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28 Redington Road, London NW3 7RB

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 13398-09

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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 28 Redington Road, London NW3 7RB (planning reference 2019/6407/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 (BIA) 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 Symmetrys Structural Engineers with supporting information provided by Socotec UK Ltd and Card Geotechnics Ltd. The qualifications of the authors of the reports are in accordance with LBC guidance.

1.5. The existing building is of brick construction with accommodation arranged over four floors, including lower ground. The proposed development involves extending the property and lowering the lower ground floor level by 0.4m.

1.6. The proposed development involves new retaining walls to be constructed by underpinning methodologies.

1.7. The BIA includes the majority of the information required from a desk study in line with the LBC guidance.

1.8. Consultation of the 'Lost Rivers of London' map has confirmed that a tributary of the lost River Westbourne runs northeast to southwest (along Redington Gardens) approximately 50m northwest of the proposed development.

1.9. An historic site investigation identified that the existing lower ground level is underlain by Made Ground, Bagshot Formation, Claygate Member and London Clay. Groundwater was recorded at depths of 4.78 to 6.40m bgl during monitoring in January to March 2016. The proposed basement slab level will be above groundwater level. There will be no impact to the wider hydrogeological environment.

1.10. The site investigation report highlights an absence of information available for the southwest part of the site, close to the boundary retaining wall with 30 Redington Road. The geotechnical design

parameters recommended in the site investigation report and ground movement assessment (GMA) have not been adopted within the structural calculations. Further clarification is required.

1.11. Outline permanent and temporary structural information is provided. A consultation response highlights potential instability of the retaining wall on the boundary of 28 and 30 Redington Road due to a change in loading conditions, which should be clarified.

1.12. The GMA considers the movements relating to the proposed basement construction and the impacts upon the foundations at 26 Redington Road, the foundation of 26 Redington Road retaining wall and the foundations at 30 Redington Road. A maximum of Category 0 (Negligible) damage is predicted, in accordance with the Burland Scale. Clarifications on ground conditions and the structural scheme should be provided, as discussed in 1.10 and 1.11, and the GMA further reviewed to confirm impacts to neighbouring structures.

1.13. The BIA provides a strategy for monitoring structural movements to ensure construction is controlled and impacts are limited to those predicted. This should be reviewed once the Engineer and Contractor are appointed and be consistent with any review of the GMA, as 1.12.

1.14. The site is not located within a Local Flood Risk Zone. The site is indicated to be at 'very low' risk of flooding from surface water run-off.

1.15. Redington Road is within a Critical Drainage Area (Group 3-010). The proposed development will not increase the impermeable area of the site. The proposed drainage strategy comprises attenuation SuDS with a controlled discharge rate of 2 l/s to the public combined sewer. There will be no impact to the wider hydrological environment.

1.16. Further to 1.15, a consultation response highlights potential instability to the retaining wall between 28 and 30 Redington Road in the event of a drainage failure and build-up of water behind the wall. Clarification of mitigation measures to address this potential stability issue should be provided.

1.17. Queries and matters requiring further information or clarification are discussed in Section 4 and summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of CPG Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 9th March 2020 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 28 Redington Road, London NW3 7RB, Camden Reference 2019/6407/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): Basements. March 2018.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The 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; 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 planning portal describes the proposal as: "*Replacement of north-westerly extension including new windows at ground floor on northwest elevation; alteration and enlargement to south-eastern wing to include first floor extension; rebuild and extend rear extension to include lantern rooflight; enlargement of 2nd floor including raising height of rear gable, erection of two*

dormers and rooflights to north west elevation; removal and relocation of chimneys; solar panels to rear roof and glazed balustrade to 3rd floor roof terrace; alteration and enlargement of front porch including limestone cladding and alteration to front steps and door; excavation of lower ground floor level to lower by 0.4m and excavation of front lightwell; alterations to windows, ground floor bay and erection of balcony at first floor level, all on the rear elevation; erection of entrance gates and railings to existing garden wall; and alterations to landscaping".

The planning portal also confirmed the site lies within Redington Frognal Conservation Area but that the building is not listed. The nearest listed building to the site is No. 16 Redington Road.

