

**Templar House, 81-87 High Holborn,
London, WC1V 6NU**

**Basement Impact Assessment
Audit**

For

London Borough of Camden

Project Number: 12727-25
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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 (BIA) submitted as part of the Planning Submission documentation for Templar House, 81-87 High Holborn, London WC1V (planning reference 2015/4407/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 existing property is located at 81-87 High Holborn and also with an address at 24-27 Eagle Street in the London Borough of Camden, WC1.
- 1.5. The current layout comprises a seven to nine storey building with a single level basement which occupies the full footprint of the site and extends under High Holborn. It is proposed that the basement is deepened by up to around 2m within a secant piled wall.
- 1.6. The Basement Impact Assessment (BIA) has been carried out by Ove Arup and Partners Ltd. The authors' qualifications are in accordance with the requirements of Camden Planning Guidance (CPG) 4. The BIA is based upon desk study information as the building is in use and recognises that a ground investigation is required to confirm the assumptions made. Non-technical summaries are not provided but the evidence and conclusions in the BIA are clearly stated.
- 1.7. It is understood that the development will be partly within the buffer zone of a London Underground tunnel. However, a letter of no objection for the works has been obtained from LUL by Arup.
- 1.8. The BIA has confirmed that the proposed basement will extend in to the River Terrace Deposits, with piled foundations extending below that into the London Clay.
- 1.9. It is anticipated that the groundwater table may be encountered during basement foundation excavation. The BIA recognises the need for dewatering. The BIA concludes that the water level change is insignificant with respect to surrounding basements. Groundwater monitoring should be undertaken to verify the predicted level changes and impacts.

- 1.10. A qualitative Ground Movement Assessment (GMA) is described in the BIA which states the movements will be within acceptable limits according to CPG 4 (not greater than Burland Category 1). This requires to be confirmed once the ground and groundwater conditions are known.
- 1.11. Mitigation measures to ensure that ground movements will be contained within acceptable limits are presented in the BIA.
- 1.12. It is accepted that there are no slope stability concerns regarding the basement development.
- 1.13. It is accepted that there are no surface water flow or flooding concerns regarding the basement development.
- 1.14. It is accepted that, subject to a confirmatory GI, the BIA meets the criteria of CPG4.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 12/12/17 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for Templar House, 81-87 High Holborn, London WC1V 6NU.
- 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 - 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 "*Redevelopment of the site, following demolition of the existing building to provide 13 storey building onto High Holborn comprising 607 sq. m of retail floorspace (Class A1-A3) at ground floor level, 15,346 sq. m of office floor space (Class B1) at basement to 12th floor levels and 14 storey building fronting onto Eagle Street comprising a total of 64 Class C3 residential units (7 studio, 25 x 1 bed, 24 x 2 bed and 8 x 3 bed units)...."*

- 2.6. The Audit Instruction also confirmed that the proposal does not involve a listed building, although the BIA identifies one listed property within 25m of the site.
- 2.7. CampbellReith accessed LBC's Planning Portal on 12/01/18 and 02/02/18 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment (BIA) Rev 1 by Ove Arup and Partners Ltd (REP/237116/G004), dated February 2018.
 - A Geotechnical Desk study (GDS) by Ove Arup and Partners Ltd (REP/237116/S001), dated December 2014.
 - Drawings by AStudio Architecture, uploaded 31/12/17.
- 2.8. Numerous comments on the application are shown on the planning portal, however CampbellReith has not been requested to review any of these as part of the audit.

