

**54 Regents Park Road, London,  
NW1 7SX**

**Basement Impact Assessment  
Audit**

For

London Borough of Camden

Project Number: 12066-48  
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### Document History and Status

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## 1.0 NON-TECHNICAL SUMMARY

- 1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment, (BIA) submitted as part of Planning Submission documentation for 54 Regents Park Road, London, NW1 7SX (reference 2015/2786/P). The basement is considered to fall within Category B as defined by the Terms of Reference.
- 1.2. The Audit reviewed the 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. The BIA by Form Structural Design Ltd and the supporting BIA review by Chord Environmental Ltd have been prepared by individuals with suitable qualifications.
- 1.4. The property is mid terrace, has 5 storeys and is in an area with very gently sloping topography. The planning application includes lowering of the lower ground floor level by around 0.5m. The basement does not involve a listed building nor is it adjacent to a listed building.
- 1.5. The single borehole undertaken showed Made Ground to a depth of around 0.50m below which was the London Clay Formation. The London Clay is likely to extend to some depth beneath the site.
- 1.6. Rootlets were recorded to a depth of 2.2m bgl, although the application suggests that no trees are to be felled as part of re-development proposals.
- 1.7. Groundwater monitoring in March and April 2015 recorded a groundwater level of 3.4m bgl. The BIA suggest that additional monitoring should be undertaken to determine the winter groundwater level.
- 1.8. Slope angles at and around the site are very gentle and it is accepted that risks from slope stability are negligible.
- 1.9. Local residents have raised concerns, and suggest personal experience, of shallow groundwater in the area. It is recommended that further assessment is made of the resident's suggestions of a high groundwater level and the need for pumping in adjacent basements.
- 1.10. All additional surface water flows are to discharge to the existing drainage and it is accepted that impacts to the hydrological environment will be negligible. The flood risk assessment concludes that flood risk is low.

- 1.11. The structural scheme proposed in the BIA is traditional underpinning beneath existing walls. The BIA states the scheme to be superseded and from checks with LBC no additional structural information is available at the current time.
- 1.12. An assessment of ground heave has been made (10mm), although soil parameters used in the assessment are not included. Settlement of foundations after underpinning have also been predicted (<25mm). No assessment of potential lateral movements or potential Burland Damage Category have been made.
- 1.13. No proposals for structural monitoring; pre, during and post construction are provided.

## 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 28/08/2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 54 Regents Park Road, NW1 7SX (planning reference 2015/2786/P).
- 2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the BIA for potential impact on land stability and local ground and surface water conditions arising from basement development.
- 2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
  - Camden Planning Guidance (CPG) 4: Basements and Lightwells.
  - Camden Development Policy (DP) 27: Basements and Lightwells.
  - Camden Development Policy (DP) 23: Water.
- 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.

It should also evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and make recommendations for the detailed design.

- 2.5. LBC's Audit Instruction described the planning proposal as *"Lowering of existing lower ground floor level including front lightwell. Erection of front and rear extensions at 2<sup>nd</sup> floor level including extension of rear stairwell rotunda and single storey extension at rear lower ground floor level with terrace and metal railing above. Increase in width of side dormer to roof, creation of new terrace at 3<sup>rd</sup> floor level with metal railing and enlargement of existing rear windows. Installation of replacement front dormer window. Conversion from 2 x flats to 1 x single family dwelling/house."*

2.6. CampbellReith accessed LBC's Planning Portal on 07/09/2015 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment, Stage 1 Screening; Form Structural Design Ltd, 142297 v2, March 2015. It includes:
  - Appendix A to C – Flow Screening Charts
  - Appendix D – Aquifer Designation Map
  - Appendix E – Camden groundwater protection zone
  - Appendix F – Extract from building survey (CMB)
  - Appendix G – Sketch section (s) of underpinning
  - Appendix H – London underground location map
  - Appendix I – Flood Risk Assessment (Desk Study)
  - Appendix J – Site Investigation (AVIRON report 15-125.011, May 2015)
  - Appendix K – FORM SD Plans & Section
- A review of the Form BIA by Chord Environmental Ltd in letter 1127/LJE210815, (August 2015).
- Design and Access Statement Rev A
- Revised drawings, SaY Architects-job no. 1095, drawings P(01) 01-03, P(02) 01-03, 05-10, 21-30 and P(03) 01-02.
- Planning Comments and Responses
  - 5 residents responses that relate to concerns associated with ground and groundwater conditions or construction of the basement.

### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	YES	Cover page of Form BIA report. Introductory paragraph of Chord Environmental Ltd letter.
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	Throughout the BIA
Are suitable plan/maps included?	YES	Throughout 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 of BIA and review letter report by Chord Environmental.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	YES	Section 2 of BIA and letter review report by Chord Environmental.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	YES	Section 4 of BIA and letter review report by Chord Environmental.
Is a conceptual model presented?	YES	The Aviron Ground Investigation Report 15-125.01 in Appendix J of the BIA.



Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	YES	The Aviron Ground Investigation Report 15-125.01 in Appendix J of the BIA and comments in letter review report by Chord Environmental.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	YES	The Aviron Ground Investigation Report 15-125.01 in Appendix J which describes groundwater monitoring completed at the site. Also comments in letter review report by Chord Environmental. Aviron recommend additional monitoring to determine winter groundwater levels.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	YES	Flood Risk Assessment provided in Appendix I of the BIA. Also comments in letter review report by Chord Environmental.
Is factual ground investigation data provided?	YES	The Aviron Ground Investigation Report 15-125.01 in Appendix J of the BIA.
Is monitoring data presented?	YES	The Aviron Ground Investigation Report 15-125.01 in Appendix J of the BIA. Single borehole standpipe. Aviron recommend additional monitoring to determine winter groundwater levels.
Is the ground investigation informed by a desk study?	YES	A specific desk study is not presented but desk study resources have been consulted within the BIA.
Has a site walkover been undertaken?	NOT CLEAR	Specific reference to a site walkover is not mentioned. The information provided is well presented and informed so we suspect the site walkover was completed. Simple clarification is likely all that is needed.
Is the presence/absence of adjacent or nearby basements confirmed?	NO	Not specifically addressed in the BIA.
Is a geotechnical interpretation presented?	YES	The Aviron Ground Investigation Report 15-125.01 in Appendix J of the BIA.

Item	Yes/No/NA	Comment
Does the geotechnical interpretation include information on retaining wall design?	NO	However, scheme comprises only modest underpinning.
Are reports on other investigations required by screening and scoping presented?	YES	Flood Risk Assessment in Appendix I and the Aviron Ground Investigation Report 15-125.01 in Appendix J of the BIA.
Are baseline conditions described, based on the GSD?	YES	
Do the base line conditions consider adjacent or nearby basements?	NO	No specific reference to adjacent or nearby basements in the BIA.
Is an Impact Assessment provided?	NO	
Are estimates of ground movement and structural impact presented?	NO	Heave assessment and anticipated settlements beneath foundations are provided. No assessment of ground movements due to underpinning or Burland damage assessment included.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	NO	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	NO	Mitigation of potential damage to adjacent structures needs to be provided. No mitigation measures against groundwater and surface water have been provided. We note adjacent residents comments that they believe a nearby basement required continual pumping.
Has the need for monitoring during construction been considered?	NO	
Have the residual (after mitigation) impacts been clearly identified?	NA	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be	NO	Sketch underpinning scheme is presented in Appendix G but stated as superseded. No construction method statement provided.

Item	Yes/No/NA	Comment
maintained?		
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	YES	Increased impermeable surface will be created but all additional flows will discharge to sewer.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	NO	Sketch underpinning scheme is presented in Appendix G but stated as superseded. No cumulative impacts to water environment as per Sections 2 & 4 and Flood Risk Assessment (Appendix I) within BIA.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	NO	
Are non-technical summaries provided?	YES	No specific non technical summary but report is well written and easily understood.

## 4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by, Form Structural Design Ltd (FSD). A BIA review letter was prepared by Chord Environmental. Together, the documents have been written by individuals with suitable qualifications.
- 4.2. The LBC instruction to proceed with the audit identified that the basement proposal does not involve a listed building nor is it adjacent to a listed building.
- 4.3. The existing property is mid terrace, has 5 storeys and is in an area with very gently sloping topography. The current lower ground floor has restricted floor to ceiling heights and the planning application includes lowering of the lower ground floor level by around 0.50m.
- 4.4. An exploratory hole was formed in the rear garden and encountered a thin veneer of Made Ground (0.50m) below which lies the London Clay Formation to the maximum depth of investigation (10m). The London Clay is likely to extend to some depth beneath the site.
- 4.5. Rootlets were recorded in the single borehole undertaken to a depth of 2.20 mbgl. However, the proposed foundation depth is likely to be below the zone of influence of the observed roots.
- 4.6. As reported in the BIA, groundwater was not encountered on the day the ground investigation was undertaken within the maximum 10m depth of investigation. However, subsequent groundwater monitoring in March and April 2015 recorded a dry borehole to 5.0m depth and a groundwater level of 3.4m bgl respectively. Aviron who undertook the ground investigation recommend that additional monitoring be undertaken to understand the winter groundwater regime.
- 4.7. The BIA states that the slope angle at and around the site is  $<7^\circ$  and that the proposed development will not change this. It is accepted that risks from slope stability are negligible.
- 4.8. The BIA states that the London Clay is Unproductive Strata i.e. low permeability and negligible significance for water supply or river base flows.
- 4.9. The nearest surface water course is the Ground Union Canal approximately 100m from the site. No historical water wells or 'Lost Rivers of London' were identified within 100m of the site. Impacts to hydrogeological conditions from the development proposal are accepted as being negligible.
- 4.10. The proposed extension of external space at the rear of the property and new patio area will increase impermeable surfacing by approximately 25m<sup>2</sup>. All additional flows are to discharge to the existing drainage and hence it is accepted that impacts to the hydrological environment will be negligible.

