.2016
3	Subterranean flows/Land Stability	A site investigation report is recommended to confirm the groundwater table and provide engineering properties for outline and detailed design.	Closed.	16.06.2016
4	Land stability	Ground movement assessment is expected to be submitted.	Open. The assessment should also consider the effects of the horizontal movement.	
5	Land stability	Indicative structural drawings and calculations for the retaining walls, foundations and slab are required.	Closed.	16.06.2016
6	Land stability	Agreement of condition surveys and monitoring of potentially affected properties.	To be agreed as part of party wall award.	N/A
7	Land stability	Agreement of party wall underpinning with special foundation.	To be agreed as part of party wall award.	N/A

Appendix 3: Supplementary Supporting Documents

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Wednesday 4th May 2016

Development Management
Regeneration and Planning
London Borough of Camden
Judd Street
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WC1H 8ND

FAO: Emily Whittredge

Dear Sir/Madam,

REF: 2015/6086/P
RE: 17 CROFTDOWN ROAD, DARTMOUTH PARK, LONDON, NW5 1EL

HOUSEHOLDER APPLICATION FOR PLANNING PERMISSION FOR WORKS OR EXTENSION TO A DWELLING AND FOR RELEVANT DEMOLITION OF AN UNLISTED BUILDING IN A CONSERVATION AREA:

Please find enclosed the following documentation in response to queries as set out in Campbell Reith's Basement Impact Assessment Audit dated March 2016, project number: 12336-21, rev: D1. The information is in support of a Householder Application at the above property, submitted on behalf of our client, David Shukman and Jessica Pryce-Jones:

Query No:

1) BIA – General
BIA has to be reviewed by a Chartered geologist and a specialist in flood risk assessment

2) Surface flows
BIA should be updated with respect to the local pond and reservoir flood risk identified above

3) Subterranean flows / Land stability
A site investigation report is recommended to confirm the groundwater table and provide engineering properties for outline and detailed design

4) Land stability
Ground movement assessment is expected to be submitted

Documentation supplied to close out queries no. 1-4:
Basement Impact Assessment Report by Soiltechnics Environmental and Geotechnical Consultants
BIA Review by Chord Environmental Ltd

5) Land stability
Indicative structural drawings and calculations for the retaining walls, foundations and slab are required

Documentation supplied to close out query no. 5 by Price & Myers Structural Engineers:
24555 Croftdown Rd Basement Calculations
24555 SK300 C
24555 SK301 C
24555 SK302 B
24555 SK303 C
24555 SK304 B
24555 SK305 B
24555 SK306 B
24555 SK307 B
24555 Construction Method Statement

6) Land stability
Agreement of condition surveys and monitoring potentially affected properties
To be agreed as part of party wall award

We also include architectural drawings deemed to generally be acceptable 04/03/2016 for your reference:

17CR(PL)110C Proposed Lower Ground and Ground Floor Plan
17CR(PL)210C Proposed Front and Rear Elevation
17CR(PL)260C Proposed Section AA
17CR(PL)261C Proposed Section BB
17CR(PL)262D Proposed Section CC

We trust that this additional information meets the requirements and the planning application will be approved. Please let us know if you require any further information in order to consider the application.

Yours sincerely,

Claire Kennedy

Claire Kennedy
for Susan Walker Architects

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