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52 Holmes Road, London, NW5 3AB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-03
Revision: D1

September 2016

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1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by the 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 52 Holmes Road, NW5 3AB (Camden planning reference 2016/1986/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the BIA for potential impacts to 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. Two BIA reports were uploaded on the Planning Portal, however, the more up to date out of the two was audited.

1.5. The BIA was undertaken by G.D.C Partnership Ltd and whilst the author has a CEng MICE qualification, the input of a CGeol is also required in the production of a BIA.

1.6. It is proposed to construct a 7 storey building over a single storey basement following demolition of the existing building. Sections and elevations to indicate the proposed development are requested. The basement is proposed to be formed be a secant piled retaining wall around its full perimeter, with a reinforced concrete liner wall. A construction sequence with sketches to illustrate it is not included and this is requested together with any temporary propping indicated.

1.7. Preliminary calculations are requested for the proposed foundation and basement design including an indicative temporary works propping arrangement to confirm that the piles will remain sufficiently stiff to ensure movements of the pile wall will be minimised.

1.8. The BIA has confirmed the proposed basement is to be founded in the London Clay.

1.9. It is stated it is likely that the groundwater table will be encountered during basement foundation excavation although it is agreed that the likely inflows would be negligible. Additionally a secant pile wall is proposed.

1.10. The responses to Question 8 of the land stability screening and Question 2 of the hydrogeology screening are considered incorrect and should be assessed further.

1.11. An assessment of the effect of the construction on the nearby tree should be undertaken.

1.12. The retaining wall parameters are considered incomplete as they do not include the parameters for the Made Ground or stiffness values for the London Clay.

1.13. It should however be confirmed if heave mitigation measures will be considered in the design of the foundations.

1.14. The structural sketches provided do not show how the internal columns and stability core walls will be supported. Details on the pile arrangement proposed and the associated depth of excavation to form the pile caps should be provided if these are to be supported on piled foundations.

1.15. It should be confirmed whether the RC frame of the new building will connect to the party wall with No 48 – 50 in any way and whether there are any issues associated with the lack of restraint to the existing wall as a result of the building demolition.

1.16. The BIA predicts anticipated ground movements as a result of the construction, however, no supporting analysis is provided. It is requested the Ground Movement Assessment (GMA) is reconsidered based on the queries detailed in Audit paragraph 4.14. This should indicate the vertical and horizontal movements from all the construction activities.

1.17. A works programme is not included as required by Cl. 233 of the ARUP GSD. An outline programme is requested with details to be provided by the appointed contractor.

1.18. Proposals for movement monitoring of the neighbouring structures have not been outlined and this should be provided.

1.19. Thames Water require a piling method statement to be submitted and approved, however, this is subject to a separate approvals process.

1.20. It is accepted there are no slope stability, flooding or hydrogeological concerns regarding the proposed development.

1.21. Queries and requests for clarification are discussed in Section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 26 August 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 52 Holmes Road, NW5 3AB, reference 2016/1986/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 *"Demolition of existing building and replacement with a new build mixed use development of 6 storeys (plus basement) comprising 9 self-contained units (8x2 bed and 1x3 bed) on floors 1 – 5 and 377sq.m of industrial employment space (B1c) on the basement and ground floors."*

2.6. The Audit instruction also confirmed 52 Holmes Road is not listed nor is it a neighbour to a listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 15 September 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA): G.D.C Partnership, dated 30 August 2016
- Preliminary Risk Assessment: Site Remedial Services Ltd, dated March 2016
- Ground Investigation Report (GI): Site Analytical Services Ltd (SAS), dated August 2016
- GML Architects Planning Application Drawings dated 5 April 2016 consisting of:

  Location Plan

  Existing Plans

  Proposed plans
- Design and Access statement: GML Architects, April 2016
- SUDS Appraisal: RSK 1 September 2016
- 1 x Response Thames Water (Redacted) 20 April 2016

