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78 Malden Road
London, NW5 4DA

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 12727-52
Revision: D1

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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 (BIA) submitted as part of the Planning Submission documentation for 78 Malden Road, London NW5 4DA (planning reference 2017/4992/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 site currently comprises a four storey mid-terrace property which includes a lower ground floor. It is intended to excavate part of the front garden to lower ground floor level to create a bike and bin store.

1.5. The Basement Impact Assessment (BIA) has been produced by individuals who possess the necessary qualifications. No structural engineering input is provided.

1.6. The BIA has confirmed that the proposed retaining walls will be constructed in a series of panels on a hit and miss sequence. Outline retaining wall calculations, a construction sequence and indicative temporary works sequence should be provided.

1.7. Site specific ground investigations and ground water monitoring have been carried out and are accepted as suitable for the purposes of the BIA. The basement will be founded in London Clay which was encountered beneath a thin mantle of Made Ground

1.8. It is possible that ground water will be encountered during the basement foundation excavation. It has been recommended that ground water monitoring continues until construction and local dewatering during construction might be necessary.

1.9. Ground Movement Analysis and Damage Assessment have been carried out to indicate a worst case damage category of Burland Category 0. It is stated that this is dependent on 'robust' propping.

1.10. The BIA notes the presence of trees close to the proposed basement excavation and recommends an arboricultural assessment. This has not been provided.

1.11. The site is identified as lying in an area of low to medium risk of surface water flooding. A Flood Risk Assessment presented in the BIA recommends numerous mitigation measures which should be adopted.

1.12. It is accepted that there is no change to impermeable areas, there is no significant impact to the hydrogeology and there are no potential slope stability impacts.

1.13. An outline works programme is required.

1.14. Given the above queries, it cannot be confirmed that the proposal adheres to the requirements of CPG4. Outstanding queries are described in Section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 22 February 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 78 Malden Road, London NW5 4DA (Reference: 2017/4992/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.
- Local Plan 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;

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 *"Conversion of residential building from 2x self-contained flats … to 4x self-contained flats … including a rear infill extension at the lower ground floor level with terrace above … and alterations to the front garden including part-excavation of land for the provision of cycle and bin storage (Class C3 use)."*

2.6. The Audit Instruction confirmed that the proposal does not involve any listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 2 March 2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by Southern Testing Environmental and Geotechnical, BIA stages 1-3, dated 12 December 2017 (watermarked 'draft').
- Basement Impact Assessment (BIA) by Southern Testing Environmental and Geotechnical, BIA stage 4, Ref: TRL/AM/j13124, dated 17 January 2018 (file reference refers to 'draft').
- Architect's existing and proposed General Arrangement Plans & Sections.
- Design and Access Statement by Projection Architects, dated 7 September 2017.

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 hold CGeol and CEng accreditation. No structural engineering information has been provided.
Is data required by Cl.233 of the GSD presented?	No	No works programme; no detail of construction method beyond form of retaining walls.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Adequate details of the proposed structure and temporary works are not provided.
Are suitable plan/maps included?	Yes	Plan and maps are included in the BIA.
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?	Yes	Ground condition, sequence and depth of strata are presented along with the description of hydrology and hydrogeology of the area.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	An appropriate scoping statement is provided for items identified from screening.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As per above.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As per above.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	BIA.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	A walkover survey was carried out on 31 May 2017.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Host property and neighbouring properties have full lower ground floors.
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?	No	Arboricultural report recommended in BIA but not presented.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	

Item	Yes/No/NA	Comment
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Arboricultural report recommended in BIA but not presented.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	No construction methodology, temporary works or outline structural calculations presented.
Has the need for monitoring during construction been considered?	Yes	Mitigation measures to ensure that movements will be contained within acceptable limits include the installation of temporary propping system. These are not included in the BIA.
Have the residual (after mitigation) impacts been clearly identified?	No	Requires construction methodology or outline structural calculations. Arboricultural assessment not provided.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	No construction methodology, temporary works or outline structural calculations presented.
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?	No	No construction methodology or outline structural calculations presented.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	The GMA states that Burland Category 0 will not be exceeded but that this depends on 'robust' propping.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by Southern Testing and the individuals concerned in its production have suitable qualifications. No structural drawings and construction method statement have been produced. When submitted, the qualifications of those producing them should be confirmed.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal does not involve, nor is neighbour to, a listed building.

4.3. The site currently comprises a four-storey -including lower ground floor (basement)- mid-terrace, residential building with a small single storey outbuilding to the rear of the property, within the garden area. The proposed works are intended to, principally, include a mansard roof extension and alterations to the single storey outbuilding and front garden; the latter by excavation to lower ground level to provide cycle and bin storage areas.

4.4. It is understood that site specific ground investigations were performed in November 2017 with two exploratory holes and three foundation inspection pits being sunk from lower ground floor (LGF) level. A summary of ground conditions provided in the BIA reports a limited thickness of Made Ground (0.65 to 1.10m below LGF) underlain by London Clay to a depth of approximately 3.50m blgl, where the window samples stopped. Thus, the proposed excavation will lie within the London Clay.

