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Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12727-73
Revision: F1

September 2018

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	May 2018	Comment	NSns-12727-73-010518-30 Glenilla Road-D1.doc	N Simonini	F Drammeh	F Drammeh
D2	June 2018	Comment	NSns-12727-73-290618-30 Glenilla Road-D2.doc	N Simonini	F Drammeh	F Drammeh
F1	September 2018	Planning	NSns-12727-73-210918-30 Glenilla Road-F1.doc	N Simonini	F Drammeh	F Drammeh

Document Details

Last saved	21/09/2018 15:03
Path	NSns-12727-73-210918-30 Glenilla Road-F1.doc
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Project Number	12727-73
Project Name	30 Glenilla Road
Planning Reference	2018/0932/P

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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 30 Glenilla Road (Camden planning reference 2018/0932/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 qualifications of the individuals involved in the BIA meet Camden Planning Guidance requirements.

1.5. It is stated the basement is to be constructed using a contiguous piled wall and sketches indicating the construction sequence were included in the CMS.

1.6. Contradictory information was given in the previous BIA on the issue of an increase in the area of hardstanding. The issue has now been addressed.

1.7. The revised CMS concludes the risk of flooding is low as discussed in Section 4. A topographic survey has been presented, as requested, to support this statement. An outline drainage strategy has also been presented as requested following the initial audit.

1.8. The presence or absence of basements beneath the neighbouring properties have been confirmed in the revised documents as requested.

1.9. A utilities search has been undertaken as requested.

1.10. The BIA identifies the presence of trees within the site although it is stated these would not be affected by the construction proposals which is confirmed in the arboricultural assessment.

1.11. Preliminary retaining wall design has been included in the BIA reflecting the construction sequence and the ground model indicated in the report.

1.12. The GMA has been updated to reflect the proposed construction methodology and damage categories for the neighbouring properties are within 1 (Very slightly).

1.13. An outline monitoring strategy with trigger levels based on the updated GMA has been presented after being requested in the initial audit.

1.14. It is accepted that there are no slope stability concerns regarding the basement development.

1.15. On the basis of the additional information presented, the BIA meets the requirements of the Camden Planning Guidance: Basements.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 30 Glenilla Road, London NW3 4AN (Reference: 2018/0932/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 Basements. March 2018.
- 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,

d) 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 *"Demolition of existing dwelling house and erection of four storey replacement dwelling house with single storey basement and associated hard and soft landscaping works, including erection of garden room to rear and bin store to front of property."*

2.6. The audit instruction also confirmed that the proposal does not involve any listed building.

2.7. CampbellReith accessed LBC's Planning Portal on 2 May 2018 and gained access to the following relevant documents for audit purposes:

- Construction Method Statement/Basement Impact Assessment Report (BIA) by Davis Maguire (DMAG-1650-CMS), dated February 2018.
- Desk Study & Ground Investigation Report by GEA Ltd (Ref. J17299), dated February 2018.
- Ben Adam's Architects Planning Application drawings:

  Proposed site plan and ground floor (P004/A)

  Proposed basement plan (P199)

  Proposed ground floor plan (P200)

  Proposed section A-A (P500)

  Proposed section B-B (P501)

  Proposed north east Elevation (P400)

  Proposed south elevation (P403)

  Proposed north west Elevation (P401)

  Proposed south east Elevation (P402)

  Existing section A-A (P130/A)

  Existing ground floor plan (P100/A)

  Existing north west elevation (P121/A)

  Existing north east elevation (P120/A)

  Existing south west elevation (P123/A)

  Existing south east elevation (P122/A)
- Design and access statement (Ben Adams Architects, 17-058, February 2018)
- Arboricultural Assessment (Arboricultural Solutions LLP, November 2016)

2.8. The following documents were updated in response to the queries raised and comments on the initial audit. These were received via email from the planning officer on 10 June 2018. The documents are available on the planning portal and have therefore not been included on Appendix 3.

- Desk Study & Ground Investigation Report by GEA Ltd (Ref. J17299), dated 8 June 2018 (Issue No 2).
- Construction Method Statement/Basement Impact Assessment Report (BIA) by Davis Maguire (DMAG-1650-CMS), dated June 2018 (Revision PO3).

