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13-15 St John's Mews
London, WC1N 2PA

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12727-12
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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 13-15 St John's Mews, London, WC1N 2PA (planning reference 2017/4302/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 Chelmer Site Investigation Laboratories Ltd with structural inputs from Barrett Maloney. The authors of the BIA possess suitable qualifications that comply with the requirements of CPG4.

1.5. It has been confirmed that the existing building is not listed, but 25 John Street, to the rear, is Grade II listed.

1.6. The proposal is the refurbishment of an existing two storey building at 13-15 St John's Mews. The works include a new single basement, a new infill floor at ground level and a new mansard roof extension.

1.7. Intrusive ground investigations confirm that the site is underlain by a variable depth of Made Ground, proven to 5.9m below ground level (bgl), over London Clay. Where Made Ground was encountered to 3.0m bgl, soft to firm Alluvium and dense River Terrace Gravel were encountered below, with London Clay from approximately 5.7m bgl.

1.8. The BIA states that the proposed basement will be founded at approximately 3.9m bgl. The structural drawings do not show the level of the basement slab. Further clarification should be provided.

1.9. Monitoring indicates a winter groundwater level of approximately 2.9m bgl. It is likely that groundwater will be encountered during basement excavation and construction.

1.10. Geotechnical interpretation has been provided. However, given the variable nature and depth of Made Ground, the parameters and assessment presented are not considered to be reasonably conservative.

1.11. An outline construction programme should be presented.

1.12. The BIA states that the new basement will be formed by reinforced concrete retaining walls and basement slab supported by piles. The submitted structural drawings show that two-stage mass concrete underpinning is proposed to the existing party walls, and the front and rear walls. The bearing stratum of the underpins should be confirmed. Outline design calculations for the mass concrete underpins, new retaining walls and piled basement slab should also be provided.

1.13. The temporary works sequencing and propping drawings should be submitted for review.

1.14. A ground movement analysis and damage category assessment has been carried out to assess effects on the surrounding properties. Nos. 11, 17 and 19 St John's Mews have been included. However, the assessment has not provided any information regarding the rear walls to No. 22, 24 and 25 John Street, which are in close proximity to the proposed basement.

1.15. The BIA predicts impacts to neighbours of damage category Burland Category 1 (very slight) to Burland Category 2 (slight). Category 2 does not satisfy the policy requirements of LBC. Additionally, the assessment is not considered to address worst case sections, the impacts of two stages of underpinning or use reasonably conservative parameters, and should be reconsidered.

1.16. A structural movement monitoring strategy should be presented, to ensure that impacts are limited to a maximum of Category 1 damage.

1.17. The BIA identifies that there is a disused railway oriented north-east to south-west about 22m north of the site. It is recommended that further information of the tunnel is obtained to determine whether it is relevant to the BIA. The presence or absence of other underground infrastructure within the zone of influence should also be confirmed.

1.18. It is accepted that the development will not impact on the wider hydrological and hydrogeological environments and is not in an area subject to flooding.

1.19. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2. Until the additional information and assessment requested is provided, the criteria contained within LBC's policies have not been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on the 1st November 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 13-15 St John's Mews, London, WC1N 2PA, Camden Reference 2017/4302/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.
- Local Plan 2017, Policy A5 Basements.

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 *"Partial demolition of existing building and change of use from Class B1 (garage / workshop / offices) to Class C3 residential flats (4 x 2 bed units), including excavation of a basement level, a mansard extension and associated works."*

The Audit Instruction also confirmed the property is a neighbour to listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 06 November 2017 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment dated July 2017 by Chelmer Site Investigation Laboratories Ltd
- Structural Drawings dated 25 May 2017 by Barrett Maloney which include the following:
  - Proposed Lower Ground Floor Plan.
  - Existing and Proposed Ground Floor Plans.
  - Existing and Proposed First Floor Plans.
  - Existing and Proposed Second Floor Plans.
  - Proposed Roof Plan.
  - Full Height Sections A and B.
  - Sections Sheet 1.
  - Sections Sheet 2.
- Design & Access Statement undated by Marek Wojciechowski Architects.
- Architectural drawings dated 30 June 2017 by Marek Wojciechowski Architects which include the following:
  - Site Location Plan.
  - Demolition and Proposed Basement Plan.
  - Demolition and Proposed Ground Floor Plan.
  - Demolition and Proposed First Floor Plan.
  - Demolition and Proposed Second Plan.
  - Demolition and Proposed Roof Plan.
  - Demolition and Proposed Front West Elevation
  - Demolition and Proposed Rear East Elevation.
  - Existing and Demolition Section AA.
  - Proposed Section AA.
  - Demolition and Proposed Section BB.

