CampbellReith
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Brill Place
Central Somers Town
London

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12336-12
Revision: F1

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Project Number	12366-12
Project Name	Site Adjacent to Brill Place, CST
Planning Reference	2015/2704/P

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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 Site Adjacent to Brill Place, Central Somers Town (planning reference 2015/2704/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 BIA has been prepared by Buro Happold Engineering. The qualifications of the authors meet LBC's requirements.

1.5. The ground conditions information within the ESG SI report are presented as 'draft' and the final version should be presented, confirming ground conditions are as stated.

1.6. The BIA assumes a retaining walls will be formed by a 600mm diameter hard / firm secant piled wall. An outline assessment for the piled retaining wall and piled foundations is provided. Temporary works assumptions are presented in outline. Further details of proposed methods of structural propping and contingency measures for groundwater control will be required in the BCP to ensure stability impacts are mitigated.

1.7. The proposed basement is indicated to be formed within Made Ground and the London Clay Formation and should have negligible impact upon the surrounding hydrogeological environment. The proposed basement may encounter Alluvium and the extent of the Alluvium should be investigated across the basement footprint in advance of the works.

1.8. It is accepted that piling into the Lambeth Group, a Secondary aquifer, is unlikely to present any impact to hydrogeology in the long term. However, the BCP should address suitable methodology to prevent potential contamination during piling.

1.9. One round of groundwater monitoring data has been presented, although longer term monitoring would normally be appropriate to establish baseline conditions. The use of a hard/firm secant piled wall with cavity drainage, as proposed, should exclude perched groundwater.

1.10. The BIA has not identified any surface water / hydrological impacts. A Flood Risk Assessment (FRA) has been undertaken which identifies the site, including the basement, to be at low to very low risk of flooding from all sources.

1.11. The GMA indicates there will be Negligible (Burland Damage Category 0) impact to the Francis Crick Institute and 1 Coopers Lane. The Thames Water assets within the development's zone of influence will be subject to strains within the threshold criteria stated by Thames Water. The Francis Crick Institute and Thames Water assets may be sensitive to vibrations induced by construction and a suitable monitoring regime should be agreed with both parties in advance of the works.

1.12. It is accepted that there are no stability issues relating to slopes >7°.

1.13. The BIA satisfies the requirements of CPG4 and DP27. Outstanding information should be provided in a BCP prior to construction.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 23 December 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Site adjacent to Brill Place, which forms Plot 7 of the Central Somers Town, London, NW1, Camden Reference 2015/2704/P. The audit was delayed until a Ground Investigation Report was submitted on 21 March 2016.

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 *"Demolition of existing buildings and the provision of Plot 7: 45no residential units over flexible A1/A2/A3/D1 floor space at ground level (approximately 70 sqm)."*

2.6. CampbellReith accessed LBC's Planning Portal on 7 March 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (Rev 00 November 2015 and Rev 01 March 2016) by Buro Happold.
- Proposed Development Site Location Plan, Basement and Ground Floor Plans (Rev P03) by dRMM Architects issued 30 November 2015.
- Central Somers Town CIP Flood Risk Assessment by AKTII issued December 2015.
- Phase 1 Geo-Environmental Desk Study (R12794/G001A) by Pell Frischmann issued May 2013.

2.7. In addition, the following documents were received on 20 May 2016:

- Basement Impact Assessment (Rev 04, dated 16 May 2016) by Buro Happold.
- Central Somers Town CIP Flood Risk Assessment by AKTII issued May 2016.

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?	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 proposals should be confirmed by the Contractor.
Are suitable plan/maps included?	Yes	Desk Study.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Desk Study.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Appendix C.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Mitigation of potential contamination of Secondary Aquifer during piling to be addressed in BCP.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	BIA Appendices. However, only draft report presented.
Is monitoring data presented?	Yes	Only one round of groundwater monitoring presented within draft ESG factual SI report.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	
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?	Yes	
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	
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	The BIA assumes the Contractor will address structural mitigation measures in the BCP.
Has the need for monitoring during construction been considered?	Yes	Due to the sensitivity of the structures, the BIA states that specific monitoring requirements are to be agreed with Thames Water and The Francis Crick Institute in advance of the works.
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Based on assumed structural methodology for formation of the retaining walls and foundations, which should be confirmed by detailed design / contractor's method statement.
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	The extent of the Alluvium across the basement footprint should be investigated by the Contractor in advance of the works. If lateral continuity is proven, then re-assessment may be required.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Category 0 is predicted.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The BIA has been prepared by Buro Happold Engineering. It has been confirmed that the qualifications of the authors meet the LBC requirements.