4.5. Two monitoring visits recorded groundwater water levels at about 0.5m below the existing lower ground floor level. This level lays within the Made Ground stratum and above the London Clay founding level.

4.6. The BIA did not confirm the foundation depths to the neighbouring properties, but it is noted that the neighbouring properties have lower ground floors like No 78.

4.7. The proposed basement construction is to construct a retaining wall utilising an underpinning sequence with an in-situ reinforced concrete basement slab and ground floor to form a structural enclosure.

4.8. It is understood that the construction method will allow for the retaining wall panels to be formed in a 'hit and miss' sequence. No method statement has been provided including details related to the specific construction proposals, temporary propping and construction sequencing.

4.9. The magnitude of clay heave is discussed and is concluded to unlikely exceed 4mm millimetres in the centre of the main basement area or to have any significant impact on the surrounding structures. Calculations have been produced to support this assertion and this is accepted.

4.10. The BIA contains soil engineering properties for the design of the proposed retaining walls, but no calculations have been submitted for these.

4.11. A Ground Movement Analysis (GMA) has been carried out by Southern Testing using CIRIA C760 to represent the installation of the underpins. Although this is intended for use with piled retaining walls, it is accepted that the predicted movements are reasonable. A damage assessment has subsequently been carried out using the principles contained in CIRIA C760 which identified Negligible (Burland Category 0) damage to surrounding properties, which is as permitted by LBC and acceptable. As correctly noted in the BIA, the underpinning techniques should be carried out with good control of workmanship on site. It is noted that the GMA assumes a 'robust' level of propping; this should be demonstrated via an outline temporary works scheme and confirmation provided that the GMA remains valid.

4.12. While it has been identified that the basement may extend below the ground water level, it has been concluded that ground water will not be significantly disrupted by the basement due to the absence of a continuous ground water pathway. However, there is the potential for ground water to ingress the excavation during the works and to rise during seasonal changes or after periods of heavy rainfall. It has been advised that ground water monitoring continues until construction - in order to better understand seasonal variation in ground water level - and local dewatering during construction might be necessary; both of these are agreed.

4.13. The BIA notes the presence of trees in the footpath in front of No 78 and recommends an arboricultural assessment. This has not been provided.

4.14. The BIA confirms that monitoring of the adjoining properties will be undertaken throughout the works at regular intervals, however a monitoring strategy is not provided.

4.15. An outline works programme for construction has not been provided and this is required.

4.16. The development is in an area at low to medium risk from surface water flooding. A Flood Risk Assessment presented in the BIA describes a number of mitigation measures that should be adopted.

4.17. It is confirmed that the areas of hard and permeable landscaping will not result in any significant change and thus the volume of surface water inflow from surface run-off will remain unchanged due to the proposed development. It is accepted that the detailed below ground drainage will be developed during the detailed design stage.

4.18. The BIA has shown that it is unclear whether the development is to be located over or very close to the course of river Fleet. This is now indicated as being culverted and 'located some distance away from the development site'. It is felt that adequate consideration of the hydrology has been carried out with no surface water features within the immediate vicinity of the site.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been produced by individuals who possess the necessary qualifications. No structural engineering input is provided.

5.2. The BIA has confirmed that the proposed retaining walls will be constructed in a series of panels on a hit and miss sequence. Outline retaining wall calculations, a construction sequence and indicative temporary works sequence should be provided.

5.3. Site specific ground investigations and ground water monitoring has been carried out and is accepted as suitable for the purposes of the BIA. The basement will be founded in London Clay which was encountered beneath the thin mantle of Made Ground

5.4. It is possible that ground water will be encountered during the basement foundation excavation. It has been recommended that ground water monitoring continues until construction and local dewatering during construction might be necessary.

5.5. Ground Movement Analysis and Damage Assessment have been carried out to indicate a worst case damage category of Burland Category 0. It is stated that this is dependent on 'robust' propping. It should be confirmed that the GMA remains valid for the indicated construction sequence.

5.6. The BIA notes the presence of trees close to the proposed basement excavation and recommends an arboricultural assessment. This has not been provided.

5.7. The site is identified as lying in an area of low to medium risk of surface water flooding. A Flood Risk assessment presented in the BIA recommends numerous mitigation measures which should be adopted.

5.8. It is accepted that there is no change to impermeable areas, there is no significant impact to the hydrogeology and there are no potential slope stability impacts.

5.9. An outline works programme is required.

5.10. Given the above queries, it cannot be confirmed that the proposal adheres to the requirements of CPG4. Outstanding queries are summarised in Appendix 2.

Appendix 1: Residents' Consultations Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The Arup GSD suggests that a construction programme should be provided.	Open	
2	Stability	No structural engineering information provided as described in paras 4.8, 4.10 and 4.11.	Open	
3	Stability	GMA to be confirmed valid for construction sequence.	Open	
4	Stability	BIA recommends an arboricultural assessment which is not provided.	Open	

Appendix 3: Supplementary Supporting Documents

None