2.6. CampbellReith accessed LBC's Planning Portal on 25th March 2020 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment Report (ref. 19117, Rev B) dated 18th December 2019 by Symmetrys Structural Engineers including:
    - Structural Engineer's Statement and Calculations (ref. 19117-CAL-001) dated 26th November 2019 by Symmetrys.
    - Interpretative report on Ground Investigation (ref. D9036-19) dated October 2019 by SOCOTEC UK Ltd.
    - Ground Movement Assessment (ref. CG/38114) dated 17 September 2019 by Card Geotechnics Ltd.
    - Flood Risk Assessment ('Flood Smart') Report (ref. 71978R1) dated 18th July 2019 by GoeSmart Information Ltd.
    - SuDS Feasibility Report ('SuDSmart Pro') (ref. 71978.01R2) dated 18th December 2019 by GeoSmart Information Ltd.
    - Regulated Drainage & Water Search Report (ref. 71978) dated 16th July 2019 by GeoSmart Information Ltd.
- Proposed elevations, plans and sections dated July and September 2019 by Thomas Croft Architects.
- Design and Access Statement dated 19th December 2019 by Thomas Croft Architects.
- Planning Statement dated December 2019 by Montagu Evans LLP.
- Arboricultural Survey Report dated August 2019 by Boward Tree Management.

- Comments and objections to the proposed development from local residents.

2.7. A previous application (2016/2997/P) for the subject site was refused due to lack of sufficient information in the Basement Impact Assessment which did not satisfy the policy criteria. Campbell Reith undertook three audits of information provided as part of this application, the final report being issued in September 2017 (Report ref. KZrm-12336-98-110917-28 Redington Road-D3). The subsequent appeal was dismissed and the inspector upheld this reason for refusal.

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	
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 plans/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?	No	BIA Report, Section 4.1. Screening does not identify the nearby historic tributary of the River Westbourne although this is discussed within BIA text and accepted as not impacting / being impacted by the site.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	The site is located within a Critical Drainage Area (Group 3-010) but this has not been identified during screening.
Is a conceptual model presented?	Yes	CGL Ground Movement Assessment Report, Figure 5 (Appendix 4 of BIA).

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 5.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Report, Section 5.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No Hydrology Scoping provided as the Screening did not identify any issues. The BIA has not identified that the site is within a Critical Drainage Area Group (as defined by LBC). The site does not lie within a local flood risk zone. A Flood Risk Assessment has been provided. The BIA notes that SuDS will be required to mitigate impacts.
Is factual ground investigation data provided?	Yes	Noted that Socotec UK Ltd highlight an absence of information available for the southwest part of the site. -
Is monitoring data presented?	Yes	Socotec UK Ltd report on Ground Investigation (Appendix 3 of BIA), Section 3.5. Records of the groundwater levels encountered during the drilling process are provided.
Is the ground investigation informed by a desk study?	Yes	Not provided with this planning application but available for review on previous application.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	The GMA report states that 'both neighbouring properties are of a similar brick construction with single level lower ground floor level'.
Is a geotechnical interpretation presented?	Yes	Site investigation report and GMA – noted the parameters are not adopted in the structural engineering calculations.

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	Yes	Site investigation report and GMA – noted the parameters are not adopted in the structural engineering calculations.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Movement Assessment, Flood Risk Assessment, SuDS Feasibility Report, Regulated Drainage & Water Search Report and Arboricultural Survey Report.
Are baseline conditions described, based on the GSD?	Yes	
Do the baseline conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	BIA Report, Section 8.
Are estimates of ground movement and structural impact presented?	Yes	A Ground Movement Assessment is provided within the BIA (Appendix 4). However, to be clarified as Section 4.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	A Ground Movement Assessment is provided within the BIA (Appendix 4). However, to be clarified as Section 4.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	SuDS proposed. However, note concerns regarding the build-up of water behind retaining wall with No 30.
Has the need for monitoring during construction been considered?	Yes	BIA Report, Section 7.6 and Section 7 of the GMA.
Have the residual (after mitigation) impacts been clearly identified?	No	Further consideration to be given, as Section 4.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	To be clarified, see Section 4.

Item	Yes/No/NA	Comment
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	SUDS Strategy. However, note concerns regarding drainage and stability impacts to retaining wall with No 30.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	See Section 4.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	GMA concludes that maximum damage will be a Category 0 (negligible). However, see Section 4. Clarification required.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The BIA has been prepared by Symmetrys Structural Engineers with supporting information provided by Socotec UK Ltd and Card Geotechnics Ltd. The qualifications of the authors of the reports are in accordance with CPG guidelines.

