CampbellReith
consulting engineers

63 Goldhurst Terrace
London NW6 3HB

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12066-79
Revision: D1

December 2015

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Appendix

1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by the London Borough of Camden (LBC) to carry out an audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 63 Goldhurst Terrace, NW6 3HB (planning reference 2015/3793/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the BIA for potential impacts 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 the LBC Planning Portal and examine the latest revisions of submitted documentation and review it against an agreed audit check list.

1.4. The BSMS and BIA have been carried out by individuals having suitable qualifications.

1.5. The BSMS states that an initial examination of nearby properties did not indicate any evidence of shrink / swell subsidence in the area.

1.6. It has been confirmed that land stability will not be adversely affected by the construction of the proposed basement.

1.7. The basement will not affect the groundwater flow due to the basement being above ground water level and within impermeable London Clay.

1.8. Surface water runoff has been adequately considered. As a contingency measure, construction of an upstand around the lightwell has been recommended. The residual risk of flooding to the basement is considered low.

1.9. It has been confirmed that groundwater flows are unlikely to be disrupted by the construction of the basement due to the basement founding within the impermeable London Clay and the lack of any water strikes during GI.

1.10. The BSMS refers to structural drawings in Appendix B and structural calculations in Appendix C. However, the above documents are not loaded on LBC's Planning Portal. It is recommended that all structural drawings and calculations (including buoyancy check) are submitted with the BSMS.

1.11. Design loadings for the lower basement slab have not been included within the BSMS and should be submitted with the BIA.

1.12. The indicative method statement for construction of the basement retaining walls has been provided. However, it is recommended that coordinated details of all permanent and temporary works are confirmed in a Basement Construction Plan (BCP).

1.13. The damage assessment has concluded that damage to the neighbouring properties caused by the construction of the basement will be slight. This category is within limits set by the LBC.

1.14. Movement monitoring has been proposed and it is agreed that this should be carried out during the Works.

1.15. It is noted that condition surveys will be carried out before and after completion of the Works and any repairs works, if required, to the neighbouring properties, carried out in accordance with the Party Wall Act.

1.16. Queries and requests for clarification/further information are summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by the London Borough of Camden (LBC) on 5th November 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 63 Goldhurst Terrace, London NW6 3HB, (Planning Reference 2015/3793/P).

2.2. The Audit was carried out in accordance with the Terms of Reference set by the LBC. The audit has reviewed the BIA for potential impacts 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 the following documents:

a) Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

b) Camden Planning Guidance (CPG) 4: Basements and Lightwells.

c) Camden Development Policy (DP) 27: Basements and Lightwells.

d) 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 detailed design.

2.5. LBC's Audit Instruction described the planning proposal as *'Excavation of basement with front and rear lightwells with cycle store to the front'.*

The Audit Instruction confirmed that neither the building proposed for development nor any of the neighbouring buildings are listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 27 November 2015 and examined the following documents for audit:

- The Basement Structural Method Statement (BSMS) 15-139-24 June 2015 – Rev A – AND Design Ltd., in conjunction with the BIA – Stephen Buss Environmental Consulting Ltd., including appended drawings and reports as follows:

  - Location Plan.
  - Existing Plan 63GT E01.
  - Proposed Plan 63GT P01.
  - Structural Plans of Adjoining Properties No 61 and 63 – 4295-01-03 and 4402-01C, 02B and 03B.
  - Sustainability Statement.
  - Soil Factual Report FACT/512 6B.
  - Hydro-geological Assessment and Flooding Risk Report-Rev A.
  - Construction Traffic Management Plan.
  - Construction Method Statement.

