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Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12727-27
Revision: D1

January 2018

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	Jan 2018	Comment	SOrm-12727-27-220118-Spiritualist Temple-D1.doc	SO	RM	RM

Document Details

Last saved	22/01/2018 15:04
Path	SOrm-12727-27-220118-Spiritualist Temple-D1.doc
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Project Number	12727-27
Project Name	Former Spiritualist Temple, Rochester Square, London, NW1 9RY
Planning Reference	2016/7088/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 34A King Henrys Road, London, NW3 3RP (planning reference 2017/3029/P). The basement is considered to fall within Category B as defined by the Terms of Reference.

1.2. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.

1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list.

1.4. The Basement Impact Assessment (BIA) and supplementary information has been produced by those holding suitable qualifications.

1.5. The proposed development involves the complete demolition of an existing church building and the construction of a mixed use community space and residential four storey building occupying the entirety of the site including single storey basement level.

1.6. The proposed basement structure is proposed to be formed of a piled wall using common construction methods.

1.7. A site specific ground investigation has been conducted including recording ground water levels, along with relevant analysis of the soil properties.

1.8. The geology consists of previously worked ground overlaying granular soils and Clay.

1.9. The basement is anticipated to be located below the ground water level, however suitable construction methods have been proposed to allow this to be carried out.

1.10. It has been concluded that the wider ground water environment will not significantly impacted by the proposed basement.

1.11. Outline structural calculations are required for the basement wall structure.

1.12. An outline draft construction programme has been provided.

1.13. It has not been demonstrated that the proposal will limit damage to the neighbouring properties to Burland Category 1 or less.

1.14. A flood risk assessment confirms that the property is in a low to medium risk of flooding.

1.15. Green roofs are proposed as part of the surface water management, however further information is required to demonstrate compliance with The London Plan.

1.16. Evidence of consultation with transportation asset owners has been provided.

1.17. A movement monitoring strategy of the neighbouring buildings has been proposed.

1.18. It has not been demonstrated that the proposal adheres to the requirements of CPG4 and other Camden Planning Policy. A schedule of queries for further information is summarised in Appendix 2 of this audit.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 22nd November 2017 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for The Former Spiritualist Temple, Rochester Square, London, NW1 9RY, reference 2016/7088/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) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- Local Plan 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;

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 *"Redevelopment of site involving demolition of the building (Use Class D1) and erection of a 3-storey building, plus basement level, to accommodate an art workshop/gallery (Use Class B1) and 9 self contained flats (Use Class C3) comprising 8 x 2 bed and 1 x 1 bed, together with landscape works."*

The Audit Instruction also confirmed The Former Spiritualist Temple was not, or was not a neighbour to, listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 15th December 2017 and gained access to the following relevant documents for audit purposes:

- BIA Report and Appendices A to D (D in two parts)
- 27.06.17 1606_Design and Access Statement_Planning
- CMP-Pro-Forma v2.1(1)
- Planning Statement June 2017FINAL
- Planning Comments and Response
- Existing and proposed Architectural drawings:
  - 1606_GA_001_RochesterSq_LocationPlan(1)
  - 1606_GA_002_Rochester Sq_Site Images 01(1)
  - 1606_GA_003_Rochester Sq_Site Images 02.compressed(2)
  - 1606_GA_004_Rochester Sq_Site Analysis(1)
  - 1606_GA_005_Rochester Sq_Recent Local Development.compressed(1)
  - 1606_GA_010_Rochester Sq_Existing Ground Floor Plan(1)
  - 1606_GA_011_Rochester Sq_Existing Roof Plan(1)
  - 1606_GA_012_Rochester Sq_Existing Elevation AA - Rochester Sq. (South)(1)
  - 1606_GA_013_Rochester Sq_Existing Elevation BB - (East)
  - 1606_GA_014_Rochester Sq_Existing Elevation CC - Rochester Sq. (North)(1)
  - 1606_GA_015_Rochester Sq_Existing Elevation DD - (West)(1)
  - 1606_GA_016_Rochester Sq_Existing Contextural Elevations(1)
  - 1606_GA_017_Rochester Sq_Existing Section AA(1)
  - 1606_GA_018_Rochester Sq_Existing Section BB(1)
  - 1606_GA_019_Rochester Sq_Existing Section CC(1)
  - 1606_GA_061_Rochester Sq_Existing Church Plan(1)
  - 1606_GA_030_Rochester Sq_Proposed Site Plan_Rev A
  - 1606_GA_031_Rochester Sq_Proposed Basement Plan_Rev B

