CampbellReith
consulting engineers

28 Charlotte Street, London W1T 2NF

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
14006-01

Date
August 2023

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Document Details

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APPENDICES

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 28 Charlotte Street, London, W1T 2NF (planning reference 2022/4794/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 Soils Ltd and the qualifications of the of the authors of the BIA are in accordance with LBC requirements.

1.5 The proposed basement will extend to the rear of the property, below the footprint of the existing building. It is proposed to construct the extension as a concrete box detached from the adjacent existing party walls supported on concrete piles.

1.6 A screening and scoping assessment is presented, supported by desk study information.

1.7 The ground conditions comprise Made Ground over Lynch Hill Gravel, with London Clay below. Groundwater levels between 4.77m and 5.30m depth were recorded.

1.8 It is accepted that the surrounding slopes to the development site are stable.

1.9 It is accepted that the development will not impact on the hydrology and wider hydrogeology of the area and is not in an area subject to flooding.

1.10 The need for dewatering is considered unlikely although mitigation measures to avoid subsidence during dewatering are provided.

1.11 A Proposed Construction Sequence is included in Appendix B of the Structural Methodology Statement that outlines the piling and propping layout. Further information demonstrate the stability of the structures can be maintained in the temporary and permanent cases.

1.12 A Ground Movement Assessment has been undertaken indicating any movement will be within acceptable limits (Category 1 of the Burland Scale). The method of assessment is accepted.

1.13 The revised submission includes utility data and a utility search report. Soils Ltd recommends a utility scan is undertaken prior to construction to confirm the absence of any services.

1.14 Proposals are provided for a movement monitoring strategy during excavation and construction and baseline monitoring is recommended prior to construction. The final strategy may be agreed with the party wall surveyor.

1.15 The BIA complies with the requirements of CPG: Basements.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 10th January 2023 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 28 Charlotte Street, London, W1T 2NF, reference 2022/4794/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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance (CPG): Basements. January 2021.
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Neighbourhood Plan - Fitzrovia East (designated area only).

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 mansard roof to front to enclose sides of existing roof terrace; new skylight in main roof; replacement windows at roof level; excavation of basement below existing rear extension (studio); removal of wastepipes from front elevation; internal works at all levels"*.

2.6 The Audit Instruction confirmed 28 Charlotte Street is a Grade II listed building. The applicant's building shares a party wall with no. 26 Charlotte Street which is also a Grade II listed building. Additional listed buildings are located nearby at Colville Place to the northwest of the site.

2.7 CampbellReith accessed LBC's Planning Portal on 21st February 2023 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (BIA) at 28 Charlotte Street, Camden, London, W1T, Soils Ltd, Ref: 18860/BIA_R38, October 2022

- Structural Methodology Statement (SMS) for 28 Charlotte Street, Fitzrovia, London, W1T, Rodrigues Associates, Job no. 1964, October 2022
- Design Access Statement (DAS), Montagu Evans, 28CS(RP)A01, October 2022
- Planning and Heritage Statement, Montagu Evans, November 2022
- Archaeological Desk-Based Assessment, Land at 28 Charlotte Stret, London, W1T 2NF, RPS Group, Project Code: JAC28023, April 2022
- Planning Application Drawings consisting of:
  - Site Location Plan Drawing no. 28CS(00)A00, 28/10/22
  - Existing Plans, Elevations and Sections 28CS(00)A01 to 28CS(00)A036, 28/10/22
  - Demolition Plans and sections 28CS(10)A01 to 28CS(10)A06, 28/10/22
  - Proposed Plans, Elevations and Sections 28CS(20)A01 to 28CS(20)A06, 28/10/22

2.8 Additional information submitted in response to queries raised during the initial audit and subsequent correspondence is listed below and forms the basis of this audit report.

