

35 – 41 New Oxford Street
London, WC1A 1AP

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 35-41 New Oxford Street, 10-12 Museum Street and 16A-18 West Central Street, London, WC1A 1AP (planning reference 2016/0477/P). The basement is considered to fall within Category C 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 carried out by a well-known firm of consultants who possess relevant qualifications and experience.
- 1.5. The development site comprises approximately two-thirds of an island site formed by New Oxford Street, Museum Street and West Central Street. The buildings on New Oxford Street and Museum Street will be retained and the buildings on West Central Street are to be demolished behind a retained façade. All buildings have existing basements which are to be lowered by between 1 and 1.20m of underpinning. Internal loadbearing walls and columns will be supported on new raft foundations. Royal Mail and LUL tunnels lie at depth below the corner of the site or close to its northern boundary. The redeveloped buildings share party walls with adjoining properties.
- 1.6. A ground investigation has shown the site to be underlain by Made Ground, Lynch Hill Gravel and London Clay. The lowered basements will be founded in the Lynch Hill Gravel but will be above the existing groundwater level in the Gravel.
- 1.7. Although a number of trial pits have been excavated to identify the form of the existing foundations, the presence of existing basements within adjoining properties has not been determined.
- 1.8. The Ground Movement Analysis predicts damage to surrounding structures will not exceed Burland Category 0 (negligible). Whilst this appears to ignore movement associated with underpinning, it is accepted that for such a nominal deepening of the foundations, any such movements are unlikely to be significant. Therefore assuming good workmanship and that the buildings are in sound condition, it is agreed that damage should not exceed Category 1 (very

slight). A final ground movement and building damage assessment should be agreed as part of the party wall awards.

- 1.9. A movement monitoring proposal is discussed in principle but specific details are requested so that actual movements can be compared with predicted values during the construction process in order to minimise potential damage.
- 1.10. It is accepted that there are no slope stability concerns, no hydrogeological concerns and no hydrological concerns with respect to the development proposals. A Flood Risk Assessment has been reviewed and its conclusions are accepted.
- 1.11. It is recommended that a Basement Construction Plan is provided and approved prior to commencement on site and this should include:
 - demolition proposals for the West Central Street buildings and retention of its façade
 - temporary stability bracing for all buildings
 - underpinning bay sequence
 - identification of the presence of any adjoining basements
 - monitoring proposals of ground movements
 - confirmation of Royal Mail and LUL approvals.
- 1.12. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 10 March 2016 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 35-41 New Oxford Street, 10-12 Museum Street and 16A-18 West Central Street, London, WC1A 1AP, Camden Reference 2016/0477/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 "*Refurbishment and extension of the site to provide a mixed use scheme which includes 21 self-contained units (7 x 1 bed, 12 x 2 bed and 2 x 3 bed), flexible A1, A2, A3 and A4 uses at ground floor level and/or B1 and/or D1 at basement and ground floor levels and associated works.*"

The Audit Instruction also confirmed the property did not involve any listed buildings nor was adjacent to any listed buildings.

2.6. CampbellReith accessed LBC's Planning Portal on 30 March 2016 and gained access to the following relevant documents for audit purposes:

- Ground Investigation and Basement Impact Assessment Report (BIA) dated November 2015 by GEA and Appendices.
- Letter dated 23 November 2015 from GEA to MNP revising parts of the Ground Movement Analysis included in the BIA
- Structural Methodology Statement (SMS) dated December 2015 by MNP
- Flood Risk Assessment (FRA) dated December 2015 by MNP
- Surface Water Drainage Statement (SWDS) dated February 2016 by MNP
- Draft Construction Management Plan (CMP) dated December 2015 by McLaren

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	See BIA Section 1.3.2.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	See BIA Section 2.
Are suitable plan/maps included?	Yes	See BIA Section 2.
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	See BIA Section 3.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 3.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	See BIA Section 3.
Is a conceptual model presented?	Yes	See BIA Section 7.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	See BIA Section 4.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	Screening identified no impacts.
Is factual ground investigation data provided?	Yes	See BIA Appendix.
Is monitoring data presented?	Yes	See BIA Section 5.4.
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	No	
Is a geotechnical interpretation presented?	Yes	See BIA Section 5.
Does the geotechnical interpretation include information on retaining wall design?	Yes	See BIA Section 8.
Are reports on other investigations required by screening and scoping presented?	Yes	Flood Risk Assessment provided and Surface Water Drainage Statement.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	
Is an Impact Assessment provided?	Yes	See BIA Section 9.
Are estimates of ground movement and structural impact presented?	Yes	See BIA Section 10 and Appendix.

