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26 Dartmouth Park Avenue London NW5 1JN

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12336-13

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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 26 Dartmouth Park Avenue, London NW5 1JN (planning reference 2015/2845/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The screening, scoping and assessment phases have not been completed as required by CPG4.

1.3. The Audit reviewed the 'Basement Impact Assessment Subsurface Flow' and the 'Basement Impact Assessment Structure' which addressed the potential impact on local ground water conditions and land stability arising from basement development in accordance with LBC's policies and technical procedures. The effect on Surface water has not been adequately addressed.

1.4. 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.

1.5. The BIA and Structural Strategy Report (SSR) have been prepared by engineering consultants using individuals who possess suitable qualifications, although the authors of the Structural Report did not provide evidence of suitable engineering geology expertise.

1.6. The BIA expects the basement to be founded within London Clay, however a Ground Investigation for the site is yet to be carried out.

1.7. The ground water table is assumed not to be encountered during basement excavation.

1.8. The basement construction will include underpinning to the existing retaining wall of the adjoining property (N^0s 28-42) and a reinforced concrete wall to the extension itself.

1.9. It is recommended that further investigation of the below ground soils and groundwater and neighbouring foundations is carried out, to enable the preparation of a more detailed construction methodology.

1.10. No analysis has been undertaken of horizontal and vertical ground movements and this should be carried out once the above investigations have been completed.

1.11. No proposals are provided for condition surveys and a movement monitoring strategy during excavation and construction.

1.12. Further details of the existing and proposed levels and finishes are required to prepare a screening for surface water flow and flooding.

1.13. Queries and requests for clarification 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 26 January 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 26 Dartmouth Park Avenue London NW5 1JN (planning reference 2015/2845/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 replacement single storey side extension to basement under rear garden; extension to rear ground floor extension; new rear double doors; glazed side return."*

2.6. The Audit Instruction Form A confirmed that the basement proposals do not involve a listed property, nor do they neighbour any listed buildings.

2.7. CampbellReith accessed LBC's Planning Portal on 12 February 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (Subsurface Flow)

- Basement Impact Assessment Report (Structure)
- Planning Application Drawings consisting of
  - Existing Site Plan DPA.01.03
  - Location Plan DPA.01.03
  - Existing Plans DPA.01.01 B
  - Proposed Plans DPA.01.02 C
- Design & Access Statement
- Planning Application (Planning Form A)
- Arboriculture Report

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The authors of the sub surface assessment and structural assessment have relevant professional qualifications.
Is data required by Cl.233 of the GSD presented?	No	A works programme, details of construction and mitigation, scale of impact and details of topography have 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?	No	The description does not include details of temporary and permanent works. In the absence of a site investigation the geology has been assumed.
Are suitable plan/maps included?	Yes	Plans are included although they have limited dimensions, topography or details of proposed finishes.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	The plans do not have details of adjacent properties.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Land stability screening has not been carried out.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Yes, however further justification of how run off from increased building footprint will be mitigated is required.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	There is a statement that surface water flow will be unchanged, but this was not demonstrated.
Is a conceptual model presented?	No	Not provided.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Not provided.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	NA	NA
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	There is a statement that surface water flow will be unchanged, but this was not demonstrated.
Is factual ground investigation data provided?	No	No site investigation has been carried out for the site.
Is monitoring data presented?	No	No monitoring data has been presented.
Is the ground investigation informed by a desk study?	NA	No desk study and no ground investigation. Desk study to be produced to inform scoping of site investigation.
Has a site walkover been undertaken?	NA	No specific reference is made to a site walkover other than by the aboricultural consultant.
Is the presence/absence of adjacent or nearby basements confirmed?	No	The Sub Surface report refers to a basement under No 24, however no details are provided for foundations or basements to this or the adjacent property to the north.
Is a geotechnical interpretation presented?	No	In the absence of a ground investigation, it has been assumed that London Clay is present.
Does the geotechnical interpretation include information on retaining wall design?	No	There is a drawing showing 300mm thick retaining wall, but no details of its design.
Are reports on other investigations required by screening and scoping presented?	No	Only the Sub Surface flows were screened. No screening/scoping for Land Stability or Hydrology, therefore no reports identified.
Are the baseline conditions described, based on the GSD?	No	For Hydrogeology (sub surface flows) yes. Not for Land Stability or Hydrology.
Do the base line conditions consider adjacent or nearby basements?	No	The Hydrogeology (sub surface flows) references an adjoining basement, but not included for Land Stability or Hydrology.
Is an Impact Assessment provided?	No	
Are estimates of ground movement and structural impact presented?	No	