- Basement Impact Assessment Report Rev1.03 (BIA) at 28 Charlotte Street, Camden, London, W1T, Soils Ltd, Ref: 18860/BIA_R38/Rev1.03, September 2023
- Structural Methodology Statement (SMS) Rev C for 28 Charlotte Street, Fitzrovia, London, W1T, Rodrigues Associates, Job no. 1964, October 2023
- Email clarification on ground movement and building damage assessment from Soils Ltd, dated 13 November 2023 (see Appendix 3).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Document control page of BIA
Is data required by Cl.233 of the GSD presented?	Yes	The revised submission includes utility data and a utility search report discussed in paragraph 2.12 and included as Appendix C of the BIA.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Detailed within Appendix B of the Structural Methodology Statement (SMS).
Are suitable plan/maps included?	Yes	Figures 1 to 28 of the BIA.
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	Section 3.3 of the BIA Revised submission confirms mapped Made Ground is c.150m distance from site.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Included in Section 2 of the BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Included in Section 2 of the BIA.
Is a conceptual model presented?	Yes	Table 5.2 and Section 5.4 of the BIA.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Included in Section 4 of the BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Included in Section 4 of the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	As above
Is factual ground investigation data provided?	Yes	Sections 5 and 6 and Appendix C and D of the BIA. The revised submission includes foundation pit sketches.
Is monitoring data presented?	Yes	Included in Section 5.4 of the BIA.
Is the ground investigation informed by a desk study?	Yes	Section 2 of the BIA.
Has a site walkover been undertaken?	Yes	Undertaken in 2020 during the site investigation works.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 2.5 of the BIA. Basements are reported to be present beneath Nos 26 and 30 Charlotte Street as well as Crabtree Place/Whitfield Street to the rear.
Is a geotechnical interpretation presented?	Yes	Section 8 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 11.3 and Table 11.2 of the BIA.
Are reports on other investigations required by screening and scoping presented?	NA	None required.

Item	Yes/No/NA	Comment
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Included in Sections 5 and 6 of the BIA.
Is an Impact Assessment provided?	Yes	Section 4.2 of the BIA. The revised submission includes an assessment of the host building in the GMA (Section 11).
Are estimates of ground movement and structural impact presented?	Yes	Sections 11 and 12 of the BIA detail a Ground Movement Assessment for No 30 Charlotte Street and the host building.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	However, further information is required to confirm the impact assessment.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Covered in updated BIA and SMS.
Has the need for monitoring during construction been considered?	Yes	
Have the residual (after mitigation) impacts been clearly identified?	Yes	Ground movement and building damage assessment clarified and monitoring strategy proposed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	As above.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	

Item	Yes/No/NA	Comment
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 1?	Yes	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been carried out by engineering consultants Soils Limited and the individuals concerned in its production have suitable qualifications.

4.2 The Structural Methodology Statement (SMS) has been prepared by Rodrigues Associates and includes a proposed structural scheme, construction sequence and monitoring regime.

4.3 The LBC Instruction to proceed with the audit identified that the applicant's building (No. 28) with the proposed basement extension is a Grade II listed building. The instruction indicated that the adjacent building, No. 26, is also Grade II listed. The Design & Access Statement identified that the site is within Charlotte Street Conservation Area.

4.4 The BIA confirms site is within the Fitzrovia East Neighbourhood Area.

4.5 No. 28 Charlotte Street is a terraced building with four above ground storeys and a basement level beneath the front portion of the building. To the rear, a later extension is present, comprising a single storey, double height workshop. The proposed development comprises the extension of the existing basement level beneath the single-storey rear extension. The basement will be fully within the existing footprint of the property.

4.6 The new basement will be supported by a reinforced concrete (RC) wall formed within the historic perimeter party walls and footings, which will remain in place. Where the basement extends below the existing foundations at the front of the property and beneath the party wall with No 26 Charlotte Street, the RC wall is to be constructed in board of the foundations to avoid undermining them.

4.7 The revised submission includes utility data and a utility search report. The BIA states that, because the basement is to the rear of the property, interference with assets/apparatus is highly unlikely and recommends a services scan of the excavation area before starting site activities.

4.8 The BIA has identified that the proposed basement slab will be constructed on Made Ground and will be supported on piles that will extend into competent material. The Made Ground extends to a depth of 5.30m bgl and is anticipated to be underlain by 2.40m of the Lynch Hill Gravel Member which in turn is underlain by London Clay from 7.70m bgl.

4.9 The results of two ground investigations are presented and discussed in Sections 5 and 6 of the BIA. Two trial pits and one borehole were undertaken by Chelmer in 2016. Subsequently, two further trial pits were undertaken by Soils Ltd. in 2020.