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	No	Proposal not sufficiently detailed (see Audit paragraph 4.4) and works programme not included.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	As above.
Are suitable plan/maps included?	No	The scheme drawings are considered inadequate and the ARUP GSD maps with the site location indicated are not included. (See Audit paragraphs 4.4 and 4.5).
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	See Audit paragraphs 4.4 and 4.5
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Relevant maps not included and mostly not referenced. Response to Question 8 is considered incorrect. (See Audit paragraph 4.6).
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Relevant maps not included and mostly not referenced. Response to Question 2 is considered incorrect. (See Audit paragraph 4.6).
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Relevant maps not included and not always referenced.
Is a conceptual model presented?	Yes	Section 4.2 of Site Analytical Services Ltd GI Report.
Land Stability Scoping Provided?	No	One issue should have been carried forward from the screening.

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	As above.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Section 5.2.
Is factual ground investigation data provided?	Yes	SAS GI report.
Is monitoring data presented?	Yes	BIA Section 6.2.
Is the ground investigation informed by a desk study?	Yes	Assumed this was informed by the Site Remedial Services Ltd Preliminary Risk Assessment.
Has a site walkover been undertaken?	Yes	Preliminary Risk Assessment Section 2.2.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 2.9 G.D.C BIA.
Is a geotechnical interpretation presented?	Yes	Some interpretation is provided in the SAS GI Report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Included but incomplete (See Audit Paragraph 4.9).
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation report provided.
Are the baseline conditions described, based on the GSD?	Yes	Included within BIA.
Do the base line conditions consider adjacent or nearby basements?	Yes	As above.
Is an Impact Assessment provided?	Yes	G.D.C BIA Section 7. Provided but not all of the potential issues

Item	Yes/No/NA	Comment
		have been identified by the screening.
Are estimates of ground movement and structural impact presented?	No	Incomplete and no supporting analysis provided.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Not all the issues have been identified or addressed.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Some mitigation measures are discussed however not all of the potential impacts of the proposed basement have not been identified or discussed in sufficient detail, this is considered inadequate.
Has the need for monitoring during construction been considered?	No	Not considered and no outline proposal included.
Have the residual (after mitigation) impacts been clearly identified?	No	Not possible to determine if these are needed as all the potential impacts have not been assessed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Supporting analysis not provided to be able to verify this.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Potential impact to the tributary of the River Fleet should be assessed.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Not demonstrated. (See Audit paragraphs 4.14 and 4.15).
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Category 1 (Slight) predicted but no supporting analysis provided.
Are non-technical summaries provided?	No	Only provided for the screening.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) was undertaken by GDC Partnership Ltd and the individual involved has a CEng MICE qualification. The preparation of a BIA also requires the input of an individual with a CGeol qualification and this is not the case.

4.2. Two BIA reports were uploaded on the Planning Portal, however, the more up to date out of the two was audited.

4.3. The site is occupied by a light industrial two storey building with lower and upper ground floor levels. It is proposed to demolish the existing building with the replacement building indicated to occupy the same footprint.

4.4. It is proposed to construct five floors of residential accommodation over two floors of light industrial use which requires an excavation of c.5m to the north (adjacent to Regis Road) and c.3m to the south (adjacent to Holmes Road) over a single storey basement. The Design and Access Statement makes reference to section and elevation drawings, however, these are not available on the planning portal. Although there is limited information on the proposed development, it is stated that the basement is to be formed by a secant pile retaining wall around the full perimeter.

4.5. The BIA did not reference most of the relevant ARUP and Camden SRFA, or include map extracts with the site location identified to support the BIA screening questions. It would be beneficial if these are included to support the statements made in the screening.

4.6. A 'No' response is given to Question 2 of the hydrogeology screening and Question 8 of the land stability screening which relate to whether or not the site is within 100m of a water course. Reference to Figure 11 of ARUP GSD indicates that a 'lost' River potentially running close to the site. Although these have been culverted and incorporated into the Thames Water sewers, this issue should have been highlighted in the screening stage and appropriately addressed.