4.2. A draft SI factual report is presented, including a single round of groundwater monitoring data. The report should be issued as final, confirming ground conditions are as stated. Longer term groundwater monitoring should be considered to identify baseline conditions.

4.3. The proposed development is the construction of residential towers of 19 and 24 storeys. A single storey basement is proposed across part of the development footprint. The BIA states that the proposed basement will be founded in the London Clay at approximately 5.6m below existing ground level (at 13.01m AOD). A piled foundation solution will be required. The total retained height is approximately 7m.

4.4. Currently assessments are based upon numerous assumptions. An outline structural methodology statement has been provided. Further detail is required, however, it is accepted this may be provided in a Basement Construction Plan.

4.5. The initial audit identified that potential hydrogeological and hydrological impacts (such as the presence of a surface water feature, the surface water flood risks, etc) had been omitted from the BIA and the structure provided by the guidance of CPG4 (screening, scoping, impact assessment, mitigation, residual impact) had not been followed. Non-technical summaries have also been omitted. The revised BIA largely recognises the CPG4 guidelines and includes mitigation measures and residual impact assessments.

4.6. The BIA states that the proposed basement will be formed within Made Ground and the London Clay Formation and will have negligible impact upon the surrounding hydrogeological environment. However, Alluvium has been identified across the wider site and the extent of the Alluvium should be confirmed in advance of the works. Should lateral continuity be proved, reassessment of the impact to the wider hydrogeology should be reviewed. This is to be confirmed in a BCP.

4.7. The foundation piles may penetrate the Lambeth Group which is a secondary aquifer. It is accepted the potential impact to the surrounding water environment in the long term is negligible. The BCP should address the potential for contamination during the piling operation and how this will be mitigated.

4.8. Groundwater seepages are indicated at shallow depths within the SI data and may be encountered during excavation / construction, especially if Alluvium is encountered. It is

accepted that a secant pile wall provides appropriate mitigation for the temporary case. Proposals for the permanent exclusion of water should be described.

4.9. The proposed development will alter the existing proportion of hard surfaces and paved areas. However, this will have negligible impact on the quantity of local rainfall entering the existing sewer system as the underlying London Clay precludes the use of local soakaway drainage or SUDS.

4.10. A Flood Risk Assessment (FRA) was provided for review. Issues within the original FRA were not presented / discussed in the BIA and potential impacts had been omitted. The FRA did not consider the presence of a basement within the development and the Environment Agency identified the development as being within a zone of low to high risk of pluvial or sewer flooding. The FRA has now been updated and confirms there is a very low risk of flooding from any source to the development, including the basement.

4.11. The BIA assumes retaining walls will be formed by a 600mm diameter hard / firm secant piled wall. The BIA includes an outline assessment of a piled retaining wall and piled foundations. Detailed structural information to confirm the toe depth of foundation and retaining wall piles, construction sequencing, temporary works and recommendations to the contractors should be provided in a BCP.

4.12. The GMA indicates there will be Negligible (Burland Damage Category 0) impact to the Francis Crick Institute and 1 Coopers Lane. The Thames Water assets within the development's zone of influence will be subject to strains within the threshold criteria stated by Thames Water. However, it should be noted that the material type, diameters and current condition should be confirmed with Thames Water. If these differ from the assumptions made in the GMA then re-assessment should be undertaken.

4.13. The BIA states that the Francis Crick Institute and Thames Water assets may be sensitive to vibrations induced by construction and that a suitable monitoring regime should be agreed with both parties in advance of the works.

