



## **Document History and Status**

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#### **Document Details**

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# 58A Redington Road, NW3 7RS BIA – Audit



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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 58A Redington Road, London, NW3 7RS (planning reference 2018/5112/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 qualifications of the individuals involved meet the LBC guidance requirements.
- 1.5. It is proposed to demolish the existing structure, excluding a lower ground floor level below the front garden. This is to be extended with a new four storey building constructed above it.
- 1.6. Clarification is requested on the construction methodology and temporary works proposals.
  Outline construction sequence sketches or an underpinning bay sequence plan is not provided and is requested.
- 1.7. Structural calculations are not legible and should be resubmitted.
- 1.8. Some of the justification to support the responses to the screening questions are not considered valid or do not sufficiently address the issues. Some responses contradict each other and require clarification.
- 1.9. Groundwater monitoring during the winter months should be undertaken. The potential for the loss of fines during dewatering and potential effect on the stability of excavations should be addressed.
- 1.10. Clarification is requested on the percentage increase in impermeable surface area and a surface water management strategy with specific and coherent proposals for the additional volumes.
- 1.11. The depth and nature of the neighbouring property foundations should be established prior to construction.
- 1.12. A utilities search has not been provided and is required.
- 1.13. The potential for volume change and any resulting effects should be addressed.

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- 1.14. The GMA predicts Category 1 (Very Slight) damage to neighbours and potential slope stability issues have been assessed. This is accepted subject to temporary works clarifications.
- 1.15. The BIA recommends movement monitoring and an outline proposal with trigger levels is presented. The detailed strategy should be agreed with the relevant parties prior to construction.
- 1.16. An indicative works programme as required by cl. 233 of the Arup GSD is not included and should be presented.
- 1.17. It is accepted that the site is not in an area prone to flooding and there are no slope stability concerns.
- 1.18. Queries and requests for information are summarised in Appendix 2. Until the additional information and further assessments requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

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#### 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 18 January 2019 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 58A Redington Road, London, NW3 7RS (Reference: 2018/5112/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 Basements. March 2018.
  - Camden Development Policy (DP) 27: Basements and Lightwells.
  - Camden Development Policy (DP) 23: Water.
  - Local Plan 2017: Policy A5 Basements.
- 2.4. The BIA should demonstrate that schemes:
  - a) maintain the structural stability of the building and neighbouring properties;
  - avoid adversely affecting drainage and run off or causing other damage to the water environment;
  - avoid cumulative impacts upon structural stability or the water environment in the local area, and;
  - d) 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 "Erection four-storey dwelling house (including basement excavation) following demolition of existing dwelling house."
- 2.6. The audit instruction also confirmed that the proposal does not involve any listed building.

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- 2.7. CampbellReith accessed LBC's Planning Portal on 11 February 2019 and gained access to the following relevant documents for audit purposes:
  - Basement Impact Assessment by Elite Designers Ltd (ref: 2018 059), dated October
     2018. Includes existing drawings in Appendix A and B:
    - Existing Garden Floor Layout (2018-059-20 Rev B)
    - Existing Lower Ground Floor Layout (2018-059-21 Rev B)
    - Existing Section (2018-059-25 to 28 Rev B)
    - Proposed Garden Floor Layout (2018-059-01 Rev B)
    - Proposed Lower Ground Floor Layout (2018-059-02 Rev C)
    - Proposed Sections (2018-059-06 to 12 Rev C)

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- Structural Report on Proposed Demolition by Elite Designers Ltd (ref: 2018 059). Dated March 2018.
- Desk Study and Ground Investigation Report by Geotechnical & Environmental Associates
   Ltd (ref: J18142), dated October 2018.
- Ground Movement Report by Geotechnical Consulting Group (ref: 0814\10001), dated October 2018.
- Hydrogeological Impact Assessment by Geotechnical Consulting Group (ref: 0814\10001), dated October 2018.
- 1 No. (pertinent) consultation comments.



## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	BIA & supporting documents.
Is data required by CI.233 of the GSD presented?	No	A works programme is not presented and a utilities search was not undertaken.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	No	Clarification requested on the GEA report. (Audit paragraph 4.5 – 4.6)  Clarification required on the proposed propping sequence. (Audit paragraph 4.7)  Clarification required on how the monitored groundwater level will affect the proposed excavation level. (Audit paragraph 4.10 – 4.13)
Are suitable plan/maps included?	Yes	Existing plans showing the subject site and immediate neighbouring properties  Arup GSD map extracts are not included.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	BIA appendices.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Contradictory aquifer designation in BIA and desk study information (see Audit paragraph 4.10).  Maps from the Arup GSD and other relevant guidance documents not referenced or included with site location indicated.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	As above. Some of the responses are not considered valid and justification is not provided for all the No responses. (Audit paragraph 4.11)



Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	As above. Page 9 BIA and although the responses are considered to be largely valid, justification is not provided for the No answers (see Audit paragraph 4.12).
Is a conceptual model presented?	Yes	Ground Investigation Report
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Comment is not made on the site being located within a Secondary A Aquifer (Audit paragraph 4.10).
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Increase in hardstanding has been identified and carried forward.
Is factual ground investigation data provided?	Yes	Although the investigation of neighbouring/party wall foundations was not undertaken successfully.
Is monitoring data presented?	Yes	Ground Investigation Report.
Is the ground investigation informed by a desk study?	Yes	Appendix F of the BIA.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	Not confirmed.
Is a geotechnical interpretation presented?	Yes	Appendix F of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Appendix H of the BIA



Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Investigation Report and Ground Movement Assessment (GMA) and Hydrogeological study.
Are the baseline conditions described, based on the GSD?	No	Page 14 and 15 BIA.
		Utilities search is not provided. (Audit paragraph 4.17)
Do the base line conditions consider adjacent or nearby basements?	Yes	Ground Movement Assessment.
Is an Impact Assessment provided?	Yes	Page 15 BIA.
Are estimates of ground movement and structural impact presented?	Yes	Ground Movement Assessment.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	(Audit paragraph 4.9)
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Mitigation of ground movements provided in GMA however not all potential issues have been identified or adequately addressed (see Section 4).
Has the need for monitoring during construction been considered?	Yes	Ground movement assessment Section 6.2.
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	The GMA conclusions are considered to be reasonable however the scheme structural calculations are not legible and should be re submitted at a higher quality (Audit paragraph 4.8).
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	See Audit Section 4.



Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Refer to queries above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	See Audit paragraph 4.23.
Are non-technical summaries provided?	Yes	Page 5 BIA.



#### 4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) was undertaken by Elite Designers Ltd. A ground investigation report was undertaken by Geotechnical & Environmental Associates Ltd (GEA). A Ground Movement Assessment (GMA) and a Hydrogeological Assessment undertaken by GEA is also provided and the individuals concerned in their production have suitable qualifications.
- 4.2. The site is a three storey semi-detached residential property built into a slope with a subterranean extension below the front garden. The adjoining semi-detached property to the south west comprises number 48 and 48A Redington Road, an upper and lower ground floor flat that shares a party wall with the site.
- 4.3. The LBC Instruction to proceed with the audit identified that the basement proposal neither involves, nor is neighbouring to, a listed building.
- 4.4. The development proposal comprises demolition of the existing building but with the retention of the existing lower ground floor subterranean extension below the front garden. Construction will comprise a new basement below the footprint of the existing building alongside a widening of the property by 1m along a 10m central portion on the north western side of site. The basement will also extend into the rear garden by approximately 60 to 70m². The new building will then be constructed over the new footprint.
- 4.5. Existing ground level in the rear garden is reported to be 44.85m TBM. The proposed underside of basement level is indicated in Appendix B to be 41.65m TBM (3.20m bgl) generally, with a sump chamber with an underside level of 40.70m TBM (4.15m bgl). These levels differ from those quoted in Section 7 of the GEA Desk Study and Ground Investigation report. The levels should be clarified and the appropriate report updated.
- 4.6. The GEA report also describes a strip or pad foundation to be designed with an allowable bearing pressure of 150k Pa. The soil parameters (e.g. Cu value) and the dimensions of the proposed foundations used to determine this resistance is requested.
- 4.7. It is proposed to construct the basement with reinforced concrete underpins supporting the ground on all sides. An outline construction sequence is described in the BIA but sketches or an underpinning bay sequence plan is not provided. The proposed construction methodology is not sufficiently detailed. It is stated on page 19 of the BIA that temporary propping is to be utilised but it is unclear if the propping will be on multiple levels and this should be clarified. Appendix C ('Temporary Works Ground Support, Movement Monitoring Plans and Underpin Generic Sequence') of the BIA is missing and should be provided.
- 4.8. The scheme structural calculations presented as Appendix D are not legible due to low resolution and should be resubmitted at a higher quality.

