

**17 Wadham Gardens
London NW3 3DN**

**Basement Impact Assessment
Audit**

For
London Borough of Camden

Project Number: 12066-25

Rev: D1

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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 17 Wadham Gardens, London NW3 3DN (planning reference 2015/1987/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 review it against an agreed audit check list.
- 1.4. It has been confirmed that the development site does not involve a listed building, nor is it in the neighbourhood of listed buildings.
- 1.5. The BIA has confirmed that the proposed basement will be founded on the London Clay and that the surrounding slopes are stable.
- 1.6. Localised perched groundwater may be encountered in the Made Ground above the London Clay and this will need to be controlled to permit excavation of the basement.
- 1.7. The proposed basement will be excavated and constructed utilising established techniques; however estimation of ground movements and any associated affect on adjacent structures needs to be addressed.
- 1.8. It is accepted that the risk of surface water flooding the buildings is low.
- 1.9. No ground movement assessment has been presented to indicate that damage to the adjacent properties will be Burland Category 2 or less. Confirmation of the nature and depth of the neighbouring foundations is required.
- 1.10. Works adjacent to the Primrose Hill buried tunnel are to be agreed with Network Rail. Updated drawings show building footprint to be 'stepped in level' to avoid the 'exclusion zone', but it is not known if the exclusion zone has been agreed with Network Rail.
- 1.11. The BIA lacks a construction method statement which is required to confirm matters such as the proposed sequencing and methodology, monitoring of adjacent structures and groundwater control during construction.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 8th July 2015 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 17 Wadham Gardens, Camden Reference 2015/1987/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 the "*Basement excavation including front and rear lightwells and car lift in front garden, dormer extension on rear and east roof planes, installation of turret roof above 1st floor rear bay windows, installation of rooflight over ground floor rear extension, alterations to rear, side and front elevations and installation of enclosed air conditions unit to northeast rear garden corner.*"

The Audit Instruction also confirmed that the basement proposals did not involve a listed building nor does the site neighbour listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 10th August 2015 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment (March 2015 Pringuer – James)
- Drawings;
 - 462-PA-04 Basement Plan (gpad Architects)
 - 462-PA-03 Lower Ground Floor Plan (gpad Architects)
- Planning and Design Statement (planningSense)
- A revised Basement Impact Assessment Rev A June 2015 was received by email on 13 August, this document is also included in the audit.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The authors of the BIA and the Ground Investigation report both have suitable credentials.
Is data required by Cl.233 of the GSD presented?	No	Work programme and construction method statement not 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	BIA Section 3.
Are suitable plan/maps included?	Yes	BIA and drawings.
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?	No	BIA Section 2.6.2. Q14 Network Rail tunnel exclusion zone to be confirmed.
Hydrogeology Screening: Groundwater Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 2.6.1
Hydrology Screening: Surface Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	BIA Section 2.6.3
Is a conceptual model presented?	Yes	Ground model in Ground investigation report Section 5.0
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	No	BIA Section 3.1.2 Works in the vicinity of tunnel require agreement with Network Rail.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	NA	Not Applicable
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	NA	Not Applicable
Is factual ground investigation data provided?	Yes	Ground investigation report Appendix C
Is monitoring data presented?	No	Record of standpipes installed but no monitoring recorded
Is the ground investigation informed by a desk study?	Yes	Desk study and ground investigation report Appendix C cl 1.0 – 3.0
Has a site walkover been undertaken?	Yes	Ground investigation report Appendix C cl 3.2
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	15 Wadham Gardens - extent of basement to be confirmed
Is a geotechnical interpretation presented?	Yes	Ground investigation report Section 6.0
Does the geotechnical interpretation include information on retaining wall design?	Yes	Ground investigation report Section 6.1
Are reports on other investigations required by screening and scoping presented?	No	Network Rail TBC
Are baseline conditions described, based on the GSD?	Yes	BIA Section 2.0
Do the base line conditions consider adjacent or nearby basements?	No	Basement to No 15 not noted
Is an Impact Assessment provided?	Yes	BIA Section 5.0
Are estimates of ground movement and structural impact presented?	No	

Item	Yes/No/NA	Comment
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	No	Estimation of ground movement and effect on adjacent houses and tunnel to be confirmed.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	No	Construction Method Statement to be confirmed.
Has the need for monitoring during construction been considered?	No	Not included in BIA
Have the residual (after mitigation) impacts been clearly identified?	No	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure been maintained?	No	Estimation of ground movement to be confirmed
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Stability of adjacent structures to be confirmed
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	No	No Burland Category noted in BIA
Are non-technical summaries provided?	No	

