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32 Ferncroft Avenue, NW3 7PE

Basement Impact Assessment Audit

For

London Borough of Camden

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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 32 Ferncroft Avenue, NW3 7PE (planning reference 2015/2460/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 BIA has been prepared by an established firm of engineering consultants using individuals who possess suitable accreditation for the ground stability and surface water aspects of the report. However a Geologist with the required accreditation was not involved with the production of the ground water flows aspect of the report.

1.5. The report relies on a BIA and site investigations report from a previous planning application from 2012. Confirmation is required if the current applicant can rely on the information in these reports, as the applicant from that of the 2012 application.

1.6. The basement will be founded in the London Clay Formation, and will be located several metres above the ground water level. The basement will not affect ground water flows; nor are significant inflows of water anticipated during construction.

1.7. The attached neighbouring property has a similar basement; other basements in the vicinity are not confirmed or otherwise. However due to the ground water flow not being affected, the importance of neighbouring basements when considering cumulative impacts is less relevant.

1.8. It is accepted that the surrounding slopes to the development site are stable.

1.9. It is accepted that the area is not subject to surface water flooding. However, proposals to drain the additional surface water flows will have to be agreed with Thames Water.

1.10. Due to the neighbouring property containing a basement, the basement level party wall already exists. It is understood the majority of the neighbouring properties original shallow foundations have been underpinned to form the basement walls. Therefore the attached properties susceptibility to ground movements during the construction phase is greatly diminished. The next nearest property is some 15m away. Due to this and the above point, it is accepted that a

ground movement and damage assessment are not required. There is a proposal of a movement monitoring strategy during excavation and construction and this should be adopted.

1.11. The basement floor slab is proposed to be lowered by approximately 700mm. Clarification is required that this does not undermine the basement walls that are to be retained without carrying out further structural works. The design of the floor slab to accommodate heave should be clarified.

1.12. The sequence of works and temporary works that are required is not clearly indicated, and it is not clear if the underpins are to be formed from the internal ground level, of which the ground floor is largely down for retention. The temporary works and sequence of works information is to be clarified and resubmitted.

1.13. The underpins appear to have been designed as propped with the existing ground floor to provide lateral restraint to the heads of the underpinning. No details of the construction of the existing ground floor is provided nor how this will provide a propping force to the heads of the underpins. Further information is required.

1.14. Items to be clarified and further information required are summarised in Appendix 2. It is recommended that the BIA updated and resubmitted to include this information.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 30/07/2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 32 Ferncroft Avenue, NW3 7PE (2015/2460/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.

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.

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 *"Various external alterations including a rear extension at ground and lower ground floor levels and excavation work to increase the size of the existing basement"*

The Audit Instruction also confirmed that neither 32 Ferncroft Avenue nor any of the neighbouring buildings are listed.

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

- Basement Impact Assessment Report (BIA), Price & Myers. Including appended drawings and reports.
- Architectural drawings, Mobile Studio
    - Existing Plans, Elevations, and Sections
    - Proposed Plans, Elevations, and Sections
    - Site Location Plan
- Site photographs, Mobile Studio.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	A Hydrogeologist with the CGeol accreditation has not had involvement with the production of the subterranean flow aspect of the report.
Is data required by Cl.233 of the GSD presented?	No	No 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	Permanent and temporary works drawings are provided in the appendices of the BIA along with written description of the works in section 3 of the BIA.
Are suitable plan/maps included?	Yes	The Flood Risk Assessment in the BIA contains annotated maps indicating the position of the site relative to the numerous hydrological features that are being checked against. Structural and architectural plans are provided of the proposal itself.
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	Between the BIA and the 2012 report by Vincent and Rymill land stability screening has been carried out with justification provided for no answers.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Between the BIA and the 2012 report by Vincent and Rymill hydrogeology screening has been carried out with justification provided for no answers.
Hydrology Screening:	Yes	Between the BIA and the 2012 report by Vincent and Rymill

Item	Yes/No/NA	Comment
Have appropriate data sources been consulted? Is justification provided for 'No' answers?		hydrology screening has been carried out with justification provided for no answers.
Is a conceptual model presented?	Yes	2012 Report on Ground Investigation.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	A scoping statement is provided for each yes question from the screening stage in the BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	A scoping statement is provided for each yes question from the screening stage in the BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	A scoping statement is provided for each yes question from the screening stage in the BIA.
Is factual ground investigation data provided?	Yes	2012 Report on Ground Investigation.
Is monitoring data presented?	No	It appears that a single water level reading was taken at the time that the borehole investigation was carried out and no further monitoring has taken place.
Is the ground investigation informed by a desk study?	Yes	2012 Report on Ground Investigation section 2.
Has a site walkover been undertaken?	Unclear	It is not clear if a site walk over has been carried out by the authors of the current BIA.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	It is confirmed that the attached property contains a basement. It is not confirmed if other neighbouring properties contain basements, however the next closest property is located some 15m away.

