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30A Thurlow Road
London NW3 5PH

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12066-74
Revision: D1

November 2015

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Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	30/11/15	Comment	PCDjw12066-74-301115-30A Thurlow Road - D1.doc	P C Daniels	P C Daniels	E M Brown

Document Details

Last saved	30/11/2015 11:11
Path	PCDjw12066-74-301115-30A Thurlow Road - D1.doc`
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Project Number	12066-74
Project Name	30A Thurlow Road NW3 5PH
Planning Reference	2015/5409/P

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1.0 NON-TECHNICAL SUMMARY

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

1.3. CampbellReith has accessed LBC's Planning Portal and reviewed the latest revisions of submitted documentation against an agreed audit check list.

1.4. The BIA includes screening, scoping, site investigation and impact assessment stages as required and defined in the LBC Planning Guidance document 'Basements and Lightwells (CPG4)', dated July 2015.

1.5. The qualifications of the authors, checkers and approvers of the BIA and various supporting documents are generally in compliance with the requirements of CPG4. It is accepted that there are no significant residual impacts with respect to surface water, subterranean flows and slope stability.

1.6. Information has been supplied to confirm the location of existing basements within the vicinity of the proposed development.

1.7. Information on the structural condition of 41 Rosslyn Hill and 30 Thurlow Road should be obtained for inclusion within a Basement Construction Plan.

1.8. The absence of significant groundwater in the Made Ground or the Claygate Beds is accepted. However, it is recommended that further monitoring is undertaken prior to construction to confirm the design of the temporary and permanent works.

1.9. It is acknowledged that the proposed construction (propped contiguous bored piled wall) is appropriate. The means of achieving a suitably high support stiffness to the capping beam and contiguous piled perimeter retaining walls should be clarified in a Basement Construction Plan. The BCP should also include details of the sequencing of construction (piling, propping and excavation).

1.10. The use of void former and/or tension piles within the basement box should be confirmed in the BCP.

1.11. Full hydrostatic groundwater pressures should be adopted for the permanent design of the inner basement walls with groundwater level taken at 1m bgl or so to allow for possible storm water flows or a burst water main(s).

1.12. Preliminary geotechnical parameters and assumptions for the design of the contiguous piled perimeter walls and the sheet-piled wall adjacent to 41 Rosslyn Hill should be provided in the BIA. The calculations should demonstrate that the perimeter walls are stable under all reasonable assumptions of ground and groundwater pressures and surcharge loading from the adjacent foundations.

1.13. The sequencing of installation of the contiguous piles to the perimeter walls and the propping arrangements to be adopted should be clearly defined. Most importantly, the sequencing and propping arrangements for the initial high level excavations to the capping beam adjacent to 30 Thurlow Road should be rigorously defined.

1.14. The proposed monitoring regime should be outlined in the BIA to give confidence that the basement excavation process will at all stages, be tightly controlled.

1.15. Pre and post-condition surveys of adjacent properties will be required to be undertaken to comply with the Party Wall Act.

1.16. An outline works programme sufficient for planning purposes should be provided.

1.17. The GMA and damage assessments are not clear or satisfactory and are required to be resubmitted before the audit can be closed out. Horizontal ground movements are to be included.

1.18. Queries and requests for clarification/further information are summarised in Appendix 2.

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 above Audit has been carried out in accordance with the Terms of Reference set by the LBC. The Audit has 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. 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.

2.4. 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.

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

2.5. The LBC Audit Instruction described the planning proposal as '*Demolition of existing single-storey house and erection of three-story 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.

2.6. CampbellReith accessed the LBC Planning Portal on 25 November 2015 and has 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 'Geotechnical, Hydrogeological & Ground Movement Assessment' prepared by LBH Wembley Geotechnical & Environmental (LBH), dated 21 September 2015.

e) A 'Basement Impact Assessment (BIA), prepared by LBH and Clancy Consulting (CC), dated 22 September 2015.

f) The following planning application drawings:

Existing Plans Elevations and Sections.

Proposed Plans Elevations and Sections.

Engineering Drawings.

g) Comments received from the public on the planning application and identified for audit by the LBC.

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	Except that no works programme has 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?	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.