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	NA	Hydrogeology did not identify scoping/impact. As no screening/scoping for Land Stability/Hydrology there has been no Impact Assessment.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Hydrogeology did not identify further mitigation. Land stability referenced ground movement and propping but did not discuss in any detail.
Has the need for monitoring during construction been considered?	Yes	Reference is made to a structural engineer being on site, but no specific monitoring scheme discussed.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Stability of adjoining properties has not been demonstrated.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	The scheme has not demonstrated that there will be no effect on the drainage or run off.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	No screening/scoping for Land Stability/Hydrology
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Report states that damage 'should be aesthetic', although no supporting information is provided as to how this will be achieved.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment Subsurface Flow (BIA) has been carried out by an experienced firm of hydrologists, UNDA. This addressed the screening for ground water flow/hydrogeology. The author is Dr Steve Buss MA MSc CGeol and he has suitable qualifications.

4.2. The Basement Impact Assessment (Structure) has been carried out by David A Berle BSc CEng MICE MIStructE of David A Berle Consulting Engineers. This was an overview of the structural solution. The author is a chartered civil and structural engineer.

4.3. The Audit Instruction Form A did not identify that the property was listed, or that it neighbours any listed properties.

4.4. The proposed basement consists of a single storey extension to an existing basement at the rear of a semi-detached property. The excavation will be L-shaped with the full width of the property for approximately 3m beyond the rear wall and half width for a further 4.5m. The basement finished floor level will be approximately 2.9m below the level of the garden, although this is level with Dartmouth Park Avenue to the front of the property.

4.5. The BIA Structure has identified that there will be underpinning to the existing side and boundary wall of the property and new reinforced concrete retaining walls to form the extension itself.

4.6. The BIA Structure expects the underpinning and new walls to be formed in London Clay, although the site investigation has yet to be carried out. However it is noted that the ground levels within the rear gardens of No. 26 and 24 are one storey higher than the ground levels to the front of these properties and therefore, that the levels within the rear gardens may have been raised resulting in an increased thickness of Made Ground.

4.7. No discussion of the potential for heave to occur is included or measures to address such forces.

4.8. For the underpinning the BIA Structure states that 'temporary side shutters and propping will be installed to retain soil and provide protection to operatives as found necessary' and that works will be monitored by a structural engineer. It does not discuss whether the chartered engineer will be on site full time or the criteria on which the extent of propping will be determined.

4.9. For the formation of the retaining walls, BIA Structure states that 'temporary supports to retain the soil will be installed as excavation progresses' and these will 'if required' be a proprietary system.

4.10. Propped trench sheeting is shown on the preliminary drawings included within the BIA structure but no indication of the type, level or frequency of the props is shown on the parameters for their design.

4.11. The BIA Structure states that 'no movement is expected to the adjacent block of flats because the underpinning is too shallow and the block too far away to have an effect' and that 'the excavations to permit construction of the new retaining walls will be adequately supported during progress of the works which will also limit any potential movement'. In the next paragraph it says that 'the expected settlement will be zero. In practice some minor cracking may occur but this should be aesthetic'.

4.12. There is no record information or physical investigations relating to the neighbouring properties, although it is stated in the BIA Subsurface flow (from visual inspection) that there is a basement to the adjoining property to the south.

4.13. No ground movement assessment has been carried out. It is considered that the prediction of zero settlement is unrealistic. No evaluation of horizontal movement of the retaining walls has been made to justify the anticipated damage classification. No proposals are provided for a movement monitoring strategy during excavation and construction.

4.14. Temporary works have been referenced in various sections, but there is no detail.

4.15. If the boundary wall to the north is acting as a retaining wall then the temporary and permanent design will have to address the potential sliding of the underpins and rotation at the junction of the underpinning and original foundations. There are no details of how to form the retaining wall against the boundary wall with the adjoining property.

4.16. There will be temporary works to form new openings in the existing walls. The BIA Structure states that 'temporary pad foundations may be required or they may also be supported on the underpinning'. All temporary propping needs to be carefully considered to ensure elements are adequately designed and to provide adequate work space on site.

