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6 Nutley Terrace
London NW3 5BX

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12066-31
Rev: D1

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Appendices

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 6 Nutley Terrace, London NW3 5BX (planning reference 2015/2229/P). The basement is considered to fall within Category C 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 review it against an agreed audit check list.

1.4. It has been confirmed that the development site does not involve a listed building, nor is it in the neighbourhood of listed buildings.

1.5. The BIA has confirmed that the proposed basement will be located within the London Clay and that the surrounding slopes are stable.

1.6. There is a shallow groundwater level which will require the use of a secant pile wall, or similar, to permit excavation of the basement. It is accepted that the permeability in the London Clay is low and so the proposed basement should not impact on groundwater flows.

1.7. The proposed basement will be excavated and constructed utilising established techniques.

1.8. It is accepted that the risk of surface water flooding the buildings is low. The use of an attenuation tank is proposed to control the flow of surface water which should mitigate the impact of surface water flows on the drainage system and on neighbouring properties.

1.9. A construction survey and monitoring of adjacent properties should be provided.

1.10. The ground movement assessment provided indicates that damage to the adjacent properties will be up to category 4. At most risk of damage is No 4 Nutley Terrace.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 6th August 2015 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 6 Nutley Terrace, Camden Reference 2015/2229/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 the "Erection of a 4 storey building (including basement) comprising 6 flats (Class C3) (3 x 4 bed units and 3 x 2 bed units) following demolition of existing dwelling (C3) new vehicular crossover and provision of associated landscaping."

The Audit Instruction also confirmed that the basement proposals do not involve a listed building, nor does the site neighbour listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 6th August 2015 and gained access to the following relevant documents for audit purposes:

- Structural engineering report and subterranean construction method statement

- Site Investigation and Basement Impact Assessment
- Groundwater impact assessment
- Drawings;

  Location plan

  Existing site plan

  Existing ground floor plan

  Existing front elevation

  Existing side elevations

  Existing rear elevation

  Existing sections

  Demolition plan

  Demolition elevations

  Proposed lower ground floor plan

  Proposed section A-A

  Proposed section B-B

  Proposed front elevations

  Proposed rear elevation

  Proposed side elevation

  Street elevation
- Ground movement assessment.

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, the Structural Engineering report, the Groundwater Impact Assessment and the Ground Movement Assessment all have suitable credentials.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Structural Engineering report and BIA
Are suitable plan/maps included?	Yes	BIA and drawings.
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	BIA Section 3
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Groundwater Impact Assessment Section 4
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Groundwater Impact Assessment Section 4
Is a conceptual model presented?	Yes	Ground model in Site investigation report Section 7
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 4

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Groundwater Impact Assessment Section 5
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Groundwater Impact Assessment Section 5
Is factual ground investigation data provided?	Yes	Site investigation report Section 4
Is monitoring data presented?	Yes	Groundwater monitoring in the Site investigation report
Is the ground investigation informed by a desk study?	Yes	Site investigation report Section 2
Has a site walkover been undertaken?	Yes	Site investigation report Section 1.3
Is the presence/absence of adjacent or nearby basements confirmed?	No	No discussion on other basements being present or not.
Is a geotechnical interpretation presented?	Yes	Site investigation report Section 7
Does the geotechnical interpretation include information on retaining wall design?	Yes	Site investigation report Section 8.1.1
Are reports on other investigations required by screening and scoping presented?	Yes	Network Rail asset information
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	No discussion on other basements being present or not.
Is an Impact Assessment provided?	Yes	Ground Movement Assessment
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement Assessment

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	Secant piled wall with temporary propping SUDS / attenuation tank Monitoring of nearby structures
Has the need for monitoring during construction been considered?	Yes	Structural Engineering report Sections 7.1 and 9
Have the residual (after mitigation) impacts been clearly identified?	Yes	High degree of damage to neighbouring buildings is indicated
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure been maintained?	No	Ground movement assessment indicates up to Burland Category 4 damage.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	With attenuation tank / SUDS
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?	No	Predicted to be Burland Category 4 or less.
Are non-technical summaries provided?	Yes	Structural Engineering report

4.0 DISCUSSION

4.1. The BIA has been carried out by an established firm of structural engineers, ElliotWood, who have employed the services of GEA and Chord to supplement the work needed to form the BIA. The authors and reviewers from all of these organisations have suitable qualifications.

