CampbellReith
consulting engineers

1A St John's Wood Park
London NW8 6QS

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 1A St John's Wood Park, London NW8 6QS - Planning Reference 2015/4800/P.

1.2. Subsequent to the issue of the initial audit, a revised and updated BIA and accompanying hydrogeology and land stability assessment were issued in December 2015 and a further audit carried out by CampbellReith. This second audit was issued on 06 January 2016. Following the issue of the second audit, further amendments have been made to the main BIA. This current report constitutes a revision to the original two CampbellReith audits, to accommodate the clarifications and confirmations within the most recent BIA and associated documentation.

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

1.4. The qualifications of the authors, checkers and approvers of the BIA and companion documentation are generally as required by CPG4.

1.5. Whilst the outstanding screening and scoping issues noted in Section 3 of this audit have not all been addressed, it is accepted that the main potential impacts from basement construction have been identified.

1.6. The revised BIA has confirmed that an external visual inspection of nearby properties, including 1 St John's Wood Park, revealed no signs of structural defects.

1.7. Ground conditions at the site were found to comprise a thin covering of Made Ground overlying London Clay. The monitoring of standpipes has indicated groundwater at shallow depth, ranging from 0.47m bgl to 0.23m bgl.

1.8. In terms of slope/ground stability, it is confirmed in the BIA that the site is essentially flat and thus not prone to slope stability issues.

1.9. Although the basement will be founded largely within the London Clay, basement depths are likely to be such as to preclude any issues arising from vegetation induced shrink/swell effects. Heave will occur due to basement excavation but is to be mitigated by the use of void formers beneath the basement slab. Heave is stated in the BIA as not likely to exceed 30mm or so and this estimate is considered to be reasonable.

1.10. The site is located immediately adjacent to the highway of St John's Wood Park and the Jubilee Line running tunnels also lie in close proximity to the site. Consultations have commenced with LUL to determine the depth and distance of the tunnels from the proposed basement and any constraints that LUL might have.

1.11. It is accepted that the site did not flood in 2002 and that the site and adjacent properties should not be at increased risk of flooding from surface water following basement construction.

1.12. Although groundwater was recorded in the GI standpipes, measurable groundwater flows are likely to arise from the Made Ground only. It is stated in the BIA that groundwater level in basement design will be taken at ground level. This is accepted as prudent design practice.

1.13. Mention is made in the BIA of the need to install 'well-points' during basement excavation from which water may be pumped. It is assumed that this is not a reference to 'well-pointing' which would be unnecessary and probably ineffective but to conventional sump-pumping.

1.14. The proposed basement will result in a differential in foundation depths relative to neighbouring properties and so the basement excavation perimeter is to be supported by a contiguous piled wall. No calculations have been included in the BIA for the design of the wall. However, a semi-empirical assessment has been made of the likely depth of the piles. This is accepted for outline design purposes and for informing the GMA.

1.15. The revised BIA confirms the proposal to adopt contiguous piled perimeter walls. The intention is to form a stiff propping system and thereby minimise wall deflections and potential damage to 1 St John's Wood Park and the nearby highway and associated services.

1.16. There remain a number of inconsistencies in the revised GMA but the predicted building damage category is likely to have been over-estimated as a result and is thus conservative. The revised BIA has confirmed the predicted CIRIA C580 damage category for 1 St John's Wood Park to be Category 0 ('Negligible') to Category 2 ('Slight'). This is accepted, assuming the that a high level of site control is maintained throughout the duration of the basement works.

1.17. An outline monitoring scheme is presented in the BIA comprising condition surveys plus vertical and lateral movement monitoring of nearby properties against defined trigger levels.

1.18. An outline works programme has been included within Appendix G of the revised BIA.

1.19. Queries and requests for clarification/further information are summarised in the Audit Query Tracker in Appendix 2. However, the reader is also referred to the discussion in Section 4 and conclusions in Section 5 for further detail. The revised BIA and supporting documents adequately identify the likely impacts of the basement proposals and include suitable mitigation measures.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by the London Borough of Camden (LBC) on 27 October 2015 to carry out a Category 'B' Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 1A St John's Wood Park, London NW8 6QS - Planning Reference 2015/4800/P.

2.2. The Audit was carried out in accordance with the Terms of Reference set by the LBC. The Audit reviewed the 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 above initial audit, a revised and updated BIA and accompanying hydrogeology and land stability assessment were issued in December 2015 and a further audit carried out by CampbellReith. This second audit was issued on 06 January 2016. Following the issue of the second audit, further amendments have been made to the main BIA and these were issued on 11 January 2016.