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 an outline programme for construction is missing.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	YES	See BSMS Section 10.
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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	YES	However, data required not always identified.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	YES	
Is a conceptual model presented?	YES	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	YES	Scoping not required.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	YES	Scoping not required.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	YES	Scoping not required.
Is factual ground investigation data provided?	YES	
Is monitoring data presented?	NO	No groundwater monitoring was undertaken.
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	Refer to structural drawings for properties 61 and 65.
Is a geotechnical interpretation presented?	NO	Factual data only has been provided. This should be rectified.
Does the geotechnical interpretation include information on retaining wall design?	NO	No parameters have been given for retaining wall design. No calculations have been included for retaining wall design. This should be rectified.
Are reports on other investigations required by screening and scoping presented?	NA	No further reports are required.
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	BSMS Section 10.
Are estimates of ground movement and structural impact presented?	NO	It has been considered that the adjacent properties will not be susceptible to damage due to having basements.

Item	Yes/No/NA	Comment
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	Refer to BSMS Section 7.6.
Has the need for monitoring during construction been considered?	YES	Refer to BSMS Section 10.
Have the residual (after mitigation) impacts been clearly identified?	NA	No mitigation was considered necessary.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	YES	It has been considered that the adjacent properties will not be susceptible to damage due to having basements.
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	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	YES	Refer to BSMS Section 10.
Are non-technical summaries provided?	YES	

4.0 DISCUSSION

4.1. The Basement Structural Method Statement (BSMS) has been carried out by a firm of engineering consultants, AND Design Ltd. The reviewer is a chartered structural engineer. The structural assessment has been carried out in conjunction with the BIA Stephen Buss Environmental Report.

4.2. The complementary BIA by Stephen Buss Environmental Consulting has been carried out by individuals with suitable qualifications.

4.3. The LBC instruction to proceed with the audit confirmed that neither the site in question nor any of the neighbouring sites contain a listed building.

4.4. The proposed development consists of the construction of a single-storey basement. The proposed basement will cover the entire footprint of the property together with two lightwells to the front and rear.

4.5. A limited ground investigation (GI) was carried out by Chelmer Site Investigations in August 2015 and identified the geological conditions as comprising 0.9m of Made Ground overlying 1.4m of silty clay, overlying London Clay formation to the depth of boring (5m). Groundwater was not encountered.

4.6. The BSMS states that an initial examination of nearby properties did not indicate any evidence of shrink/swell subsidence in the area.

4.7. According to the information provided it is accepted there are no slope stability concerns regarding the proposed development.

4.8. The site is outside the catchment area of the pond chains on Hampstead Heath. No watercourses or spring lines are located within the immediate vicinity of the site. The site is outside the Environmental Agency (EA) flood zones.

4.9. Regarding surface water flooding, drainage and discharge to sewer systems, the BIA confirms that the new works will not increase the impermeable paved area and existing surface water routes will remain unchanged. On this basis, there will be no change to the quality or the profiles of the inflows of surface water received by adjacent properties or downstream watercourses.

4.10. It is recognised that the only potential flood risks are due to surface water flooding and failure of the existing sewers in the vicinity of the site. The site was flooded in 1975 and 2002. However, investigations have confirmed that Thames Water has since increased the capacity of the existing relief sewer and the road is now considered to be at low risk of surface water flooding.

4.11. A remaining possibility of floodwater flow into the front garden and basement has been recognised and an upstand is recommended to be constructed around the front lightwell. A dual pumping system is also proposed as a contingency in the event of a failure of the basement pumping system.

4.12. It is accepted that the effect of the basement construction on subterranean (groundwater) flows in the surrounding area will be minimal as the site is not located above an aquifer and will be founded largely within the relatively impermeable London Clay. It is assumed that any flows arising from perched water within the Made Ground would be able to find a path around the basements.

4.13. The adjoining properties to either side of 63 Goldhurst Terrace contain basements of a similar size and depth to the one proposed. Since the party walls on both sides have been underpinned, no further underpinning is proposed along the party wall lines.

4.14. Due to the existence of the neighbouring basements, the work proposed comprises the underpinning of the front and rear walls of 63 Goldhurst Terrace to the same depth as the adjoining basements, with the basement slab cast. The new front and rear underpinned walls will be designed as reinforced concrete (RC) cantilevers.

