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Highgate Newtown CC, 25 Bertram Street, London N19 5DQ

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-40

Revision: F1

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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 submitted as part of the Planning Submission documentation for Highgate Newton Community Centre, 25 Bertram Street, N19 5DQ (planning reference 2016/6088/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 reviewed it against an agreed audit check list.

1.4. The BIA has been carried out by a well known firm of consultants who possess relevant qualifications and experience.

1.5. It is proposed to demolish the existing buildings and construct a single level basement below each new building, 3.0m deep in the west of the site and 4.0m deep in the east.

1.6. A soils investigation confirmed the existence of London Clay to the depth of investigation below Made Ground at depths varying between 0.80m and 1.70m. An existing buried fuel tank located in the north of the site was surrounded in increased depths of Made Ground.

1.7. Perched groundwater was encountered in the Made Ground which should be controllable by sump pumping although care should be taken to ensure fine materials are not removed during the process.

1.8. The Lead Local Flood Authority (LLFA) has identified detailed design information required to satisfy the SUDS drainage arrangements and assessment of impermeable paving areas contained within the Flood Risk Assessment.

1.9. A Basement Construction Sequence indicates that, following demolition of the existing buildings, the basement to the eastern building will be constructed by the installation of a contiguous bored pile retaining wall. An outline temporary works plan is presented confirming stiff propping.

1.10. The revised submissions indicate that the western and southern parts of the site will utilise sheet piled retaining walls to allow construction of the basement. An outline temporary works plan is presented confirming stiff propping.

1.11. The original Ground Movement Assessment (GMA) indicated that damage to surrounding properties would range from Negligible (Burland Category 0) to Slight (Burland Category 2). In the revised GMA, which considers the stiffly propped piled walls, damage impacts are predicted in the range of Negligible to Very Slight (Burland Category 0 to 1).

1.12. In the revised submissions, the proposed temporary works are considered to mitigate damage impacts to as low as practicable. The structural monitoring plan, whilst not extensive in detail, indicates that condition surveys should be undertaken and suitable trigger levels are proposed. The final monitoring strategy should ensure trigger values are linked to the predicted movements, propose monitoring intervals that are appropriate to the phase of construction and ensure that damage impacts are limited to Category 1.

1.13. BIA proposals to alleviate the effect on the proposed basement from heave, due to the excavation, of the London Clay are accepted.

1.14. It is accepted that there are no slope stability or hydrogeological concerns with regard to the proposed development.

1.15. Queries and requests for clarification are described in Section 4 and summarised in Appendix 2. On the basis of the revised submissions, the BIA meets the criteria of CPG4.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 22 December 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Highgate Newtown CC, Camden Planning Reference 2016/6088/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;

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 *"Redevelopment of the existing Highgate Newtown Community Centre and Fresh Youth Academy and the change of use of the People's Mission Gospel Hall to provide replacement community facilities (Use Class D1) and 31 residential units (Use Class C3) with associated public open space, landscaping, cycle storage, plant and disabled parking."*

2.6. The Audit instruction confirmed that the basement proposals involved 5 no. Grade II listed buildings at the end of Winscombe Street.

2.7. CampbellReith accessed LBC's Planning Portal on 23 January 2017 and gained access to the following relevant documents for audit purposes:

- Ground Investigation and Basement Impact Assessment (BIA) dated November 2016 by Geotechnical & Environmental Associates
- Flood Risk Assessment and Sustainable Drainage Strategy (FRA) dated December 2016 by Conisbee
- Design and Access Statement dated November 2016 by rcka
- Architectural Floor Plans, Elevations and Sections, Existing and Proposed, dated January 2016 by rcka

2.8. The BIA referred to a Conisbee document entitled Construction Method Statement (CMS) dated October 2015 and this was requested on 23 January, and received on 24th, but was actually Basement Construction Sequence drawing no. 140009/SSK101 rev P1.