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- 4.9. The Arup GSD map extracts and other relevant figures with the site location indicated are not provided or referenced in the BIA to support the responses to the screening questions. Justification is not provided for all of the 'No' responses and some of the responses are not considered valid or sufficiently addressed.
- 4.10. A 'No' response is given to Question 10 of the land stability screening which relates to whether or not the basement is within an aquifer. This is contradictory to the response given to Question 1a which relates to the same issue and was carried forward to scoping. Additionally, the Ground Investigation has indicated a depth of Claygate Member to 40.65 39.00m TBM (4.60 9.00m bgl). The Landmark Report included as part of the Desk Study (Part 5 'Bedrock Aquifer Designation) identifies that a Secondary A Aquifer exists below the site, associated with the Claygate Member.
- 4.11. A 'No' response is given to Question 1b of the Ground-water (Hydrogeology) screening which relates to whether or not the basement will extend below the water table surface and this is not accepted. The Desk Study and Ground Investigation report indicate that ground level is at 44.75m TBM and the groundwater was monitored between 42.50 and 38.50m TBM. The proposed underside of basement level is approximately 41.65m TBM (3.2m bgl) generally, with a sump chamber with an underside level of 40.70m TBM (4.15m bgl). The Claygate Member is a Secondary A Aquifer that is considered capable of supporting water supplies at a local scale and can form an important source of base flow to rivers. Distributaries of the Lost Rivers of London are located approximately 100m north and south of site and may be fed by the Claygate Member.
- 4.12. The BIA and Hydrogeological Assessment has identified that water will be encountered during basement excavation but describe the groundwater as perched. It is noted that groundwater monitoring was undertaken in August and early September (the late summer) but will continue until basement construction takes place. Monitoring during the winter months should be provided to confirm groundwater levels will not be encountered at shallower depths than that already reported on.
- 4.13. Considering the construction method to be adopted, and the BIA's proposal on page 22 to control water ingress into excavations by pumping from local sumps, the potential loss of fines during dewatering should be considered as it may affect the stability of excavations. The PSD result and log descriptions indicate a silt and fine sand component in the predominately clayey Claygate member, which will likely be encountered during excavation of the basement.
- 4.14. It is stated on the surface water and flooding screening that there will be an increase in the hardstanding area as part of the proposed development which will result in an increase in the volume of surface water run-off. It is further stated on Page 11 of the BIA that a SUDs system will be required for this and on page 20 of the BIA it is stated that the rainwater will be

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'collected and fed into the soakaway in the garden and thus attenuated before discharging into the same ground as present'. The percentage increase in impermeable surface area indicated is confusing and clarification is requested. A surface water management strategy with specific and coherent proposals for the additional volumes (some form of attenuation) should be presented. If soakaways in the rear garden are proposed as part of the SUDS design, the suitability of the underlying stratum should be assessed through infiltration testing which does not appear to have been undertaken. The proposals should meet policy guidance and require agreement with Thames Water and LBC.

- 4.15. A summary layout of the neighbouring properties is provided in Appendix A and B. The presence of basements in the adjacent properties has not been confirmed.
- 4.16. A site specific Desk Study and Ground Investigation was undertaken and included four boreholes to a depth of 15.45m bgl to determine the site geology and five foundation inspection pits to 1.20m bgl to investigate the foundations of the existing and neighbouring properties. The boreholes identified Claygate Member over London Clay. The foundation inspection pits were unable to prove the nature of the foundations of adjacent properties nor the presence or absence of basements (TP4 & 5). Although record drawings for the foundations to No 58 and 58b are included in the GMA, the nature and depth of neighbouring property foundations require confirmation prior to construction as the party/boundary walls are proposed to be underpinned.
- 4.17. A utilities search has not been provided and is requested. It is stated on page 10 and 11 of the BIA that the proposed basement is 'more than 5m away from the highway therefore there is no risk to the integrity or support of the highway. Established guidance on ground movements suggests that any buildings and infrastructure within a distance of 4 x excavation depth could experience ground movements. Although the assets running beneath the pavements are subject to separate approvals, the roadway is within this distance based on an excavation depth of c.3.20m, therefore the potential for movement of the road and utilities running beneath it should be assessed and any impacts agreed with the owners.
- 4.18. A geotechnical assessment is included in the ground investigation report and separate ground movement impact assessment (GMA) provided.
- 4.19. The presence of trees within the vicinity of the proposed basement is identified in the BIA text and on the site plan (S01) provided. The BIA states on Page 16 that 'the properties are currently founded on soils that do not shrink or expand seasonally'. This is misleading as the laboratory testing undertaken as part of the Ground Investigation indicate the clay to have a 'moderate volume change potential' as per NHBC guidance. Although the proposed foundations may be beyond the zone of influence of shrink-swell effects based on the depths, this issue should be assessed and sufficiently addressed.