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	The BIA includes all the data required.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	The BIA includes all these aspects.
Are suitable plan/maps included?	Yes	Plan and maps are included in both the BIA and GDS.
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	Although the buffer zone of a London Underground tunnel is shown to be inside the site, London Underground Ltd (LUL) has been consulted by Arup and a letter of no objection for the works has been obtained from LUL.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	The hydrogeology has been informed by the GDS.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	The hydrology has been informed by the GDS.
Is a conceptual model presented?	Yes	Ground condition, sequence and depth of strata are presented along with neighbouring basements and the anticipated position of the tunnels.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Every positive response identified in the screening stage was carried forward to the scoping process.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Every positive response identified in the screening stage was carried forward to the scoping process.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Every positive response identified in the screening stage was carried forward to the scoping process.
Is factual ground investigation data provided?	No	A project specific ground investigation has not been undertaken yet. However, the assessments are based on site investigation data from nearby Arup projects and publicly available sources.
Is monitoring data presented?	No	Although a project specific ground investigation with a consequent groundwater monitoring plan has not been undertaken yet, the groundwater level in the upper aquifer at the site has been estimated using borehole logs from Crossrail, BGS and Arup databases.
Is the ground investigation informed by a desk study?	NA	No GI undertaken to date.
Has a site walkover been undertaken?	Yes	On the 14 th October 2014 Arup completed a site walkover of the existing building and the surrounding area.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Surrounding basements are described in the BIA.
Is a geotechnical interpretation presented?	Incomplete	Geotechnical parameters have been evaluated based on desk study information. Properties for geotechnical design must be obtained from a site specific ground investigation.
Does the geotechnical interpretation include information on retaining wall design?	Incomplete	As per above.

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	Yes	Screening and scoping stages indicated the need of a site specific ground investigation. This is to be undertaken prior to construction when the site is vacated.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	See Section 3.4 of the BIA.
Is an Impact Assessment provided?	Yes	See Stage 4 of the BIA.
Are estimates of ground movement and structural impact presented?	Yes	See Section 7.3 of the BIA.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	All the matters identified by screening and scoping are appropriately assessed in the Impact assessment.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Mitigation measures have been qualitatively considered. The BIA concludes that during construction, a monitoring regime will be established to guarantee the work impacts are within acceptable limits.
Has the need for monitoring during construction been considered?	Yes	As per above.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Although these remain to be confirmed prior to construction.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Neighbouring buildings damage will be limited to Burland Category 1.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	However, conclusions to be confirmed following GI.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	However, conclusions to be confirmed following GI.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	No	

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Ove Arup and Partners Ltd. The qualifications of the BIA's authors comply with those required by CPG4.
- 4.2. The LBC Instruction to proceed with the audit identified that the basement proposal does not involve a listed building. The BIA identifies the presence of such approximately 25m from the site, however, this is beyond the zone of influence of the basement.
- 4.3. The existing property is located at 81-87 High Holborn and also with an address at 24-27 Eagle Street in the London Borough of Camden, WC1.
- 4.4. The current layout comprises a seven to nine storey building with the ground floor level at approximately 24m AOD. There is a single level basement which occupies the full footprint of the site and extends under High Holborn. The basement floor level is typically 21.20m AOD.
- 4.5. It is intended to demolish the existing building and to construct a new mixed use development comprising an office building to the south and a residential building to the north. The existing basement will be deepened by up to 2m.
- 4.6. It is understood that the development will be partly within the buffer zone of a London Underground tunnel. However, London Underground Ltd (LUL) has been consulted by Arup to agree the potential impact of the proposed development on their assets and a letter of no objection for the works has been obtained from LUL by Arup.
- 4.7. The basement extension will proposed to be constructed within a propped secant piled wall. However, Arup will consider alternative methods of construction (a contiguous piled wall) once future site investigations are undertaken.
- 4.8. Although a site specific ground investigation has not been performed yet, an anticipated stratigraphy is available in the Arup Desk Study, dated December 2014, obtained from Crossrail, BGS and Arup pre-existing logs. This reports a 2m thickness of Made Ground underlain by the River Terrace Deposits to a depth of 6.50m bgl (17.5m AOD). London Clay was recorded to lie below the River Terrace Deposits to a depth of approximately 25m bgl. Thus, the basement extension will extend into the River Terrace Deposits.
- 4.9. In one of the historic boreholes, soft deposits (Langley Silt) are recorded to lie underneath the Made Ground and they are known to be prone to rapid settlement and collapse when loaded. The presence, depth and extent of such stratum should be confirmed through a site specific ground investigation.