Item	Yes/No/NA	Comment
Is a conceptual ground model presented?	Yes	
Slope and Ground Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
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?	No	A description only of groundwater monitoring results has been given on the basis that no groundwater was encountered.
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?	No	
Does the geotechnical interpretation include information on retaining wall design?	No	

Item	Yes/No/NA	Comment
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	
Are estimates of ground movement and structural impact presented?	No	The GMA and structural damage category assessment are to be resubmitted.
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	However, further details are required.
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?	No	The GMA and structural damage category assessment are to be resubmitted.

Item	Yes/No/NA	Comment
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	The GMA and structural damage category assessment are to be resubmitted.
Does the BIA report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	However, the GMA and structural damage category assessment are to be resubmitted.
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. The BIA includes screening, scoping, site investigation and impact assessment stages as required and defined in the LBC Planning Guidance document 'Basements and Lightwells (CPG4)', dated July 2015.

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 late 1970's single-storey house 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 single-storey 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 three-storey house, including a 4m or so deep basement. The new basement will partially extend under the existing garden areas. A single tree is to be removed from the garden to accommodate basement construction – this has been accepted by the LBC and is discussed in the arboricultural report (this 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. Basement excavation level on this side of the property is shown to be similar to current ground levels at the rear of 41 Rosslyn Hill.

4.9. No specific information is given on the current structural condition of 41 Rosslyn Hill or 30 Thurlow Road except to note that cracks were observed in one of the garden/boundary walls.

Information on the structural condition of the two adjacent properties should be obtained under the Party Wall Act as building condition will have a bearing on the sensitivity of these properties to ground movements caused by excavation for the proposed basement.

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 stiff and very stiff, silty clay.

4.12. It is reported that groundwater was not encountered during the GI or during subsequent monitoring visits, although groundwater monitoring data are not presented.

4.13. 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}.

4.14. The BIA confirms that there was no evidence of shrink/swell subsidence in the local area. The above noted cracking observed to the garden/boundary wall was attributed to poor foundation design.

4.15. The proposed basement bottom slab will be founded on the London Clay and although this stratum is generally considered to be more susceptible to shrink/swell issues than the overlying Claygate Beds, the depth of the basement should preclude it from being affected by seasonal or transpiration induced effects or removal of the tree. It should be confirmed that the tree removal will not impact neighbouring foundations.

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

4.17. The BIA notes that the site is not located within 100m of a watercourse, well, local pond or potential spring line nor is it within 50m of Hampstead Heath ponds. The site is located more than 350m to the south of a tributary of the culverted River Fleet. The basement is thus not at risk of ground instability or groundwater related flooding due to lying in the vicinity of or below such water features.

4.18. The BIA states 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. However, given that monitoring was undertaken during the summer months only, it is recommended that additional monitoring is carried out prior to construction.

4.19. 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 potential damage are maintained within acceptable limits.

4.20. 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. This issue is to be addressed by the adoption of suitable excavation support and construction methodologies – see below.

4.21. It is confirmed in the BIA that the site does not lie over or within the exclusion zone of any tunnels.

4.22. In the context of surface water flow and flooding (and also groundwater flow – generally discussed below), the BIA confirms that the site is not within the catchment area of the pond chains on Hampstead Heath.

4.23. Regarding any changes in the areas of impermeable surfacing and any changes to the route or profile of surface water flows, the BIA notes that here will be little change in the case of the former and that in the case of the latter, surface water flows will be disposed of to the local sewers as per the existing arrangement. The quality of surface water received by adjacent properties or downstream water courses will not be affected in the future due to the water being diverted to the sewers.

4.24. With respect to the risk or otherwise of surface water flooding or because the basement lies below the static water level of a nearby surface water feature, it was stated in the BIA that the site is not at risk from such flooding. This is accepted.

4.25. With regard to subterranean (groundwater) flows, the basement will be constructed largely within the Claygate Beds, with the lower basement slab being founded (probably) within the London Clay. The Claygate Beds are a noted aquifer, but the BIA states that the absence of any significant sand seams during the recent GI and of groundwater during recent monitoring means that the basement will not extend below a definable water table. This accepted, however,

as monitoring was undertaken during the summer months, it is recommended that this is confirmed by further monitoring prior to construction to allow the final design of the temporary and permanent works.

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

4.27. Drawings submitted with the BIA show the basement structure 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 prior to construction of the basement box is to comprise fully propped contiguous RC bored piling on three sides and a sheet-piled retaining wall on the downhill side. It is proposed that the perimeter walls should be constructed by cfa piling techniques because of the greater ground support that these piles provide at all stages of construction.

