

43A Redington Road &
NW3 7RA

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13693-21
Revision: D1

December 2021

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	December 2021	Comment	MEemb13693-21-43A Redington Road D1.doc	ME	NS	GK

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Document Details

Last saved	10/12/2021 09:28
Path	MEemb13693-21-43A Redington Road D1.doc
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Project Number	13693-21
Project Name	43 A Redington Road, London, NW3 7RA
Planning Reference	2021/4234/P

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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 43A Redington Road (planning reference 2021/4234/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. It is proposed to deepen and extend the existing lower ground floor at the site.
- 1.5. The qualifications of the individuals involved in the BIA have not been demonstrated to be in accordance with LBC guidance.
- 1.6. Architectural drawings presented do not indicate the existing and proposed basement levels and should be updated to be fully dimensioned.
- 1.7. Screening and scoping assessments are presented, supported by desk study information. However, further clarification is requested, as detailed in Section 4.
- 1.8. A site investigation has been undertaken indicating the basement will be constructed within the Claygate Member. The proposed geotechnical parameters for design require further consideration as detailed in Section 4.
- 1.9. The BIA states that groundwater may be encountered during the basement excavation and indicates the potential need for dewatering from sumps. Whilst the BIA states that there is unlikely to be impacts to groundwater flow, further monitoring and assessment is required, as detailed in Section 4.
- 1.10. The Ground Movement Assessment (GMA) should be revised in accordance with the comments presented in Section 4.
- 1.11. Sustainable Drainage Strategy (SUDs) measures will be adopted to ensure that the surface water run-off will not increase as a part of the development. The drainage design will be subject to Thames Water and LBC approval.

- 1.12. Queries and requests for information are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28 October 2021 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 43A Redington Road, London NW3 7RA, planning reference 2021/4234/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.
- 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 *"Erection of a single storey rear extension with terrace at first floor level, excavation at basement level for a two storey side infill extension with lightwells to the front and rear elevations and the conversion of the garage to a habitable room at lower ground and ground floor level."*
- 2.6. CampbellReith accessed LBC's Planning Portal on November 3, 2021 and gained access to the following relevant documents for audit purposes:
- Basement Impact Assessment Report (BIA) by SYMMETRYS Limited, ref: Draft Rev. P1 dated 31 August, 2021.

- Design and Access Statement by Salisbury Jones Planning dated 01 September, 2021.
- Geotechnical Interpretative Report by Geofirma Ltd, ref: 2021-028-SYM-RED/Rep.002, dated 27 August, 2021.
- Ground Movement Assessment Report by Geofirma Ltd, ref: 2021-028-SYM-RED/Rep.003, dated 27 August, 2021.
- Sustainable Drainage Assessment SuDS report by GeoSmart Information Ltd, ref: 75105.01R2, dated 27 August, 2021.
- Flood Risk Assessment report by GeoSmart Information Ltd, ref: 75105R1, dated 28 July, 2021.
- Structural Calculations Package by SYMMETRYS Limited, ref: 21141, dated 31 August, 2021.
- Structural drawings by SYMMETRYS Limited, dated August, 2021.
 - Temporary works and underpinning layout
 - Underpinning sequence
 - Ground Floor Plan
 - Sections
- Construction/Demolition Management Plan (CMP) by Paul Mew Associates – Traffic Consultants, ref: Version V1, dated 02 August, 2021.
- Architectural Drawings by Amos Goldreich Architecture, dated April, 2021.
 - Site Plans (draft)
 - Location and Block Plans
 - South-East Elevations
 - North-East Elevations (Front)
 - South-West Elevations
 - Roof Plans
 - Lower Ground Floor Plans
 - Ground Floor Plans
 - Existing and Proposed Section
- Planning Consultation Responses, by The Health & Hampstead Society, dated 20 October 2021.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	It should be demonstrated that authors have the required qualifications as CPG Basements.
Is data required by Cl.233 of the GSD presented?	No	A search to confirm the absence/presence of any underground infrastructure should be presented.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Section 3.0 of the BIA.
Are suitable plan/maps included?	Yes	
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	Drawings should be fully dimensioned.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 4.2 of the BIA. However, query re slopes.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Section 4.1 of the BIA. However, query re watercourses.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the BIA.
Is a conceptual model presented?	Yes	Appendix D – Drawing SK02 Long Section A-A and, Section 3.2 of the BIA.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.0 of the BIA. Questions regarding the slope inclination on site and surrounding areas may need to be brought to Scoping.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	Section 5.0 of the BIA. However, presence of water courses and cumulative impact due to adjacent existing basement should be discussed.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.0 of the BIA.
Is factual ground investigation data provided?	Yes	Section 6.1 and Appendix C of the BIA.
Is monitoring data presented?	Yes	Section 3.3, Appendix C of the BIA. A single monitoring visit has been undertaken, further monitoring may be required.
Is the ground investigation informed by a desk study?	Yes	Section 3.0 of the BIA.
Has a site walkover been undertaken?	Yes	Section 5.8.1 of Appendix C.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	However, it is stated that no information is available in relation to No. 41 Redington Road. Section 2.5.4 of the BIA.
Is a geotechnical interpretation presented?	Yes	However, geotechnical parameters need to be revised. Section 6.0 and 7.0 of the BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Further changes may be required depending on the new values of Cu adopted. Section 6.0 of the BIA and Section 4 of Appendix C.
Are reports on other investigations required by screening and scoping presented?	Yes	Flood Risk Assessment, Appendix E - Part 1. SuDs Report, Appendix E - Part 2.
Are the baseline conditions described, based on the GSD?	Yes	

Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	Hydrological, hydrogeological and land stability assessments require revision.
Are estimates of ground movement and structural impact presented?	Yes	GMA provided, clarifications requested. Appendix D of the BIA.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Hydrological, hydrogeological and land stability assessments require revision.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	However, further mitigation measures and/or revision of the presented mitigation measures may be required.
Has the need for monitoring during construction been considered?	Yes	Movement monitoring of neighbouring properties around the perimeter of the proposed excavation is recommended. Trigger values may need to be revised. Section 7.12.2 of the BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Negligible. However subject to further revision.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	GMA should be revised. Section 7.12.2 of the BIA.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Section 3.4 of the BIA.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	As above.

Item	Yes/No/NA	Comment
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Section 7.11 of the BIA. However, subject to GMA revision.
Are non-technical summaries provided?	Yes	Section 1.0 of the BIA.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Symmetrys Limited, and the qualifications for groundwater flow, surface water flow and slope stability impact assessments have not been demonstrated to meet the requirements of CPG Basements.
- 4.2. The building on the site comprises a 4-storey detached house divided into four flats, with load bearing masonry walls. The application property is a flat that occupies an existing lower ground floor and rear garden as well as a portion of the ground floor, including a garage.
- 4.3. The proposed development includes the erection of a single storey rear extension with terrace at first floor level and the conversion of the existing garage at ground floor level into a 2 storey habitable space, by lowering the floor level by about 2.2m. Lowering part of the existing lower ground floor by approximately 0.65 to 1.00m is also proposed.
- 4.4. Architectural drawings presented do not indicate levels and dimensions and should be updated to be fully dimensioned.
- 4.5. A site walkover has been undertaken, and it has been determined that the adjoining property 45 Redington Road has a basement of unknown depth, whereas it is unknown whether neighbouring 41 Redington Road has a basement.
- 4.6. Screening and scoping assessments are presented and informed by desk study information. Most relevant figures/maps and other guidance documents are referenced within the BIA to support responses to screening questions. The land stability screening states the site and surrounding areas do not have slopes with a gradient greater than 7°. However, with reference to the Arup GSD Figure 16, it appears that the site is in an area where slopes steeper than 7° may be present and further clarification is required.
- 4.7. A site investigation was undertaken in July 2021 by Geofirma Ltd to inform the BIA and the basement design. Two window sample boreholes (BH1 and BH2) were formed to confirm ground and groundwater conditions, and two trial holes (TP1 and TP2) were dug to expose the existing foundations. The ground investigation encountered Made Ground to a maximum depth of 1.40m bgl, whilst the Claygate Member was encountered to a maximum depth of 6.30m bgl. Soils of the London Clay Formation were noted to underlie the Claygate Member to a maximum depth of 7.45m bgl, where the boreholes terminated.
- 4.8. Groundwater was encountered during the site investigation between c. 4.00m and 4.40m bgl in BH1 and BH2. Groundwater monitoring was undertaken on one occasion in August 2021 and recorded levels at c. 4.00m bgl in BH1 and 1.00m bgl in BH2 (both at an elevation of c. 8.80m

to a relative site datum, which is above proposed formation level). The BIA indicates localised dewatering by sump pumping might be required.