4.10 Soils Ltd's trial pit TP101 was undertaken in the north rear corner of the ground floor level extension. It identified a foundation depth of 4.05m bgl in one section and 3.50m bgl in the other section. Soils Ltd's trial pit TP102 identified a foundation depth of 2.30m bgl at the existing rear wall of No. 28. Chelmer Site Investigation trial pit TP2 indicates the of the southern party wall foundation extends beyond the pit depth of 2.10m bgl, the base of foundation was not proven. The revised submission includes foundation sketches confirming the findings of the foundation exposure pits.

4.11 The Architect drawings indicate the depth of the existing foundations of No. 26 to the south is 2.40m below the floor level in section CC on drawing 28CS(20)A06 despite TP2 only reaching 2.10m bgl. Section AA on drawing 28CS(20)A05 indicates the foundation depth of the rear wall of No. 28 is "assumed". The BIA assumes a similar foundation depth to the adjacent wall foundation of 2.30m (proven in TP102) for No. 26 party wall. it is noted the construction sequence in the Structural Methodology Statement (SMS) avoids undermining existing foundations. The BIA states suitable temporary and permanent propping must be installed if shallower foundation depths are encountered.

4.12 The borehole undertaken during the Chelmer investigation recorded groundwater entry at 5.30m bgl. Two subsequent monitoring visits recorded the shallowest standing water level of 4.77m bgl.

4.13 The subterranean water screening exercise indicated that the site is underlain by the Lynch Hill Gravel Member, which is classified as a Secondary A aquifer. Based on the 2016 monitoring it is not anticipated that the basement will extend beneath the water table. It is noted that perched groundwater may be present. The BIA initially identified that a rise in the water table cannot be ruled out and the high permeability of the founding material could pose a risk to the safety of the workers at the time of construction and of the occupants during the lifetime of the structure. This is addressed in the subsequent scoping assessment.

4.14 It is accepted there are no significant impacts to groundwater flow.

4.15 The Land Stability screening exercise in the revised submission confirms that the site is neither within, nor near to, an area of worked ground and provides clarification that the mapped areas of Made/Worked Ground seen in Figure 5 of the Arup GSD (pg. 54 of BIA) is c.150m distance east/northeast of the site.

4.16 The ground investigations identified Made Ground to a depth of 5.30m and arches within the buried masonry walls/foundations TP101. The BIA uses this information to confirm the presence of a pre-existing basement at the site and provides explanation on why the Made Ground depth is greater than would be typically expected for a basement dating from the time of the building's construction.

4.17 The proposed extension will be contained within the existing footprint of the building therefore there will be no impact on existing surface water flow or surface drainage.

4.18 Potential impacts brought forward from the screening and scoping exercise include subsidence from the dewatering of the granular soils during excavation. The updated BIA reconsiders the groundwater information and anticipates that dewatering will not be required but recommends that a dewatering strategy designed by a specialist drainage engineer is undertaken prior to construction. Any such strategy must include measures to control ground movements. Assuming this is the case, it is accepted that any impacts to stability can be ameliorated.

4.19 The history of seasonal shrink-swell is unknown and the occurrence is considered unlikely owing to the predominantly granular nature of the Made Ground and Lynch Hall Gravel Member. It is considered that some residual heave may occur within the London Clay following the excavation and unloading of the overlying soil.

4.20 The basement will be constructed to a maximum depth of 3.50m bgl, corresponding to approximately 0.90m below the existing basement formation level. The proposed basement structure will be independent of the existing foundations and supported by a piled slab. The piles will be installed at ground floor level and reduced down to basement level during excavation.

4.21 The proposed construction will be undertaken using the existing perimeter foundations to support the excavation sides. Appendix B of the Structural Method Statement (SMS) provides a construction sequence including temporary propping locations to support these walls.

4.22 The SMS details the proposed construction sequence as follows:

1. Installation of monitoring positions and baseline survey.
2. Removal of existing ground floor slab.
3. Install piles up to the existing floor level.
4. Resin anchor wailing beams to party walls and install heavy duty props.
5. Excavate to 1.50m bgl and cut down exposed piles and connect further wailing beams and heavy props.
6. Excavate to formation level of no. 26 and cut down exposed piles.
7. Excavate to formation level, blind formation level and cast basement slab.
8. Cast side walls and insert well-compacted soil behind new walls.