4.28. Given the shallow depth of the foundations to the side extension to 30 Thurlow Road (a depth of 1.25m bgl was recorded during trial pitting) and their close proximity to the proposed basement excavation, the BIA affirms the need to avoid open surface excavations in proximity to the foundations and to provide 'continuous' lateral support to the capping beam and contiguous piled perimeter retaining walls. However, the means of achieving a suitably high support stiffness has not been discussed in any detail. This aspect requires elaboration to give confidence that a safe system of work will be adopted, and should be detailed in a Basement Construction Plan.

4.29. The BIA variously indicates the adoption of tension piles to resist net uplift pressures (due to hydrostatic uplift and/or heave effects) and the use of a compressible void former. The use of void former and/or tension piles should be clarified in a Basement Construction Plan.

4.30. The BIA notes that contiguous piling (as opposed to secant piling) has been selected for the perimeter walls due to the observed low groundwater levels - and the perceived low risk of groundwater flows leading to loss of fines and also consolidation of the soils beneath the footings to adjacent properties e.g. to 30 Thurlow Road. This is accepted as valid for the temporary condition before the inner basement walls are constructed. However, as noted in the BIA, full hydrostatic groundwater pressures should be adopted for the permanent design of the inner basement walls with groundwater level taken at 1m bgl or so to allow for possible storm water flows or a burst water main(s).

4.31. No geotechnical parameters have been included within the BIA for retaining wall design and no calculations have been provided for the design of the contiguous piled perimeter walls or the sheet-piled wall adjacent to 41 Rosslyn Hill. Preliminary design parameters and assumptions

should be provided in the BIA including ground and groundwater pressures and surcharge loading from the adjacent foundations for the permanent and temporary conditions.

4.32. A preliminary construction method statement is included within the BIA. The construction methodology presented is accepted as reasonable for planning purposes but will need to be developed in more detail prior to construction. The sequencing of installation of the capping beam and contiguous piles to the perimeter walls and the propping arrangements to be adopted, should be clearly defined with a view to minimising ground movements. Most importantly, the sequencing and propping arrangements for the initial high-level excavations to the capping beam adjacent to 30 Thurlow Road should be rigorously defined.

4.33. The method statement describes the need for a movement monitoring plan. The monitoring plan is to include for measurements of vertical and horizontal ground movements against pre-defined trigger levels and is to include contingency measures to be implemented should the trigger levels be exceeded. An outline scope for the monitoring regime should be provided in the BIA to give confidence that the basement excavation process will, at all stages, be tightly controlled. The monitoring regime, plus pre and post-condition surveys of adjacent properties, will be required to be undertaken to comply with the Party Wall Act.

4.34. An outline works programme sufficient for planning purposes should be provided.

4.35. For the purpose of predicting the category of damage to be assigned to each of the structures in close proximity to the site, assessments have been undertaken in accordance with CIRIA C580 to predict the vertical movements (settlements) arising from the installation of the perimeter wall piles and from the deflection of the piles as the basement is excavated. In addition to the above, global short-term heave movements arising from basement excavation have been assessed using elastic theory. An estimate has also been made of the net long term movements arising from long-term heave of the basement floor and settlement due to the imposition of the new building loads.

4.36. Contour plots of vertical movement are submitted within the BIA. However, there is no commentary in the report to explain how these plots have been derived. The data input and the programme used to produce the plots should be provided/explained.

4.37. In addition to the above, no assessment of horizontal ground movements has been undertaken. This should be rectified as building damage category assessments cannot be made on the basis of vertical movements only.

4.38. It would appear that a building damage assessment has not actually been carried out but an assessment instead made of the movements which must not be exceeded for a Damage

Category of 1 to be achieved. The predicted damage category should be based on predicted movements, not the other way around.

4.39. The GMA and damage assessments are required to be completed and resubmitted before the audit can be closed out.

5.0 CONCLUSIONS

5.1. The BIA includes screening, scoping, site investigation and impact assessment stages as required and defined in the LBC Planning Guidance document 'Basements and Lightwells (CPG4)', dated July 2015.

5.2. The qualifications of the authors, checkers and approvers of the BIA and various supporting documents are generally in compliance with the requirements of CPG4. It is accepted that there are no significant residual impacts with respect to surface water, subterranean flows and slope stability.

