CampbellReith
consulting engineers

30A Thurlow Road
London NW3 5PH

Basement Impact Assessment
Audit

For

London Borough of Camden

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1.0 NON-TECHNICAL SUMMARY

1.1. CampbellReith was instructed by the 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 30A Thurlow Road, London NW3 5PH - Planning Reference 2015/5409/P.

1.2. Subsequent to the issue of the final Audit in January 2016, a further revised and updated BIA and Ground Movement Assessment was issued by LBH Wembley Engineering dated June 2017. It is understood that the revised BIA was submitted in lieu of a Basement Construction Plan in order to address the queries highlighted in the previous audit.

1.3. The qualifications of the authors, checkers and approvers of the BIA and various supporting documents are in compliance with the requirements of CPG4.

1.4. It is accepted that there are no significant residual impacts with respect to slope instability, surface water or subterranean flows.

1.5. Condition surveys of 41 and 30 (Flats 5, 6, 7 and 8) Thurlow Road are provided in the revised BIA (dated June 2017).

1.6. The revised BIA confirms that a final determination of groundwater levels will be made prior to the commencement of construction.

1.7. It is acknowledged that the proposed construction (propped contiguous bored piles) of the basement perimeter wall is appropriate. The revised BIA has confirmed that the piled retaining wall adjacent to 30 Thurlow Road has been designed to be maintained in as rigid a state as is possible, through top-down excavation supported laterally by a contiguous bored pile retaining wall, with secondary propping placed 1m above the proposed maximum excavation depth. This method of construction presents the best assurance of stiffness through providing permanent bracing prior to the commencement of excavation with the intention of allowing negligible deflection and yielding at any level of the pile wall.

1.8. The use of a void former or suspended basement slab, is to be adopted to mitigate against the effects of heave. It is noted that heave effects are predicted to be negligible outside of the bored pile retaining walls.

1.9. Groundwater has not been encountered during the site investigation, nor in subsequent monitoring. It is understood that groundwater monitoring will be ongoing until construction commences.

1.10. In the original BIA, full hydrostatic groundwater pressures were to be adopted for the permanent design of the inner basement walls, with groundwater level taken at 1m below ground level (bgl) to allow for possible storm water flows or a burst water main(s). In the revised BIA submissions, a groundwater design level of 1m above basement slab level has been adopted. It has been confirmed by subsequent correspondence that the design will be revised to adopt a groundwater level of 1m bgl, as originally intended.

1.11. The revised BIA submissions confirm the design geotechnical parameters and design assumptions, and provide retaining wall calculations, which are accepted.

1.12. The revised BIA includes the proposed construction sequence and an outline works programme. Sufficient structural information has been provided, confirming a top down construction sequence and the use of temporary propping, in addition to the sizing of the structural members.

1.13. A revised ground movement assessment and damage impact assessment is presented, which is accepted. Damage impacts are limited to Category 0 (Negligible) to adjacent structures, with the exception of the single storey extension to 30 Thurlow Road where Category 1 (Very Slight) damage impact is predicted.

1.14. A structural monitoring regime is proposed, including survey point locations, trigger levels and contingency actions. The monitoring proposed is linked to the ground movements predicted and is considered appropriate to control construction and limit damage impacts. Pre-condition surveys of adjacent properties have been undertaken and are presented.

1.15. Queries and requests for clarification/further information raised by the audit process are summarised in Appendix 2 and discussed in Section 4. It is now accepted that the revised BIA and supporting documents adequately identify the impacts from the basement proposals and describe sufficient mitigation where required.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by the London Borough of Camden (LBC) on 28 October 2015 to carry out a Category 'B' Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 30A Thurlow Road, London NW3 5PH - Planning Reference 2015/5409/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by the LBC. The Audit reviewed the above BIA for potential impacts on land stability and on local groundwater and surface water conditions arising from the proposed basement development.

2.3. Subsequent to the issue of the final Audit in January 2016, a revised and updated BIA and accompanying Geotechnical, Hydrogeological & Ground Movement Assessment was issued (dated July 2017) which required a revision to the final Audit. It is understood that the revised BIA was submitted in lieu of a Basement Construction Plan, in order to address the queries highlighted in the previous audit.

2.4. A BIA is required for all planning applications with basements in the LBC in general accordance with policies and technical procedures contained within the following documents:

a) Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

b) Camden Planning Guidance (CPG) 4: Basements and Lightwells.

c) Camden Development Policy (DP) 27: Basements and Lightwells.

d) Camden Development Policy (DP) 23: Water.