Item	Yes/No/NA	Comment
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	
Has the need for monitoring during construction been considered?	Yes	See BIA Section 13.
Have the residual (after mitigation) impacts been clearly identified?	Yes	See BIA Section 15.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Based on the assumptions made in the GEA Ground Movement Assessment and good workmanship.
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?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Category 0 (Negligible) damage predicted.
Are non-technical summaries provided?	Yes	See BIA Executive Summary.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been produced by a well-known firm of consultants, GEA, and the authors possess qualifications and experience which meets the requirements of CPG4.
- 4.2. The development proposals comprise the retention of Nos 35 to 41 New Oxford Street, which will add a new single storey lightweight roof extension, and lower the existing basement floor slab by 1 to 1.20m. Nos 10 to 12 Museum Street will also be retained and its basement floor lowered by 1 to 1.20m. The existing properties at Nos 16A to 18 West Central Street will be demolished, behind a retained façade, and rebuilt on a new basement raft foundation, lowered by 1m from its present level.
- 4.3. The development site comprises approximately two-thirds of an island site formed by New Oxford Street, Museum Street and West Central Street. Party walls affected by the proposals are shared with 16 West Central Street, 42 New Oxford Street and a public house at 33 New Oxford Street. The site is underlain by a Royal Mail tunnel in its southwest corner and the two running tunnels of the Central Line pass to the north outside the curtilage of the site.
- 4.4. A ground investigation was carried out in the summer of 2015 and encountered Made Ground over Lynch Hill Gravel over London Clay to depth. Any existing basements currently founded in the Made Ground will be refounded in the Lynch Hill Gravel once deepened.
- 4.5. Groundwater was encountered, as anticipated, within the Lynch Hill Gravel and monitored on two further occasions. The groundwater level, monitored at levels of 19.25 to 19.38 MOD, is anticipated to be below the level of the deepened basements at 21.200 MOD.
- 4.6. The deepened basements will be formed by conventional “hit and miss” underpinning to a depth of between 1m and 1.20m. A significant number of trial pits have been excavated around the site, which identify the current form of foundations below internal loadbearing columns and walls and boundary party walls. No comment has been made regarding the presence of basements within the adjoining properties and these should be identified prior to the Party Wall process if they exist.
- 4.7. A Ground Movement Assessment has been undertaken to predict potential ground movements within the buildings to be redeveloped, their adjoining properties and the Royal Mail and LUL Central Line tunnels.
- 4.8. Anticipated vertical movements as a result of demolition, excavation and construction have been predicted using Oasys Pdisp. Short term heave movements, as a result of unloading, are indicated to be approximately 5mm in the centre of the site which reduces at the edges and

corners. No calculations have been undertaken for the movements due to underpinning, rather 1 to 2mm vertical movement is predicted based on typical anticipated movements induced by underpinning. Movement resulting from underpinning is almost entirely due to workmanship and whilst it may not be possible to limit it to 1 to 2mm, it is accepted that with good control of workmanship, movements associated with such nominal underpinning will be small. Category 0 (negligible) damage is predicted for the neighbouring properties. This appears to be based solely on the vertical movements from the Pdisp analysis, however, it is accepted that damage is unlikely to exceed Category 1 provided the works are properly controlled and the affected structures are in sound condition.