4.0 DISCUSSION

- 4.1. It is acknowledged the basement will be founded in London Clay as confirmed by two boreholes located at the front and rear of the building. Within the BIA subterranean water screening assessment, Question 2 identifies a possible water course. However no signs of a channel were identified in the site investigation and it is accepted that the potential for significant subterranean water flow is minimal. It is anticipated some local water may be encountered between the Made Ground and the London Clay that will need to be controlled through the construction phase.
- 4.2. The basement is proposed to be constructed over the full extent of the existing house and beyond with a combination of underpinning below the existing building and bored piled contiguous walls to the front extension. The depth of the excavation is up to a maximum of 6m deep. Beneath the house where the basement is deepest, the excavation is to be constructed in underpinned concrete cast in sections to maintain stability of the wall over during the construction works. The underpins are to be propped in both the temporary case and in the final design by the new ground floor. The piled wall is to be designed as a cantilever in the temporary case and as propped in the final case. This is an established method of construction, however movement of the wall/foundations in the temporary case needs to be verified, particularly if the piled wall is to act as a cantilever in the temporary case.
- 4.3. The adjacent properties, 15 and 19 Wadham Gardens, appear to be within 2m of the excavation. No 15 Wadham Gardens appears to have a basement to the rear, but the full extent cannot be determined from the Architect's drawings. It is unknown if No 19 Wadham Gardens has a basement. Foundation depths are indicated in the BIA as corbelled brickwork at a depth of around 1m however it is not possible to determine if this is correct from the information submitted.
- 4.4. A brick built rail tunnel is identified to the rear of the extension and a 5m exclusion zone is indicated with the foundations stepped to avoid this area. Currently the exclusion zone is indicated as a arch following the profile of the tunnel and not a line on plan. The profile of the extension is stepped to avoid this arch however this interpretation of the exclusion zone needs to be agreed with Network Rail. Local to the tunnel the basement wall is formed with a reinforced concrete retaining wall. From the engineers drawing L1802 21 rev 02 it is assumed this wall is to be formed in an open cut.
- 4.5. Risk of ground movement and damage to adjacent properties is identified in the BIA however this is a general statement and the work to date has not quantified movement at the site. As the adjacent properties are close to the excavation, an estimate of ground movement is

required to confirm that any damage to the adjacent buildings will be no worse than slight (Burland Category 2).

- 4.6. The BIA contains a description of the scheme and mitigation measures, but no Construction Method Statement describing the proposed sequence of forming the basement or any proposed monitoring is provided.

5.0 CONCLUSIONS

- 5.1. The BIA has been carried out by an established firm of Consulting Engineers, Pringuer-James, who have employed the services of Soil Consultants Ltd to advise on geotechnical matters. The reports have been reviewed by individuals with suitable qualifications.
- 5.2. The BIA has not identified any concerns in respect to hydrogeology or hydrology and this is accepted.
- 5.3. Land stability screening identified two concerns: seasonal shrink swell and differential depth between foundations. Both are addressed further within the BIA scoping document.
- 5.4. The structural engineer's basement plan contained in the BIA indicates the proposed layout of the retaining structure. However no outline construction methodology, temporary works statement or programme is contained in the BIA.
- 5.5. The proposed basement construction is a combination of underpinning and contiguous bored pile walls. This is an acceptable methodology using established techniques; however, estimations of ground movement are required to determine the risk of damage to the adjacent houses and the buried tunnel.
- 5.6. The BIA indicates foundations to adjacent properties as corbelled brickwork down to a level of approximately 1.m bgl however no trial pits or investigations are noted to confirm this assumption. gpad Architects drawing 462-PA.04 indicates a basement to the rear of 15 Wadham Gardens which is not noted in the BIA text.
- 5.7. The basement is founded on London Clay beneath Made Ground to approximately 1.10m. The potential for ground water ingress at this level during construction has been identified; furthermore whilst standpipes have been installed there is no record of seasonal monitoring. The presence of groundwater should be established and measures to exclude groundwater from the underpinning should be incorporated into the construction method statement.
- 5.8. A Network Rail tunnel is identified at the rear of the property. An exclusion zone is indicated as 5m but it is unclear if this, this has been confirmed with Network Rail.
- 5.9. The BIA indicates new foundations will be deeper than neighbouring foundations. Ground movement is discussed in the BIA in general terms and categorised as average-low risk. However, this cannot be validated as there is no calculation of ground movement or assessment of damage in relation to 'Burland'.
- 5.10. The BIA contains no reference to monitoring adjacent structures for movement during the construction works.

Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Findlay	1 Lower Merton Rise, NW3 3RD	22/05/15	<ul style="list-style-type: none">• Potential damage to rail tunnel• Potential flooding	Exclusion zones to be agreed with NR See BIA 2.5.3 to 2.6.3 and audit report 4.1

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Construction Method Statement required	Open	
2	Stability	Depth and type of adjacent building foundations required and building damage assessment	Open	
3	Stability	Estimation of ground movement required	Open	
4	Stability	Monitoring of adjacent structures during construction to be confirmed	Open	
5	Stability	Confirmation of exclusion zone by Network Rail	Open	

Appendix 3: Supplementary Supporting Documents

None

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