2.9. The following documents were updated in response to the queries raised and comments on the second audit. These were received via email on 10 September 2018.

- Desk Study & Ground Investigation Report by GEA Ltd (Ref. J17299), dated 7 August 2018 (Issue No 4).
- Construction Method Statement/Basement Impact Assessment Report (BIA) by Davis Maguire (DMAG-1650-CMS), dated 8 August 2018 (Revision PO3).

2.10. Further queries were raised on the construction sequence in the ground movement analysis and additional information was provided via email on 19 September 2018. This together with the documents noted on paragraph 2.9 are available on the planning portal and have therefore not been included on Appendix 3.

- Retaining wall preliminary design using WALLAP (J17299 Wallap_ULS(MP)_ULS1.pdf and J17299 Wallap_ULS(MP)_ULS2.pdf, outputs for ULS1 and ULS2 case).
- Construction sequence adjacent to No. 28b and indicative temporary propping layout by Davies Maguire (drawings No. SK-017 and SK-018).

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	GEA document control. See Audit paragraph 4.1.
Is data required by Cl.233 of the GSD presented?	Yes	Utilities search was requested in the previous audit and it has now been included in the BIA. A works programme is also included.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Maps correctly indicating site the site location are now included in the revised Davies Maguire CMS (see Audit paragraph 4.7).
Are suitable plan/maps included?	Yes	Maps correctly indicating site the site location are now included in the revised Davies Maguire CMS.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	As above.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 3.1.1 of the GEA initial report made reference to some of the relevant maps but these were not included. Some of these maps are included in the CMS.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	A change in the proportion of hard surfaced areas has now been confirmed in the BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appropriate data sources have now been consulted and reported in the BIA.
Is a conceptual model presented?	Yes	Section 7 of the GEA report presents a summary of the ground conditions.
Land Stability Scoping Provided?	Yes	Section 4.1 of the GEA report.

Item	Yes/No/NA	Comment
Is scoping consistent with screening outcome?		
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 4.1 of the GEA report.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Hydrology scoping has been updated and is now consistent with the screening outcome.
Is factual ground investigation data provided?	Yes	GEA report Appendix.
Is monitoring data presented?	Yes	Section 5.4 of the GEA report.
Is the ground investigation informed by a desk study?	Yes	Desk study information presented in Section 2 of the GEA report.
Has a site walkover been undertaken?	Yes	Section 2.1 of the GEA report.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 4.5.1 of the revised CMS states No 32 does not comprise a basement with No 28 indicated to include a single storey basement (see Audit paragraph 4.11).
Is a geotechnical interpretation presented?	Yes	Section 8 of the GEA report.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 8.1.1 of the GEA report.
Are reports on other investigations required by screening and scoping presented?	Yes	A surface water drainage strategy has now been presented in the BIA.
Are the baseline conditions described, based on the GSD?	Yes	Presence or absence of neighbouring property basements has now been confirmed following a request on the initial audit report.
Do the base line conditions consider adjacent or nearby basements?	Yes	As above.
Is an Impact Assessment provided?	Yes	Section 10 of the GEA report.
Are estimates of ground movement and structural impact presented?	Yes	Section 9 of the GEA report.

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	BIA and supporting documents.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	All potential issues have now been adequately addressed (see Audit paragraphs 4.11 and 4.16).
Has the need for monitoring during construction been considered?	Yes	Outline ground movements monitoring proposal is now presented (see Audit paragraph 4.17).
Have the residual (after mitigation) impacts been clearly identified?	Yes	Section 11 of the GEA report.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	GMA has been revised reflecting the proposed development (see Audit paragraph 4.15 and 4.16).
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	A drainage strategy has been included in Section 5.2.3 of the CMS (see Audit paragraph 4.9).
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Revised GMA indicates damage to surroundings buildings would be no worse than Burland Category 1 (see Audit paragraph 4.16).
Are non-technical summaries provided?	Yes	GEA report.