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- 4.20. Section 5.2.2 of the GMA makes reference to secant piles. Based on the proposed development drawings in Appendix B, which show an RC underpin only, and the remaining text in the GMA, this is assumed to be a typographical error. However, clarification is requested. The GMA has assumed the absence of basements in the neighbouring properties, which (without investigation) is accepted as conservative (for the damage assessment). However as stated above, the party walls are proposed to be underpinned therefore the depth and nature of the foundations require confirmation prior to construction.
- 4.21. Vertical movements have been estimated due to unloading as a result of the removal of the existing building and due to the excavation of the basement. Estimated movements have been provided and a calculation undertaken in OASYs PDISP®. Whilst the tabular input from the software is not provided, a summary is provided in Appendix A.1 of the GMA.
- 4.22. The GMA describes that 'shallow underpinning of relatively lightly loaded (underpins) carried out with good workmanship and in the dry can induce localised settlements of the wall in the order of 5-10mm'. Movements from underpinning are largely dependent on good workmanship and the predicted movements are considered to be reasonable based on those assumptions. It is assumed the movements relate to both horizontal and vertical movements, however, this is not explicitly stated. For completeness, clarification is requested.
- 4.23. The effects of ground movements on adjacent structures is provided and determined to be no more than Category 1 (Very Slight) of the Burland Scale. This is accepted subject to temporary works clarifications.
- 4.24. Potential slope stability issues have been assessed and addressed in the GMA.
- 4.25. The BIA recommends movement monitoring and includes an outline proposal to control ground movements. The GMA references the predicted movements and includes trigger level values.
- 4.26. An indicative works programme as required by cl. 233 of the Arup GSD is not included and should be presented.

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4.27. It is accepted that the site is not in an area prone to flooding.



#### 5.0 CONCLUSIONS

- 5.1. The qualifications of the individuals involved meet the LBC guidance requirements.
- 5.2. The proposed development includes a basement to be constructed by underpinning.
- 5.3. The proposed construction method is not sufficiently detailed.
- 5.4. Clarification required on the GEA Desk Study and Ground Investigation report.
- 5.5. Structural calculations are not readable and should be resubmitted at a higher resolution.
- 5.6. Responses to some of the screening questions require clarification, as discussed in Section 4.
- 5.7. Groundwater monitoring during the winter months should be undertaken. The potential for the loss of fines during dewatering and subsequent effect on the stability of excavations should be commented on and a methodology to address it provided.
- 5.8. A surface water management strategy with specific and coherent proposals for the additional volumes which meet policy guidance should be presented.
- 5.9. The depth and nature of the neighbouring property foundations which are to be underpinned require confirmation prior to construction.
- 5.10. A utilities search has not been provided and is required.
- 5.11. Clarification is required on the potential for shrink swell in the formation stratum.
- 5.12. Clarification is required on the scheme proposal as both secant piles and RC underpinning are described in the report text but only RC underpinning is indicated on the latest drawings.
- 5.13. The effects of ground movements on adjacent structures is provided and determined to be no more than Category 1 (Very Slight) of the Burland Scale. This is accepted subject to temporary works clarifications.
- 5.14. The BIA recommends movement monitoring and includes an outline proposal with trigger levels to control ground movements.
- 5.15. An indicative works programme should be presented.
- 5.16. It is accepted that the site is not in an area prone to flooding and there are no slope stability concerns.

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5.17. Queries and requests for information are summarised in Appendix 2. Until the additional information and further assessments requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

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Appendix 1: Residents' Consultation Comments

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## Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Taylor	Redacted	December 2018	Aboricultural Report is absent.	The BIA identifies that no trees will be felled or are within tree protection zones. Queries on shrink-swell effects have been raised (Audit 4.18).



Appendix 2: Audit Query Tracker

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## **Audit Query Tracker**

Query No	Subject	Query	Status	Date closed out
1	Baseline conditions	Utilities search not undertaken.	Open – to be provided (see Audit paragraph 4.16).	
		Clarity required on the GEA Desk Study.	Open – to be provided (see Audit paragraph 4.5).	
2	Stability	Additional detail on construction methodology to be provided. Construction sequence sketches or underpinning bay sequence plan to be provided.  Secant wall indicated in the GMA text.	Open (see Audit paragraph 4.6).  Open - clarification requested (see Audit paragraph 4.19)	
3	Stability	Structural calculations are not readable and should be resubmitted at a higher resolution.	Open (see Audit paragraph 4.7).	
4	Stability/Hydrogeology	Responses to Q10 of land stability and Q1b of hydrogeology screening not accepted.	Open (see Audit paragraphs 4.9 and 4.10)	
5	Stability	Potential 'shrink swell' in Claygate Member not sufficiently addressed.	Open (see Audit paragraph 4.18)	
6	Stability	Nature and depth of party wall foundations not established	Open – to be confirmed prior to construction.	N/A
7	Stability/Movement monitoring	Outline proposals with trigger values presented in GMA.	Detailed strategy to be agreed with relevant parties prior to construction.	N/A
8	Hydrogeology	Groundwater monitoring during the winter months should be undertaken.	Open - to be undertaken prior to construction.	N/A

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9	Hydrology	Clarification required on SUDs scheme.	Open (see Audit paragraph 4.13)	
10	BIA format	Outline works programme required.	Open – indicative works programme to be provided (see Audit paragraph 4.24)	



Appendix 3: Supplementary Supporting Documents

None

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