2.4. This current audit constitutes a revision to the original two CampbellReith audits, amended as necessary, to accommodate the clarifications and confirmations incorporated within the most recent BIA and associated documentation

2.5. 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.

2.6. 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.

2.7. 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.

2.8. The LBC Audit Instruction described the planning proposal as '*Erection of a 3 storey plus basement, 5 x bedroom single dwelling house, including new boundary walls, following demolition of 6 x existing garages on land adjacent to 1 St. John's Wood Park (Class C3)'.*

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 subterranean (groundwater) flow constraints.

c) The application does not require determination by the Development Control Committee (DCC).

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

2.9. CampbellReith originally accessed the LBC Planning Portal on 06 November 2015 and examined the following reports and drawings relevant to the audit:

a) A 'Ground investigation Report' prepared by Ground & Water (G&W), dated 01 July 2015.

b) A 'Geo-insight' Report' prepared by Groundsure, dated 16 July 2015.

c) An 'Enviro-insight Report' prepared by Groundsure, dated 16 July 2015.

d) A 'Basement Impact Assessment' prepared by Croft Structural Engineers (CSE), dated August 2015.

e) A 'Basement Impact Assessment (Hydrogeology & Land Stability)' prepared by Maund Geo-Consulting (MGC), dated 17 August 2015.

f) A 'Construction Traffic Management Plan (CTMP)' prepared by Transport Planning & Highway Solutions (TPHS), dated September 2015.

g) The following planning application drawings:

Proposed Site Plan.

Proposed Floor Plans.

Revised Ground Floor Plan.

Revised Basement Floor Plan.

Basement Plan B1A (Structural)

Longitudinal and Cross-Sections.

Proposed Elevations.

2.10. The second CampbellReith audit was based on a review of the following documents:

a) A revised BIA, including a surface flow and flooding (hydrology) screening, scoping and impact assessment prepared by CSE, dated 02 December 2015.

b) The accompanying hydrogeology and land stability screening, scoping and impact assessment prepared by MGC, dated 02 December 2015.

2.11. This final CampbellReith audit is based on a review of the latest version of the main BIA. prepared by CSE and dated 11 January 2016.

2.12. No comments have been received from the public on the planning application.

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	Generally within the main BIA but less so in the accompanying hydrogeology and land stability assessment.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Generally - where supplied.
Slope and Ground Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	No	Appropriate data sources have not always been consulted, although screening outcomes are correct. Justification is not always given for 'No' answers.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appropriate data sources have generally been consulted. Justification is provided for 'No' answers.
Hydrogeology (Groundwater Flow) Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Appropriate data sources have not always been consulted, although screening outcomes are correct. Justification is provided for 'No' answers.

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	
Hydrogeology (Groundwater Flow) Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	Groundwater monitoring data only. Only limited groundwater monitoring has been undertaken to date. However basement design is to assume groundwater level at ground level.
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	
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	NA	No such reports were identified as being required.

Item	Yes/No/NA	Comment
Are baseline conditions described, based on the 'Guidance for Subterranean Development (GSD)'?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	It is reported that there are (currently) no adjacent basements
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	
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	Monitoring Level 5 as defined by CSE is proposed – see Sections 4 and 5.
Have the residual (after mitigation) impacts been clearly identified?	NA	No residual impacts were considered to be applicable.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	
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	

Item	Yes/No/NA	Comment
Does the BIA report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	
Are non-technical summaries provided?	Yes	

4.0 DISCUSSION

4.1. 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 1A St John's Wood Park, London NW8 6QS - Planning Reference 2015/4800/P.

4.2. Rather than refer in this Audit to each document individually, the main revised BIA (produced by CSE) plus the accompanying documentation will simply be referred to as the BIA.

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

4.4. The qualifications of the authors, checkers and approvers of the BIA and companion documentation are generally as required by CPG4.

4.5. The proposed development is located immediately north of 1 St John's Wood Park on land currently occupied by a block of domestic garages and an area of hardstanding. The new property will form 1A St John's Wood Park. The proposed site backs onto Middlefield, a private road with residential properties and further garages.

4.6. The proposed development comprises the construction of a three-storey detached house with a 3.5m deep single-storey basement. The basement will be deepened locally to 6m below ground level (bgl) at the rear to accommodate a swimming pool. The overall basement will be 12m wide (parallel to the adjoining road) and 24m long (in the perpendicular direction). The basement will be provided with lightwells at the front.

4.7. A small group of mature trees/shrubs lines the pavement to the north-east of the site but the street directly in front of the building is devoid of vegetation.