- 4.10. The groundwater level in the upper aquifer at the site has been estimated using borehole logs from Crossrail, BGS and Arup databases. From those sources, a groundwater level for the upper aquifer has been estimated to be 18.50m AOD and conservatively assumed to lie at 20.50m AOD for the purposes of the BIA. This assumed level lies above the new proposed basement level which will cause a permanent change to the groundwater level that is estimated to be $\pm 0.20\text{m}$. Such change is considered to be insignificant for the site and its surroundings. However, groundwater monitoring should be undertaken during and after the GI to verify the validity of the assessment.
- 4.11. Sketches are presented in the BIA to demonstrate the nature of the proposed construction. These include proposed development with comparison of existing and proposed building footprints and basement outlines. A proposed basement construction sequence is also presented in Section 3.9.
- 4.12. All the parameters considered for the analyses of retaining wall inside are presented in the Desk Top Study used to inform the BIA. The values have been estimated based on information from nearby past Arup projects. All the parameters for geotechnical design must be reviewed after a site specific ground investigation is carried out.
- 4.13. The proposed development will comprise a modest deepening of the basement and a net change in foundation loading. Arup have estimated likely ground movements using CIRIA C760 and anticipate that the impacts will reduce to negligible within 5-10m of the site boundary. Using the Burland scheme, Arup predict that damage to surrounding structures will fall into Categories 0 and 1 (negligible to very slight).
- 4.14. Mitigation measures to ensure that movements will be contained within acceptable limits include the installation of an embedded secant pile retaining wall with a temporary propping system. Arup state that a 3D reflective targets and settlement studs will be used to monitor neighbouring buildings movements and to ensure the impacts of the works are no more severe than have been assessed in the BIA. It is accepted that the predicted ground movements are not significant with respect to utilities. However, a services survey should be carried prior construction.
- 4.15. It is accepted that there are no slope stability concerns regarding the basement development.
- 4.16. It is accepted that there are no surface water flow or flooding concerns regarding the basement development.

5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) has been carried out by Ove Arup and Partners Ltd and the authors qualifications are confirmed to comply with the requirements of CPG4. Non-technical summaries are not presented but the evidence and conclusions are clearly stated.
- 5.2. The BIA has not been informed by a site specific ground investigation but by extensive desk study information. This should be undertaken prior construction to confirm the validity of the BIA assessments.
- 5.3. Historic borehole records show the site stratigraphy to comprise Made Ground underlain by the River Terrace Deposits to a depth of approximately 6.50m bgl (17.50m AOD) with the London Clay below. The presence of soft deposits that may lie underneath the Made Ground should be confirmed through a site investigation.
- 5.4. There is the potential for groundwater level to be changed by the proposed basement. A $\pm 0.20\text{m}$ level change is predicted in the BIA which is considered to be insignificant in relation to surrounding basements. Dewatering from within a secant piled wall may be required. The magnitude of these impacts should be confirmed by a ground investigation with groundwater monitoring.
- 5.5. All the soils parameters considered for the analyses of retaining wall inside are presented in the Desk Top Study used to inform the BIA. All the parameters for geotechnical design must be reviewed after a site specific ground investigation is carried.
- 5.6. A qualitative ground movement assessment confirms that damage to surrounding structures can be limited to Burland Categories 0 or 1. Mitigation measures to ensure that ground movements will be contained within acceptable limits are presented in the BIA.
- 5.7. It is accepted that there are no slope stability concerns regarding the basement development.
- 5.8. It is accepted that there are no surface water flow or flooding concerns regarding the basement development.
- 5.9. A letter of 'no objection' has been obtained from London Underground in relation to the Central line which runs beneath High Holborn.
- 5.10. It is accepted that, subject to a confirmatory ground investigation, the BIA satisfies the criteria of CPG4.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

None

Appendix 3: Supplementary Supporting Documents

None

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