2.5. 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.

The BIA should evaluate the impacts of the proposed basement considering the issues of land stability, hydrology and hydrogeology via the process described within the GSD and should make recommendations for detailed design.

2.6. The original LBC Audit Instruction described the planning proposal as '*Demolition of existing single-storey house and erection of three-storey house including excavation of basement levels.'*

The Audit Instruction noted the following:

a) The basement proposals do not involve a listed building nor does the site neighbour any listed buildings.

b) The site is in an area subject to stability constraints but is not in an area subject to surface water flow and flooding constraints or in an area subject to subterranean (groundwater) flow constraints.

c) The application requires determination by the Development Control Committee (DCC).

d) The scope of the submitted BIA extends beyond the screening stage.

2.7. CampbellReith originally accessed the LBC Planning Portal on 25 November 2015 and examined the following reports and drawings relevant to the audit:

a) Application for Planning Permission & Demolition of an Unlisted Building in a Conservation Area, dated 28 August 2015.

b) Self-Build Exemption Claim Form, dated 01 September 2015.

c) A 'Design and Access Statement (D&AS)', prepared by Square Feet Architects (SFA), undated but submitted 12 October 2015.

d) A 'Basement Impact Assessment (BIA)', prepared by LBH Wembley Geotechnical & Environmental (LBH) and Clancy Consulting (CC), dated 22 September 2015.

e) A 'Geotechnical, Hydrogeological & Ground Movement Assessment' prepared by LBH, dated 21 September 2015.

f) The following planning application drawings:

Existing Plans Elevations and Sections.

Proposed Plans Elevations and Sections.

Engineering Drawings.

2.8. The Audit was subsequently updated based on a review of the following documents:

a) A revised 'Basement Impact Assessment (BIA)', prepared by LBH Wembley Geotechnical & Environmental (LBH) and Clancy Consulting (CC), dated 11 December 2016.

b) A revised 'Geotechnical, Hydrogeological & Ground Movement Assessment' prepared by LBH, dated 11 December 2016.

2.9. The current LBC Audit Instruction describes the planning proposal as *'Variation of legal agreement (BCP) of planning permission 2015/5409/P dated 01/09/2016 (as amended by 2016/6647/P dated 17/01/2017) (for demolition of existing single storey house and erection of three storey house including excavation of basement levels) namely to alter the BCP requirement to such information as Campbell Reith considers necessary including confirmation of geotechnical design parameters, construction methodology and provision of outline retaining wall calculations, outline temporary works scheme, including sequencing and propping, ground movement and damage assessment (based on the confirmed geotechnical design parameters, construction methodology) and outline structural monitoring plan.'*

2.10. The updated audit is based on a review of the following documents:

a) 'Basement Impact Assessment (BIA)', prepared by LBH Wembley Engineering, dated 30 June 2017.

b) LBH Wembley Engineering Response to CampbellReith Query Tracker, June 2017.

c) LBH Wembley Engineering Email dated 4 August 2017.

d) Comment from the resident of Flat 5, 30 Thurlow Road.

2.11. Comments received from the public on the planning application are listed in Appendix 1.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are the BIA author(s) credentials satisfactory?	Yes	
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	
Are suitable plans/maps included?	Yes	
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Slope and Ground Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	References have not always been given for data sources. Where references to maps etc. are given, plans or plan extracts with the site location noted are not included.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrogeology (Groundwater Flow) Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	References have not always been given for data sources.
Is a conceptual ground model presented?	Yes	
Slope and Ground Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	

Item	Yes/No/NA	Comment
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	No scoping was required.
Hydrogeology (Groundwater Flow) Scoping Provided? Is scoping consistent with screening outcome?	Yes	No scoping was required.
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	LBH email 4 August 2017.
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?	Yes	
Is a geotechnical interpretation presented?	Yes	BIA / Appendices.
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	NA	
Are baseline conditions described, based on the 'Guidance for Subterranean Development (GSD)'?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	Updated in revised submissions.
Is the Impact Assessment appropriate to the matters identified by screening 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	
Have the residual (after mitigation) impacts been clearly identified?	NA	There were considered to be no residual (after mitigation) impacts.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Updated in revised submissions.
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	Updated in revised submissions.
Does the BIA report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Updated in revised submissions.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The revised BIA (dated June 2017) includes screening, scoping, site investigation and impact assessment stages as required and defined in the LBC Planning Guidance document 'Basements and Lightwells (CPG4)'.

