CampbellReith
consulting engineers

17 Middlefield

London NW8 6ND

Basement Impact Assessment

Audit

For

London Borough of Camden

Project Number: 12066-67
Revision: F1

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Appendix

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 17 Middlefield, London NW8 6ND - Planning Reference 2015/5241/P.

1.2. Subsequent to the issue of the above initial audit, a response document has been issued by Sinclair Johnston & Partners. This current audit constitutes a revision to the original CampbellReith audit, amended as necessary, to accommodate the clarifications and confirmations incorporated within the above document.

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 revised BIA are in compliance with the requirements of CPG4.

1.5. The revised BIA has confirmed that a UXO assessment to determine any potential risks to the works and the requirement for mitigation measures will be undertaken. This should be included within the project health and safety documentation.

1.6. It has been confirmed in the revised BIA that there are no existing basements in the immediate vicinity of 17 Middlefield.

1.7. The revised BIA has confirmed that there are no obvious structural issues with the adjacent properties based on an external visual appraisal. It is further confirmed that formal condition surveys will be undertaken as part of the Party Wall process.

1.8. Ground conditions at the site comprise Made Ground overlying a thin layer of Head Deposits, overlying London Clay. Groundwater was not generally in evidence at the site during the GI or subsequent monitoring. The BIA states that expected low groundwater flows into the basement excavation should be adequately dealt with by sump pumping.

1.9. Further monitoring of the existing standpipes at the site should be undertaken to confirm groundwater levels and potential groundwater flow rates into the basement excavation prior to the commencement of construction.

1.10. The BIA has confirmed that there will be an increase in the areas of impermeable surfacing and hence an increase in rainfall run-off from the site. This is intended to be offset by the use of

Sedum roofing over the basement. Surface water discharge will be into the local Thames Water sewer. Acceptable discharges should be agreed with Thames Water.

1.11. The BIA has confirmed that there is no evidence of ground movement induced damage e.g. shrink/swell effects in the site locality.

1.12. Appropriate procedures should be implemented to safeguard the root system of the large deciduous tree within the garden of 15 Middlefield during basement construction.

1.13. The BIA notes that Metropolitan Line running tunnels lie in proximity to the site beneath Finchley Road and that consultation with LUL is underway.

1.14. It is accepted following the screening exercise conducted within the BIA that there are no outstanding concerns at the site with regard to land/slope stability issues, surface water flow/flooding issues or groundwater flow issues.

1.15. The sidewalls to the basement excavation will be supported by a contiguous piled wall with a capping beam. A groundwater level of 1m bgl will be assumed in wall design. A bottom-up construction sequence will be adopted and temporary propping will be installed and maintained at capping beam level until the basement ground-bearing slab is complete. Tension piles are to be installed to resist hydrostatic and heave pressures acting upon the ground-bearing slab with calculations of hydrostatic uplift and heave forces undertaken during detailed design stage. A void former will not be used.

1.16. The revised BIA has confirmed that the support stiffness provided to the excavation sidewalls will comply with a 'High' level of support stiffness as defined in Table 2.3 of CIRIA C580.

1.17. A GMA and building damage category assessment have predicted a damage category of less than 1 (Very Slight) for 15 Middlefield, 19 Middlefield and the Metropolitan Line tunnels. The revised BIA has stated that the GMA and building damage assessment will be reviewed and confirmed during detailed design stage.

1.18. The revised BIA has confirmed that the nature and scope of monitoring to be undertaken for 15 and 19 Middlefield as required under the Party Wall Act will be discussed and agreed with the representatives of adjoining property owners.

1.19. An outline works programme only has been provided in the CMP. However, this is sufficient for planning purposes.

1.20. Queries and requests for clarification/further information are summarised in Appendix 2. Although some matters remain to be resolved (conclusion of consultations with regulators, detailed design and a UXO assessment) it is considered that the BIA has adequately identified

the potential impacts from the basement proposals and provides adequate mitigation. The outstanding items referred to above and in Section 4 should be carried out under the normal approvals processes for any new scheme.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by the London Borough of Camden (LBC) on 21 October 2015 to carry out a Category 'B' Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 17 Middlefield, London NW8 6ND - Planning Reference 2015/5241/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 above initial audit, a response document was prepared by Sinclair Johnston & Partners. This revised audit report accommodates the clarifications and confirmations incorporated within that document.

2.4. References in this audit to the revised BIA shall be taken as a reference to the original BIA updated by the response document.

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.

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.

2.7. The LBC Audit Instruction described the planning proposal as '*Demolish existing building and replace with 5 bedroom dwelling, to incorporate new basement and sunken garden'.*

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 and surface water flow and flooding constraints but is not in an area subject to 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.