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	Outline Construction Plan; underground infrastructure within the zone of influence to be confirmed; listed structures within the vicinity should be identified.
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 plan/maps included?	Yes	
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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?.	Yes	
Is a conceptual model presented?	Yes	However, due to the variable thickness of Made Ground, this may need to be reconsidered to ensure a reasonably conservative approach to the proposed works.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
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	
Is monitoring data presented?	Yes	
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	However, this is not considered to be consistent with site investigation data presented or reasonably conservative.
Does the geotechnical interpretation include information on retaining wall design?	No	These should be provided, including bearing capacity requirements for the underpins and permanent piled basement slab.
Are reports on other investigations required by screening and scoping presented?	Yes	
Are the baseline conditions described, based on the GSD?	Yes	

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	However, damage assessment should consider all structures within the zone of influence.
Are estimates of ground movement and structural impact presented	Yes	However, damage assessment should consider all structures within the zone of influence, the proposed construction method and reasonably conservative geotechnical parameters.
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?	No	The construction temporary works sequence and propping should be presented.
Has the need for monitoring during construction been considered?	No	Although monitoring of adjoining properties is mentioned in the BIA, monitoring proposal has not been submitted for review.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Structural calculations should be submitted for review. The BIA must demonstrate that the risk to neighbouring properties is no higher than Category 1 (Very Slight).
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?	No	The BIA must demonstrate that the risk to neighbouring properties is no higher than Category 1 (Very Slight).

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	GMA / damage assessment should be revised and should consider all structures within the zone of influence, the proposed construction method and reasonably conservative geotechnical parameters.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The BIA has been prepared by Chelmer Site Investigation Laboratories Ltd with structural inputs from Barrett Maloney. The authors of the BIA possess suitable qualifications that comply with the requirements of CPG4.

4.2. The LBC Instruction to proceed with the audit identified that the basement proposal either involved a listed building or was adjacent to listed buildings but provided no details. The BIA identified that the property is located in the Bloomsbury Conservation Area and that the property at 25 John Street, to its rear, is a Grade II listed building.

4.3. The proposal is the refurbishment of an existing two storey building at 13-15 St John's Mews. The works include a new single basement, a new infill floor at ground level and a new mansard roof extension.

4.4. Intrusive ground investigations were undertaken between May and August 2014 and in August 2015. The investigation confirms that the site is underlain by a variable depth of Made Ground, proven to 5.9m below ground level (bgl), over London Clay. Where Made Ground was encountered to 3.0m bgl, soft to firm Alluvium and dense River Terrace Gravel were encountered below, with London Clay from approximately 5.7m bgl.

4.5. Monitoring indicates a winter groundwater level of approximately 2.9m bgl. It is likely that groundwater will be encountered during basement excavation and construction.

4.6. A conceptual site model and geotechnical interpretation has been provided as the basis for assessment of stability. It is noted that Made Ground is inherently variable in character, and that a number of intrusive holes were attempted but unable to proceed due to obstructions, and that voids were noted in other locations. The insitu strength of Made Ground should not be expected to be consistent or relied upon for foundation design purposes. The presence of soft Alluvial Clay and 'reworked' material is noted. It is also noted that the stiffness parameters and depth of London adopted in the model is inconsistent with the site investigation and laboratory test results of shear strength are absent.

4.7. Given the variable nature and depth of Made Ground and the other inconsistencies noted in 4.6, the parameters and assessment presented are not considered to be reasonably conservative for outline assessment purposes. It is also considered likely that the Contractor will require additional investigation to be undertaken before confirming a final foundations solution and construction sequence.

4.8. The BIA states that the proposed basement will be founded approximately 3.9m below existing ground level. As noted in 4.6 and 4.7, the bearing stratum of the underpins is likely to be

variable and this should be considered within the stability assessment. The structural drawings do not show the level of the basement slab, which states that "level TBC". Further clarification should be provided.

4.9. The BIA states that the new basement will be formed by reinforced concrete retaining walls and basement slab supported by piles. The submitted structural drawings show that two-stage mass concrete underpinning is proposed to the existing party walls, and the front and rear walls. The new basement wall is shown to be cast up against the mass concrete underpins. It is not clear whether the basement wall is supported only by the basement slab or it is also supported by the mass concrete underpins as there are reinforced concrete pockets along the perimeter of the basement. Further clarification should be provided for review. Outline design calculations for the mass concrete underpins, new retaining walls and piled basement slab should also be provided.

4.10. Given that groundwater will be encountered, dewatering proposals should be outlined. Discussion in the BIA notes that sump pumping or well-pointing may be used. This should be clarified and included within the temporary works formation, to confirm how stability will be maintained during underpinning through water bearing Made Ground and Alluvium.

4.11. Permanent structural drawings have been included as part of the BIA. However, the basement construction methodology is not presented. The outline temporary works sequencing and propping drawings should be submitted for review.

