### CampbellReith consulting engineers

# Garages and land adjacent to 25 – 26

Wolsey Mews

London, NW5 2DX

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12066-64

Revision: D1

November 2015

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#### **Document Details**

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Structural • Civil • Environmental • Geotechnical • Transportation

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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 the Garages and land adjacent to 25 26 Wolsey Mews (planning reference 2015/3741/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. Input from a Chartered Geologist is required with respect to groundwater flow.
- 1.5. The basement will be constructed using a contiguous pile wall and plans are required to indicate the construction sequence. These should include an indicative temporary works propping arrangement to demonstrate horizontal movements of the piled wall will be minimised.
- 1.6. Clarification on the exact depth of the basement is requested. This should also be indicated on more detailed plans and sections of the proposed development which are also requested.
- 1.7. Confirmation is requested on the presence or absence of a basement beneath 3 7 Islip Street and 26 Wolsey Mews.
- 1.8. It is requested a better laid out screening with a definitive 'Yes' or 'No' response to the questions as well as justification to the 'No' answers is presented.
- 1.9. It is requested that scoping and impact assessment as required by the Arup GSD is presented with the information made consistent with the screening.
- 1.10. A sufficient deskstudy and site walkover were not undertaken and this is required.
- 1.11. The BIA has not demonstrated that the development will not affect the hydrogeology of the surrounding area or that it would not cause detrimental effects on surface water discharges into the network drainage system.
- 1.12. Mitigation measures are required in the event of flooding as a result of infrastructure failure.
- 1.13. A geotechnical interpretation is not presented and this is required. This should include information on retaining wall design.

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- 1.14. Supporting analyses for ground movements have not been provided and this is required.
- 1.15. The BIA does not consider the impact of the development on the roadway and additional information is required to demonstrate that the roadway and any utilities running beneath will not be adversely affected by the development.
- 1.16. It is not accepted that residual issues as a result of the development will not remain as stated in the BIA report conclusions and it is requested that these are considered in the design of the basement.
- 1.17. A construction management plan has not been provided and this is requested.
- 1.18. A works programme has not been provided and this is requested.
- 1.19. Proposals are provided for movement monitoring strategy and such measures should be adopted. These should include horizontal movements as well as vertical movements and target points should not be limited to only 25 Wolsey Mews. Condition surveys are recommended.
- 1.20. Queries and requests for further information are summarised in Appendix 2.

### 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 9 October 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for the Garages and land adjacent to 25 26 Wolsey Mews, Camden Reference 2015/3741/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 "*Erection of 2 x 2 storey plus basement dwellings following demolition of the three single storey garages."*
- 2.6. CampbellReith accessed LBC's Planning Portal on 30 October 2015 and gained access to the following relevant documents for audit purposes:
  - Basement Impact Assessment Report Ellis and Moore Consulting Engineers Ltd, dated June 2015 which includes as part of the appendices a factual Ground Investigation Report by Chelmer Site Investigations , dated March 2015

• Burd Harward Architects drawings Nos:

1590\_E01

1590\_E02

1590\_E03

1590\_E04

1590\_H04

1590\_P01C 1590\_P02C

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1590\_P04A

1590\_P05B

1590\_P06A

1590\_P07

• 2 No residents' consultation responses



### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	No	See Audit paragraph 4.1
Is data required by Cl.233 of the GSD presented?	No	The construction method and scheme drawings included in Appendix 2 of the BIA do not give the depth of the basement (see Audit paragraph 4.3) and a programme of works has not 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?	No	Although a construction method statement is included in Appendix 2 of the BIA, the depth of the basement is not stated.
Are suitable plan/maps included?	No	Inadequate. The scheme drawings included in Appendix 2 of the BIA report show the proposed layout, however, these are not detailed enough as required by cl. 233 of the Arup GSD. Plans for each stage of the basement excavation and construction are not included (see Audit paragraph 4.2).
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	No	See Audit paragraphs 4.2 and 4.4.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	See Audit paragraph 4.6. A definitive 'Yes' or 'No' response is not given to some of the questions and the responses did not make any reference to the relevant Arup GSD maps although it is noted that Stage 2 (scoping) of the BIA report states these have been consulted.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	As above. See Audit paragraph 4.6.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	As above. See Audit paragraph 4.6. Q6 was not answered.