4.7. Section 2.9 of the BIA states that there are currently no planning permissions granted for basements in the vicinity although No. 36-50, may be considering redevelopment which includes a partial basement. It is further stated in Section 7.3.1 of the BIA that both neighbouring buildings do not comprise basements. Trial pits revealed the party wall with No 48 – 50, the neighbouring property to the east, to be a brick spread footing founded on Made Ground at 0.40m bgl. It is stated that No. 54, the property to the west is '*a relatively modern building and is believed to have piled foundations*'.

4.8. It is stated in Section 7.2.2 of the BIA that the adjacent tree will have no effect on the foundation design as this will be below the zone of influence of the tree. Whilst this is accepted, there is no consideration of the effect on the construction on the tree roots.

4.9. The retaining wall parameters included in the SAS Ground Investigation report are considered incomplete as no parameters are included for Made Ground and stiffness values have not been included for the London Clay.

4.10. It is stated in the BIA that a significant flow of water in and around the site is not expected. Given the site is underlain by the London Clay which is an unproductive stratum and the secant piled retaining wall proposed, this is accepted. In the permanent condition, the basement will be waterproofed as detailed in Section 3.2 of the BIA.

4.11. Whilst no detailed structural drawings are included, sketches in the BIA indicate the perimeter columns will be supported on the retaining wall. The sketches however do not show how the internal columns and stability core walls will be supported. It is assumed these will be supported on piled foundations and should this be the case, details should be provided on the pile arrangement proposed and the associated depth of excavation to form the pile caps.

4.12. It is noted that following demolition of the existing buildings the new building will be formed using a reinforced concrete (RC) framed construction. It should be confirmed whether the RC frame will connect to the party wall with No 48 – 50 in any way and whether there are any issues associated with the lack of restraint to the existing wall as a result of the building demolition.

4.13. The BIA highlights the likelihood of heave to occur as a result of unloading of the London Clay due to excavation. The magnitude of heave has not been calculated. It is acknowledged that the effects of heave are likely to be negligible outside of the basement footprint due to the piled wall restricting the movement to within the basement. It should however be confirmed if heave mitigation measures will be considered in the design of the foundations.

4.14. It is stated in Section 7.2.6 of the BIA that ground movements are not expected to exceed 5mm in either vertical or lateral directions. 'Very Slight' (Category 1) damage is predicted for the neighbouring properties, however, no supporting analysis is provided to justify this. The assumed the pile length should also be indicated. It should be confirmed whether the over dig below the basement slab to form the pile caps has been considered in the ground movement assessment. The net heave/settlement from the combined effects of the excavation and the new building loads should also be considered in the damage assessment.

4.15. CPG4 requires mitigation measures for predicted damage of Category 1 or higher. Regardless of the above queries, this applies to the predicted damage given in the BIA.

4.16. The new secant piled wall will be subject to surcharge loading from the neighbouring footings. This should be considered in the detailed design of the piles.

4.17. A works programme is not included as required by Cl. 233 of the ARUP GSD.

4.18. Movement monitoring proposals for the neighbouring structures have not been included.

4.19. It is stated in the BIA that there will be no increase in the impermeable surface area therefore the surface water regime and volume will remain unchanged.

4.20. A response from Thames Water indicates a piling method statement is required to be submitted and approved prior to any works being undertaken to minimise potential damage to their infrastructure. This is subject to a separate approvals process.

4.21. It is accepted there are no slope stability, flooding or hydrogeological concerns regarding the proposed development.

5.0 CONCLUSIONS

5.1. Two BIA reports were uploaded on the Planning Portal, however, the more up to date out of the two was audited.

5.2. The BIA was undertaken by G.D.C Partnership Ltd and whilst the author has a CEng MICE qualification, the input of a CGeol is also required in the production of a BIA.

5.3. It is proposed to construct a 7 storey building over a single storey basement following demolition of the existing building. Sections and elevations to indicate the proposed development are requested. The basement is proposed to be formed be a secant piled retaining wall around its full perimeter, with a reinforced concrete liner wall. A construction sequence with sketches to illustrate it is not included and this is requested together with any temporary propping indicated.