Item	Yes/No/NA	Comment
Is a geotechnical interpretation presented?	Yes	2012 Report on Ground Investigation section 5.
Does the geotechnical interpretation include information on retaining wall design?	Yes	2012 Report on Ground Investigation section 5.
Are reports on other investigations required by screening and scoping presented?	Yes	Flood Risk Assessment.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	Only the attached neighbouring basement is discussed.
Is an Impact Assessment provided?	Yes	Impacts have been discussed in the scoping stage for most questions. Only questions relating to flooding and drainage have been carried through to a formal impact assessment stage where a Flood Risk Assessment has been provided.
Are estimates of ground movement and structural impact presented?	Partially	The 2012 Report on Ground Investigation determines that heave will likely be small in magnitude. It is also discussed that the damage potential to the neighbouring property is thought to be very slight, however no formal movement/damage assessment is carried out.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	The impacts for many of the points raised by screening are discussed in the scoping stage rather than a formal impact assessment discussion. A number of points regarding surface water, ground water, and drainage have been carried through to a formal impact assessment discussion.

Item	Yes/No/NA	Comment
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Clarification required with respect to construction design and sequencing.
Has the need for monitoring during construction been considered?	Yes	Section 5 in the BIA details proposals to carry out movement monitoring during and after the basement formation works.
Have the residual (after mitigation) impacts been clearly identified?	No	Clarification required with respect to construction design and sequencing.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Due to the neighbouring attached property having an existing basement many of the risks associated with stability of this property have been avoided.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	The drained area of hard standing into the sewer system has been increased by 30m^2. Connection will have to be agreed with Thames Water.
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 2?	N/A	A damage assessment was not deemed necessary.
Are non-technical summaries provided?	Partially	An executive summary is provided at the start of the BIA only. However the BIA is written in an easy to understand way without the use of excessive technical terms.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried out by a well-known firm of engineering consultants, Price & Myers, and the individuals concerned in its production have suitable accreditation for covering the surface flow and flooding, and the land stability aspects of the report. However a Hydrogeologist with the suitable accreditation has not been involved with the production of the Subterranean flow aspects of the report.

4.2. The LBC Instruction to proceed with the audit confirmed that neither the site in question nor any of the neighbouring sites contain a listed building.

4.3. The BIA appends a previous BIA report that was produced by Vincent & Rymill, and a geotechnical report produced by K F Geotechnical both for a previous planning application in 2012 that proposed a similar basement scheme. Despite planning permission being granted for this application it is apparent that construction of this basement proposal never materialised.

4.4. The applicant for the 2012 planning application was not the current applicant and it is not known whether the current applicant is entitled to rely on the reports produced by Vincent & Rymill and by K F Geotechnical. This audit has taken the pragmatic approach of reviewing all of the received information, although it should be confirmed that the current applicant can rely on the information provided in the two reports from 2012.

4.5. The 2012 report produced by Vincent & Rymill has been referenced throughout the BIA and its contents have been relied on heavily for the current BIA. The BIA refers to itself as an update to the 2012 report rather than a stand alone assessment.

4.6. The proposal consists of expanding an existing single storey basement that currently covers less than half the footprint of the property. The proposed basement will cover the entire footprint of the property as well as forming a lightwell adjacent to the front bay window, a light well to the flank wall, and a proposed courtyard to the rear.

4.7. The attached neighbouring property contains an existing basement of a similar size as is proposed. Therefore the party wall has been underpinned previously and no further underpinning is proposed along the party wall line.

4.8. Due to the existing neighbouring basement, and the existing partial basement to the property, a number of different construction methods are proposed to form the basement walls. The basement wall along the party wall line is to be retained, the perimeter walls to the existing basements areas are to be retained, reinforced concrete retaining walls are to form the lightwells, and reinforced concrete L shaped underpinning is proposed to the remaining

perimeter that is below the existing building. A reinforced concrete ground bearing slab is proposed at basement level.

4.9. A new concrete ground floor slab is proposed for the rear portion of the property which will span between the L shaped underpinning in this area. It is not clear if the new retaining walls in the other areas of the property are to be propped cantilevers as the floor in these areas has not been shown as being replaced. Clarification is required as to whether all the new retaining walls have been designed as propped cantilevers, the construction of the existing ground floor, and how this will provide propping to the heads of the walls.

4.10. The sequence of works is not clear. The temporary works drawing indicates that the underpins will be excavated in bays, this would imply that underpinning is to be carried out internally by removal of areas of the ground floor. However the ground floor structural plan indicates that the ground floor is mostly to be retained apart from a small area of new concrete slab. The sequence and temporary works drawing in general is difficult to follow and lacking in detail. This should be submitted again clearly indicating the construction sequence and at what stages temporary works are required.

4.11. The BIA mentions that the basement floor slab will be detailed to allow for a predicted long term heave movement. It is not clear if this is by way of designing the slab to be able to resist heave pressures or by providing heave protection such as compressible material beneath the slab and this should be clarified. However it is accepted that there will likely be heave forces due to the basement being in the London Clay and it is noted that heave has been considered.

