CampbellReith
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28 Maresfield Gardens
London, NW3 5SX

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12466-33
Revision: D1

December 2016

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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 28 Maresfield Gardens, London NW3 5SX (planning reference 2016/5374/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 proposed development involves the excavation of a basement and the construction of a lower ground floor extension to the rear.

1.5. The BIA has been prepared by a number of sources: Vincent & Rymill, Ground and Project Consultants Ltd, Ground and Water Ltd and H Fraser Consulting Ltd. The BIA has not been presented in a single, coherent format, and some information is contradictory between the reports. e.g. bearing capacity of founding stratum, presence of groundwater, change in impermeable site area etc. Non-technical summaries have not been provided for all aspects of the reporting, in line with CPG4.

1.6. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.

1.7. The BIA identified that a mainline railway tunnel is located 20m north of the property running along Nutley Terrace. Network Rail should be consulted regarding the basement construction and any Network Rail exclusion zones respected.

1.8. The BIA states that the site lies directly on designated unproductive strata, the London Clay. It is accepted that there should be no impact to the wider hydrogeological environment.

1.9. The risk of surface water flooding is accepted as being low and no nearby streets flooded in 1975 or 2002. Suitable drainage and flood risk protection measures should be presented.

1.10. The proposed basement will result in an increase in the proportion of hard surface/paved areas. Outline drainage plans should be provided, including attenuation proposals, with sufficient assessment to demonstrate discharge flows in line with the CPG4, section 3.51.

1.11. A site investigation confirmed the presence of London Clay below 0.6m to 0.9m of clayey Made Ground. One round of groundwater monitoring indicates that the perched groundwater level is present approximately 2.7m below ground level. Further, longer term groundwater monitoring should be undertaken to inform temporary works contingency planning, control measures and waterproofing design.

1.12. A ground movement assessment and damage impact assessment has been presented, although not in sufficient detail, and there is no information on the indicative zone of influence of the development. Calculations should be presented and the presence or absence of other nearby basements, underground structures or listed buildings (the site lies within a Conservation area) within that zone should be confirmed. An outline methodology and guidance for monitoring ground / structural movements during construction should be provided.

1.13. The structural calculations assume a bearing pressure of 125kPa. However, the geotechnical interpretation indicates a suitable bearing capacity at formation of 100kPa. The geotechnical parameters and structural calculations should be clarified.

1.14. An outline temporary works methodology is presented, including underpinning sequencing and temporary propping arrangements. Contingency measures to control groundwater during construction should be considered and presented.

1.15. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. Until the outstanding information is presented, the BIA does not meet the criteria of CPG4 and DP27.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 25 November 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 28 Maresfield Gardens, London NW3 5SX, Camden Reference 2016/5374/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 of single storey basement with rear lightwell; erection of rear extension at lower ground floor level; erection of front dormer; alterations to front and rear alterations including hard and soft landscaping works."

2.6. CampbellReith accessed LBC's Planning Portal on 6 December 2016 and gained access to the following relevant documents for audit purposes:

· Basement Impact Assessment dated September 2016 by Vincent & Rymill.

- Ground Investigation (ref GWPR1761) dated September 2016 by Ground and Water Ltd.
- Basement Impact Assessment: Groundwater Report (ref 30164R1D1) dated September 2016 by H Fraser Consulting.
- Basement Impact Assessment: Land Stability dated September 2016 by Ground & Project Consultants Ltd.
- Planning and Design & Access Statement dated September 2016 by Martin Robeson Planning Practice.
- Arboricultural Impact Assessment (ref GWA/28MFG/A1A/01a) dated September 2016 by Landmark Trees.
- Construction Traffic Management Plan dated September 2016 by Traffic Management London Ltd.
- Various existing and proposed plans and sections dated August 2016 by Greenway Architects.
- Consultation responses to the proposed development from local residents.

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?	No	Information within the BIA is broadly in line with the information required of a desk study in line with the GSD Appendix G1. Utility companies have not been approached with regards to underground infrastructure. A mainline railway tunnel is located 20m north of the property running along Nutley Terrace. Historical maps do not show the subject site in sufficient detail.
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 plans/maps included?	No	Historical maps do not show the subject site in sufficient detail.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Historical maps do not show the subject site in sufficient detail.
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?	No	The screening has not identified the presence of nearby 'Lost Rivers', which has is discussed elsewhere in the reports. However, it is accepted that these are culverted.

Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Screening does not identify change in impermeable site area, which contradicts H Fraser report indicating >10% reduction in soft landscaping. References historic flooding information but not EA detailed surface water data.
Is a conceptual model presented?	Yes	Conceptual model provided for Land Stability (Section 6 of Ground and Project Consultants Ltd report) and Hydrogeology (Section 4.1 of H Fraser Consulting report) both provided but are inconsistent.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	However, 'Scoping' discussion presented in Impact Assessment. Assumptions have been made regarding the presence of deep basements that adjoin or are adjacent to the subject property, which are not confirmed.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Incomplete. The screening identifies a number of issues which are not further discussed.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	There is a change in permeable / impermeable site ratio which is inconsistently reported. Attenuation drainage references need further detailing to assess.
Is factual ground investigation data provided?	Yes	Ground and Water Ltd report.
Is monitoring data presented?	Yes	One round of groundwater monitoring was undertaken in September 2016. The BIA recommends ongoing monitoring of groundwater levels during and up to the end of construction of the basement.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	Not discussed within the BIA. A site walkover was undertaken in August 2014 prior to the site investigation.