2.9. CampbellReith were provided with the following relevant documents for audit purposes on 27th March 2017:

- Ground Investigation and Basement Impact Assessment (ref J16021) dated March 2017 by Geotechnical & Environmental Associates
- Sketches and drawings (ref SSK011, 012, 013, 014, 015, 016, 017, 018, 019, 102, 103) dated February and March 2017 by Conisbee

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Document Control and Section 1.3.2.
Is data required by Cl.233 of the GSD presented?	Yes	Proposal not sufficiently detailed (see Audit paragraph 4.3).
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 BIA Section 2.
Are suitable plan/maps included?	Yes	See BIA and FRA Appendix D.
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	See BIA Section 3.1.2.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 3.1.1 but response to Q.4 is queried
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 3.1.3 but response to Q.3 is queried.
Is a conceptual model presented?	Yes	See BIA Section 7.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.1.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.1.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.1.
Is factual ground investigation data provided?	Yes	See BIA Appendix.
Is monitoring data presented?	Yes	See BIA Section 5.3.
Is the ground investigation informed by a desk study?	Yes	See BIA Section 1.3.
Has a site walkover been undertaken?	Yes	See BIA Section 2.1.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	See BIA Section 10.
Is a geotechnical interpretation presented?	Yes	See BIA Section 7.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See BIA Section 8.1.2.
Are reports on other investigations required by screening and scoping presented?	Yes	Flood Risk Assessment provided although not indicated as necessary in BIA. Investigation of existing fuel tank.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	None identified.
Is an Impact Assessment provided?	Yes	See BIA Section 12.
Are estimates of ground movement and structural impact presented?	Yes	See BIA Section 10.1.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	However, the need for a FRA not determined.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	See BIA Section 12.
Has the need for monitoring during construction been considered?	Yes	See BIA Section 10.2.
Have the residual (after mitigation) impacts been clearly identified?	Yes	See BIA Section 13.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Although mitigation not provided to limit damage to not exceed Burland Category 1.
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	See BIA Section 10.1.
Are non-technical summaries provided?	Yes	See BIA Section 12.2.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been produced by a well known firm of consultants, Geotechnical & Environmental Associates (GEA) and has been produced by individuals who possess relevant qualifications and experience.

4.2. It is proposed to demolish the existing community centre buildings and subsequently construct a new five-storey apartment building in the west of the site, and a new four-storey community centre in the east. It is also proposed to construct a single level basement below each of the buildings, extending to depths of 3.00m and 4.00m below existing ground floor level in the west and east of the site respectively.

4.3. A soils investigation was undertaken through two no. boreholes installed to a depth of 25m together with six no. window sampler boreholes advanced to a maximum depth of 6m. These generally encountered Made Ground at depths between 0.80m and 1.70m below which London Clay extended to the full depth of the investigation. An existing buried fuel tank was known to be present in the north of the site and Made Ground increased to depths of 2.30m and 3.00m in the area surrounding it.

4.4. Groundwater was measured at depths of between 1.82m and 5.21m during a single monitoring visit. It is accepted that this is likely to represent inflows of perched groundwater from within the Made Ground and that this should be controllable by sump pumping, although care should be taken to ensure fine materials are not removed during the process.

4.5. The Hydrogeology and Hydrology Screening responses in the BIA produced negative answers to questions regarding changes in the proportion of hard surfaced/paved areas and the profile of the inflows of surface water being received by adjacent properties or downstream watercourses. Nevertheless, a Flood Risk Assessment and Sustainable Drainage Strategy Report (FRA) has been undertaken by Conisbee. This concludes that the site is in Flood Zone 1 and is at no risk of fluvial flooding. It discusses surface water and sewer flooding and considers that there has historically been sewer flooding in areas concentrated to the western part of the borough away from the site. Sewer network plans and maps of 1 in 100 year storm flooding show a linkage between the existing network and potential flooding areas resulting in the need to attenuate the proposed flows into the combined sewer flowing southwards from the site in the rear gardens of Bramshill Gardens and Dartmouth Park Avenue. The Planning Portal includes a commentary on the FRA proposals from the Lead Local Flood Authority (LLFA). Although it indicates the proposal “is in line with the SUDS requirements”, it requires further detailed design information with respect to SUDS drainage arrangements and assessment of impermeable areas.

4.6. It is accepted that the development will not affect the hydrogeological setting as no known ponds, springlines or wells are in close vicinity to the site and the site is outside the Hampstead pond chain catchment area.

4.7. It is accepted that there are no slope stability concerns regarding the basement development.

4.8. Conisbee's Basement Construction Sequence drawing indicates that, following demolition of the existing buildings, a contiguous bored pile retaining wall will be installed along the eastern boundary with returns along part of the northern and southern boundaries. General excavation will then take place behind the propped retaining wall to reduce ground levels to below basement construction level.

4.9. The original BIA indicated that the western boundary was to be formed by open cut excavation with the top of the battered slope extending considerably into the rear gardens of houses on Croftdown Road. The revised BIA submission confirms that these areas will be retained by sheet piled walls and that the excavation will remain within the site boundary.