- 1606_GA_032_Rochester Sq_Proposed Ground Plan_Rev B
- 1606_GA_033_Rochester Sq_Proposed First Plan_Rev B
- 1606_GA_034_Rochester Sq_Proposed Second Plan_Rev B
- 1606_GA_035_Rochester Sq_Proposed Roof Plan_Rev B
- 1606_GA_040_Rochester Sq_Proposed Elevation AA
- 1606_GA_041_Rochester Sq_Proposed Elevation BB - East Rev A
- 1606_GA_042_Rochester Sq_Proposed Elevation CC
- 1606_GA_043_Rochester Sq_Proposed Elevation DD - (West) Rev B
- 1606_GA_044_Rochester Sq_Proposed Contextural Elevations
- 1606_GA_045_Rochester Sq_Proposed Section AA Rev A
- 1606_GA_046_Rochester Sq_Proposed Section BB Rev B
- 1606_GA_047_Rochester Sq_Proposed Section CC Rev B
- 1606_GA_048_Rochester Sq_Proposed Section DD Rev A
- 1606_GA_050_Proposal Analysis Rev A
- 1606_GA_051_3D Visual 1 Rev A
- 1606_GA_052_3D Visual 2 Rev A
- 1606_GA_055_3D Visual 5 Rev A
- 1606_GA_063_Rochester Sq_Proposed Gallery views_rev B
- 1606_GA_064_Rochester Sq_Proposed Entrance view Rev A

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Refer last page of BIA and Ground Investigation Report.
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 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?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A justification statement is generally provided for 'no' answers
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A justification statement is generally provided for 'no' answers
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	No justification statement provided for 'no' answers however screening outcomes are satisfactory.
Is a conceptual model presented?	Yes	
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Appendix D.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Appendix D.

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	BIA Appendix D.
Is factual ground investigation data provided?	Yes	BIA Appendix C.
Is monitoring data presented?	Yes	A single repeat monitoring visit was carried out
Is the ground investigation informed by a desk study?	Yes	BIA Appendix C.
Has a site walkover been undertaken?	Yes	BIA Appendix D.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	BIA Appendix D – Single story basement to adjoining western property.
Is a geotechnical interpretation presented?	Yes	BIA Appendix C.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Retaining wall specific geotechnical properties are provided.
Are reports on other investigations required by screening and scoping presented?	Yes	Ground Movement Assessment and Flood Risk Assessment.
Are the baseline conditions described, based on the GSD?	Yes	BIA Appendix D.
Do the base line conditions consider adjacent or nearby basements?	Yes	BIA Appendix D – Single story basement to adjoining western property.
Is an Impact Assessment provided?	Yes	BIA Appendix D.
Are estimates of ground movement and structural impact presented?	Yes	BIA Appendix D - Ground Movement Assessment.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	BIA Appendix D.

Item	Yes/No/NA	Comment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Heave protection, Party wall movement monitoring, green roofs, propping in the temporary condition.
Has the need for monitoring during construction been considered?	Yes	Party wall movement monitoring has been proposed
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Construction method, Ground movement assessment, and party wall monitoring. However the GMA indicates damage of up to category 2.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Mention of green roofs incorporated into the design. However drainage design yet to be finalised.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Drainage design yet to be finalised.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	Generally category 1 however category 2 for the property immediately adjacent.
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of Geotechnical consultants, LMB Geosolutions Ltd, and the individuals concerned in its production have suitable qualifications.

4.2. Consulting Structural engineers, Symmetrys Limited, have produced supplementary information to support the structural design and construction of the basement proposal.