4.12. It is noted that a ground movement assessment (GMA) and damage category assessment has been carried out to assess effects on the surrounding properties. Nos. 11, 17 and 19 St John's Mews have been included. However, the assessment has not provided any information regarding the rear walls to Nos. 22, 24 and 25, which are in close proximity to the proposed basement, and No.25 is noted as being Listed.

4.13. The BIA states that the damage impact to No. 11 St John's Mews is Burland Category 1 (very slight) and the damage impact to Nos. 17 and 19 St John's Mews is Burland Category 2 (slight). Category 2 does not satisfy the requirement as set out in Policies CPG4 or A5 Basements. Additionally, the assessment is not considered to address worst case sections, the impacts of two stages of underpinning, underpins bearing in Made Ground or soft Alluvium, or use reasonably conservative parameters, and should be reconsidered. The GMA and damage impact assessment should be updated, in conjunction with a review of geotechnical parameters, the conceptual site model and temporary works methodology, with sufficient assessment presented to demonstrate that a maximum of Category 1 damage will be sustained to any structure within the zone of influence.

4.14. No proposals are provided for a structural movement monitoring strategy during excavation and construction. A strategy should be presented, including trigger values and contingency actions, to ensure that impacts are limited to a maximum of Category 1 damage.

4.15. The BIA identifies that there is a disused railway oriented north-east to south-west about 22m north of the site. It is recommended that further information of the tunnel is obtained to determine whether it is relevant to the BIA. The presence or absence of other underground infrastructure / utilities with the zone of influence of the development should be confirmed, and impacts assessed as applicable.

4.16. It is accepted that the development will not impact on the wider hydrological and hydrogeological environments and is not in an area subject to flooding. Nevertheless, mitigation actions recommended within the BIA should be adopted, including raised threshold levels and adequate drainage provision.

5.0 CONCLUSIONS

5.1. The authors of the BIA possess suitable qualifications.

5.2. The proposal is the refurbishment of an existing two storey building at 13-15 St John's Mews. The works include a new single basement, a new infill floor at ground level and a new mansard roof extension.

5.3. The ground conditions beneath the site are variable, with deep Made Ground present. Geotechnical parameters based on a reasonably conservative assessment should be adopted.

5.4. The main BIA states that the proposed basement will be founded approximately 3.9m below existing ground level. The structural drawings should confirm formation level of the slab, underpins and piled foundations.

5.5. Outline design calculations for the mass concrete underpins, new retaining walls, and piled basement slab should be provided.

5.6. The temporary works sequencing and propping drawings should be submitted for review.

5.7. The GMA and damage category assessment does not assess all the structures within the zone of influence, and is not considered to address the worst case sections. Additionally, the GMA should consider the effects of two stage underpinning within water bearing Made Ground and soft Alluvium and use of reasonably conservative geotechnical parameters.

5.8. The BIA predicts impacts to neighbours of Burland Category 1 (very slight) to Burland Category 2 (slight). Category 2 does not satisfy the policy requirements of LBC. Additionally, the assessment is not considered to address worst case sections, the impacts of two stages of underpinning or use reasonably conservative parameters, and should be reconsidered.

5.9. A structural movement monitoring strategy should be presented, to ensure that impacts are limited to a maximum of Category 1 damage.

5.10. The BIA identifies that there is a disused tunnel close to the site. Further information should be obtained to determine whether it is relevant to the BIA.

5.11. It is accepted that the development will not impact on the wider hydrological and hydrogeological environments and is not in an area subject to flooding.

5.12. Queries and requests for further information are summarised in Appendix 2. Until the additional information and assessment is presented, the BIA does not meet the Criteria of CPG4 and A5 Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Saphir	11 John Mews, London, WC1N 2PA	13/09/2017	Effects of the proposed basement on the existing structures.	See Section 4 – further assessment required.
Morgan and Coombs	24 John Street, London, WC1N 2BH	04/09/2017	Effects on the existing structures.	See Section 4 – further assessment required.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Depth of the basement to be confirmed.	Open	
2	Stability	Outline calculations for underpins, piled basement slab and retaining walls. Bearing stratum of underpins to be confirmed.	Open	
3	Stability	Construction methodology, sequencing and propping; dewatering measures etc should be provided.	Open	
4	Stability	Geotechnical interpretation inconsistent with presented site investigation data. Reasonably conservative parameters to be presented. Conceptual model to consider variable ground conditions encountered.	Open	
5	Stability	GMA / damage impact assessment to be revised, considering construction methodology, all structures within the zone of influence, geotechnical parameters, conceptual model, underpinning through water bearing Made Ground and Alluvium etc	Open	
6	Stability	An outline structural monitoring strategy should be provided including trigger values and contingency actions.	Open	
7	BIA Content	Outline construction programme to be presented; underground infrastructure within the zone of influence to be confirmed.	Open	

Appendix 3: Supplementary Supporting Documents

None

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