

**80 Charlotte Street
W1T 4QP**

**Basement Impact Assessment
Audit**

For

London Borough of Camden

Project Number: 12066-95
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Contents

1.0 Non-technical summary 1
2.0 Introduction 3
3.0 Basement Impact Assessment Audit Check List 5
4.0 Discussion 8
5.0 Conclusions 10

Appendix

- Appendix 1: Residents’ Consultation Comments
- Appendix 2: Audit Query Tracker
- Appendix 3: Supplementary Supporting Documents

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 80 Charlotte Street, London W1T 4QP (planning reference 2015/7017/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 carried out by a well known firm of consultants who possess relevant qualifications.
- 1.5. The amended proposals for this previously approved development include further demolition of buildings and the deepening of the existing basement below 80 Charlotte Street by approximately 2 metres.
- 1.6. The proposed basement is likely to be founded in the River Terrace Gravel but its supporting piles will be constructed within the London Clay below. The majority of the existing building facades will be retained and will be incorporated into a contiguous bored pile retaining wall and retention system for a discontinuous existing lightwell around the perimeter of the development.
- 1.7. The River Terrace Gravel contains a relatively high permeability aquifer and the BIA has shown that basement construction will have a negligible effect on groundwater levels.
- 1.8. It is accepted that there are no slope stability, hydrogeological or hydrological concerns with respect to the development proposals.
- 1.9. It is noted that the basement retention system has not been fully developed, however, it is stated in the BIA that the retaining walls in those sections will be of sufficient stiffness to limit ground movements to within the predicted values.
- 1.10. Damage Category 1 (very slight) has been predicted for the structures across the roads. The BIA states that there will be no significant impact on the roads and the utilities running beneath them as a result of the development. These should be agreed with the asset owners.

1.11. It is confirmed that:

- The BIA has been prepared in accordance with the processes and procedures set out in Camden Planning Guidance 4.
- The methodologies and assumptions are clearly stated and are appropriate to the scale of the proposals and the nature of the site.
- The conclusions have been arrived at based on all necessary and reasonable evidence the considerations, in a reliable, transparent manner, by suitably qualified professionals, with sufficient attention paid to risk assessment and use of cautious or moderately conservative engineering values/estimates.
- The conclusions of the various documents/details comprising the BIA are generally consistent with each other and are sufficiently robust and accurate and accompanied by sufficiently detailed amelioration/mitigation measures, such that further information required can be provided within a Basement Construction Plan.

1.12. It is recommended that a Basement Construction Plan is provided and approved prior to commencement on site and this should include:

- A refined GMA/building damage assessment for the remaining sections
- The full input and output from all the ground movement analysis programmes used
- Consistent pile sizes and spacing in the various sections of the BIA
- A detailed temporary works scheme to validate assumptions made in the GMA for the remaining sections
- Results of condition surveys of potentially affected structures
- Detailed monitoring scheme for potentially affected structures
- Control measures for possible water ingress between the individual piles

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 10 December 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 80 Charlotte Street, W1T 4QP, Camden Reference 2015/7017/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 *"Creation of additional floorspace through the infilling of the existing courtyard, the extension of the existing basement, seven storey extension to the Chitty Street elevation and the construction of two additional storeys (creating a nine storey building in total, with existing buildings to be partially demolished) in association with the existing office use (Use Class B1); the creation of a new public open space,*

change of use from office (B1) to create flexible units at ground and lower ground floor levels (Class B1, A1 or A3 use); and the change of use and extensions to 67-69 Whitfield Street to create 19 residential units (Use Class C3) all to the site bounded by Chitty Street, Charlotte Street, Howland Street and Whitfield Street, erection of two additional floors and the partial change of use from office (Class B1) to residential (Class C3) to create 36 residential units; demolition of existing building and erection of a 3 storey residential (Class C3) to create 36 residential units; demolition of existing building and erection of a 3 storey residential (Class C3) building at 14 Charlotte Mews and other works incidental to the application." The Audit Instruction also confirmed the property did not include any listed buildings, nor was a neighbour to any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 22 January 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment dated December 2015 by Arup
- Basement Impact Assessment