4.23 Stage 4 of the Proposed Construction Sequence (sections A-A and B-B) indicates the maximum depth of excavation will be deeper than the party wall foundation of No. 30 and the existing wall of No. 28. The ground conditions at this depth will comprise either granular Made Ground or the Lynch Hill Gravel Member. The revised submission confirms the existing foundations will be retained using temporary propping at construction stage and by the basement structure in permanent conditions.

4.24 The BIA recommends that the RC retaining walls are formed in 1m widths. The SMS confirms a sequence of staged temporary propping and excavation. Discrepancies with the BIA have been removed.

4.25 It was initially proposed to backfill between the new and existing basement retaining walls with compacted soil. This has been amended to comprise no fines concrete.

4.26 The existing wall shown as being propped off the new RC retaining wall at ground floor level, with the existing foundations deriving lateral support from the RC wall at depth. In both situations, the RC wall is acting as a cantilever. The SMS has been updated to show the new RC wall to be propped at high level providing stability to the existing foundations in the permanent case.

4.27 The BIA notes that there will no increase in differential depth with the building to the rear on 1- 10 Crabtree Place/7-15 Whitfield Street as it has a basement deeper than that proposed. It notes that there will be a small increase differential depths with Nos 26 and 30 Charlotte Street and that No. 30 Charlotte Street is likely to be the most affected because No 26 is further from the proposed basement excavation, therefore a Ground Movement Assessment (GMA) was undertaken to consider the impact of the basement excavation on this structure. The revised submission considers the host building in the GMA because it is a Grade II listed building, and the foundation depths are shallower than the proposed basement excavation depth. The BIA concludes that damage can be limited to Burland Category 1 (Very Slight)

4.28 The updated Ground Movement Assessment (GMA) is based on predicting maximum strains that may be accommodated in the neighbouring structures. It notes that horizontal movements will be small because of the ground movements that will have occurred when the original basement was excavated. The approach is accepted.

4.29 The BIA identified that, as the extension will be undertaken to the rear of the property, ground movement impacts on the carriageway and pavement of Charlotte Street are not anticipated.

4.30 Proposals are provided for a movement monitoring strategy during excavation and construction and baseline monitoring is recommended prior to construction. Trigger limits are detailed within the Structural Methodology Statement however these should be agreed with the party wall surveyor in due course.

5.0 CONCLUSIONS

5.1 The BIA has been carried out using individuals who possess suitable qualifications.

5.2 The BIA has confirmed that the proposed basement will be founded within Made Ground and supported on a raft piled into competent material. New concrete walls are to be constructed inside existing perimeter walls.

5.3 It is accepted that the development will not impact on the hydrology and wider hydrogeology of the area and is not in an area subject to flooding.

5.4 The revised submission confirms the site is not within an area of mapped Made Ground and identifies the presence of arches within the existing foundations. This information clarifies the context for deep Made Ground at the site.

5.5 It is likely that perched ground water or the groundwater table will be encountered during basement foundation excavation. An updated groundwater assessment indicates that dewatering is unlikely to be required but recommends a specialist is commissioned to design appropriate waterproofing and drainage measures that safeguard stability prior to construction. This is accepted.

5.6 Utility data is provided in the revised submission and notes that they are unlikely to be affected by the basement proposals. The BIA recommends a services scan before starting site activities.

5.7 The Structural Method Statement proposes the piled foundations be installed before the excavation of the basement extension. The excavation will be supported by wailing beams and temporary props. The piles will be cut down to the formation level and a slab constructed followed by cast in place construction of the walls. Clarification has been provided in the updated SMS to demonstrate that the stability of the host and neighbouring properties can be maintained in the temporary and permanent case.

5.8 A Ground Movement Assessment has been undertaken to assess the impact on No. 30 Charlotte Street and the host property. The results of the assessment indicate damage to the building will not exceed Burland Category 1 (Very Slight). The updated method of assessment is accepted. It is accepted that 26 Charlotte Street and the building to the rear on Crabtree Place/Whitfield Street are unlikely to be affected by the basement proposals.