2.8. CampbellReith originally accessed the LBC Planning Portal on 16 November 2015 and examined the following reports and drawings relevant to the audit:

a) A 'Design and Access Statement (D&AS)' prepared by Rodic Davidson Architects, dated 15 July 2015.

b) A 'Planning Statement (PS)' prepared by Savills UK, dated September 2015.

c) A 'Construction Management Plan (CMP)' prepared by Motion-UK, undated but submitted on 15 September 2015.

d) A 'Structural Design & Construction Method Statement (SD&MS)' prepared by Sinclair Johnston & Partners (SJ&P), dated 11 September 2015.

e) A 'Site Investigation & Basement Impact Assessment Report (SI&BIA)' (included within the above document) prepared by Geotechnical & Environmental Associates (GEA), dated September 2015.

f) The following planning application drawings:

Site Location Plan.

Proposed Ground Floor Plan.

Proposed Basement Plan.

Proposed Section A.

Proposed Section B.

Proposed Section C.

Proposed Front Elevation.

Proposed Rear Elevation.

2.9. This updated audit is based upon a review of the following document:

a) Response to CambellReith's original audit prepared by SJP and issued on 27 November 2015 – see Appendix 3.

2.10. No comments were 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	
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?	Yes	
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?	Yes	

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	Limited groundwater monitoring only.
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	However, this is basic only and many of the foundation recommendations are not relevant to the basement solution proposed.
Does the geotechnical interpretation include information on retaining wall design?	Yes	

Item	Yes/No/NA	Comment
Are reports on other investigations required by screening and scoping presented?	No	The revised BIA has indicated that a UXO assessment will be included within a BCP.
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?	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	
Have the residual (after mitigation) impacts been clearly identified?	NA	No residual impacts have been identified that are required to be addressed.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	

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?	Yes	
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. 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.

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

4.3. 17 Middlefield is a two-storey detached house with integral garage and conservatory to the rear. The closest properties to 17 Middlefield are 15 and 19 Middlefield to either side.

4.4. 17 Middlefield is not a listed building, does not lie within the vicinity of any listed buildings and is not located within a conservation area.

4.5. The proposed development comprises the demolition of the existing property and the construction of a new two-storey steel-framed dwelling with a 5m deep single-storey reinforced concrete (RC) basement and sunken rear planted courtyard. The basement will extend into the rear garden up to the boundary wall adjacent to Finchley Road to the west of the site. At ground floor level, the building will occupy a similar footprint to the existing building but with a single-storey extension at the rear, on the northern side.

4.6. The BIA records that the site and surrounding area suffered bomb damage during WWII. The revised BIA has confirmed that a UXO assessment to determine any potential risks to the works and the requirement for mitigation measures will be undertaken and included within a basement construction plan (BCP). This audit has not suggested the need for a BCP, and It is recommended the UXO assessment is carried forward to the health and safety documentation for the scheme.

4.7. It has been confirmed in an email dated 27 November 2015 from Savills UK to the LBC planning department that there are no existing basements in the immediate vicinity of 17 Middlefield.

4.8. The revised BIA has confirmed that there are no obvious structural issues with the adjacent properties based on an external visual appraisal. It is further confirmed that formal condition surveys will be undertaken as part of the Party Wall process.

4.9. An intrusive ground investigation (GI) was undertaken at the site by GEA in July 2015. Ground conditions are indicated to generally comprise Made Ground to depths of between 0.5m and 1.4m bgl, overlying a thin layer of Head Deposits, overlying firm, becoming stiff, London Clay. No evidence was noted of soil desiccation during the GI. However, Atterberg test results on samples of London Clay confirm the stratum to be of high volume change potential.

4.10. Groundwater was not encountered during the GI other than as a perched water table identified at 1m bgl within a trial pit. A single monitoring visit was undertaken to read standpipes located in the front and rear gardens. However, access was only possible to the front garden. The standpipe there was found to be dry. Given the limited information on groundwater at the site, further monitoring of the existing standpipes should be undertaken prior to the commencement of construction to confirm groundwater levels and potential groundwater flow rates into the basement excavation. Allowance should be made for temporary dewatering.

4.11. Regarding topography and issues of slope/ground instability, the BIA confirms that the site and surrounding area are essentially flat i.e. do not slope at more than 7^{o} (1:8) and that the proposed Works will not alter this situation. The site also does not neighbour land, including railway cuttings and the like, with a slope greater than 7^{o}. The site is thus not at risk of instability due to ground inclination issues.

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

4.13. The London Clay has been shown to be the shallowest 'natural' stratum at the site and is known to be generally susceptible to shrink/swell effects. However, the BIA records that there is no evidence of ground movement induced damage to 17 Middlefield nor to the adjacent buildings. In any case, the proposed basement depths are likely to lie well below any potential soil desiccation zones and shrink-swell issues should not therefore be a problem for the new property.

4.14. The BIA records that no large or mature trees are present in the existing garden and that no trees will be felled. However, a large deciduous tree was noted within the garden of 15 Middlefield to the north of the site. Appropriate procedures should be implemented to safeguard the root system of this tree during basement construction.

4.15. The BIA notes that the site is not located within 100m of a watercourse or potential spring line, nor does it lie within 50m of Hampstead Heath Ponds. The site is located to the west of two mapped tributaries of the former River Tyburn, but the tributaries will have been culverted many years ago to form part of the local sewer network. The basement is thus not at risk of ground instability due to lying in the vicinity of any of the above features.