4.12. Due to the neighbouring attached property containing an existing and similar basement to that which is proposed, it has been deemed that the likelihood of damage to this property is low due to its foundation depth being lower. This conclusion can be generally accepted, however it may be that some areas of the neighbouring structure are still founded at a shallow depth. This should be confirmed prior to construction and methods to mitigate potential damage agreed as part of the Party Wall Award. Care should still be taken both in design and construction to minimise movements as much as possible.

4.13. The sections drawings show the basement floor level being lowered from the existing level by approximately 700mm. The relationship between the existing basement floor and the basement walls that are to be retained is not clear. Clarification is required of this relationship and details to show that lowering the basement slab will not undermine these walls.

4.14. The basement will be founded in the London Clay formation, which was observed to the depth of the single 10m deep borehole that was recorded in the neighbouring garden. Overlaying the London Clay is 0.4m depth of made ground. Ground water was struck at 8.4m; this is well below the proposed depth of the basement at approximately 3m depth. It is accepted that the

basement proposals will not adversely impact the water environment and that significant quantities of water are not expected to be encountered during construction.

4.15. The proposal involves the creation of 30m^2 of additional hardstanding area which is proposed to be discharged into the existing sewer system. It is noted that a soakaway and other forms of SUDs is not possible. The connection to the network will need to be agreed with Thames Water.

4.16. It is accepted that there are no slope stability concerns regarding the proposed development and that despite the road flooding in 1975 the road is now considered at low risk of surface water flooding.

5.0 CONCLUSIONS

5.1. The BIA has been produced by an established firm of engineers, while holding the required accreditation for land stability and surface water flows they do not hold the required accreditation for reporting on subterranean flows.

5.2. The BIA relies on a previous BIA and ground investigations study and report from a previous planning application in 2012. This 2012 planning application was submitted by a different applicant, and it should be confirmed that the current applicant can rely on the contents of these reports.

5.3. The proposal consists of extending an existing partial single storey basement to a basement covering the full plan of the property including new lightwells and courtyard at the front and rear.

5.4. The basement will be founded in the London Clay Formation, and will be located several metres above the ground water level. The basement will not affect ground water flows; nor are significant inflows of water anticipated during construction.

5.5. The attached neighbouring property has a similar basement; other basements in the vicinity are not confirmed or otherwise. However due to the ground water flow not being affected the importance of neighbouring basements when considering cumulative impacts is less relevant.

5.6. It is accepted that the surrounding slopes to the development site are stable.

5.7. It is accepted that the area is not subject to surface water flooding. However, proposals to drain the additional surface water flows will have to be agreed with Thames Water.

5.8. Due to the neighbouring property containing a basement, the basement level party wall already exists. It is understood the majority of the neighbouring properties original shallow foundations have been underpinned to form the basement walls. Therefore the attached properties susceptibility to ground movements during the construction phase is greatly diminished. The next nearest property is some 15m away. Due to this and the above point, it is accepted that a ground movement and damage assessment are not required. There is a proposal of a movement monitoring strategy during excavation and construction and this should be adopted.

5.9. The basement floor slab is proposed to be lowered by approximately 700mm. Clarification is required that this does not undermine the basement walls that are to be retained without carrying out further structural works. The design of the floor slab to accommodate heave should be clarified.

5.10. The sequence of works and temporary works that are required is not clearly indicated, and it is not clear if the underpins are to be formed from the internal ground level, of which the ground floor is largely down for retention. The temporary works and sequence of works information is to be clarified and resubmitted.

5.11. The underpins appear to have been designed as propped with the existing ground floor to provide lateral restraint to the heads of the underpinning. No details of the construction of the existing ground floor is provided nor how this will provide a propping force to the heads of the underpins. Further information is required.

Appendix 1: Resident's Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Suitability of reuse of reports from 2012 planning application	It should be confirmed whether the applicant has permission to reuse the information submitted in the 2012 reports that have been resubmitted to support this application. The authors would not usually provide permission for third parties to rely on the contents of their reports.	Open	
2	Stability	Clarification is required as to whether the retaining walls are required to be propped in the permanent condition at ground floor level, and confirmation of the construction of the existing ground floor and how this will provide a propping force to the walls if this is required.	Open	
3	Stability	Sequence of construction and temporary works requirements are not clear. To be submitted again clearly indicating the sequence that the basement is to be constructed in, the sequence of underpinning, and the temporary works requirements.	Open	
4	Stability	Clarification of the construction of the basement walls that are to be retained and confirmation that lowing the basement slab does not undermine these walls without additional structural works being required.	Open	
5	Stability	Clarification of design of basement floor slabs to accommodate heave.	Open	
6	Surface Water	Connection to sewer network to be agreed with Thames Water.	N/A	
7	BIA	Qualifications of author of hydrogeological screening and scoping to be confirmed. Programme required.	Open	

Appendix 3: Supplementary Supporting Documents

None