5.9 Proposals are provided for a movement monitoring strategy during excavation and construction and baseline monitoring is recommended prior to construction.

5.10 The BIA complies with the requirements of CPG: Basements.

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Appendix 1

Consultation Responses

Surname	Address	Date	Issue raised	Response
Edward Aydin	10 Crabtree Place London W1T 2AT	07/07/2023	(Redacted)	See audit paragraph 4.27
Edward Aydin	10 Crabtree Place London W1T 2AT	11/07/2023	Photograph of Office Basement at 7-15 Whitfield Street development.	See audit paragraph 4.27
Edward Aydin	10 Crabtree Place London W1T 2AT	11/07/2023	Photographs of Mechanical Plant Basement Rooms 1 and 2 at 7 -15 Whitfield Street development.	See audit paragraph 4.27
Edward Aydin	10 Crabtree Place London W1T 2AT	23/06/2023	Proposed studio at No. 28 party wall with 10 Crabtree Place London W1T 2AT	See audit paragraph 4.27

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Appendix 2

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Utility Data	Utility data is required. These should be included in the Ground Movement Assessment if an impact is identified.	Closed	31st July 2023
2	Existing Foundations	Clarification of the existing foundation depths is requested, including identification of areas where foundation depth is unknown. Drawings should corelate with the findings of the ground investigation. Foundation pit sections should be provided.	Closed	31st July 2023
3	Land Stability	The Land Stability screening should be updated to consider other potential reasons for 5.3m deep Made Ground to be present on site, considering the worked ground identified in the area and other desk study sources.	Closed	31st July 2023
4	Land Stability	The Ground Movement Assessment must consider the impact the proposed development will have on no. 28 as it is a Grade II listed property.	Closed	31st July 2023
5	Land Stability	Figure 34 is labelled "8 Hamstead Grove". Clarification required.	Closed	31st July 2023
6	Land Stability	The full input and output data of the PDisp and Wallap analyses should be included for review.	Closed	31st July 2023
7	Land Stability	Further detail is required regarding how excavations in granular soils will be supported, particularly where excavation extend below the base of adjacent foundations.	Closed	31st July 2023
8	Land Stability	Movement monitoring trigger limits detailed within the Structural Methodology Statement should be revised to reflect the results of the GMA.	Not applicable – may be agreed as part of party wall award	N/A
9	Land Stability	Mitigation measures to avoid subsidence during dewatering to be described	Open	5th September 2023
10	Land Stability	Further information required to confirm stability of structures will be maintained during construction as noted in Section 4	Open	29th October 2023
11	Land Stability	Outline calculations for concrete basement walls required to demonstrate stability of structures in permanent case	Open	29th October 2023
12	Land Stability	Ground movement assessment to be revised in accordance with comments in Section 4	Open	13th November 2023

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Appendix 3

Supplementary Supporting Documents

Elizabeth Brown

From: Dante Valerio Tedesco <dt@soilslimited.co.uk>
Sent: 13 November 2023 15:14
To: Elizabeth Brown
Cc: CamdenAudit
Subject: RE: 28 Charlotte St

Dear Liz,

Following to our phone conversation, I would like to clarify that the modelling of the impacts of the proposed basement development at 28 Charlotte Street on ground movements and building damage is complicated because of the specific site history and ground conditions. The Client's structural engineer designed a dedicated construction sequence in order to limit the mentioned impacts.

The approach adopted has been to back calculate the permissible movements on the basis of allowable strain. The limiting horizontal movements are small because of the way they are defined and will be difficult to control by means of monitoring. The mitigation measures described in section 11.8 of the BIA are therefore important safeguards.

For CS1, although it will be difficult to control horizontal movement of this limited magnitude by means of monitoring, the ground movement assessment has ignored the fact that a basement existed previously onsite and the majority, maybe all, of the horizontal ground yielding will already have occurred. It is therefore expected that, assuming the construction controls referred to in the BIA are adopted, damage to No 30 Charlotte Street can be limited to Burland Category 1.

For CS2 and CS3, the walls are in the ownership of the applicant, and it has been demonstrated that any building damage can be limited to aesthetic damage and therefore will not affect the structural integrity of the listed building.

Best regards,

London

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