CampbellReith
consulting engineers

# 3 Trinity Close
# London, NW3 1SD

## Basement Impact Assessment
## Audit

For

London Borough of Camden

Project Number: 12727-38

Revision: F1

March 2018

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## Document History and Status

| Revision | Date | Purpose/Status | File Ref | Author | Check | Review |
|---|---|---|---|---|---|---|
| D1 | March 2018 | Comment | KZrm12727-38-060318-3 Trinity Close-D1.doc | K Zapaniotis | R Morley | R Morley |
| F1 | March 2018 | Comment | KZrm12727-38-200318-3 Trinity Close-F1.doc | K Zapaniotis | R Morley | R Morley |
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## Document Details

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|---|---|
| Last saved | 20/03/2018 08:55 |
| Path | KZrm12727-38-200318-3 Trinity Close-F1.doc |
| Author | K Zapaniotis, Bsc MSc |
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| Project Number | 12727-38 |
| Project Name | 3 Trinity Close |
| Planning Reference | 2017/6506/P |

## Contents



## Appendix

## 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 the Planning Submission documentation for 3 Trinity Close (planning reference 2017/6506/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 existing property is located at 3 Trinity Close, NW3 1SD in the London Borough of Camden.

1.5. The site currently comprises a two-storey end of terrace property, with a single storey basement beneath the footprint of the majority of the building. The property also includes a small single storey extension (c. 1.5m x 6m).

1.6. It is proposed to extend the existing basement beneath the footprint of the single storey extension (towards Willoughby Road) including installation of an external staircase and lightwell. The existing basement was constructed in the recent past.

1.7. The Basement Impact Assessment (BIA) and Construction Method Statement been carried out by individuals who possess some of the qualifications, with the qualifications of some authors not provided.

1.8. The BIA has confirmed that the proposed basement of reinforced concrete construction utilising a common form of basement construction and good practise techniques, and will be founded within a suitable soil stratum.

1.9. Site specific ground investigations and ground water monitoring was carried out as part of the previous basement planning applications, 2013/0437/P, 2013/7665/P, which is accepted as suitable for the scale of the proposal.

1.10. It is likely that the ground water will be encountered during the basement foundation excavation. It has been noted that ground water monitoring continues until construction and local dewatering during construction might be necessary; both of which have been deemed acceptable.

1.11. Ground Movement Analysis and Damage Assessment have been carried out to indicate a worst case damage category of Burland Category 0.

1.12. An outline works programme has been provided.

1.13. It can be confirmed that the proposal confirms to the requirements of CPG4.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) in February 2018 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 3 Trinity Close, London NW3 1SD (Reference: 2017/6506/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;

2.5. 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.

2.6. LBC's Audit Instruction described the planning proposal as *"Front basement extension (towards Willoughby Road) including installation of external staircase and lightwell."*

2.7. The Audit Instruction also confirmed that the proposal does not involve any listed building.

2.8. CampbellReith accessed LBC's Planning Portal on 01/02/2018 and 20/02/2018 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (BIA) by LMB Geosolutions Ltd, dated December 2017.
- Architect's existing and proposed General Arrangement Plans & Sections.
- Build Design drawings, dated May 2017.

2.9. The following documents from planning applications 2013/0437/P and 2013/7665/P were also considered within the assessment of the proposal;

- BIA report 120445/HH by Conisbee (planning ref. 2013/0437/P)
- BIA report 61815R1D1 by ESI (planning ref. 2013/7665/P).

## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are BIA Author(s) credentials satisfactory? | Yes | The author of the BIA hold CGeol accreditation. Structural engineering drawings are provided by 'Build Design' whose accreditations are not provided. |
| Is data required by Cl.233 of the GSD presented? | Yes | The required information is generally provided within the BIA. An outline works programme has been provided. |
| 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 | Plan and maps are included in 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:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | No | Justifications are not provided for 'Unknown' answers. |
| Hydrogeology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | No | As per above. |
| Hydrology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | No | As per above. |
| Is a conceptual model presented? | Yes | Ground condition, sequence and depth of strata are presented along with the description of hydrology and hydrogeology of the area. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Land Stability Scoping Provided?<br>Is scoping consistent with screening outcome? | No | Justifications are not provided for 'Unknown' answers. |
| Hydrogeology Scoping Provided?<br>Is scoping consistent with screening outcome? | No | As per above. |
| Hydrology Scoping Provided?<br>Is scoping consistent with screening outcome? | No | As per above. |
| Is factual ground investigation data provided? | No | Local ground conditions are described referencing to previous site investigation reports. |
| Is monitoring data presented? | Yes | BIA. |
| Is the ground investigation informed by a desk study? | Yes | Desk study information is within a previously submitted Conisbee (Consulting engineers) report. |
| Has a site walkover been undertaken? | Yes | A walkover survey was carried out on 14th November 2017. |
| Is the presence/absence of adjacent or nearby basements confirmed? | Yes | It has been confirmed that the adjacent property (2 Trinity Close) does not include a basement, while Willoughby House and no.8 Willoughby Road have a basement. |
| Is a geotechnical interpretation presented? | Yes | Some values for undrained shear strength are given in the BIA referencing to existing literature. It is understood that a CAT1 check form for the retaining wall design has been submitted to the Highways Department given that the wall is close to the pavement/road. |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | As per above. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are reports on other investigations required by screening and scoping presented? | Yes | Screening and scoping stages indicated the need of previous site specific ground investigations. |
| Are the baseline conditions described, based on the GSD? | Yes | |
| Do the base line conditions consider adjacent or nearby basements? | Yes | The presence of any basement within neighbouring properties has been confirmed in the baseline description. |
| Is an Impact Assessment provided? | Yes | |
| Are estimates of ground movement and structural impact presented? | Yes | |
| Is the Impact Assessment appropriate to the matters identified by screen and scoping? | Yes | |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | Yes | The BIA recommends that movement monitoring should be undertaken with surveying points set up prior to commencement of the works and that monitoring should be undertaken at weekly intervals. |
| Has the need for monitoring during construction been considered? | Yes | Mitigation measures to ensure that movements will be contained within acceptable limits include the installation of temporary propping system are included in the BIA. |
| Have the residual (after mitigation) impacts been clearly identified? | Yes | Residual impacts have been clearly identified and are considered to be negligible. |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained? | Yes | A Ground Movement Assessment (GMA) has been undertaken as part of the BIA. The approach followed in the calculation of ground movements is considered to be conservative. |
| Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment? | Yes | |

| Item | Yes/No/NA | Comment |
|---|---|---|
| | | |
| Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area? | Yes | |
| Does report state that damage to surrounding buildings will be no worse than Burland Category 1? | Yes | The GMA states that Burland Category 1 will not be exceeded. |
| 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 engineering consultants, LMB Geosolutions Ltd (LMB) and the individuals concerned in its production have suitable qualifications for the hydrogeological aspects of the assessment.

4.2. The structural drawings and construction method statement have been produced by Build Design, whose qualifications are not provided.

4.3. The LBC Instruction to proceed with the audit identified that the basement proposal does not involve, nor is neighbour to, a listed building.

4.4. The site currently comprises residential properties within a converted religious building, that contains a single storey retrofit basement beneath the footprint of the majority of the building. The property also includes a small single storey extension (c. 1.5m x 6m). It is intended to create a basement beneath the footprint of the single storey extension (towards Willoughby Road) and install a new, external staircase to access the basement. The basement will be single storey with a formation level at c. 3.10m bgl.

4.5. It is understood that site specific ground investigations were performed in July 2012 and June 2013 when the existing basement was constructed. The information from these previous investigations have not been provided with the current application however they have been referenced, primarily a BIA report 120445/HH by Conisbee (planning ref. 2013/0437/P), and BIA report 61815R1D1 by ESI (planning ref. 2013/7665/P). No further site investigations are understood to be undertaken to support the current planning application.

4.6. A summary of ground conditions provided in the BIA reports a limited thickness of Made Ground (0.5 to 0.9m) underlain by the Claygate Member to a depth of 5.7m bgl. London Clay was recorded to lie underneath the Claygate Member to a depth of approximately 10.0m bgl, where the boreholes stopped. Thus, the basement extension will lie over the Claygate Member.

4.7. Four groundwater monitoring visits recorded groundwater levels within the Claygate Member at a depth varying from 2.9 and 3.2m bgl. These levels lay approximately 0.2m above and 0.1m below the proposed basement level.

4.8. The depth of the surrounding properties' ground floor levels are not anticipated to extend below the ground water level. None of the surrounding properties contain basement levels other than that of Willoughby House and No. 8 Willoughby Road.

4.9. The proposed basement extension construction is to utilise L-shaped, reinforced concrete underpins to the perimeter walls to a depth of c. 3.1m bgl. A concrete ground slab is to be cast in between the underpinning toes.