4.2. The site is positioned on the northern side of Redington Road which slopes down to the north-west in a south-east to north-west direction with a gradient of c. 4°. The south-western half of the plot, adjacent to Redington Road, is currently occupied by a large house, with a garden situated to the rear (north-east) of the house. The part of the site occupied by the house is bounded to the south-east and north-west by the plots of No 26 and No 30 Redington Road respectively.

4.3. The existing building is an early 20th century house of brick construction with accommodation arranged over lower ground, raised ground floor, first and second floors. Part of the proposed development (along with various extensions) comprises the reduction of finished floor level from 100.20m AOD to 99.80m AOD with an estimated maximum dig depth of 0.90m, to a level of c. 99.30m AOD. This deepening will require the existing walls to be underpinned and a new lower ground floor level slab to be cast.

4.4. The BIA documents include the majority of the information required from a desk study in line with the GSD Appendix G1.

4.5. Consultation of the 2016 'Lost Rivers of London' map has confirmed that a tributary of the lost River Westbourne runs northeast to southwest (along Redington Gardens) approximately 50m northwest of the proposed development.

4.6. A previous investigation was undertaken by Socotec, then trading as ESG, in 2015 (Report No D5513-15, dated April 2016) as part of a previous planning application at the site. The site investigation undertaken by ESG identified that the existing lower ground level is underlain by Made Ground and layers of Bagshot Formation, Claygate Member and London Clay from 0.60 - 3.40m below ground level (bgl) (99.15 – 104.27m OD) to the bottom of the exploratory holes (20.00m bgl). Whilst groundwater was encountered between 7.40m bgl and 12.00m bgl during the investigation, further monitoring over January, February and March 2016 confirmed water to be present within the London Clay Formation and at depths of 5.79 to 6.40m (97.29 to 97.90m OD) in BH4 and 4.78 to 4.87m (94.98 to 95.07m OD) in BH5 with an average level of 95.76m OD.

4.7. At 99.00m AOD, the proposed basement slab is above the site's groundwater level. There will be no impact to the wider hydrogeological environment.

4.8. Interpretative geotechnical information broadly in accordance with the GSD Appendix G3 is presented. Socotec UK Limited was commissioned in July 2019 by Symmetrys to carry out a geotechnical assessment of the site, including assessing suitable allowable bearing capacities for the shallow foundations being proposed to underpin the existing house that occupies the site. At the proposed formation level of c. 99.30m OD the floor slab is likely to be underlain by strata of the London Clay Formation. An allowable bearing capacity of 85kN/m^2 is stated, which is reflected also in the ground movement assessment (GMA). However, it is noted that the structural calculations adopt an allowable bearing capacity of 150kN/m^2. The calculations should be reviewed and assessment / calculations should be consistently presented.

4.9. The site investigation report highlights the absence of information in the southwest part of the site, which is in proximity to the retaining wall between No 28 and No 30 Redington Road, and recommends that further investigation works is undertaken to confirm the ground conditions and local foundation depths. These works should be undertaken and the impact assessment updated, as required.

4.10. The lower ground floor level extension beneath the existing property will be constructed using traditional underpinning techniques employing a 'hit and miss' construction sequence with pins excavated in sequence in bays typically 1.0m wide. Temporary works information is provided, including sequencing, propping and structural calculations. A consultation response highlights potential instability of the retaining wall on the boundary of No 28 and No 30 Redington Road due to a change in loading conditions, which should be further clarified.

4.11. The GMA considers the movements relating to the proposed basement construction and the impacts upon the foundations at No 26 Redington Road, the foundation of No 26 Redington Road retaining wall and the foundations at No 30 Redington Road. A maximum of Category 0 (Negligible) damage is predicted, in accordance with the Burland Scale. Clarifications on ground conditions and the structural scheme should be provided, as 4.9 and 4.10, and the GMA further reviewed to confirm impacts to neighbouring structures. For clarification, a plan from the software used in the analysis showing the geometry analysed and ground movement contours should be presented.

4.12. The BIA provides a strategy for monitoring structural movements to ensure construction is controlled and impacts are limited to those predicted. This should be reviewed once the Engineer and Contractor are appointed and be consistent with any review of the GMA, as 4.11.