4.10. In the revised BIA, an outline temporary works scheme is provided (described within the Ground Movement Assessment (GMA) and with indicative sketches) confirming that stiff propping will be provided to both the bored piles and sheet piled walls to minimise horizontal ground movements.

4.11. A GMA was undertaken by GEA, which has been updated in the revised submissions and reflects the proposed scheme and temporary works. Although software outputs were not presented, the input parameters and assumptions used in the analysis were reviewed. The resulting vertical and horizontal movements predicted are within the expected range for the works proposed.

4.12. The original results of the GMA assessment indicated damage to surrounding properties in the range of Negligible (Category 0) to Slight (Category 2). In the revised submissions, damage impact is assessed in the range of Negligible to Very Slight (Category 0 to 1). The proposed sequence and stiff propping of the temporary works, and the permanent stiff propping provided by the development buildings, are considered to minimise ground movements to as low as practicable.

4.13. The BIA identifies the need for the monitoring of adjacent properties and structures. In the revised submission the structural monitoring plan presented, whilst not extensive in detail, indicates that condition surveys should be undertaken and suitable trigger levels are proposed. The final monitoring strategy should ensure trigger values are linked to the predicted movements, propose monitoring intervals that are appropriate to the phase of construction and ensure that damage impacts are limited to Category 1.

4.14. The BIA recognises that heave of the underlying clay material will occur, due to the excavation, and the proposals to alleviate the effect on the basement are accepted.

4.15. It is accepted that there are no slope stability concerns, wider hydrogeological issues or any other surface water considerations regarding the proposed development.

5.0 CONCLUSIONS

5.1. The BIA has been carried out by a well known firm of consultants who possess relevant qualifications and experience.

5.2. It is proposed to demolish the existing buildings and construct a single level basement below each new building, 3.0m deep in the west of the site and 4.0m deep in the east.

5.3. A soils investigation confirmed the existence of London Clay to the depth of investigation below Made Ground at depths varying between 0.80m and 1.70m. An existing buried fuel tank located in the north of the site was surrounded in increased depths of Made Ground.

5.4. Perched groundwater was encountered in the Made Ground which should be controllable by sump pumping although care should be taken to ensure fine materials are not removed during the process.

5.5. The Lead Local Flood Authority (LLFA) has identified detailed design information required to satisfy the SUDS drainage arrangements and assessment of impermeable paving areas contained within the Flood Risk Assessment.

5.6. A Basement Construction Sequence indicates that, following demolition of the existing buildings, the basement to the eastern building will be constructed by the installation of a contiguous bored piled retaining wall, and the western building by the installation of a sheet piled retaining wall. An outline temporary works plan is presented confirming stiff propping.

5.7. A Ground Movement Analysis has been undertaken which indicates that damage to surrounding properties will range from Negligible (Burland Category 0) to Very Slight (Burland Category 1).

5.8. The structural monitoring plan indicates that condition surveys should be undertaken and suitable trigger levels are proposed. The final monitoring strategy should ensure trigger values are linked to the predicted movements, propose monitoring intervals that are appropriate to the phase of construction and ensure that damage impacts are limited to Category 1.

5.9. BIA proposals to alleviate the effect on the proposed basement from heave, due to the excavation, of the London Clay are accepted.

5.10. It is accepted that there are no slope stability or hydrogeological concerns with regard to the proposed development.

5.11. The revised BIA meets the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Hydrology/Hydrogeology	LLFA requirements to be completed via Planning Process.	N/A	N/A
2	Stability	Proposal for excavation slopes to extend beyond western boundary to be authenticated.	Closed – sheet piling now proposed.	March 2017
3	Stability	Indicative temporary works propping scheme to be provided.	Closed – temporary works plan provided.	March 2017
4	Stability	Mitigation measures to limit damage to Category 1 to be provided.	Closed – confirmed by temporary works and GMA.	March 2017
5	Stability	Reassessment of GMA to identify damage has been limited to Category 1 following Mitigation.	Closed - the final monitoring strategy should ensure trigger values are linked to the predicted movements, propose monitoring intervals that are appropriate to the phase of construction and ensure that damage impacts are limited to Category 1.	March 2017
6	Stability	Movement monitoring contingency measures and trigger levels requested.		March 2017

Appendix 3: Supplementary Supporting Documents

Ground Investigation and Basement Impact Assessment (ref J16021) dated March 2017 by Geotechnical & Environmental Associates

Sketches and drawings (ref SSK011, 012, 013, 014, 015, 016, 017, 018, 019, 102, 103) dated February and March 2017 by Conisbee

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