4.2. The proposed basement will generally be excavated with the sides supported by a propped secant pile wall. This is an acceptable methodology using established techniques.

4.3. The BIA does not discuss the presence of other nearby basements. An investigation of the presence of other nearby basements is required.

4.4. It is acknowledged that the basement is founded within the London Clay. The site investigation indicates the upper part of the London Clay is more sandy and this particular aspect and any impact on the hydrogeology is not discussed. However, it is accepted that groundwater flows should be low and so not significantly affected by the proposed basement.

4.5. The groundwater is shown to be at shallow depth and so the basement will be significantly below the groundwater level. The proposal to use a secant piled wall to form the sides of the basement should be adopted.

4.6. The BIA has shown that the surrounding slopes to the development are stable.

4.7. The BIA indicates that the new foundations will be deeper than any neighbouring foundations.

4.8. There will be an increase in the area of surface water run-off unless the proposed mitigation measures such as SUDS or an attenuation tank are adopted. On the basis that suitable mitigation is provided it is accepted that will not significantly alter the existing surface water drainage conditions.

4.9. The risk of surface water flooding is accepted as being low.

4.10. The Ground Movement Assessment concludes that any damage to the neighbouring properties will be Burland Category 4 or less. The highest levels of damage are associated with No 4 Nutley Terrace. The predictions in the Ground Movement Assessment are conservative as the beneficial effects of heave ground movements have not been considered. However, it is not possible to validate the statement in the Structural Engineering report Section 6.3 that the damage will be Category 2 or less due to the submitted Ground Movement Assessment. Also the assumption that the secant piles will only be 10m long seems optimistic for a 7.6m deep basement.

4.11. A movement monitoring regime on the adjacent properties during construction is proposed and this should be provided. Surrounding residents mention a history of subsidence and condition surveys of potentially affected properties should also be undertaken prior to construction commencement and after completion.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by established organisations. The authors and reviewers from all of these organisations have suitable qualifications.

5.2. The proposed basement will generally be excavated with the sides supported by a propped secant pile wall. This is an acceptable methodology using established techniques.

5.3. The BIA has confirmed that the proposed basement will be located within the London Clay and that the surrounding slopes are stable.

5.4. There is a shallow groundwater level which will require the use of a secant pile wall, or similar, to permit excavation of the basement. The Groundwater Impact Assessment does not address the presence of a more sandy zone at the top of the London Clay, however, it is accepted that groundwater flows will be low and so not affected by the proposed basement.

5.5. The proposed basement will be excavated and constructed utilising established techniques.

5.6. It is accepted that the risk of surface water flooding the buildings is low. The use of an attenuation tank is proposed to control the flow of surface water which should mitigate the impact of surface water flows on the drainage system and on neighbouring properties.

5.7. A construction survey and monitoring of adjacent properties should be provided.

5.8. The ground movement assessment provided indicates that damage to the adjacent properties will be up to category 4. At most risk of damage is No 4 Nutley Terrace.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Powell	4 Nutley Terrace, London, NW3 5BX	17/06/15	Property at No 4 has suffered subsidence on the side closest to No 6. Concerns raised regarding additional damage being caused.	See Sections 4.10 and 4.11.
Leigh	6 All Souls Road, Ascot, SL5 9EA	11/06/15	Increased risk of flooding due to surface water run-off Displacement of groundwater to neighbouring properties	See Sections 4.4, 4.8 and 4.9.
Dannecker	3 Nutley Terrace, London, NW3 5BX	04/06/10	Concerns regarding subsidence	See Sections 4.10 and 4.11.
Gabran	3 Nutley Terrace, London, NW3 5BX	09/06/10	Concerns regarding subsidence and risk for neighbouring properties	See Sections 4.10 and 4.11.
Bruce	27 Daleham Gardens	11/06/15	Concerns regarding flooding	See Section 4.4.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Ground movement assessment rejected on the basis that the predictions of damage that will be caused are greater than Burland Category 2.	Open	
2	Stability	As neighbouring properties have are reported to have suffered historical subsidence, confirmation is required that a condition survey will be undertaken of potentially affected properties both before and after construction of the proposed basement.	Open	

Appendix 3: Supplementary Supporting Documents

None