4.8. The BIA states that neither the existing property at 1 St John's Wood Park nor any other adjacent properties have basements. However, the garages to the west of the property which are not to be demolished as part of the works are designated to be replaced in the future with new residential buildings with basements.

4.9. The revised BIA has confirmed that an external visual inspection of nearby properties, including 1 St John's Wood Park, revealed no signs of structural defects.

4.10. A small ground investigation (GI) was undertaken within the footprint of the proposed development on 01 July 2015 by Ground & Water Ltd (G&W) and comprised the sinking of a single windowless sampler borehole (BH1) to 12.5m bgl and the excavation of two trial pits

(TP2 and TP1) to the front and rear respectively of the garages. A standpipe was installed within the borehole to 5m bgl.

4.11. Subsequent to the original BIA, an additional GI was undertaken by G&W in September 2015 further to the west of the site. This GI comprised the sinking of two windowless sampler boreholes (WS1 & WS2) to 12.45m bgl and a further trial pit in the garage area. Standpipes were installed in WS1 and WS2 to depths of 5m and 4.5m bgl respectively.

4.12. Ground conditions in borehole BH1 (closest to the development) were found to comprise Made Ground to 0.5m bgl, overlying London Clay. Possible Head Deposits/Made Ground was recorded directly below the garage footing in TP1. The BIA comments that any Head Deposits logged at the site are more likely to be Made Ground. This is accepted.

4.13. Groundwater was not encountered during either GI. However, monitoring of the standpipes at the two GI locations over the period August to December 2015 has indicated groundwater close to ground level at depths of 0.47m and 0.23m bgl in boreholes BH1 and WS2 respectively.

4.14. Regarding topography and issues of slope/ground instability, the BIA confirms that the site does not slope at more than 7^{o} (1:8), does not lie within a wider hillside setting in which the general slope is greater than 7^{o} and that ground slopes will not be changed as a result of the development. The site is also confirmed not to neighbour land, including railway cuttings and the like with a slope greater than 7^{o}.

4.15. The London Clay has been found not to be the shallowest stratum at the site but does lie at shallow depth. Laboratory plasticity test results indicate the material to be generally of high volume change potential. However, the BIA states that there is no evidence of subsidence in the vicinity of the site. In any case, the proposed basement depth is such that it will be beyond the zone likely to be influenced by vegetation-induced shrink/swell issues, although heave will inevitably occur as a result of excavation. It is confirmed that this will be accommodated by the use of a compressible void former below the lower basement slab.

4.16. The BIA includes an assessment of the likely proximity of the root protection zone of the nearest tree to the site and concludes that the roots would not be intercepted by the basement. It is believed that there is possible confusion between the effective radius and effective diameter of the root protection zone. However, there are not considered to be any implications for local building stability.

4.17. The BIA confirms that the property is not located within 100m of a watercourse or potential spring line. Although not noted in the BIA, the site is located to the west of two mapped tributaries of the former River Tyburn. However, the tributaries will have been culverted many

years ago to form part of the local sewer network and thus cannot contribute to current above ground or subterranean flows.

4.18. The BIA has confirmed that the site is not within an area of previously worked ground and that no operational or historic landfills or waste transfer, treatment or disposal sites are recorded nearby.

4.19. Due to the basement being founded largely within the low permeability London Clay i.e. a non-aquifer, there should not be any need for other than minor dewatering/pumping during construction and hence settlements that might otherwise arise from more extensive drainage measures will not occur.

4.20. The BIA confirms that the proposed basement will result in a differential in foundation depths relative to neighbouring properties, but states that associated risks will be mitigated in design e.g. by suitable propping of the excavation support walls, movement monitoring etc. The site is also located immediately adjacent to the highway of St John's Wood Park. The above approach is accepted in principle and with the adoption of suitable measures, the integrity of the adjacent property and highway plus associated infrastructure should not be at risk.

4.21. Although the site has been identified as lying 50m or so south of tunnelled sections of the Network Rail Euston to Willesden Junction line, the tunnels lie well outside the zone of influence of the works. However, it has been confirmed in the revised BIA that Jubilee Line running tunnels lie beneath St John's Wood Park and Metropolitan Line tunnels run beneath Finchley Road to the west of the site. The Jubilee Line tunnels are in closest proximity to the site and consultations have commenced with LUL to determine the depth and distance of the tunnels from the proposed basement and any constraints that LUL might have.

4.22. In the context of surface water flow and flooding, the BIA confirms that the property is not within the catchment area of the ponds on Hampstead Heath and that there are no reservoirs, canals or other artificial sources near the site that could pose a flood risk to the site. The site is too elevated to be at risk of tidal flooding.