Item	Yes/No/NA	Comment
Is the presence/absence of adjacent or nearby basements confirmed?	No	Assumptions are presented re 30 Maresfield Gardens.
Is a geotechnical interpretation presented?	Yes	Section 5 of Ground Investigation report and Land Stability Report. Bearing capacity presented not adopted in structural calculations.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 6 of Ground Investigation report.
Are reports on other investigations required by screening and scoping presented?	No	Network Rail consultations and further groundwater monitoring required.
Are baseline conditions described, based on the GSD?	No	Stage 4 of BIA report although inconsistent with other reports.
Do the base line conditions consider adjacent or nearby basements?	No	No consideration of Network Rail infrastructure and assumption made regarding adjacent and nearby basements.
Is an Impact Assessment provided?	Yes	Stage 4 of BIA report.
Are estimates of ground movement and structural impact presented?	Yes	Section 6 of Ground Investigation report. However, incomplete.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Groundwater, impermeable site area, presence of basements, impact to tunnel and other underground infrastructure.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Structural monitoring, groundwater monitoring, groundwater control, attenuation SUDS etc require discussion.
Has the need for monitoring during construction been considered?	No	Movement monitoring is discussed in Section 6 of the Ground Investigation Report but no detail or recommendations are provided.
Have the residual (after mitigation) impacts been clearly identified?	No	

Item	Yes/No/NA	Comment
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Ground movement assessment / damage impact assessment incomplete.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	The proposed scheme will increase the impermeable site area. Outline drainage to mitigate change in surface water discharge flow to be presented.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Ground movement assessment / damage impact assessment incomplete.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	However, ground movement assessment / damage impact assessment incomplete. A zone of influence should be identified and nearby basements and assets (tunnels / utilities etc.) should be identified. Calculations to be presented.
Are non-technical summaries provided?	No	No coherent report presenting the BIA from screening to assessment with relevant summaries.

4.0 DISCUSSION

4.1. The BIA has been prepared by a number of sources: Vincent & Rymill, Ground and Project Consultants Ltd, Ground and Water Ltd and H Fraser Consulting Ltd. The BIA has not been presented in a single, coherent format, and non-technical summaries have not been provided for all aspects of the reporting, in line with CPG4. The authors' qualifications are in accordance with the requirements of CPG4.

4.2. The proposed scheme involves excavating a single storey basement with a rear lightwell and the erection of a rear extension at lower ground floor level with alterations to the hard and soft landscaping of the site.

4.3. The BIA includes the majority of the information required from a desk study in line with the GSD Appendix G1. However, utility and transportation companies have not been approached with regards to underground infrastructure. The BIA identified that a mainline railway tunnel is located 20m north of the property running along Nutley Terrace. Network Rail should be consulted regarding the basement construction and any Network Rail exclusion zones respected.

4.4. A site investigation confirmed the presence of London Clay below 0.6m to 0.9m of clayey Made Ground.

4.5. The BIA identified the old course of the headwaters of the River Tyburn approximately 100m east of the site, and the old course of the headwaters of the River Westbourne approximately 200m west of the site. It is accepted that these are unlikely to impact upon the site.

4.6. The BIA states that the site lies directly on a designated unproductive stratum, the London Clay. It is accepted there should be no impacts to the wider hydrogeological environment. However, seepage flows within the London Clay may impact the site during construction and should be considered (see 4.9).

4.7. The risk of surface water flooding is accepted as being low. The BIA states that no nearby streets flooded in 1975 or 2002. Environment Agency data indicates a surface water flow route across the site in the event of a flood event, and this should be appropriately mitigated against. Suitable drainage and flood risk protection measures should be proposed.

4.8. The proposed basement will result in an increase in the proportion of hard surface/paved areas. Outline drainage plans should be provided, including attenuation proposals, with sufficient assessment to demonstrate discharge flows will be in accordance with LBC's and Thames Water's requirements, as indicated in CPG4 section 3.51.

4.9. Groundwater monitoring data suggests that perched groundwater level is present approximately 2.7m below ground level. However, only one round of monitoring has been undertaken. Further

longer term groundwater monitoring should be undertaken to inform temporary works contingency planning, control measures and waterproofing design.

4.10. A ground movement assessment and damage impact assessment has been presented, although not in sufficient detail. There is no information on the indicative zone of influence of the development, the presence or absence of other nearby basements, underground structures or listed buildings within that zone, which should be confirmed. The BIA refers to an 'adjoining garage'. However, this is not referred to in any other information reviewed. The damage impact to adjacent structures is stated as being Category 0, 'Negligible'. The GMA also assumes stiff London clay, but at the level of underpinning the shear strengths are soft to firm, and this should be considered. Calculations should be presented to allow the assessment to be reviewed, and the presence or absence of nearby basements, underground structures or listed buildings within the zone of influence should be confirmed.