Appendix A – GI Data

Appendix B – Frew Analysis

Appendix C – Pdisp Analysis

- Façade Retention and Basement Proposals dated December 2015 by Arup.
- Architect's General Arrangement Plans and Cross-Sections Planning Issue dated 11 December 2015, Existing and Proposed, by Make.
- Construction Method Statement dated December 2015 by Arup.
- Supplementary Design Report dated December 2015 by Make.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Section 1.1.
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	See BIA Section 2.
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	See BIA Section 2.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 6.1.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 5.1.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 4.1.
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 6.3.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 5.3.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.3.
Is factual ground investigation data provided?	Yes	See BIA Sections 7 and 8 and Appendix A.
Is monitoring data presented?	Yes	See BIA Section 5.3.
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	See BIA Section 2.5.
Is a geotechnical interpretation presented?	Yes	See BIA Section 8.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See BIA Section 8.4.
Are reports on other investigations required by screening and scoping presented?	N/A	
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	See BIA Section 9.
Are estimates of ground movement and structural impact presented?	Yes	See BIA Section 9.4.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	See BIA Section 9.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	See BIA Section 9.
Has the need for monitoring during construction been considered?	No	
Have the residual (after mitigation) impacts been clearly identified?	Yes	See BIA Section 9.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	
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	
Are non-technical summaries provided?	Yes	See BIA Section 1.1.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been produced by a well-known firm of consultants, Arup, and has been prepared by individuals who possess relevant qualifications.
- 4.2. The development site consists of a block of buildings around a central courtyard, the whole of which is surrounded by Charlotte Street, Howland Street, Whitfield Street and Chitty Street. The majority of this block is to be redeveloped with the current courtyard area infilled by a 9 storey building founded on piles. The current scheme is an amendment to a previously approved scheme which now includes further demolition of buildings and the deepening of the existing basement below 80 Charlotte Street by approximately 2 metres.
- 4.3. Two phases of soils investigation have been undertaken to identify that the site consists of Made Ground, underlain by River Terrace Deposits (ie Gravel), underlain by London Clay. The proposed basement is likely to be founded within the River Terrace Deposits but its supporting piles will be constructed within the London Clay below. The majority of the façade of the existing buildings will be retained with the structure behind being demolished other than a northern portion of Block G of 80 Charlotte Street being retained and refurbished.
- 4.4. It is intended to install a contiguous bored pile retaining wall around the site perimeter to construct the deepened basement and support an existing discontinuous lightwell around each elevation of the building.
- 4.5. It is accepted that there are no slope stability concerns regarding the proposed development.
- 4.6. It is accepted that no known ponds, springlines or wells are in close vicinity to the site and that the site is outside the Hampstead pond chain catchment area.
- 4.7. It is accepted that the proposal will not alter the existing proportion of hard surfaces and paved areas and, hence, the quantity of local rainfall entering the existing sewer system.
- 4.8. It is accepted that the site is not in Flood Risk Zone based upon Camden Flood Risk Management Strategy maps and is not identified as a street that flooded in either 1975 or 2002.
- 4.9. The BIA recognises that the River Terrace Gravels contain a relatively high permeability aquifer but the basement slab is expected to be approximately 1 metre above the anticipated groundwater level of 22m OD. A groundwater model has been carried out to show that the contiguous piled retaining wall installation will have negligible (2cm) effect on groundwater levels. Further information is requested to address the possible removal of fine materials through water ingress between piles.

- 4.10. It is noted that the basement retention system has not been fully developed. Various options are being considered for the small sections in the west where a new wall replaces the existing lightwell wall. The proposals for the north eastern area have also not been developed. It is however stated in the BIA that the retaining walls in those sections will be of sufficient stiffness to limit ground movements to within the predicted values.
- 4.11. It is noted that there is a discrepancy in the pile size and spacing given in the text in Section 3 of the BIA and Figure 15, the proposed construction sequence drawings for configuration A (northwestern section). Inconsistent pile diameters and spacing are also given in the text in Section 9.2 and Table 10 of the BIA.
- 4.12. The effects of the pile installation and subsequent excavation have been assessed on surrounding infrastructure in the roadways, adjacent buildings across each street and nearby tunnels. The effects of heave as a result of excavation have also been considered.
- 4.13. Although the soil parameters used in the Pdisp analysis have been provided together with contours of ground movements and displacement plots of all the surrounding infrastructure, the input and output from the Pdisp programme has not been included.
- 4.14. Damage Category 1 (very slight) has been predicted for the structures across the roads with Category 2 predicted for No 67-69 Whitfield Street, however, it is stated that this property is within the site and is to be redeveloped as part of the approved scheme.
- 4.15. The BIA states that there will be no significant impact on the roads as a result of the development. It is also stated that there will be on significant impact on the utilities running beneath the roadways which include the Thames Water mains, sewers, gas mains and the BT tunnel. This should be agreed with the owners of the roadways and utilities.
- 4.16. It is acknowledged in the BIA that parts of the final configuration of the basement retention system have not yet been decided. However, the quality of the documentation provided, gives confidence to the statement that the remaining sections will have high support stiffness as in other areas, and that the same level of care will be taken with the further design to be undertaken. These proposals can be submitted in a Basement Construction Plan. Although the Construction Method Statement briefly refers to the establishment of survey control positions around the existing site, the Basement Construction Plan should also contain a detailed movement monitoring strategy during pile installation and excavation.