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) was undertaken by GEA and the individuals involved hold CEng MICE, CGeol and CWEM MCIWEM qualifications. A construction method statement (CMS) undertaken by Davies Maguire Ltd is presented and the reviewer holds CEng MIStructE qualifications.

4.2. The initial GEA report made reference to CPG4: Basements and Lightwells together with the Local Plan (2017) and other guidance documents. It was noted in the initial audit that CPG4 is superseded by Camden Policy Guidance: Basements March 2018 and any future revisions should make reference to this. This has been addressed in the revised documents.

4.3. The main BIA was prepared by GEA with the CMS undertaken by Davies Maguire. Following the initial audit, it was requested that the documents be made consistent with each other. The construction methodology is now consistent in the two documents. This is further discussed below.

4.4. The site comprises a two storey detached residential structure with a garden at the rear. The proposed development includes the demolition of existing building and erection of a four storey building with a single storey basement. The depth of excavation is indicated to be 3.40m and the basement is indicated to be constructed using a contiguous piled wall.

4.5. A ground investigation undertaken by GEA Ltd identified Made Ground to a maximum 2.50m bgl underlain by Superficial Deposits described as clay to up to 4.00m bgl overlying the London Clay which was proven to 20.00m bgl. Groundwater was monitored at c. 0.70m which is within the proposed basement depth.

4.6. Groundwater monitoring was undertaken on a single occasion recording the shallowest groundwater levels to be within the Head Deposits at 0.73m bgl at the rear of the house. The screening assessment ruled out groundwater as a potential issues, however, it is stated in the conclusions that '*it may be prudent to carry out a rising head test within the existing standpipes to confirm the likely inflow rate. Shallow inflows of localised perched water are likely to be encountered from within the made ground, which should be adequately controlled through sump pumping […] It would be prudent to carry out trial pits on the site once the existing house has been demolished to provide further information about the existing groundwater regime […]'.*

4.7. Although some of the relevant figures/maps from the Arup GSD and other guidance documents were referenced in the initial GEA report, these were not included with the site location indicated to support the statements made in the screening assessments. The Davies Maguire

report previously included flood risk maps which did not correctly identify the location of the site. This has now been addressed as requested.

4.8. Clarity was requested in the previous audit on the hydrogeology and hydrology assessments regarding increase in the area of hardstanding that could result in a decreased recharge to the underlying ground and an increase in surface water run-off. This has now been confirmed in both the documents.

4.9. An outline drainage strategy which was previously requested has now been presented in Section 5.2.3 of the CMS. This includes the use of permeable paving and an underlying attenuation system. It is accepted that the proposed overall outflow value will be close to the existing so will not have a negative impact on the existing Thames Water drainage network.

4.10. No 28, one of the neighbouring properties is indicated to be located in an area of high risk for surface water flooding, although the site itself is not. It should be noted the boundaries of these areas are not exact. The CMS states that the driveway to No 30 is at a similar level to the highway unlike No 28 which has a downward sloping drive which accounts for the high flood risk indicated. A topographic survey that was requested in the previous audit to support this statement has now been presented. The site is not indicated to be susceptible to any other type of flooding.

4.11. Following the initial audit, it was requested that the presence or absence of basements beneath the neighbouring properties and the depths of these where present be confirmed. Section 4.5.1 of the revised CMS states No 32 does not comprise a basement with No 28 indicated to include a single storey basement.

4.12. A utilities search was requested in the previous audit. This has been undertaken and is presented in the BIA Appendices. The information presented does not shown any utilities to be in the zone of influence of the basement.

4.13. It is stated in the BIA and CMS that although trees are present within the site, these would not be affected by the construction proposals. One tree has been recommended for removal due to its poor condition, while the rest of the trees surveyed can be retained with tree protection installed.

4.14. Outline structural proposals were presented on sketches which also indicate temporary propping in the initial CMS. Outline calculations or details indicating the proposed wall depth was requested in the previous audit and it has now been included (WALLAP calculations in the BIA Appendix). This indicates a 450mm diameter contiguous piled wall to a depth of c. 6.00m bgl.