5.4. Preliminary calculations are requested for the proposed foundation and basement design including an indicative temporary works propping arrangement to confirm that the piles will remain sufficiently stiff to ensure movements of the pile wall will be minimised.

5.5. The BIA has confirmed the proposed basement is to be founded in the London Clay.

5.6. It is stated it is likely that the groundwater table will be encountered during basement foundation excavation although it is agreed that the likely inflows would be negligible. Additionally a secant pile wall is proposed.

5.7. The responses to Question 8 of the land stability screening and Question 2 of the hydrogeology screening are considered incorrect and should be assessed further.

5.8. An assessment of the effect of the construction on the nearby tree should be undertaken.

5.9. The retaining wall parameters are considered incomplete as they do not include the parameters for the Made Ground or stiffness values for the London Clay.

5.10. It should however be confirmed if heave mitigation measures will be considered in the design of the foundations.

5.11. The structural sketches provided do not show how the internal columns and stability core walls will be supported. Details on the pile arrangement proposed and the associated depth of excavation to form the pile caps should be provided if these are to be supported on piled foundations.

5.12. It should be confirmed whether the RC frame of the new building will connect to the party wall with No 48 – 50 in any way and whether there are any issues associated with the lack of restraint to the existing wall as a result of the building demolition.

5.13. The BIA predicts anticipated ground movements as a result of the construction, however, no supporting analysis is provided. It is requested the Ground Movement Assessment (GMA) is reconsidered based on the queries detailed in Audit paragraph 4.14. This should indicate the vertical and horizontal movements from all the construction activities.

5.14. A works programme is not included as required by Cl. 233 of the ARUP GSD. An outline programme is requested with details to be provided by the appointed contractor.

5.15. Proposals for movement monitoring of the neighbouring structures have not been outlined and this should be provided.

5.16. Thames Water require a piling method statement to be submitted and approved, however, this is subject to a separate approvals process.

5.17. It is accepted there are no slope stability, flooding or hydrogeological concerns regarding the proposed development.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Thames Water	Rickmansworth, WD3 9DQ	20/04/2016	Back flow control measures- Non-return valve or other suitable devices to avoid the risk of back flow at a later date.	See SUDs Appraisal and BIA Section 3.5
			Developer to ensure proper discharge of surface water into the public sewer	Subject to agreement with Thames Water
			Measure to minimise groundwater discharge into the public sewer.	To be agreed with Thames Water.
			Piling method statement to be submitted and approved.	See Audit paragraph 4.20

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA format	BIA author qualifications.	Open – evidence required to demonstrate a suitably qualified individual with a CGeol qualification has contributed to the BIA.	
2	BIA format	A works programme is not included.	Open – Outline programme to be provided.	
3	BIA format/Stability	Scheme drawings inadequate	Open - Sections and elevations to be provided.	
4	Hydrogeology	Response Question 2 of the hydrogeology screening is incorrect.	Open – Issue to be assessed and appropriately addressed.	
5	Stability	Response to Question 8 of the land stability screening is considered incorrect.	Open – Issue to be assessed and appropriately addressed.	
6	Stability	Assessment of the effect of construction on the adjacent tree roots.	Open – to be provided	
7	Stability	Retaining wall parameters incomplete.	Open – Made Ground parameters and stiffness parameters for the London Clay to be provided.	
8	Stability	Structural details not provided in the text and structural sketches not sufficiently detailed	Open – Further information to be provided as discussed on Audit paragraphs 4.11 and 4.12.	
9	Stability	Unclear if RC framed will connect to the party wall and if there are any issues associated with the lack of restraint to the existing wall following demolition.	Open – confirmation to be provided.	
10	Stability	Confirmation on whether the effects of heave within the basement have been considered in	Open – to be provided.	

		the foundation design.		
11	Stability	Supporting analysis required to justify predicted 'Very Slight' (Category 1) damage to the neighbouring properties via the GMA (See Audit Paragraph 4.14)	Open – to be provided	
12	Stability	Mitigation measures for the damage category predicted should be provided.	Open – to be provided.	

Appendix 3: Supplementary Supporting Documents

None

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