Item	Yes/No/NA	Comment
Is a conceptual model presented?	No	A summary of the ground investigation is given in Stage 3 of the BIA report, however, this is inadequate and not in accordance with cl. 254 of the Arup GSD (see Audit paragraph 4.3)
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	The BIA includes a scoping section, however, this is not in accordance with the Arup GSD and is not consistent with the screening (see Audit paragraph 4.7)
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	No	As above. Not consistent with the screening (see Audit paragraph 4.7)
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	No	As above. Not consistent with the screening (see Audit paragraph 4.7)
Is factual ground investigation data provided?	Yes	Appendix 1 of the BIA report
Is monitoring data presented?	No	It appears that monitoring was not undertaken as part of the ground investigation
Is the ground investigation informed by a desk study?	No	Reference is made to information obtained from various sources under the scoping section of the BIA, however, this is not accepted as a sufficient deskstudy (see Audit paragraph 4.8).
Has a site walkover been undertaken?	No	No reference is made to a site walkover in the BIA or ground investigation report (GIR)
Is the presence/absence of adjacent or nearby basements confirmed?	Incomplete	Section 2.0 of the BIA report notes a basement is not present beneath the property to the 'right' (assumed to be 25 Wolsey Mews), however, makes no confirmation of the presence or absence of a basement beneath 26 Wolsey Mews and the property to the 'left' (assumed to be 3 -7 Islip Street). See Audit paragraph 4.5.
Is a geotechnical interpretation presented?	No	The GIR only includes factual information
Does the geotechnical interpretation include information on retaining wall design?	No	The GIR only includes factual information



Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	No	No such reports were identified as being required
Are baseline conditions described, based on the GSD?	Yes	Although this is considered incomplete.
Do the base line conditions consider adjacent or nearby basements?	Incomplete	It is noted that the presence or absence of a basement beneath 26 Wolsey Mews and 3 – 7 Islip Street was not confirmed.
Is an Impact Assessment provided?	Inadequate	The impact assessment presented is not in accordance with the Arup GSD and is not consistent with the screening
Are estimates of ground movement and structural impact presented?	Yes	The BIA includes an estimate of likely settlements and anticipated damage category, however, supporting analyses are not provided (see Audit paragraph 4.14).
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	No	Not an impact assessment (see Audit paragraph 4.7)
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	See Audit paragraph 4.17
Has the need for monitoring during construction been considered?	Yes	The BIA report recommends monitoring points on the neighbouring property to the 'right' but no such measures are recommended for the property to the 'left' (see Audit paragraph 4.20)
Have the residual (after mitigation) impacts been clearly identified?	No	The BIA concludes that there should be no residual issues due to the construction of the basement.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	No	Not demonstrated (see Audit paragraph 4.14 to 4.17)
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	No	Not demonstrated (see Audit paragraph 4.11)
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Not demonstrated.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Basement construction methodology Section 10, however, no supporting analyses provided (see Audit paragraph 4.14)



Item	Yes/No/NA	Comment
Are non-technical summaries provided?	No	

### 4.0 **DISCUSSION**

- 4.1. The Basement Impact Assessment (BIA) was prepared by a well-established firm of consultants, Ellis and Moore, and the author has CEng MICE qualifications. However, preparation of a BIA also requires the involvement of a Chartered Geologist (C. Geol) with respect to appraisal of groundwater flow and this does not appear to be the case.
- 4.2. The basement is to be constructed by installing a contiguous pile wall. Plans to indicate the construction sequence are not provided and these are requested. An indicative temporary works propping arrangement should also be provided to confirm that the head of the contiguous piles will remain sufficiently stiff to ensure horizontal movements of the piled wall will be minimised.
- 4.3. The depth of the basement is not given in the BIA report or the proposed drawings although the subterranean screening appears to suggest it is approximately 3m bgl. The ground investigation encountered Made Ground over possible Head Deposits described as gravelly clay and clayey gravel overlying the London Clay. Confirmation is needed as to the exact depth of the basement to determine which stratum the basement will be founded in.
- 4.4. The proposed plans and sections are not detailed enough and it is requested that detailed plans and sections showing the dimensions of the proposed development are provided.
- 4.5. The BIA report states that a basement is not present beneath the property to the 'right' (assumed to be 25 Wolsey Mews) and that to the 'left' a building is not present at the site boundary. It is noted that whilst the property to the 'left' (3 7 Islip Street) is detached, it is still within the zone of influence of the proposed basement. The presence or absence of a basement on this property as well as 26 Wolsey Mews needs to be confirmed.
- 4.6. The BIA screening does not include the questions on the flowcharts as given in Appendix E of the Arup GSD. Some of the responses do not include a definitive 'Yes' or 'No' therefore in some cases it is unclear if the issue needs to carried forward to scoping or not. A response is not given to Question 6 of the surface flow and flooding screening flowchart which relates to flood risk.
- 4.7. The scoping stage presented as Stage 2 in the BIA report does not identify the potential impacts of the issues considered as matters of concern in the screening as required by the Arup GSD. A summary of information obtained from maps and other sources is presented as scoping. Contradicting information regarding the drainage is given in Stage 4 (impact assessment) of the BIA.
- 4.8. A sufficient desk study and a site walkover as required by the Arup GSD does not appear to have been undertaken. It is noted that a summary of information from several sources is