4.15. A Ground Movement Assessment (GMA) was undertaken by GEA Ltd, however, this was based on reinforced concrete walls rather than the secant piled wall indicated in the CMS. It was requested that a revised GMA based on the proposed construction methodology and taking into consideration the structural proposals presented.

4.16. A revised GMA has been presented in the GEA report taking into account the proposed construction methodology and structural proposals. The ground movement analysis undertaken using Oasys XDisp indicates a contiguous wall. Horizontal ground movements due to excavation are determined from a WALLAP analysis and imported into the XDisp to complete the analysis.

4.17. The construction sequence in the WALLAP analysis is not considered to be practically achievable in terms of gap allowed between temporary props and excavation levels. The analysis however demonstrates that by adopting a series of temporary propping, ground movements can be kept within acceptable limits. Predicted damage to the neighbouring properties determined in the updated GMA are limited to Category 1 (very slight).

4.18. The need for movement monitoring was considered in the GMA output, however outline proposals with trigger levels were not provided and this was requested in the previous audit. Outline trigger values based on predicted ground movements has been provided in the updated BIA.

4.19. An indicative works programme is now included as required by the planning guidance. A detailed programme should be submitted by the appointed contractor at a later date.

4.20. It is accepted that there are no slope stability concerns regarding the basement development.

5.0 CONCLUSIONS

5.1. The qualifications of the individuals involved in the BIA meet Camden Planning Guidance requirements.

5.2. It is stated the basement is to be constructed using a contiguous piled wall and sketches indicating the construction sequence were included in the CMS.

5.3. Contradictory information was given in the previous BIA on the issue of an increase in the area of hardstanding. The issue has now been addressed.

5.4. The revised CMS concludes the risk of flooding is low as discussed in Section 4. A topographic survey has been presented, as requested, to support this statement. An outline drainage strategy has also been presented as requested following the initial audit.

5.5. The presence or absence of basements beneath the neighbouring properties have been confirmed in the revised documents as requested.

5.6. A utilities search has been undertaken as requested.

5.7. The BIA identifies the presence of trees within the site although it is stated these would not be affected by the construction proposals which is confirmed in the arboricultural assessment.

5.8. Preliminary retaining wall design has been included in the BIA reflecting the construction sequence and the ground model indicated in the report.

5.9. The GMA has been updated to reflect the proposed construction methodology and damage categories for the neighbouring properties are within 1 (Very slightly).

5.10. An outline monitoring strategy with trigger levels based on the updated GMA has been presented as requested following the initial audit.

5.11. It is accepted that there are no slope stability concerns regarding the basement development.

5.12. On the basis of the additional information presented, the BIA meets the requirements of the Camden Planning Guidance: Basements.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker*

Query No	Subject	Query	Status	Date closed out
1	BIA format	Planning guidance referenced in the BIA superseded.	Closed - Current Planning guidance now correctly referenced. See Audit paragraph 4.2.	27/06/18
2	BIA format	Outline construction programme not presented.	Closed - Presented in revised CMS. See Audit paragraph 4.18.	27/06/18
3	BIA format/hydrology/hydrogeology.	Contradictory information on the increase in paved areas.	Closed – Information is now consistent. See Audit paragraph 4.8.	21/09/18
4	BIA format	Utility search not undertaken.	Closed – It has been presented in the BIA Appendix.	21/09/18
5	Hydrology	Site incorrectly identified on flood risk maps, no FRA and drainage strategy.	Maps identifying correct site location now included. Flood risk assessed in updated CMS. Closed- Topographic survey has been provided to support conclusions relating to surface water flood risk. Drainage strategy has also been included.	21/09/18
6	Stability	No outline retaining wall calculations.	Closed – Preliminary retaining wall design is now consistent with proposals. See Audit paragraph 4.14.	21/09/18
7	Stability	GMA not based on proposed construction methodology. Revised GMA should be provided.	Closed - GMA updated and consistent with proposals. See Audit paragraph 4.15 and 4.16.	21/09/18
8	Stability	Monitoring proposal.	Closed – Outline proposal with trigger values based on updated GMA is presented. See Audit paragraph 4.17.	21/09/18

Appendix 3: Supplementary Supporting Documents

None

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