4.17. The BIA Structure states that locations of services are unknown and that they 'will be rerouted if necessary'.

4.18. The BIA Structure states that 'all existing drainage and sewer connections will be maintained' and 'there will be no impact on them'. There are no locations shown or proposals as to how they will be protected in the works.

4.19. No check appears to have been made regarding the risk of surface water flooding from drainage systems or overland flow.

4.20. It states that as it is a single family residence there will be 'no significant increased discharge' into the existing system. However, there are no calculations for existing and proposed use and no correspondence with building control or Thames Water confirming this.

4.21. A surface flow and flooding assessment has not been carried out.

4.22. Both BIA Structure and BIA Subsurface flow state that there will be 'no change in the amount of surface water discharged' into the existing system and 'no change in impermeable area'. This

has not been clearly demonstrated. There are no details of the extent of existing or proposed hard standing and the finishes over the new extension have not been identified. It appears the existing hardstanding area has been raised.

4.23. The BIA Subsurface Flow addresses the questions in CPG4. It states that the property is not located above an aquifer; that it does not extend beneath the water table; that it is not within 100m of a watercourse; that the proportion of hard standing is unchanged; that it will not discharge to ground; and the lowest point of excavation will not be lower than any adjacent pond.

4.24. While they do not consider the London Clay (expected to be present), to be an aquifer, they do refer to water strikes in some local boreholes.

4.25. The BIA Subsurface Flow considers that the screening criteria have been satisfied and that the basement impact assessment does not require scoping, impact assessment or a site investigation. While it is accepted that ground water may not be a significant issue, without a site investigation the ground conditions have yet to be confirmed and some of the statements are based on assumptions.

4.26. The aboricultural report concludes that the works can be undertaken without adverse impacts on the existing within the curtilage of No.26 provided that appropriate fencing is erected prior to construction and an Aboricultural Supervision Scheme is to be implemented. However, no assessment of the potential impacts on trees in the adjoining gardens is included.

4.27. An existing tree is to be retained 1.8m from the new basement wall but no assessment of the potential impacts on the basement structure has been provided.

5.0 CONCLUSIONS

5.1. The BIA Subsurface and BIA Structure have been carried out by consultants using individuals who possess suitable qualifications however the authors of the BIA Structure did not identify suitable expertise in engineering geology.

5.2. The screening, scoping and assessment phases have not been completed as required by CPG4.

5.3. The BIA Structure has stated that the proposed basement will be founded on London Clay. This will need to be proved with a site investigation.

5.4. The ground water table is not expected to be encountered during basement excavation. This will need to be confirmed as part of the site investigation.

5.5. The BIA Structure discusses underpinning of the existing walls and reinforced concrete walls to the new basement.

5.6. It is recommended that further investigation of the below ground soils and neighbouring foundations is carried out and used to determine the temporary works required to carry out the extension.

5.7. No analysis has been undertaken of horizontal and vertical ground movements and this should be carried out once the above investigations have been completed.

5.8. No proposals are provided for a movement monitoring strategy during excavation and construction.

5.9. Further work is required to confirm that there is no change to the surface water discharge.

5.10. The change of area should be discussed with Thames Water to confirm existing outfall is adequate.

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.

5.12. No assessment of the basement works on the trees in the adjoining gardens is included.

5.13. No assessment of the impacts of the retained tree on the basement works is included.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Harriss	38 Dartmouth Park Avenue	29/10/15	Potential noise, disruption and traffic resulting from construction.	
			Potential to cause "destabilisation" to N^{o}s 28-42 Dartmouth Park Avenue.	

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Screening and Scoping not complete	Open	
2	Hydrology	Proposed basement significantly increases building footprint but method for attenuating and/or discharging additional run off is not explained.	Open	
3	Stability	Site investigation to be provided to include details of adjoining retaining wall foundations.	Open	
4	Stability	Calculations to be produced to demonstrate stability of underpinned retaining wall in both the temporary and permanent conditions.	Open	
5	Stability	Temporary works plan to be provided to show all locations where propping is required.	Open	
6	Stability	Assessment of likely heave required to be provided together with corresponding mitigation measures (due to both excavation in London Clay and due to presence of trees).	Open	
7	Stability	Justification of likely absence of damage to adjoining building required.	Open	
8	Stability	Methodology and criterion for monitoring and assessing movements of adjoining buildings to be provided.	Open	

Appendix 3: Supplementary Supporting Documents

None

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