4.13. The site is not located within a Local Flood Risk Zone. The site is indicated to be at 'very low' risk of flooding from surface water run-off.

4.14. Redington Road is within a Critical Drainage Area (Group 3-010). The proposed development will not increase the impermeable area of the site. The proposed drainage strategy comprises

attenuation SuDS with a controlled discharge rate of 2 l/s to the public combined sewer. The SUDs strategy considers a suitable return period and uplift for climate change in accordance with policy. There will be no impact to the wider hydrological environment.

4.15. Further to 4.14, a consultation response highlights potential instability to the retaining wall between 28 and 30 Redington Road in the event of a drainage failure and build-up of water behind the wall. Clarification of mitigation measures to address this potential stability issue should be provided.

5.0 CONCLUSIONS

5.1. The qualifications of the authors of the reports are in accordance with CPG guidelines.

5.2. The proposed development involves extending the property and lowering the lower ground floor level by 0.4m.

5.3. The proposed development involves new retaining walls to be constructed by underpinning methodologies.

5.4. The BIA includes the majority of the information required from a desk study in line with the LBC guidance.

5.5. The underlying ground conditions comprise Made Ground, Bagshot Formation, Claygate Member and London Clay.

5.6. It is understood the proposed basement slab level will be above groundwater level. There will be no impact to the wider hydrogeological environment.

5.7. Site investigation data are absent for the southwest part of the site, close to the boundary retaining wall with No 30 Redington Road. The geotechnical design parameters recommended have not been adopted within the structural calculations. Further clarification is required.

5.8. Outline permanent and temporary structural information is provided. A consultation response highlights potential instability of the retaining wall on the boundary of No 28 and No 30 Redington Road due to a change in loading conditions, which should be clarified.

5.9. The GMA predicts a maximum of Category 0 (Negligible) damage to neighbouring structures, in accordance with the Burland Scale. Clarifications on ground conditions and the structural scheme should be provided and the GMA further reviewed to confirm impacts to neighbouring structures.

5.10. The site is not located within a Local Flood Risk Zone. The site is indicated to be at 'very low' risk of flooding from surface water run-off.

5.11. The proposed development will not increase the impermeable area of the site. There will be no impact to the wider hydrological environment.

5.12. A consultation response highlights potential instability to the retaining wall between No 28 and No 30 Redington Road in the event of a drainage failure and build-up of water behind the wall. Clarification of mitigation measures to address this potential stability issue should be provided.

5.13. Queries and requests for information are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comments

Consultation Comments

Surname	Address	Date	Issue raised	Response
Zimmerman	26 Redington Road	14/01/2020	Mr Zimmerman has employed the services of Eldred Geotechnics Ltd who have provided a review of the BIA in relation to his property at 26 Redington Road. - Concerns regarding temporary works not adequately supporting the foundations of 26 Redington Road.	Section 4
Ashmount Management Company	30 Redington Road	20/2/2020	Ashmount Management Company employed the services of Eldred Geotechnics Ltd who have provided a review of the BIA in relation to the property at 30 Redington Road. Concerns raised about the retaining wall between No 30 and No 28 and the surface water disposal associated with the proposed SuDS. - Concerns regarding geotechnical parameters adopted in structural calculations. - Concerns regarding loading on retaining wall between No 28 and No 30 Redington Road and potential for instability. - Concerns regarding drainage scheme and potential for build-up of water causing instability.	Section 4

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Land Stability	Site investigation data is absent for the southwest part of the site, close to the boundary retaining wall with 30 Redington Road. The site investigation report recommends further investigation in this area.	Open	
2	Land Stability	The geotechnical design parameters recommended have not been adopted within the structural calculations. The calculations should be reviewed and updated to be consistent with recommended parameters.	Open	
3	Land Stability	Outline permanent and temporary structural information is provided. A consultation response highlights potential instability of the retaining wall on the boundary of 28 and 30 Redington Road due to a change in loading conditions, which should be clarified.	Open	
4	Land Stability	The GMA should consider the responses to queries 1 to 3 and update the assessment as required. A plan showing all the walls analysed and ground movement contours should be presented.	Open	
5	Land Stability	Potential instability to the retaining wall between 28 and 30 Redington Road in the event of a drainage failure and build-up of water behind the wall. Clarification of mitigation measures to address this potential stability issue should be provided.	Open	

Appendix 3: Supplementary Supporting Documents

None

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