4.2. The qualifications of the authors, checkers and approvers of the BIA and various supporting documents are generally in compliance with the requirements of CPG4.

4.3. 30A Thurlow Road is a single-storey property located at the far end of the former rear garden to 41 Rosslyn Hill. The nearest properties to 30A Thurlow Road are 41 Rosslyn Hill on the downhill side and the immediately adjacent 30 Thurlow Road on the uphill side.

4.4. 41 Rosslyn Hill and 30 Thurlow Road are substantial three/four-storey buildings of conventional masonry/brick construction and are split into flats. 41 Rosslyn Hill is a detached building whereas 30 Thurlow Road is semi-detached, with a side extension facing the development site. There are a number of trees and shrubs within the gardens to 30A Thurlow Road and at the front adjacent to the road. The rear garden of 39 Rosslyn Hill lies behind the property boundary remote from the road and also has trees.

4.5. 30A Thurlow Road is not a listed building and does not lie within the vicinity of any listed buildings. The property is however located within the Fitzjohn's/Netherhall Conservation Area of Hampstead.

4.6. The proposed development comprises the demolition of the existing building and the construction of a new two-storey house with a single level of basement extending to a depth of approximately 5m. The new basement will extend partially under the existing garden areas. A single tree is to be removed from the garden to accommodate basement construction – this has been accepted by LBC and is discussed in the arboricultural report (that report was not examined as part of this audit).

4.7. Both 41 Rosslyn Hill and 30 Thurlow Road are noted in the BIA to have a lower ground floor/basement. The BIA also notes that there is a proposal to construct a basement at 39 Rosslyn Hill.

4.8. The drawings submitted with the BIA indicate a substantial drop in elevation from the founding level of the extension to 30 Thurlow Road to the proposed basement excavation level. There is no such difference in level on the downhill side of the proposed basement facing 41 Rosslyn Hill. Basement excavation level on this side of the property is shown to be similar to current ground levels.

4.9. Condition surveys of 41 Rosslyn Hill and 30 Thurlow Road (Flats 5, 6, 7 and 8) are provided in the BIA (dated June 2017). Hairline cracks are noted in places, but no evidence of any substantial structural issues is referenced.

4.10. A ground investigation (GI) was undertaken at the site in June 2015 by LBH and comprised the sinking of seven boreholes to a maximum depth of 20m below ground level (bgl), two dynamic probe holes and four trial pits. The trial pits were excavated to determine boundary wall foundation conditions and to assess the foundations to the side extension to 30 Thurlow Road. Three groundwater monitoring standpipes were installed at the site.

4.11. Ground conditions were found to comprise Made Ground to a maximum depth of 1.3m bgl, overlying Claygate Beds to 3.5m bgl or so, overlying probable London Clay. The Claygate Beds were found to generally comprise silty, occasionally slightly sandy, clay. The London Clay (probable) comprised firm to stiff (becoming very stiff with depth) silty clay. Groundwater was not encountered during the GI or during subsequent monitoring visits. The revised BIA confirms that a final determination of groundwater levels will be made prior to the commencement of construction. It is understood, in July 2017, that monitoring is ongoing.

4.12. Regarding topography and issues of slope and ground instability, the BIA confirms ground levels along Thurlow Road to slope at less than 7^{o} (1:8) and that the proposed works will not alter this situation. It is also confirmed that the site does not lie within a wider hillside setting in which the general slope is greater than 7^{o} nor does it neighbour land, including railway cuttings and the like with a slope greater than 7^{o}. The site does not lie within the exclusion zone of any tunnels. The site is thus not at risk of ground instability due to any of the above.

4.13. The BIA confirms that the site does not lie within an area of previously worked ground or landfill, thus also avoiding any stability issues arising from this cause.

4.14. The BIA confirms that the London Clay (which is prone to shrink/swell issues) is not the shallowest stratum at the site (see above). Although the proposed basement will be founded within/on the London Clay which is generally considered to be more susceptible to shrink/swell issues than the overlying Claygate Beds, it is accepted that the depth of the basement should preclude it from being affected by seasonal or transpiration induced effects or the proposed tree removal. It is noted that a cherry tree is to be removed as part of the proposals, to be replaced with a similar tree outside the footprint of the new basement.

4.15. The BIA confirms there to be was no current evidence of shrink/swell subsidence in the local area. The cracking observed to the garden/boundary wall was attributed to poor foundation design.