4.14. It is accepted that are no stability issues relating to slopes >7°.

5.0 CONCLUSIONS

5.1. The BIA has been prepared by Buro Happold Engineering. The qualifications of the authors meet LBC's requirements.

5.2. An outline assessment for the assumed piled retaining wall and piled foundations is provided. Temporary works assumptions are presented in outline. Further details of proposed methods of structural propping and contingency measures for groundwater control will be required in the BCP to ensure stability impacts are mitigated.

5.3. Groundwater seepages may be encountered during excavation / construction. One round of groundwater monitoring data has been presented. Longer term monitoring would normally be appropriate to establish baseline conditions and the groundwater conditions should be established by the Contractor prior to construction.

5.4. The ground conditions information within the ESG SI report are presented as 'draft' and the final version should be presented, confirming ground conditions are as stated.

5.5. The proposed basement will be formed within Made Ground and the London Clay Formation and will have negligible impact upon the surrounding hydrogeological environment. The potential presence of Alluvium is not considered to present a regional hydrogeological impact. However, the proposed basement may encounter Alluvium and the extent of the Alluvium should be investigated across the basement footprint in advance of the works. Should lateral continuity be proven then re-assessment of the impact to the wider hydrogeological environment may be required.

5.6. The foundation piles may penetrate the Lambeth Group. The long term potential for contamination to migrate from Made Ground to the Lambeth Group is discussed in the BIA and the impact is accepted as negligible. The BCP should address the potential for contamination during piling itself and how this will be mitigated.

5.7. It is accepted that there are no surface water or hydrological impacts likely to impact either the proposed development or the surrounding environment.

5.8. The GMA indicates there will be Negligible (Burland Damage Category 0) impact to the Francis Crick Institute and 1 Coopers Lane. The Thames Water assets within the development's zone of influence will be subject to strains within the threshold criteria stated by Thames Water. However, it should be noted that the material type, diameters and current condition of the assets should be confirmed with Thames Water. If these differ from the assumptions made in the GMA then re-assessment should be undertaken.

5.9. The Francis Crick Institute and Thames Water assets may be sensitive to vibrations induced by construction and a suitable monitoring regime should be agreed with both parties in advance of the works.

5.10. It is accepted that are no stability issues relating to slopes >7°.

5.11. The BIA satisfies the requirements of CPG4 and DP27. Outstanding information should be provided in a BCP prior to construction.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	Author qualifications be confirmed as compliant with LBC requirements.	Closed - Provided in Rev 2	23/03/16
2	BIA	Buro Happold Desk Study should be provided.	Closed - Provided in Rev 4	20/05/16
3	Hydrogeology	Longer term monitoring should be considered to establish baseline conditions.	Open	BCP
4	Hydrogeology	The depth of the foundation piles should be confirmed and if they extend into the Lambeth Group and beyond an impact should be assessed. The potential presence of Alluvium should be assessed.	Open - Accepted that long term contamination impact to Lambeth Group Secondary aquifer is likely to be negligible. BCP should address specific risk of impact during piling. Contractor should identify lateral extent of Alluvium across the basement footprint and if continuous re-assessment of impact may be required.	BCP
5	Hydrology	Potential impacts of surface water flood risk and the culverted River Fleet should be addressed. The FRA should assess the impact of basements within the development.	Closed - Updated in Rev 4	20/05/16
6	Stability	Structural Methodology Statement / Construction Methodology to be confirmed and outline calculations and indicative drawings provided.	Open – Outline information has been provided in Rev 4 which should be confirmed and supplemented with additional information in the BCP.	BCP
7	Stability	GMA should address both the excavation and construction methodology effects e.g piling. It should also identify a zone of influence and assess all structures within the zone.	Closed – Updated in Rev 4. BCP should confirm structural methodology assumptions are correct and GMA should be updated if necessary.	20/05/16 and BCP

8	Impact Mitigation Measures	Best practice / requirements to mitigate impacts e.g. monitoring, temporary works etc should be provided.	Open – Updated in Rev 4 but requires supplementary information in the BCP. Additionally the BIA identifies that asset owners should agree the requirements of vibration / movement monitoring.	BCP and consultation with asset owners

Appendix 3: Supplementary Supporting Documents

None

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