4.23. The BIA confirms that surface water flows from the proposed development will follow the same route as before i.e. that water will be collected from hard surfaced areas and will be directed into the existing drainage system. On this basis, there will be no change in the volume or quality of inflows received by adjacent properties or downstream watercourses.

4.24. The revised BIA states that the site is not on the list of streets that were flooded in 2002. This is accepted.

4.25. The BIA has noted that a trunk sewer runs beneath St John's Wood Park and that flooding could arise as a result of blockage or damage. Mitigation measures proposed to deal with this

are the inclusion of upstands to the basement lightwells and the installation of suitable pumping in the new basement. This is accepted as reasonable.

4.26. With regard to subterranean (groundwater) flows, the BIA notes that the site does not lie within 100m of a watercourse, well or potential spring line and will not result in a change in the area of hard surfacing, thus altering the rate of groundwater recharge. Due to the above and due also to the basement being constructed within the relatively impermeable London Clay, it will not be the cause of any increase or decrease in local groundwater flows which could otherwise potentially adversely affect nearby structures. Although groundwater was recorded in the GI standpipes, measurable groundwater flows are likely to arise from the Made Ground only.

4.27. The proposed basement walls are shown in the BIA to comprise an external contiguous piled wall with an internal RC lining wall. The two walls will extend in parallel around the entire basement perimeter.

4.28. To allow for the possibility that groundwater levels may rise above normal levels due to breakage of a water main or similar, it is stated in the BIA that groundwater level in design will be taken at ground level. This is accepted as prudent design practice.

4.29. No calculations have been included in the BIA for the design of the contiguous piled perimeter wall. However, a semi-empirical assessment has been made of the likely depth of the contiguous piled wall. This is accepted for outline design purposes and for informing the GMA.

4.30. No basement buoyancy or heave calculations are presented in the BIA. Buoyancy is stated to be satisfactory 'by inspection'. Heave is stated as not likely to exceed 30mm or so and as noted above, will be compensated for by the use of a suitable void former below lower basement slab level.

4.31. A preliminary method statement is provided in the BIA for planning purposes. The method statement is fairly generic and so will need to be developed further prior to construction.

4.32. The revised BIA confirms that the contiguous piled perimeter walls will be propped by means of inclined props extending from capping beam level to found within thrust blocks at basement floor level. The intention is to form a stiff propping system and thereby minimise wall deflections and potential damage to 1 St John's Wood Park and the nearby highway and associated services.

4.33. Mention is made in the BIA of the need to install 'well-points' from which water may be pumped. It is assumed that this is not a reference to 'well-pointing' which would be unnecessary and probably ineffective but to conventional sump-pumping.

4.34. Horizontal and vertical ground movements arising from installation of the contiguous piled perimeter wall, wall movements due to basement excavation and their combined effects have been assessed based on CIRIA C580 Tables 2.2 and 2.4 respectively. Calculations have been provided for the main basement and for the deeper swimming pool area.

4.35. Following the comments made in the last audit, a number of modifications have been undertaken to the GMA for the main basement and the swimming pool area. There are a number of inconsistencies in the revised GMA but the predicted building damage category is likely to have been over-estimated as a result and is thus conservative.

4.36. The revised BIA has confirmed the predicted CIRIA C580 damage category for 1 St John's Wood Park to be Category 0 ('Negligible') to Category 2 ('Slight'). This is accepted, assuming the implementation of a stiff propping system and that a high level of site control is maintained throughout the duration of the basement works.

4.37. An outline monitoring scheme is presented in the BIA comprising condition surveys plus vertical and lateral movement monitoring against defined trigger levels. The proposed scheme includes provision for the review of methods of working and monitoring intervals to ensure that movements are restricted. The implementation of emergency remedial measures e.g. increased propping is also proposed in the event of adverse results being recorded. In the extreme case, works will cease and a revised method of working will be implemented.

4.38. An outline works programme has been included within Appendix G of the revised BIA.

5.0 CONCLUSIONS

5.1. The revised BIA includes screening, scoping, site investigation and impact assessment stages as required 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 companion documentation are generally as required by CPG4.

5.3. Whilst the outstanding screening and scoping issues noted in Section 3 of this audit have not all been addressed, it is accepted that the main potential impacts from basement construction have been identified.

5.4. The revised BIA has confirmed that an external visual inspection of nearby properties, including 1 St John's Wood Park, revealed no signs of structural defects.

5.5. Ground conditions at the site were found to comprise a thin covering of Made Ground overlying London Clay. The monitoring of standpipes has indicated groundwater at shallow depth, ranging from 0.47m bgl to 0.23m bgl.