5.0 CONCLUSIONS

- 5.1. The BIA has been carried out by a well-known firm of consultants who possess relevant qualifications.
- 5.2. The amended proposals for this previously approved development include further demolition of buildings and the deepening of the existing basement below 80 Charlotte Street by approximately 2 metres.
- 5.3. The proposed basement is likely to be founded in the River Terrace Gravel but its supporting piles will be constructed within the London Clay below. The majority of the existing building facades will be retained and will be incorporated into a contiguous bored pile retaining wall and retention system for a discontinuous existing lightwell around the perimeter of the development.
- 5.4. The River Terrace Gravel is a relatively high permeability aquifer and the BIA has shown that basement construction will have a negligible effect on groundwater levels.
- 5.5. It is accepted that there are no slope stability, hydrogeological or hydrological concerns with respect to the development proposals.
- 5.6. It is noted that the basement retention system has not been fully developed, however, it is stated in the BIA that the retaining walls in those sections will be of sufficient stiffness to limit ground movements to within the predicted values.
- 5.7. It is noted that there is a discrepancies in the pile size and spacing in some sections of the BIA and it is requested that these are made consistent.
- 5.8. The effects of the pile installation and subsequent excavation have been assessed on surrounding infrastructure in the roadways, adjacent buildings across each street and nearby tunnels as well as the effects of heave as a result of excavation.
- 5.9. The input and output from the Pdisp programme has not been provided.
- 5.10. Damage Category 1 (very slight) has been predicted for the structures across the roads.
- 5.11. The BIA states that there will be no significant impact on the roads and the utilities running beneath them as a result of the development. This should be agreed with the owners of the roadways and utilities.
- 5.12. It is confirmed that:
 - The BIA has been prepared in accordance with the processes and procedures set out in Camden Planning Guidance 4.

- The methodologies and assumptions are clearly stated and are appropriate to the scale of the proposals and the nature of the site.
- The conclusions have been arrived at based on all necessary and reasonable evidence the considerations, in a reliable, transparent manner, by suitably qualified professionals, with sufficient attention paid to risk assessment and use of cautious or moderately conservative engineering values/estimates.
- The conclusions of the various documents/details comprising the BIA are generally consistent with each other and are sufficiently robust and accurate and accompanied by sufficiently detailed amelioration/mitigation measures, such that further information required can be provided within a Basement Construction Plan.

5.13. It is recommended that a Basement Construction Plan is provided and approved prior to commencement on site and this should include:

- A refined GMA/building damage assessment for the remaining sections which have not been fully developed
- Consistent pile sizes and spacing in the various sections of the BIA
- The full input and output from all the ground movement analysis programmes used
- A detailed temporary works scheme to validate assumptions made in the GMA for the remaining sections.
- Results of condition surveys of potentially affected structures.
- Detailed monitoring scheme for potentially affected structures.
- Control measures for possible water ingress between the individual piles.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Stability	Refined GMA/building damage assessment which includes the full detailed proposals for the sections not yet developed	To be provided as part of a Basement Construction Plan	N/A
2	Stability	Pile diameters and spacing made consistent	To be provided as part of a Basement Construction Plan	N/A
3	Stability	Detailed temporary works scheme for remaining sections	To be provided as part of a Basement Construction Plan	N/A
4	Stability	Condition surveys of any potentially affected structures including existing façade	To be provided as part of a Basement Construction Plan	N/A
5	Stability	Detailed movement monitoring scheme for affected structures including existing façade	To be provided as part of a Basement Construction Plan	N/A
6	Stability	Impact on the roadways and utilities running beneath them	To be agreed with the owners of the roadway and utilities	N/A
7	Hydrogeology	Control measures for possible water ingress between piles	To be provided as part of a Basement Construction Plan	N/A

Appendix 3: Supplementary Supporting Documents

None

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