4.16. The BIA notes that the site is not located within 100m of a watercourse or potential spring line nor is it within 50m of Hampstead Heath ponds. The site is located some 350m south of a tributary of the River Fleet, but this will have been culverted. The basement is thus not at risk of ground instability due to lying in the vicinity of or below such water features.

4.17. It is stated that although the Claygate Beds are classified by the Environment Agency (EA) as a Secondary 'A' Aquifer, the unit locally would not be likely to support a definable water table and be a source of groundwater flow on the basis that the GI did not identify permeable sand seams etc. within the stratum and groundwater was not encountered during monitoring of the standpipes. Monitoring of the standpipes in 2015 did not encountered any groundwater, and it is understood that monitoring will be undertaken in 2017 prior to construction.

4.18. The BIA confirms that the new basement will lie within 5m of the pedestrian pavement and public highway. However, it is accepted that the adoption of closely supported contiguous piled perimeter walling to the basement excavation with full implementation of construction monitoring (see below) should ensure that ground movements and any damage are maintained within acceptable limits.

4.19. The BIA confirms that the proposed basement will result in a differential in foundation depths relative to neighbouring properties – in particular, with respect to 30 Thurlow Road. However, this issue is to be mitigated by the adoption of suitable excavation support and construction methodologies – see below.

4.20. In the context of surface water flow and flooding, the BIA confirms that the site is not within the catchment area of the pond chains on Hampstead Heath and thus will not be the cause of any changes to the inflow, storage capacity or water quality of the ponds.

4.21. Regarding any changes in the areas of impermeable surfacing and any changes to the route, profile or quality of surface water flows, the BIA confirms that the area of hardstanding will remain much as at present and that surface water flows will be discharged to local sewers as per the existing arrangement. There will thus be no change in flow to adjacent properties or downstream watercourses.

4.22. With respect to any known level of flood risk due to surface water or flooding arising from the basement lying below the static water level of any nearby surface water features, it was stated in the BIA that the site is not at risk from such flooding. This is accepted.

4.23. With regard to subterranean (groundwater) flows, as noted above, the basement will be constructed largely within the Claygate Beds and the London Clay. It is accepted that the general impermeability of the Claygate Beds and London Clay will limit the effect that the proposed basement will have on the groundwater regime.

4.24. Regarding whether or not more surface water than at present from rainfall will be discharged into the ground (e.g. via soakaways or SUDS), as noted above, drainage will be to the local sewer as at present.

4.25. The basement structure is to comprise a reinforced concrete (RC) box with internal columns to support the basement top slab and loads from the upper floors. Perimeter walling required to support the excavation sidewalls is to comprise fully propped contiguous RC bored piling on three sides and a sheet-piled wall on the downhill side. It is proposed that the bored piles should be constructed by CFA techniques because of the greater ground support that this type of pile provides at all stages of construction.

4.26. The revised BIA has confirmed that the piled retaining wall adjacent to 30 Thurlow Road has been designed to be maintained in as rigid a state as is possible, through top-down excavation, supported laterally by a contiguous bored pile retaining wall, with secondary propping placed 1m above the proposed maximum excavation depth. This method of construction presents the best assurance of stiffness through providing permanent bracing prior to the commencement of excavation with the intention of allowing negligible deflection and yielding at any level of the pile wall. The BIA notes that contiguous piling (as opposed to secant piling) has been selected for the basement perimeter piling due the perceived low risk of groundwater inflow into the basement during excavation.

4.27. In the original BIA, full hydrostatic groundwater pressures were to be adopted for the permanent design of the inner basement walls, with groundwater level taken at 1m bgl to allow for possible storm water flows or a burst water main(s). In the revised BIA submissions (June 2017), a groundwater design level of 1m above basement slab level has been adopted. It has been confirmed by subsequent correspondence (email 4 August 2017) that the original design groundwater level of 1m bgl will be adopted.

4.28. Preliminary geotechnical parameters and design assumptions for the design of the basement perimeter wall were included within the original BIA. The revised BIA (June 2017) submissions confirm the design geotechnical parameters and design assumptions, and provide retaining wall calculations, which are accepted.

4.29. The revised BIA (June 2017) includes the proposed construction sequence and an outline works programme. Sufficient structural information has been provided, confirming a top down construction sequence and the use of temporary propping, in addition to the sizing of the structural members.