5.6. In terms of slope/ground stability, it is confirmed in the BIA that the site is essentially flat and thus not prone to slope stability issues.

5.7. Although the basement will be founded largely within the London Clay, basement depths are likely to be such as to preclude any issues arising from vegetation induced shrink/swell effects. Heave will occur due to basement excavation but is to be mitigated by the use of void formers beneath the basement slab. Heave is stated in the BIA as not likely to exceed 30mm or so and this estimate is considered to be reasonable.

5.8. The site is located immediately adjacent to the highway of St John's Wood Park and the Jubilee Line running tunnels also lie in close proximity to the site. Consultations have commenced with LUL to determine the depth and distance of the tunnels from the proposed basement and any constraints that LUL might have.

5.9. It is accepted that the site did not flood in 2002 and that the site and adjacent properties should not be at increased risk of flooding from surface water following basement construction.

5.10. Although groundwater was recorded in the GI standpipes, measurable groundwater flows are likely to arise from the Made Ground only. It is stated in the BIA that groundwater level in basement design will be taken at ground level. This is accepted as prudent design practice.

5.11. Mention is made in the BIA of the need to install 'well-points' during basement excavation from which water may be pumped. It is assumed that this is not a reference to 'well-pointing' which would be unnecessary and probably ineffective but to conventional sump-pumping.

5.12. The proposed basement will result in a differential in foundation depths relative to neighbouring properties and so the basement excavation perimeter is to be supported by a contiguous piled wall. A semi-empirical assessment has been made of the likely depth of the piles. This is accepted for outline design purposes.

5.13. The revised BIA confirms the proposal to adopt contiguous piled perimeter walls. The intention is to form a stiff propping system and thereby minimise wall deflections and potential damage to 1 St John's Wood Park and the nearby highway and associated services.

5.14. There are a number of inconsistencies in the revised GMA but the predicted building damage category is likely to have been over-estimated as a result and is thus conservative. The revised BIA has confirmed the predicted CIRIA C580 damage category for 1 St John's Wood Park to be Category 0 ('Negligible') to Category 2 ('Slight'). This is accepted, assuming that a high level of site control is maintained throughout the duration of the basement works.

5.15. An outline monitoring scheme is presented in the BIA comprising condition surveys plus vertical and lateral movement monitoring of nearby properties against defined trigger levels.

5.16. An outline works programme has been included within Appendix G of the revised BIA.

5.17. The revised BIA and supporting documents adequately identify the likely impacts of the basement proposals and include suitable mitigation measures.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA - General	There are numerous discrepancies to be resolved before the BIA (and supporting documents) can be approved. These relate to the form of construction and the depth and extent of the basement (see Section 5 for the main summary points and Section 4 for detailed comments).	Closed. The method statement and associated drawings have been modified to clarify that a stiff propping system will be adopted during basement construction.	11/01/16
2	Surface Water	It is reported that the site benefits from a relief sewer, this should be confirmed. Discrepancies exist over whether drainage routes and surface water flows will be altered.	Closed.	06/01/16
3	Hydrogeology	The impact on subterranean flows and potential need for drainage around the basement should be confirmed.	Closed.	06/01/16
4	Stability	The GI interpretation does not cover the proposed form of construction.	Closed.	06/01/16
5	Stability	The impacts to the highway and surrounding buildings are to be clarified and calculations clearly presented.	Closed. A revised GMA and building damage category assessment has been submitted.	11/01/16
6	Stability	There are various references to dewatering including sump pumping and well-pointing. This should be clarified.	Closed. Discrepancies remain but only nominal groundwater flow is anticipated.	06/01/16
7	Stability	The presence of the Jubilee line tunnel and any associated constraints should be confirmed.	Closed. Consultations with LUL are ongoing.	06/01/16
8	Stability	The absence or otherwise of cracking to 1 St John's Wood Park should be confirmed.	Closed. It has been confirmed that there is no external evidence of existing cracking to 1 St John's Wood Park.	11/01/16
9	Stability.	The proximity of the roots of the nearest trees to the basement and any mitigation	Closed.	06/01/16

		measures required should be confirmed.		
10	Stability.	The proposed monitoring scheme should be updated prior to construction. An outline works programme should be provided.	Closed. An outline works programme has now been included in Appendix G of the BIA.	11/01/16
11	BIA - screening, scoping etc.	The outstanding screening and scoping issues noted in the audit check list in Appendix 3 should be addressed.	Closed.	06/01/16

Appendix 3: Supplementary Supporting Documents

None

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