4.10. The construction method describes L-shaped underpinning formed a 'hit and miss' sequence was sufficient detail provided regarding temporary propping and construction sequencing. However the method statement is generic and does not include details related to the specific construction proposal or issues, such as those posed by the extension of an existing basement. However given the modest scale of the proposed basement extension in relation to the existing basement it is felt that adequate construction details are provided.

4.11. The magnitude of clay heave is discussed and is concluded to 'unlikely to exceed a few millimetres or to have any significant impact on the surrounding structures'. While no detailed calculation has been produced to support this assertion, some assessment of heave pressures has been made, and the conclusion of which can be accepted.

4.12. It is understood that a CAT1 check form for the retaining wall design has been submitted to and approved by the Highways Department given that the wall is close to the pavement/road.

4.13. A Ground Movement Analysis (GMA) has been carried out by LMB using CIRIA report C760 to represent the installation of the underpinned foundations as a planar diaphragm wall and on the assumption of an excavation in front of a wall in soft and firm clay. A damage assessment has subsequently been carried out using the principles contained in CIRIA C760 which identified Negligible (Burland Category 0) damage to surrounding properties, which is as permitted by LBC and acceptable. As correctly noted in the BIA, the underpinning techniques should be also carried out with good control of workmanship on site.

4.14. While it has been identified that the basement may extend below the ground water level, it has been concluded that groundwater will not be significantly disrupted by the basement due to any ground water present anticipated as being located within discrete lenses of permeable material rather than a continuous ground water pathway. However, there is the potential for groundwater to ingress the excavation during the works and to rise during seasonal changes or after periods of heavy rainfall. It has been noted that ground water monitoring continues until construction - in order to better understand seasonal variation in ground water level - and local dewatering during construction might be necessary; both of which have been deemed acceptable.

4.15. The BIA confirms that monitoring of the adjoining properties will be undertaken throughout the works at regular intervals, however a monitoring strategy is not provided.

4.16. An adequately detailed outline works programme for construction has been provided.

4.17. It is confirmed that the areas of hard and permeable landscaping will remain the same and thus the volume of surface water inflow from surface run-off will remain unchanged due to the proposed development. It is accepted that the detailed below ground drainage will be developed during the detailed design stage.

4.18. The BIA has shown that it is unclear whether the development is within 100m of a water course or potential spring line which is indicated as being within 250m within the desktop study information. However it is felt that adequate consideration of the hydrology has been carried out with no surface water features within the immediate vicinity of the site.

4.19. It is accepted that the development is not in an area prone to flooding and there are no slope stability concerns.

## 5.0 CONCLUSIONS

5.1. The Basement Impact Assessment (BIA) has been carried out by an established firm of engineering consultants, with the construction method statement carried out by a structural engineering consultancy.

5.2. The LBC Instruction to proceed with the audit identified that the basement proposal does not involve, nor is neighbour to, a listed building.

5.3. The proposal consists of extending an existing single storey retrofit basement to the front of the property beneath a front extension.

5.4. The BIA has confirmed that the proposed basement level will be founded in Claygate Member, with L-shaped reinforced concrete underpinning foundations. It is understood that site specific ground investigations were performed in July 2012 and June 2013 and a desktop study was produced in June 2012. However, they are not presented in the BIA.

5.5. It has been confirmed that the ground water table will be encountered during basement excavation due to excavation for the underpinning. Outline temporary works proposals and allowances for sump pumping of groundwater during excavation have been provided and these are accepted.

5.6. Ground Movement Analysis and Damage Assessment have been carried out to show that Negligible (Burland Category 0) damage to neighbouring properties.

5.7. A CAT1 check form for the retaining wall design has been submitted to the Highways Department given that the proposed wall is close to the pavement/road.

5.8. It has been confirmed that heave movements will be small, with no heave protection proposed.

5.9. Proposals to develop and agree the movement monitoring strategy during the Party Wall Act approval process has been deemed acceptable.

5.10. It is understood that the areas of hard and permeable landscaping will remain the same. It is accepted that below ground drainage will be developed should planning consent is approved.

5.11. It is accepted that the development is not in an area prone to flooding and there are no slope stability concerns.

5.12. An outline works programme has been provided.

5.13. It can be confirmed that the proposal generally confirms to the requirements of CPG4.

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# Appendix 1: Residents' Consultations Comments

None

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# Appendix 2: Audit Query Tracker

Audit Query Tracker

| Query No | Subject | Query | Status | Date closed out |
|---|---|---|---|---|
| 1 | Programme | An outline construction programme is required indicating main phases of works and approximate durations and start dates | Closed | 20/03/18 |

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# Appendix 3: Supplementary Supporting Documents

None

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