4.30. A revised ground movement assessment and damage impact assessment is presented (June 2017), which is accepted. Damage impacts are limited to Category 0 (Negligible) to adjacent structures, with the exception of the single storey extension to 30 Thurlow Road where

Category 1 (Very Slight) damage impact is predicted. It is noted that using empirical data from CIRIA C760 larger ground movements were predicted and damage impact to the extension at 30 Thurlow Road was predicted to be Category 2 (Slight). However, it is accepted that the Engineer has modelled the site-specific conditions, including the construction sequence and propping arrangements, and that these are likely to mitigate the movements significantly. It is also noted, as discussed further below, that the works will be controlled by a structural monitoring regime, in order to maintain the damage impacts as low as practicable.

4.31. The structural monitoring regime proposed (June 2017) includes survey point locations, trigger levels and contingency actions. The monitoring proposed is linked to the ground movements predicted and is considered appropriate to control construction and limit damage impacts. Pre-condition surveys of adjacent properties have been undertaken and are presented.

5.0 CONCLUSIONS

5.1. The revised BIA includes screening, scoping, site investigation and impact assessment stages as required and defined in the LBC Planning Guidance document 'Basements and Lightwells (CPG4)'.

5.2. The qualifications of the authors, checkers and approvers of the BIA and various supporting documents are in compliance with the requirements of CPG4.

5.3. It is accepted that there are no significant residual impacts with respect to slope instability, surface water or subterranean flows.

5.4. Condition surveys of 41 and 30 Thurlow Road are provided in the revised BIA.

5.5. The revised BIA confirms ground and groundwater conditions and geotechnical design parameters. Monitoring is ongoing, but to date groundwater has not been encountered.

5.6. The construction sequence, temporary works proposals and design calculations presented are accepted as appropriate.

5.7. The ground movement and damage impact assessments presented are accepted. Damage impacts to adjacent structures are predicted to be Category 0 to Category 1 (Negligible to Very Slight).

5.8. An appropriate structural monitoring regime is proposed, including trigger values and contingency actions, to control the construction works and limit damage impacts to within the categories predicted. Pre-condition surveys have been undertaken and are presented.

5.9. Queries and requests for clarification/further information raised by the audit process are summarised in Appendix 2. It is now accepted that the revised BIA and supporting documents adequately identify the impacts from the basement proposals and describe sufficient mitigation where required.

Appendix 1: Residents' Consultation Comments

Surname	Address	Date	Issue(s) raised	Response
Smouha	Garden Flat 5, 30 Thurlow Road, London NW3 5PH	11/0717	Section 6.3.4.1 states that the damage to the extension of 30 Thurlow Road would be Category 2 (Slight) but section 6.3.5.1 lowers this to Category 0 (Negligible).	See 4.30, Engineer has undertaken site specific assessment adopting pile design and construction sequence proposed.
Katz	c/o 1 Keats Grove, London NW3 2RT	22/10/15	a) The proposed basement poses a significant risk of structural damage to 41 Rosslyn Hill.	See Section 4.0 & Appendix 2.
Wensauer	Top Floor Flat 41 Rosslyn Hill – c/o Osterholzallee, 76 D-71636, Ludwigsburg, Germany	28/10/15	a) The BIA states that the proposed basement will significantly increase the differential depth of foundations relative to 41 Rosslyn Hill. b) The stability of 41 Rosslyn Hill is not guaranteed. c) Short and long-term movements are probable and hence there exists a danger of cracking to 41 Rosslyn Hill. d) The greater proximity of the proposed new basement to 41 Rosslyn Hill (relative to the current situation) poses a risk to the foundations and, e) of causing groundwater movements.	See Section 4.0 & Appendix 2.
Parmer	41A Rosslyn Hill, London NW3 5UJ	02/11/15	a) Risks of vibration, movement and flooding damage.	See Section 4.0 & Appendix 2.
Lessani	Flat C, 41 Rosslyn Hill, London NW3 5UJ	03/11/15	a) Risks of foundation instability and groundwater movements.	See Section 4.0 & Appendix 2.
Fisher	Flat 6, 30 Thurlow Road, London NW3 5PH	04/11/15	a) Concern expressed that there is a reported risk of excavation induced movement to the foundations to 30	See Section 4.0 & Appendix 2.