5.3. Information has been supplied to confirm the location of existing basements within the vicinity of the proposed development.

5.4. Information on the structural condition of 41 Rosslyn Hill and 30 Thurlow Road should be obtained for inclusion within a Basement Construction Plan.

5.5. The absence of significant groundwater in the Made Ground or the Claygate Beds is accepted. However, it is recommended that further monitoring is undertaken prior to construction to confirm the design of the temporary and permanent works.

5.6. It is acknowledged that the proposed construction (propped contiguous bored piled wall) is appropriate. The means of achieving a suitably high support stiffness to the capping beam and contiguous piled perimeter retaining walls should be clarified in a Basement Construction Plan. The BCP should also include details of the sequencing of construction (piling, propping and excavation).

5.7. The use of void former and/or tension piles within the basement box should be confirmed in the BCP.

5.8. Full hydrostatic groundwater pressures should be adopted for the permanent design of the inner basement walls with groundwater level taken at 1m bgl or so to allow for possible storm water flows or a burst water main(s).

5.9. Preliminary geotechnical parameters and assumptions for the design of the contiguous piled perimeter walls and the sheet-piled wall adjacent to 41 Rosslyn Hill should be provided in the BIA. The calculations should demonstrate that the perimeter walls are stable under all reasonable assumptions of ground and groundwater pressures and surcharge loading from the adjacent foundations.

5.10. The sequencing of installation of the contiguous piles to the perimeter walls and the propping arrangements to be adopted should be clearly defined. Most importantly, the sequencing and

propping arrangements for the initial high level excavations to the capping beam adjacent to 30 Thurlow Road should be rigorously defined.

5.11. The proposed monitoring regime should be outlined in the BIA to give confidence that the basement excavation process will at all stages, be tightly controlled.

5.12. Pre and post-condition surveys of adjacent properties will be required to be undertaken to comply with the Party Wall Act.

5.13. An outline works programme sufficient for planning purposes should be provided.

5.14. The GMA and damage assessments are not clear or satisfactory and are required to be resubmitted before the audit can be closed out. Horizontal ground movements are to be included.

Appendix 1: Residents' Consultation Comments

Surname	Address	Date	Issue(s) raised	Consultation Response from SFA, CC and LBH	Campbell Reith Comments (See Notes for Abbreviations)
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.	a) See responses to Smouha, below.	a) The proposed basement is in closest proximity to 30 Thurlow Road rather than 41 Rosslyn Hill. Provided the GMA and predicted SDC for 30 Thurlow Road are shown to be within acceptable bounds, the SDC for 41 Rosslyn Hill will also be within acceptable bounds – see Section 5.15.
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.	a), b), c), d) & e) - see responses to Smouha, below.	a) The proposed basement is in closest proximity to and also presents the greatest differential in founding levels with 30 Thurlow Road rather than 41 Rosslyn Hill. b), c) & d) Provided the GMA and predicted SDC for 30 Thurlow Road are shown to be within acceptable bounds, the SDC for 41 Rosslyn Hill will also be within acceptable bounds. The GMA and SDC are to be reassessed – see Section 5.15. e) The recent GI indicated there to be no definable water table at the site. However, this should be confirmed by GWM - see Section 5.5.

Surname	Address	Date	Issue(s) raised	Consultation Response from SFA, CC and LBH	Campbell Reith Comments (See Notes for Abbreviations)
Parmer	41A Rosslyn Hill, London NW3 5UJ	02/11/15	a) Risks of vibration, movement and flooding damage.	a) See responses to Smouha, below.	a) General - see CR responses above and below.
Lessani	Flat C, 41 Rosslyn Hill, London NW3 5UJ	03/11/15	a) Risks of foundation instability and groundwater movements.	a) See responses to Smouha, below.	a) General - see CR responses above and below.
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 Thurlow Road and a risk to the building.	a) See response b) to Smouha below.	a) See response b) to Smouha below.
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.	a) No response. b) The risk to the extension will be mitigated by the proposed temporary and permanent works. There will also be a system of monitoring, with pre-planned interventions in place.	a) The BIA wording should be reviewed in this regard. b) The GMA and SDC are to be reassessed – see Section 5.15.
			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	c) The basement is proposed to be formed within a fully braced bored piled perimeter wall. The bracing and piled wall will maintain the equilibrium of the surrounding soils. It is	c) The GMA and SDC are to be reassessed – see Section 5.15.