- 4.9. It is noted that the ground investigation and subsequent groundwater monitoring was undertaken in summer when the groundwater levels are likely to be at their annual lowest. It is recommended that additional groundwater monitoring is undertaken before construction to inform the temporary works design and dewatering strategy.
- 4.10. The BIA states there are no impacts on the wider hydrogeological environment. However as the basement will be at/below the groundwater level, the assessment should be reviewed and clarified to include consideration of the presence of neighbouring basements and the potential for cumulative impacts.
- 4.11. The site is not within a critical drainage area. An increase in hardstanding areas is proposed since some landscaping areas will be converted to impermeable areas. The BIA states that the proposed development will not increase the risk of flooding and a 'Sustainable Drainage Assessment' is presented including SuDS proposals to ensure that the surface water run-off will not increase and be managed in accordance with LBC's guidance. It's noted that the detailed drainage design is subject to Thames Water and LBC's approval.
- 4.12. In accordance with London Lost Rivers 2016 (Barton & Meyers, 2016) the BIA states that a lost river (Westbourne) is located approximately 60m away from the property. However, in accordance with Lost Rivers 2013 (Barton, 2013) the Westbourne River is indicated running adjacent to the property (see figure in Appendix 3). There is the potential to encounter alluvial deposits associated with the river during the excavation and consideration of potential impacts and contingency mitigation measures should be presented in the BIA.
- 4.13. The structural drawings presented indicate that it is proposed to construct the basement using reinforced concrete underpinning following a typical 'hit and miss' sequence. A construction sequence and construction method statement are presented in the BIA along with a description temporary works (including propping and groundwater management). As discussed below, structural calculations should be clarified.
- 4.14. The geotechnical parameters used in the retaining wall calculations, foundation design and settlement calculation are presented in the BIA. However, the design line adopted for the undrained shear strength (cu) of the Claygate Member is mostly based on "nearby logs" rather than on the site specific ground investigation. This may overestimate the undrained shear strength and other parameters derived from it and not represent the data obtained from the ground investigation (from BH1 in particular). Due to the sloping nature of the site, it is recommended that the cu line is presented versus the elevation (in mOD) in addition to depth below ground level (m bgl) to clarify conditions at proposed formation level. The geotechnical

parameters should be revised accordingly and allowable bearing capacities, Ground Movement Assessment (GMA) and Structural Calculation Package consequently updated as necessary.

- 4.15. The GMA has been undertaken to demonstrate that ground movements and consequential damage to neighbouring properties will be within LBC's policy requirements. Ground movements due to underpinning and consequent excavation have been modelled using FEM program PLAXIS 2D. The GMA states that damage is predicted to fall into category 0 for walls of both properties 41 and 45 Redington Road. However the GMA requires clarification as per the paragraphs below.
- 4.16. Ground movements between 3 and 4 mm were calculated due to excavation and new loads imposed by the development. The BIA states that ground movements due to installation of underpins have been considered in the analysis. However, the software is considered unable to predict ground movements due to construction (underpinning installation). Those ground movements should be added to the analysis and the damage category assessment updated accordingly.
- 4.17. In the GMA, the deflection ratio estimation (Figure 7 of the GMA) should be revised considering a vertical distance perpendicular to the x axis as indicated in Figure 6.27a of CIRIA C760.
- 4.18. It's noted that the settlements predicted in the GMA are less than the stated 10mm to 15mm of predicted settlement at the quoted allowable bearing capacities presented in the site investigation report, which should be clarified.
- 4.19. In good conditions for underpinning (e.g. dry, firm to stiff cohesive deposits) a range of movements of 5mm to 10mm vertically and horizontally per lift are generally anticipated. Further to the comments in 4.14 to 4.18, considering the low strength profile of the soils and potential for encountering groundwater, the currently predicted range of movements does not appear to be reasonably conservative.
- 4.20. The GMA should explicitly predict damage to the other properties (flats above the subject property) in addition to the surrounding structures, and consider any infrastructure (e.g. highways, utilities etc) within the zone of influence of the works.
- 4.21. An outline monitoring proposal has been presented, including suggested monitoring point locations and trigger values considering the nearby properties. It is noted that trigger values should be clarified following revisions to the GMA.

5.0 CONCLUSIONS

- 5.1. The qualifications of the individuals involved in the BIA should be demonstrated to be in accordance with LBC guidance.
- 5.2. Architectural drawings presented should be updated to be fully dimensioned.
- 5.3. Screening and scoping assessments are presented, supported by desk study information. However, further clarification is requested, as detailed in Section 4.
- 5.4. A site investigation has been undertaken indicating the basement will be constructed within the Claygate Member. The proposed geotechnical parameters for design require further consideration as detailed in Section 4.
- 5.5. Further consideration of impact to the hydrogeological environment is requested, as detailed in Section 4.
- 5.6. The Ground Movement Assessment (GMA) should be revised in accordance with the comments presented in Section 4.
- 5.7. Sustainable Drainage Strategy (SUDs) measures will be adopted to ensure that the surface water run-off will not increase as a part of the development. The drainage design will be subject to Thames Water and LBC approval.
- 5.8. Queries and requests for information are summarised in Appendix 2. Until the clarifications requested are presented, the BIA does not meet the requirements of Camden Planning Guidance: Basements.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