Surname	Address	Date	Issue(s) raised	Response
			Thurlow Road and a risk to the building.	
Smouha	Garden Flat 5, 30 Thurlow Road, London NW3 5PH	04/11/15	a) The extension to 30 Thurlow Road is an integral part of 30 Thurlow Road. There should be no implication in the BIA that the extension is of lesser importance to the main building when assessing ground movements. b) The BIA states that while the foundations to the main building are outside the zone of possible influence of the basement excavation, the foundations for the post-war extension will be at some risk of movement. c) Concern at the abrupt and significant change in level from the footings to 30 Thurlow Road and the proposed basement excavation level and the implications of this for the stability of the adjacent properties at 41 Rosslyn Hill and 30 Thurlow Road. d) A pile depth of 12m or so is currently shown for the perimeter piles. Justification is not given for this depth. e) The BIA assesses vertical ground movements (heave and settlement) arising from excavation and building work but does not address horizontal movements which are considered to be of particular significance to 30 Thurlow Road.	See Section 4.0 & Appendix 2.

Surname	Address	Date	Issue(s) raised	Response
			f) Estimates of ground settlement due to piling are provided but are based on pile depths of less than 12m. The sufficiency of the pile depths is questioned. g) The BIA discusses the need to consult with piling engineers and that pile diameters have not yet been determined. There is also a lack of clarity on pile spacings and whether or not the perimeter wall will be continuous. h) Although groundwater was not encountered during GI at the site, previous GIs in the higher ground to the south-west of the site did encounter groundwater. Local gardens suffer from water saturation in the autumn and winter months. The proposed basement will cause a damming effect on groundwater flow. Long-term hydrostatic loading of the retaining walls does not appear to have been taken into account in design. i) No measures are proposed to disperse groundwater which might accumulate within the higher ground south-west of the site. j) A substantial basement at 39 Rosslyn Hill is currently the subject of a planning application. This basement will occupy much of the garden area to 39 Rosslyn Hill and will only be a few metres away	

Surname	Address	Date	Issue(s) raised	Response
			from the proposed development. No consideration has been given in the current proposal to the combined effect of the two basements on ground stability and hydrogeology.	
Youdell	Flat 2, 29 Thurlow Road	09/11/15	a) The proposed development will affect the structural integrity of 29/30 Thurlow Road and also 41 Rosslyn Hill. b) 29/30 Thurlow Road have been found to be fragile and sensitive to alteration. c) Possible effects on groundwater flows.	See Section 4.0 & Appendix 2.
McNair	10D Eldon Grove	10/11/15	a) A protected tree will be removed. b) The excavation depth will create a high risk of ground instability for the surrounding houses. c) The structural drawings do not sufficiently explain how the proposed piling will support the neighbouring ground, particularly towards 30 Thurlow Road, where there will be a large change in elevation. d) Ground investigations for recent basement developments in the area have revealed the presence of groundwater and drainage provisions made. There are no provisions for drainage at 30A Thurlow Road.	See Section 4.0 & Appendix 2.

Surname	Address	Date	Issue(s) raised	Response
			e) A further substantial basement at 39 Rosslyn Hill is currently the subject of a planning application. This basement will also occupy much of the garden area and will only be a few metres away from the proposed development. No consideration has been given in the current proposal to the combined effect of the two basements on ground stability and drainage.	
Jacks	Top Flat, 29 Thurlow Road	13/11/15	a) Excavations for the proposed basement will cause damage to 29 and 30 Thurlow Road.	See Section 4.0 & Appendix 2.

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Stability.	Preliminary geotechnical parameters and assumptions for the design of the basement perimeter walls and basement slab should be provided.	Closed.	14/01/16 July 2017
2	Stability.	The GMA should be revised to include horizontal movements. Justification should be given for the derivation of the movement contour plots. A building damage assessment is required for affected properties.	Closed.	14/01/16 July 2017
3	Stability.	An outline works programme should be provided.	Closed.	14/01/16
4	Stability.	Outline proposals for monitoring should be provided.	Closed.	14/01/16 July 2017
5	Stability, hydrology and hydrogeology.	Groundwater monitoring should be undertaken at the site to confirm groundwater levels.	Closed. Monitoring on-going but not detected to date.	14/01/16 July 2017
6	Stability.	The use of a void former and/or tension piles within the basement box should be confirmed.	Closed.	14/01/16 July 2017

7	Stability.	The construction sequence and propping arrangements for the capping beam and basement perimeter walls should be clarified, especially in relation to 30 Thurlow Road.	Closed.	14/01/16 July 2017
8	Stability.	Information should be provided on the structural condition of 41 Rosslyn Hill and 30 Thurlow Road.	Closed.	14/01/16 July 2017

Appendix 3: Supplementary Supporting Documents

Basement Impact Assessment (BIA), by LBH Wembley, June 2017.

LBH Wembley Response to Campbell Reith Query Tracker, June 2017.

LBH Wembley Engineering Email, 4 August 2017.

London

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