- 4.9. The result of the analysis on the Royal Mail and LUL tunnels are stated as negligible and it is understood that calculations and structural proposals have been submitted to both parties for their approval and are currently awaiting their comments.
- 4.10. Although a monitoring strategy is discussed in principle, no specific details are provided. It has been identified that condition surveys of the existing structures will be carried out before and after the proposed works.
- 4.11. It is accepted that there are no slope stability concerns regarding the proposed development.
- 4.12. It is accepted that no known ponds, springlines or wells are in close vicinity to the site and the site is outside the Hampstead pond chain catchment area.
- 4.13. It is accepted that the proposal will not alter the existing proportion of hard surfaces and paved areas and, hence, the quantity of local rainfall entering the existing sewer system.
- 4.14. It is accepted that the site is not in Flood Risk Zone based upon Camden Flood Risk Management Strategy maps and is not identified as a street that flooded in either 1975 or 2002. A Flood Risk Assessment has been carried out by MNP dated December 2015, the conclusions of which are acceptable.
- 4.15. It is recommended that a Basement Construction Plan (BCP) is provided prior to construction commencement which should be based upon final construction information including Principal Contractor's proposals for demolition of the West Central Street buildings and retention of its façade, temporary stability bracing, underpinning bay sequence, identification of the presence of any adjoining basements, monitoring of ground movements and confirmation that Royal Mail and LUL have accepted the development proposals.

5.0 CONCLUSIONS

- 5.1. The BIA has been carried out by a well-known firm of consultants who possess relevant qualifications and experience.
- 5.2. The development site comprises approximately two-thirds of an island site formed by New Oxford Street, Museum Street and West Central Street. The buildings on New Oxford Street and Museum Street will be retained and the buildings on West Central Street are to be demolished behind a retained façade. All buildings have existing basements which are to be lowered by between 1 and 1.20m of underpinning. Internal loadbearing walls and columns will be supported on new raft foundations. Royal Mail and LUL tunnels lie at depth below the corner of the site or close to its northern boundary. The redeveloped buildings share party walls with adjoining properties.
- 5.3. A ground investigation has shown the site to be underlain by Made Ground, Lynch Hill Gravel and London Clay. The lowered basements will be founded in the Lynch Hill Gravel but will be above the existing groundwater level in the Gravel.
- 5.4. Although a number of trial pits have been excavated to identify the form of the existing foundations, the presence of existing basements within adjoining properties has not been demonstrated.
- 5.5. The Ground Movement Analysis predicts damage to surrounding structures will not exceed Burland Category 0 (negligible). Whilst this appears to ignore movement associated with underpinning, it is accepted that for such a nominal deepening of the foundations, any such movements are unlikely to be significant. Therefore assuming good workmanship and that the buildings are in sound condition, it is agreed that damage should not exceed Category 1 (very slight). A final ground movement and building damage assessment should be agreed as part of the party wall awards.
- 5.6. A movement monitoring proposal is discussed in principle but specific details are requested so that actual movements can be compared with predicted values during the construction process in order to minimise potential damage.
- 5.7. It is accepted that there are no slope stability concerns, no hydrogeological concerns and no hydrological concerns with respect to the development proposals. A Flood Risk Assessment has been reviewed and its conclusions are accepted.
- 5.8. It is recommended that a Basement Construction plan is provided and approved prior to commencement on site and this should include:
 - demolition proposals for the West Central Street buildings and retention of its façade

- temporary stability bracing for all buildings
- underpinning bay sequence
- identification of the presence of any adjoining basements
- monitoring proposals of ground movements
- confirmation of Royal Mail and LUL approvals

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability	Demolition proposals for West Central Street, buildings and retention of its façade.	Open - to be provided as part of a Basement Construction Plan.	N/A
2	Stability	Detailed proposals for the monitoring of ground movements on surrounding properties.	Open - to be provided as part of a Basement Construction Plan	N/A
3	Stability	Final ground movement and building damage assessment should be agreed as part of the Party Wall Awards	Open - to be agreed as part of the Party Wall awards	N/A
4	Stability	Identification of the presence of any adjoining basements	Open - to be provided as part of a Basement Construction Plan	N/A
5	Stability	Temporary stability bracing for all buildings.	Open - to be provided as part of a Basement Construction Plan	N/A
6	Stability	Underpinning bay sequence.	Open - to be provided as part of a Basement Construction Plan	N/A
7	Stability	Confirmation of Royal Mail and LUL approvals.	Open - to be provided as part of a Basement Construction Plan	N/A

Appendix 3: Supplementary Supporting Documents

None

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