4.3. The existing property is a double height single storey masonry building with a timber pitched roof previously used as a religious building.

4.4. The proposed development involves the complete demolition of the existing church and the construction of a mixed use community space and residential four storey building occupying the entirety of the site including single storey basement level, with the site being some 45m in length by 10m in width.

4.5. The basement structure is proposed to be approximately 3m deep and constructed from secant piled walls with an RC liner wall, RC basement slab and RC suspended ground floor providing lateral support to the head of the piles in the permanent case. The superstructure is proposed as traditional load bearing masonry with suspended timber floors.

4.6. A site specific ground investigation was conducted, comprising two boreholes to a depth of 15mbgl, along with recording of ground water along with a single repeat monitoring visit.

4.7. The ground model consists of a layer of Made Ground to depths between 0.65mbgl and 0.8mbgl, overlaying Head Deposits to depths of between 1.5mbgl to 1.75mbgl, overlaying London Clay to depth.

4.8. Groundwater was observed during the drilling process and subsequently in one follow up monitoring visit. During drilling water was recorded at 0.7mbgl and 7.0mbgl BH1. No water was encountered during the drilling of BH2 however the following morning water was observed at a depth of 3.4mbgl. During the follow up visit water was encountered at 6.58mbgl BH1 and 1.64mbgl BH2. The ground investigation report considers the groundwater to form a thin, laterally continuous aquifer unit within the Head Deposits. This is not regional and a fair assertion is made that the impact of the scheme on groundwater flow within the head deposits will be minimal as ground water will flow uninterrupted around the basement with any small increase in groundwater level occurring locally against the basement.

4.9. The proposed scheme proposes the use of secant piled retaining walls with lateral restraint at the head of the wall provided in both the temporary and permanent cases. The secant piles walls are to exclude ground water in the temporary case with localised dewatering during

excavation and construction of the basement. An RC liner wall provides the main water retention in the permanent case. The impact of groundwater on construction has been adequately considered.

4.10. An interpretive geotechnical report has been produced that provides geotechnical design parameters for basement raft, retaining walls, and piled foundations based on the site specific site investigations. A recommendation is made that retaining walls are designed for groundwater pressures in accordance with good design practise and the site specific hydrogeological conditions, however a specific design water level is not provided.

4.11. Outline structural calculations have been produced for the basement slab under heave loading. No outline calculations have been produced for the piled wall or liner wall to indicate the feasibility of the solution to provide stability in the temporary and permanent case, which should be provided.

4.12. A Construction management plan has been produced that outlines a draft programme of the proposed works covering key phases and approximate durations.

4.13. A Structural Methodology Statement has been produced. Structural drawings are included in the statement that clearly show the temporary propping required to mitigate lateral movement of the pile caps.

4.14. It has been identified that as the London clay will experience unloading due to the excavation there is the potential for heave. To mitigate the heave effects the basement slab is to have proprietary heave protection installed underneath. Structural calculations have also been presented to indicate that the slab is designed to resist moments generated by hydrostatic uplift pressures. Generally these are accepted as appropriate methods to deal with heave pressures.

4.15. A ground movement assessment has been produced to calculate a damage category for the neighbouring properties. This has been produced combining settlement as calculated following the method described in CIRIA C580, along with calculated heave values. The basement to the adjoining Western property has been considered. Burland category 1 is calculated for the neighbouring properties of Julian Court and 29-36 Rochester Square. The worst case damage category has been confirmed as being Burland category 2 at the adjoining Western property. A damage category of Burland 2 is not accepted by LBC planning policy. The construction method or form of construction should be amended, with the GMA updated, in order to demonstrate that the damage category to neighbouring buildings is no greater than 1.

4.16. A flood risk assessment is provided which indicates the property is located in an area of Low to Medium risk of flooding from surface water and Negligible/low risk of flooding from

groundwater. Consideration has been given to the risk of sewer flooding and this was found to be low.

4.17. It is recognised that the proposed works will increase the volume of surface water drainage on the site. Green roofs are to be incorporated in the proposed development to provide some attenuation of the surface water run off to the local drainage system. The BIA acknowledges the drainage design is yet to be finalised, however further details should be submitted to indicate feasibility of the surface water management strategy in accordance with The London Plan.