4.15. The BSMS appends a set of structural drawings by MMP Design of the adjoining two properties at 61 and 65.

4.16. The BSMS refers to structural drawings being in Appendix B and structural calculations being in Appendix C, but these documents are not included on LBC's Planning Portal. The proposed design assumptions and loading arrangements are illustrated in BSMS Section 10. A worst case design water level of 1m below ground level (bgl) has been considered. Design loadings for the basement slab are not included within the BSMS. This should be rectified.

4.17. The BSMS states that design of the basement has been checked for overall buoyancy of the structure assuming peak groundwater levels. It is concluded that the structure is not buoyant. However, no calculations have been provided to support this statement.

4.18. It is accepted that having both front and rear walls underpinned would reduce or eliminate any potential differential settlements relative to the adjacent properties.

4.19. The BSMS includes a method statement provided by the structural engineering consultancy MMP Design. An indicative underpinning sequence is described together with the maximum lengths of underpins that can be carried out at each stage and the time intervals between each stage. The actual sequence of underpinning for the property is not provided nor have any calculations been carried out to confirm the reinforcement of underpins and propping positions. The method statement states that the underpins will be propped in the temporary case. It is

confirmed that full design coordination between temporary and permanent works is currently outstanding and will be carried out once all information is available.

4.20. Outline proposals are provided for a movement monitoring strategy during excavation and construction. The predicted category of damage is likely to be within BRE Category 'Slight' with possible localised crack widths between 2-5mm which is no worse than Burland Category 2.

4.21. It is recognised that condition surveys will be necessary before and after completion of the works and any repairs works if required to the neighbouring properties will be carried in accordance with the Party Wall Act.

5.0 CONCLUSIONS

5.1. The BSMS and BIA have been carried out by individuals having suitable qualifications.

5.2. The BSMS states that an initial examination of nearby properties did not indicate any evidence of shrink / swell subsidence in the area.

5.3. It has been confirmed that land stability will not be adversely affected by the construction of the proposed basement.

5.4. The basement will not affect the groundwater flow due to the basement being above ground water level and within impermeable London Clay.

5.5. Surface water runoff has been adequately considered. As a contingency measure, construction of an upstand around the lightwell has been recommended. The residual risk of flooding to the basement is considered low.

5.6. It has been confirmed that groundwater flows are unlikely to be disrupted by the construction of the basement due to the basement founding within the impermeable London Clay and the lack of any water strikes during the GI.

5.7. The BSMS refers to structural drawings in Appendix B and structural calculations in Appendix C. However, the above documents are not loaded on LBC's Planning Portal. It is recommended that all structural drawings and calculations (including buoyancy check) are submitted with the BSMS.

5.8. Design loadings for the lower basement slab have not been included within the BSMS and should be submitted with the BIA.

5.9. The indicative method statement for construction of the basement retaining walls has been provided. However, it is recommended that coordinated details of all permanent and temporary works are confirmed in a Basement Construction Plan (BCP).

5.10. The damage assessment has concluded that damage to the neighbouring properties caused by the construction of the basement will be slight. This category is within limits set by the LBC.

5.11. Movement monitoring has been proposed and it is agreed that this should be carried out during the Works.

5.12. It is noted that condition surveys will be carried out before and after completion of the Works and any repairs works, if required, to the neighbouring properties, carried out in accordance with the Party Wall Act.

Appendix 1: Resident's Consultation Comments

NONE

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	A geotechnical interpretation of the findings from the GI is required and should include all parameters for the design of the retaining walls and the basement slab.	Open	
2	Stability	Structural drawings and calculations are to be submitted.	Open	
3	Stability	Design parameters and loadings for the lower basement slab are to be confirmed.	Open	
4	Stability	An updated method statement which would fully coordinate with the permanent works should be included in a Basement Construction Plan (BCP).		NA
5				
6				

Appendix 3: Supplementary Supporting Documents

NONE

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