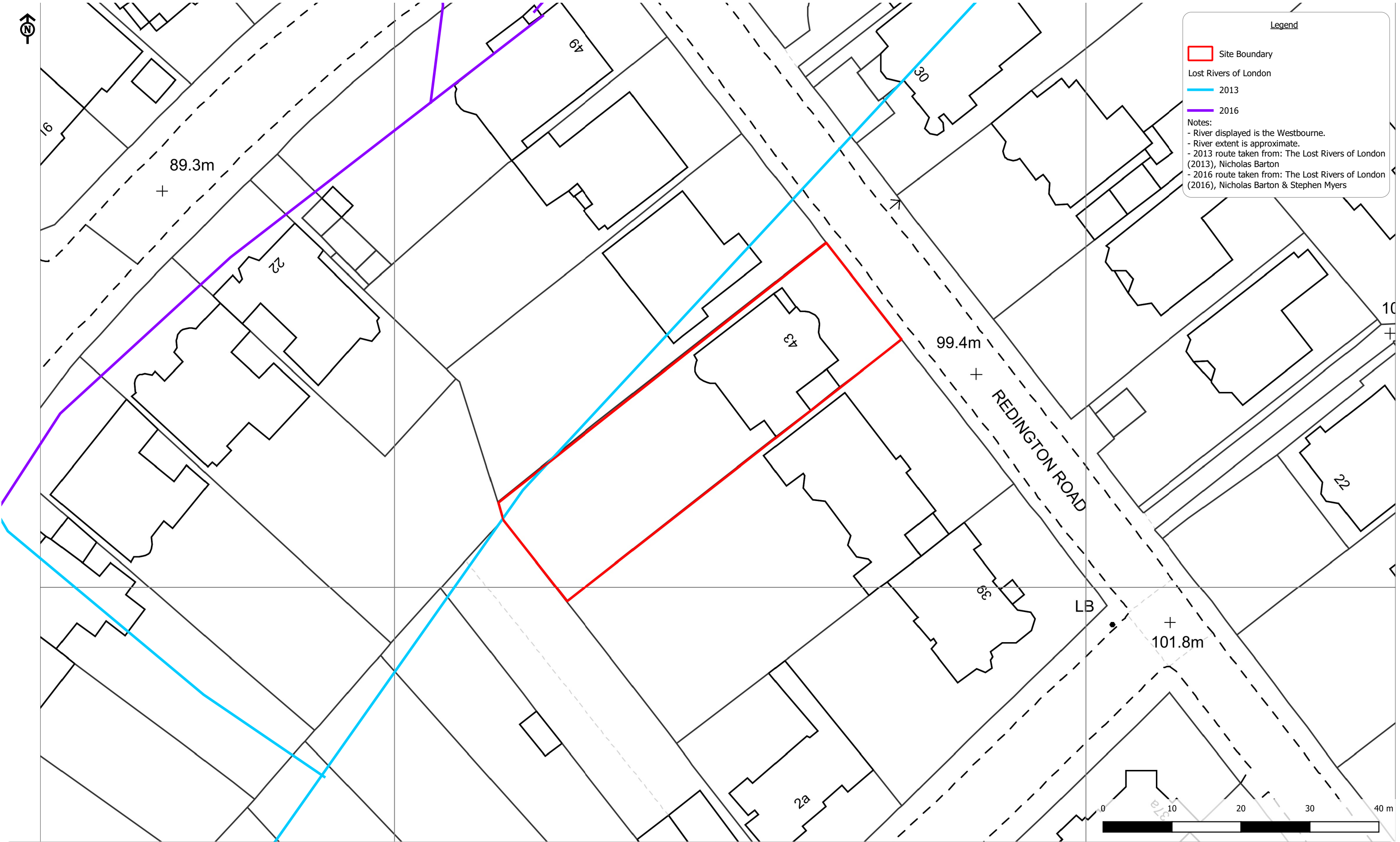
Surname	Address	Date	Issue raised	Response
The Health & Hampstead Society	NA	20/10/2021	Adjacent buildings and levels of front and back gardens are not adequately shown in the drawings.	See Section 4.4

Appendix 2: Audit Query Tracker

Audit Query Tracker

8	Subject	Query	Status	Date closed out
1	BIA	The qualifications of the individuals involved in the BIA have not been demonstrated to be in accordance with LBC guidance.	Open – See Section 4.1.	
2	BIA	Architecture drawings should be updated to report levels and dimensions.	Open – See Section 4.4.	
3	Land Stability	Clarification of the sloping gradient at the site and surrounding areas should be presented and the impact assessed, as required.	Open - See Section 4.6.	
4	Hydrogeology	Impact on the wider hydrogeological environment should be revised considering cumulative effect due to neighbouring basement.	Open – See Section 4.8 - 4.10.	
5	Land Stability	Geotechnical parameters, potential presence of alluvial soils, presence of groundwater etc	Open – See Section 4.12 - 4.14.	
6	Land Stability	GMA to be clarified; monitoring strategy to be clarified	Open – See Section 4.15 – 4.21.	

Appendix 3: Supplementary Supporting Documents



43A Redington Road

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Lost Rivers Locations

London

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