4.11. An outline methodology and guidance for monitoring ground / structural movements during construction should be provided, based on the movements and damage impacts predicted.

4.12. Geotechnical parameters presented in the ground investigation are not the same as those interpreted in the Land Stability report, and the bearing pressures adopted in the structural calculations exceed the bearing capacity recommended in the land stability report. The reports should be reviewed and a coherent set of geotechnical parameters should be presented. The structural calculations should adopt the parameters presented.

4.13. An outline temporary works methodology is presented, including underpinning sequencing and temporary propping arrangements. Contingency measures to control groundwater during construction should be considered and presented.

4.14. Comment re heave being noted within BIA together with the inclusion of cordek installed below the basement slab. Structural basement plan shows 3 no. tension piles, to resist heave, and a load bearing single pile below the corner lower ground floor extension over. However, these are not mentioned in the text.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by a number of sources. The BIA has not been presented in a single, coherent format, and non-technical summaries have not been provided for all aspects of the reporting, in line with CPG4. The authors' qualifications are in accordance with the requirements of CPG4.

5.2. A desk study has been presented, broadly in accordance with aspects recommended in the GSD Appendix G1.

5.3. Network Rail should be consulted regarding the proximity of the mainline tunnel 20m north of the property and any Network Rail exclusion zones respected.

5.4. The BIA states that the site lies directly on designated unproductive strata, the London Clay. It is accepted that there should be no impact to the wider hydrogeological environment.

5.5. The risk of surface water flooding is accepted as being low. Suitable drainage and flood risk protection measures should be presented.

5.6. The proposed basement will result in an increase in the proportion of hard surface/paved areas. Outline drainage plans should be provided, including attenuation proposals in line with CPG4 section 3.51.

5.7. Longer term groundwater monitoring should be undertaken to inform temporary works contingency planning, control measures and waterproofing design.

5.8. A ground movement assessment and damage impact assessment has been presented, although not in sufficient detail. Calculations should be presented and the presence or absence of other nearby basements, underground structures or listed buildings within that zone should be confirmed. The assessment should consider the stiffness of the London Clay.

5.9. An outline methodology and guidance for monitoring ground / structural movements during construction should be provided.

5.10. The structural calculations assume a bearing pressure of 125kPa. However, the geotechnical interpretation indicates a suitable bearing capacity at formation of 100kPa. The geotechnical parameters and structural calculations should be clarified.

5.11. An outline temporary works methodology is presented. Contingency measures to control groundwater during construction should be considered and presented.

5.12. Queries and matters requiring further information or clarification are summarised in Appendix 2. Until the outstanding information is presented, the BIA does not meet the criteria of CPG4 and DP27.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Com30ments

Surname	Address	Date	Issue raised	Response
Williams for and on behalf of Netherhall Neighbourhood Association	Little House A, 16A Maresfield Gardens	14th November 2016	… 3 its proximity within 1 metre of No 26 will have risk of structural damage to the structure of the adjoining building. 4 The Basement Impact Study shows a different plan for the new basement to that shown in the submitted plan. It makes no reference to the basement projecting south to abut the boundary with No 26 (with no plan showing the relationship with adjacent building structures) and does not address the excavation being 1m away from the adjoining building at No 26. It fails to argue that the new basement would not cause damage to the structure of the adjoining buildings.	GMA / damage impact and engineering parameters / calculations to be reviewed and updated.
Osband	Little House A, 16A Maresfield Gardens	30th November 2016	….. it will be too near the boundary of no. 26 and this may have structural implications for no. 26……	GMA / damage impact and engineering parameters / calculations to be reviewed and updated.

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	The BIA should be presented as a single, coherent report with supporting documents appended (to avoid inconsistency / contradiction between documents). To include non-technical summaries.	Open	
2	Hydrogeology	In accordance with the BIA's own recommendations, long term groundwater monitoring should be undertaken.	Open – The baseline should be confirmed by longer term monitoring and/or by the contractor in advance of the works.	N/A
3	Land Stability	The works should be undertaken in consultation with Network Rail.	Open – details of Network Rail responses / requirements to be provided to the Engineer / Building Control and works to be undertaken in accordance with tolerances / restrictions imposed.	N/A
4	Land Stability	Ground movement assessment and damage impact assessment calculations to be provided. Structures within the zone of influence should be identified, along with basements / listed buildings / utilities / underground infrastructure.	Open	
5	Surface Water Flow	A drainage strategy be presented in line with CPG4 3.51. Flood risk protection measures should be detailed.	Open	
6	Land Stability	Geotechnical parameters to be confirmed. Structural calculations to adopt presented parameters.	Open	
7	Land Stability / hydrogeology	Residual risk and temporary groundwater control measures to be presented.		

Appendix 3: Supplementary Supporting Documents

None

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