- 4.11. The flood risk assessment concludes that flood risk is low. It is reported that a nearby basement requires continued pumping and measures to prevent the inflow of groundwater in the basement should be provided.
- 4.12. A sketch underpinning scheme is presented in Appendix G, although the Appendix title page suggests it has been superseded. It shows underpins to extend 1712mm below finished floor level.
- 4.13. The BIA provides outline guidance on retaining walls design and soil parameters for stability. Assessments of ground heave caused by the excavation and settlement beneath foundations are provided, 10mm and <25mm respectively. However, assessment of ground movements associated with underpinning and excavation, or the anticipated Burland Category of structural damage are not provided.
- 4.14. Five residents consultation comments that relate to ground conditions, ground/surface water or structural aspects were identified on LBC's Planning Portal. These are considered in Appendix 1.

## 5.0 CONCLUSIONS

- 5.1. The BIA by Form Structural Design Ltd and supporting BIA review by Chord Environmental Ltd have been prepared by individuals with suitable qualifications.
- 5.2. The basement does not involve a listed building nor is it adjacent to a listed building.
- 5.3. The property is mid terrace, has 5 storeys and is in an area with very gently sloping topography. The planning application includes lowering of the lower ground floor level by around 0.50m, supported by underpinning to a depth of 2m below current levels.
- 5.4. The site is underlain by a thin veneer of Made Ground below which lies the London Clay Formation. The London Clay is likely to extend to some depth beneath the site.
- 5.5. Groundwater monitoring in March and April 2015 recorded a groundwater level of 3.4m bgl, which is below the level of the proposed basement floor level. However, it is reported that a nearby basement floods and the BIA suggests that additional groundwater monitoring be undertaken to determine the winter groundwater level.
- 5.6. Slope angles at and around the site are  $<7^\circ$  and it is accepted that risks from slope stability are negligible.
- 5.7. From the findings of the BIA and supporting ground investigations, impacts to hydrological conditions from the development proposal would appear to be low. However, a response is required to the resident's suggestions of a high groundwater level and the need for pumping in adjacent basements.
- 5.8. The proposed development will increase impermeable surfacing by approximately 25m<sup>2</sup>. All additional flows are to discharge to the existing drainage and it is accepted that impacts to the hydrological environment will be negligible. The flood risk assessment concludes that flood risk is low.
- 5.9. The structural scheme proposed in the BIA is traditional underpinning beneath existing walls. The BIA states the scheme to be superseded and from checks with LBC no additional structural information is available at the current time.
- 5.10. An assessment of ground heave has been made (10mm), although soil parameters used in the assessment are not included. Settlement of foundations after underpinning have also been predicted ( $<25\text{mm}$ ). These must be confirmed for the currently proposed scheme and an assessment of potential movements resulting from the construction of the underpinning and an estimate of the resultant Burland Damage Category is required.

- 5.11. No proposals for condition surveys and structural monitoring; pre, during and post construction of potential affected neighbouring properties are provided and these are required.
- 5.12. Five residents' consultation comments relating to ground conditions, ground/surface water and structural aspects have been viewed. These are considered in Appendix 1.

## **Appendix 1: Resident's Consultation Comments**



Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Hoyles	52 Regents Park Road	14/06/15	Concerns over local ground floor lowering, that resulted in flooding on several occasions and need for constant pumping.	See Query Tracker item 4.
Cottrell	Flat 3, 56 Regents Park Road	23/06/15	Notes the lack of calculations to support estimate of ground movement, the lack of an estimate of an estimate of horizontal movement and no prediction of damage in accordance with the Burland Categories.	See Query Tracker 1.
Miller	52 Regents Park Road	21/06/15	Requests the investigation for the groundwater level and/or springs that could cause problems for neighbouring properties.	See Query Tracker item 4.
Middleton	Basement flat at 52 Regents Park Road	18/06/15	Notes that when she had an extension built in 2013, the new foundations filled with water that did not drain away over time. She also described how the basement at No. 50 was previously lowered and now requires pumping and is concerned about the nuisance, especially at night.	See Query Tracker item 4.
Cottrell	Ground floor flat at 56 Regents Park Road	20/06/15	Raised concerns regarding possible damage that could result from the proposals.	See Query Tracker 1.

## **Appendix 2: Audit Query Tracker**

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	No assessment of ground movements associated with underpinning and potential building damage. Scheme shown described as superseded.	To be included in revised BIA	
2	Stability	No reference to whether neighbouring properties have basements.	Further investigate and update in revised BIA.	
4	Groundwater	Neighbouring residents suggest No. 50 Regents Park Road had basement level reduced and requires constant pumping. BIA suggests winter groundwater level to be established.	Further monitoring and confirmation of groundwater regime required with measures to prevent water ingress.	
5	Stability	No proposal for condition surveys and outline structural monitoring plan provided.	To be included in revised BIA.	

### **Appendix 3: Supplementary Supporting Documents**

None

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