included in Stage 2 (scoping) of the BIA report, however, this is considered inadequate as a deskstudy.

- 4.9. A groundwater level of 4.60m bgl is indicated in Stage 3 of the BIA report. The results of a groundwater level monitoring programme are not presented. This value appears to relate to standing level recorded at the end of drilling. This is unlikely to represent equilibrium conditions. Conversely the screening appears to suggest a water level of about 3m bgl. Groundwater was encountered during drilling at 2.10 and 2.90m bgl within the possible Head Deposits. Further groundwater monitoring is required. Although it is stated in Stage 4 of the BIA report that it is likely that pumping may be required during excavation, the BIA has not demonstrated that the development will not affect the hydrogeology of the surrounding area nor appear to consider the potential for this pumping to generate ground movements.
- 4.10. Stage 3 of the BIA report states that groundwater will be investigated further at the start of the site works. Given the above factors we would suggest that leaving matters associated with groundwater level unresolved until the start of site works is not acceptable. A suitable programme of groundwater monitoring needs to have been completed as part of the design process.
- 4.11. The BIA surface flow and screening states there will be increased surface water as a result of the development and that this will be attenuated into the Thames Water drains. This is contradictory to the statement in the impact assessment that the proposed drainage will take care of any rainfall and runoff as it is likely to be similar and also the subterranean screening which states the surface water will be attenuated to the same level. Clarification is requested. The BIA has not demonstrated that the development will have little detrimental effect on the surface water discharges into the network drainage system.
- 4.12. The BIA concludes that the site is in a low risk area with respect to flooding. Whilst this is accepted, it is noted that Caversham Road, just to the south of the site flooded in 2002. Stage 3 of the BIA reports notes the presence of a combined sewer beneath the roadway. No mitigation measures have been proposed in the event of infrastructure failure which could result in basement flooding.
- 4.13. It is noted that a geotechnical interpretation is not presented. The ground investigation report only contained factual information. A geotechnical interpretation which includes information on retaining wall design is requested.
- 4.14. Whilst the BIA concludes that settlements in the order of 15 to 20mm are anticipated with damage Category 2, supporting analyses have not been provided. Given that the proposal involves the installation of a contiguous pile wall and the proximity to adjacent structures, a quantitative ground movement analysis is required. This should consider the effects of

demolition, excavation and wall installation on the neighbouring properties and should include calculations for both horizontal and vertical movements. It should also consider the proposed sequence of construction and propping requirements.

- 4.15. The BIA does not consider the impact of the development on the roadway despite stating in the screening that the development is within 5m of a roadway. Additional information is required to demonstrate that the roadway and any utilities running beneath will not be adversely affected by the development.
- 4.16. It is noted that the BIA screening states there is a history of subsidence in the area and this will be taken into account in structural design although no such designs are presented.
- 4.17. The BIA concludes that there should be no residual issues affecting the neighbouring property or the surrounding land. This is not accepted and appropriate mitigation measures should be incorporated into the scheme as well as consideration given to residual impacts.
- 4.18. A construction management plan has not been provided and this is requested.
- 4.19. A works programme as required by cl.233 of the Arup GSD has not been provided and this is requested.
- 4.20. Proposals are provided for monitoring and whilst such a mitigation measure should be adopted, it is noted that the proposal only includes measurement of vertical movements and target points on the property to the 'right' (assumed to be 25 Wolsey Mews). Horizontal movements as well as vertical movements will need to be monitored and target points should not be limited to only 25 Wolsey Mews. Condition surveys are recommended.