4.18. Evidence of consultation with transportation asset owners has been provided, who have confirmed that there are no assets located within the immediate vicinity of the site.

4.19. Monitoring of the neighbouring properties has been proposed during the basement works. A site specific monitoring strategy has been proposed. It is accepted that monitoring will be carried out in accordance to good practise principles.

4.20. A schedule of queries for further information is summarised in Appendix 2 of this audit.

5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) and supplementary report been carried out by a well-known firm of engineering consultants, and the individuals concerned in its production have suitable qualifications.

5.2. The proposed development involves the complete demolition of an existing church building and the construction of a mixed use community space and residential four storey building occupying the entirety of the site including single storey basement level.

5.3. The basement structure is proposed to be of propped secant piled walls with RC slabs and liner walls in the permanent case.

5.4. A site specific ground investigation was conducted, comprising boreholes and ground water monitoring.

5.5. The site geology consists of up to 0.8m of Made Ground, overlaying approximately 1m of Head Deposits, overlaying London Clay.

5.6. During the return monitoring visit ground water was recorded at depths of 6.58mbgl and 1.64mbgl at either end of the site. The ground water has been identified as perched water to varying depths within the head deposits, and is not anticipate forming a strategic ground water flow. It has been concluded that the basement may penetrate beneath the ground water level, which is not anticipated to significantly impact on the ground water level.

5.7. Appropriate temporary works have been proposed with propping provided to the piled wall during construction, with local dewatering within the piled wall which is to act as a barrier to water in the temporary case.

5.8. An appropriate geotechnical interpretation has been produced with engineering properties of the soil for use the design of the piled wall and basement slab provided. Outline structural calculations have been provided for the basement slab, however an outline design for the piled walls has not been provided.

5.9. Outline structural calculations are required for the basement wall structure.

5.10. An outline draft construction programme has been provided.

5.11. Heave pressures due to the unloading of the clay soil have been taken into account.

5.12. A ground movement assessment has been produced, however this indicates a damage category of 2 to a number of the neighbouring properties, which is greater than the maximum permitted damage category of 1.

5.13. A flood risk assessment confirms that the property is in a low to medium risk of flooding from surface water.

5.14. The developed area is increasing which will increase the volume of surface water drainage into the sewer system. It is indicated that SUDs will be provided by way of greens roofs, however further details of surface water management strategy is required.

5.15. Evidence of consultation with transportation asset owners has been provided.

5.16. A movement monitoring strategy of the neighbouring buildings has been proposed.

5.17. It has not been demonstrated that the proposal adheres to the requirements of CPG4 and other Camden planning policy. A schedule of queries for further information is summarised in Appendix 2 of this audit.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Where similar quires have been raised more than once they have only been listed once

Surname	Address	Date	Issue raised	Response
Syed	-	11/08/17	Consideration of ground water during and after construction	The BIA and supporting reports have adequately assessed the characteristics of the ground water and determined that the proposed basement will not significantly impact the wider ground water environment. The construction method chosen adequately takes into account the ground water. See paragraphs 4.8 and 4.9.
Syed	-	11/08/17	Excavation of the basement may undermine foundations of neighbouring buildings, gardens, and below ground services.	Appropriate temporary works details and construction methodology have been provided by the applicant. Further ground movement assessment has been requested of the applicant.
Rochester	-	06/08/17	Nearby spring line not taken into consideration in the design	The ground water beneath the site has been identified as perched water not forming a strategic flow to the wider area.

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Hydrology	Outline details of SUDs strategy required due to potential increase in surface water area to demonstrate compliance with The London Plan.	Open	
2	Stability	Burland Category 2 unacceptable – Measures to reduce this to category 1 for the Western adjoining property required.	Open	
3	Stability	Outline structural calculations are required for the basement piled/liner wall to demonstrate feasibility that stability can be provided in the permanent and temporary case.	Open	

Appendix 3: Supplementary Supporting Documents

None

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