Surname	Address	Date	Issue(s) raised	Consultation Response from SFA, CC and LBH	Campbell Reith Comments (See Notes for Abbreviations)
			41 Rosslyn Hill and 30 Thurlow Road.	envisaged that there will be minimal movement.	
			d) A pile depth of 12m or so is currently shown for the perimeter piles. Justification is not given for this depth.	d) See response to f) below.	d) Consultation response accepted.
			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.	e) The GMA does include for ground movements arising from horizontal yielding of the proposed basement wall.	e) Consultation response not accepted. Horizontal ground movements are to be evaluated – see Section 5.15.
			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.	f) Perimeter pile depths of 1.5 times the depth of excavation have been assumed (as a default) when estimating ground settlements due to pile installation. The analysis is not sensitive to an increase in pile depth.	f) Consultation response not accepted, although impact is small.
			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.	g) Basement perimeter piling will be continuous with piles placed side by side. Final design (diameter, depth etc.) will be undertaken by a specialist contractor to a performance specification.	g) Consultation response accepted.

Surname	Address	Date	Issue(s) raised	Consultation Response from SFA, CC and LBH	Campbell Reith Comments (See Notes for Abbreviations)
			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 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.	h) The structural design of the perimeter retaining wall and the basement wall will assume a groundwater depth of 1m bgl to cater for surface water flooding or a burst water main. i) No response. j) Both basements will be provided with suitable piling etc. and will be designed to cater for the relevant soil etc. loads to ensure stability. Groundwater encountered at 39 Rosslyn Hill is attributed to the ingress of rainwater. In the absence of any groundwater flow in the area, there is no scope for adverse hydrogeological impacts, either	h) Consultation response accepted. i) This matter should be clarified following the results of groundwater monitoring – see Section 5.5. j) Stability response accepted in principle. Groundwater response not accepted. This matter should be clarified following the results of groundwater monitoring – see Section 5.5.

Surname	Address	Date	Issue(s) raised	Consultation Response from SFA, CC and LBH	Campbell Reith Comments (See Notes for Abbreviations)
				individually or cumulatively.	
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.	a), b) & c) - see responses to Smouha, above.	a) General - see CR responses above and below.
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.	a) No response. b) See response b) to Smouha above. c) See responses c) and g) to Smouha above.	a) This has been accepted by the LBC. b) It is for the GMA and predicted SDC for 41 Rosslyn Hill and 30 Thurlow Road to demonstrate that parameters are within acceptable bounds. The GMA and SDC are to be reassessed – see Section 5.15. c) See CR responses c) and g) to Smouha above.

Surname	Address	Date	Issue(s) raised	Consultation Response from SFA, CC and LBH	Campbell Reith Comments (See Notes for Abbreviations)
			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. 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.	d) See response h) to Smouha above. e) See response j) to Smouha above.	d) See CR response h) to Smouha above. e) See CR response j) to Smouha above.
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 responses to Smouha, above.	The GMA and SDC are to be reassessed – see Section 5.15.
Abbreviations: GMA – Ground Movement Assessment. GWM – Groundwater Monitoring. SDC – Structural Damage Category.					

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 contiguous piled perimeter walls, sheet-piled wall adjacent to 41 Rosslyn Hill, and basement slab should be provided.	Open	
2	Stability.	Ground movement assessment to be revised to include horizontal movement and justify derivation of contour plots. Building damage assessment required for affected properties.	Open	
3	Stability.	An outline works programme should be provided.	Open	
4	Stability.	Outline proposals for monitoring should be provided.	Open	
5	Stability, hydrology and hydrogeology.	Groundwater monitoring should be undertaken at the site to confirm groundwater levels.	Prior to construction	N/A
6	Stability.	The use of void former and/or tension piles within the basement box should be confirmed.	To be provided in Basement Construction Plan	N/A
7	Stability.	The construction sequence propping arrangements for the capping beam and contiguous piled perimeter retaining walls should be clarified, especially in relation to 30 Thurlow Road.	To be provided in Basement Construction Plan	N/A
8	Stability.	Information should be provided on the structural condition of 41 Rosslyn Hill and 30 Thurlow Road.	To be agreed with Party Wall Surveyor	N/A

Appendix 3: Supplementary Supporting Documents

None