### 5.0 CONCLUSIONS

- 5.1. The BIA report author is a Chartered Civil Engineer, however, the input of a Chartered Geologist is required with respect to the appraisal of groundwater flow.
- 5.2. It is requested that plans are provided to indicate the construction sequence. These should include an indicative temporary works propping arrangement to ensure horizontal movements of the piled wall will be minimised.
- 5.3. Clarification on the exact depth of the basement is requested. This should also be shown on more detailed plans and sections of the proposed development which are requested.
- 5.4. Confirmation is needed on the presence or absence of a basement beneath 3 7 Islip Street and 26 Wolsey Mews.
- 5.5. A definitive 'Yes' or 'No' response was not given to some of the screening questions and one of the questions relating to flood risk was not answered. It is requested a better laid out screening with a definitive 'Yes' or 'No' response to all the questions as well as justification to the 'No' answers is presented.
- 5.6. The scoping and the impact assessment as presented in the BIA report are not in accordance with the Arup GSD and are not consistent with the screening. None of the issues raised in the screening are addressed. It is requested that scoping and impact assessment as required by the Arup GSD is presented with the information made consistent with the screening.
- 5.7. A sufficient deskstudy and a site walkover were not undertaken and this is required.
- 5.8. The BIA has not demonstrated that the development will not affect the hydrogeology of the surrounding area or that it would not cause detrimental effects on surface water discharges into the network drainage system.
- 5.9. Mitigation measures are required in the event of flooding from infrastructure failure.
- 5.10. A geotechnical interpretation is not presented and this is required. This should include information on retaining wall design.
- 5.11. Supporting analyses for the ground movement assessment have not been provided and this is required.
- 5.12. The BIA does not consider the impact of the development on the roadway and additional information is required to demonstrate that the roadway and any utilities running beneath will not be adversely affected by the development.

- 5.13. It is not accepted that residual issues as a result of the development will not remain as stated in the BIA conclusions and it is requested that these are considered in the design of the basement.
- 5.14. A construction management plan has not been provided and this is requested.
- 5.15. A works programme has not been provided and this is requested.
- 5.16. Proposals are provided for movement monitoring strategy and such measures should be adopted. This should include horizontal movements as well as vertical movements and target points should not be limited to only 25 Wolsey Mews. Condition surveys are recommended.

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



#### Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Chubb	26 Wolsey Mews, NW5 2DX	Not dated	None. Support development	N/A
Francis	Not given but states building is adjacent to the development	03-08-15	Lighting issues and alteration to safe environment for victims supported and disagree with applicant's light assessment	N/A
			Proximity of the development	N/A
			Stability and ground movements	See Audit paragraphs 4.14 to 4.17

**Appendix 2: Audit Query Tracker** 



#### Audit Query Tracker

Query No	Subject	Query	Status	Date Closed Out
1	BIA Author Qualifications	Input of a Chartered Geologist is required with respect to the appraisal of groundwater flow	To be provided in updated document	
2	BIA format	Screening, scoping, impact assessment not undertaken in accordance with Arup GSD	To be provided in updated document	
3	BIA format	Non technical summaries and conceptual model not provided	To be provided in updated document	
4	BIA format	A sufficient deskstudy and site walkover not undertaken	To be provided in updated document	
5	BIA format	A works programme has not been submitted as required by cl.233 of the GSD	To be provided in updated document	
6	BIA format	Geotechnical interpretation not provided	To be provided in updated document	
7	Hydrogeology	Groundwater level to be reconsidered	To be provided in updated document	
8	Surface flow and flooding & Subterranean flow	Contradictory information in Stage 1 and Stage 4 of the BIA report	Clarification is requested in updated document	
9	Flooding	Mitigation measures not provided in the event of flooding due to infrastructure failure	To be provided in updated document	
10	Stability	Supporting analyses for ground movement assessment not provided	To be provided in updated document	
11	Stability	No impact assessment on the roadway	To be provided in updated document	
12	Stability	BIA offers monitoring of vertical movements building to the 'right' (assumed to be 25 Wolsey Mews) but does not appear to	To be provided in updated document. Monitoring regime and target levels to be agreed with Party	



		consider horizontal movements and other properties such as 26 Wolsey Mews and 3- 7 Islip Street	Wall Surveyor.	
13	Construction management plan	Not provided	To be provided in updated document	



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

None

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