4.16. The BIA confirms that the proposed basement will not be constructed within an aquifer but will sit largely within the low permeability London Clay. On this basis, dewatering and associated settlement issues should not be of concern.

4.17. The BIA confirms the site to lie within 5m of two pedestrian rights of way and highways - Middlefield Road and Finchley Road. The proposed basement will also result in a differential in

foundation depths relative to the adjacent properties. However, it is accepted that subject to the adoption of a suitably stiff and suitably propped contiguous piled perimeter wall to the basement (see below) and suitable monitoring, the stability and integrity of the pavements, highways and adjacent properties should not be at risk.

4.18. It is stated in the BIA that the site does not lie over or within the exclusion zone of any tunnels but notes that the London Underground Ltd (LUL) Metropolitan Line runs at shallow depth under Finchley Road. Potential ground movements of the tunnels arising from basement construction have been evaluated in the BIA and consultations are ongoing with LUL. The revised BIA confirms that the applicant has consulted with LUL and intends to complete any of LUL's requirements post – planning. It is recommended that any constraints to development are clarified in advance of the planning application being determined.

4.19. With respect to 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.

4.20. Regarding any changes in the areas of impermeable surfacing or to the route, profile or quality of surface water flows, the BIA confirms that basement construction will result in an increase in impermeable surfacing due to a loss of garden area and hence that there will be an increase in rainfall run-off. However, this is intended to be offset by the use of Sedum roofing over the basement. Surface water discharge will be as per the existing routes i.e. into the local Thames Water sewer. On the basis of the above, there will not be any change in the quantity or quality of surface water received by adjacent properties or downstream water courses as a result of basement construction. Acceptable discharges from the new development should be agreed with Thames Water.

4.21. It was stated in the BIA that the site has a low risk of flooding from surface water, sewers, reservoirs (and other artificial sources) and groundwater and is also elevated and thus not at risk of tidal flooding. This is accepted.

4.22. In terms of subterranean (groundwater) flow, the basement will be constructed largely within the relatively impermeable London Clay which as noted above, is a non-aquifer and thus not able to sustain a defined water table. The low permeability London Clay will tend to inhibit significant groundwater flows either into the basement excavation during construction or around the basement upon completion. In the case of the former, seepages will most likely be controllable by sump-pumping. In the case of the latter, any groundwater flow would be confined to the Made Ground and although the basement would provide some diversion of flow and change in groundwater levels, this is not likely to be overly significant as far as nearby structures are concerned.

4.23. The absence of any nearby watercourses or springs as noted above means that basement construction will also not result in any increase, decrease or diversion of groundwater flow from such features, nor act as a drain to water flow. Similarly, the location of the basement to the south of the catchment area of the pond chains on Hampstead Heath means there will be no reduction in spring flow to the ponds.

4.24. The excavation for the basement is to be supported by means of an 8m or so deep stiff (600mm diameter) RC contiguous piled wall with RC capping beam. The revised BIA has confirmed that a bottom-up construction sequence will be adopted for basement construction. Once the perimeter contiguous piled wall has been fully installed and capped and the inner face of the piles lined with concrete, a reinforced concrete box will be constructed to form the main basement structure. Tension piles are to be installed to resist hydrostatic and heave pressures acting upon the basement ground-bearing slab. It is confirmed that a void former will not be used.

4.25. The BIA states that expected low groundwater flows into the basement excavation should be adequately dealt with by sump pumping.

4.26. The revised BIA has confirmed that calculations for the expected hydrostatic uplift and heave forces acting upon the basement ground-bearing slab and for tension pile design will be undertaken at detailed design stage.

4.27. The method statement and sequence drawings included within the BIA indicate that temporary propping to the outer contiguous piled perimeter wall will be provided at capping beam level and maintained during excavation to basement formation level. Once the basement ground-bearing slab has been cast and has attained its design strength, the temporary propping at capping beam level will be removed. The basement perimeter piles will thus act in cantilever mode following removal of the temporary props until such time as the basement upper slab is in place.

4.28. The revised BIA has confirmed that the support stiffness provided to the excavation sidewalls adopting the proposed propping configuration will nominally comply with the requirement for a 'moderately' stiff walling system as defined in Table 2.3 of CIRIA C580. However, the adoption of large diameter piles will ensure sufficient stiffness to limit wall deflections at capping beam level to 10mm. The BIA states that this will be consistent with the achievement of a 'high' degree of support stiffness as defined in CIRIA C580. A high degree of support stiffness has been assumed in the GMA – see below.

4.29. Structural calculations have been submitted within the BIA for the short-term (propped at high level) and long-term (cantilever) design of the contiguous piled perimeter walls. A behind the wall ground level surcharge of 20kN/m^2 has been adopted. The revised BIA has confirmed that

the surcharge is based on 45 Units of HB loading acting along Finchley Road and that this will not be exceeded elsewhere e.g. under the adjacent buildings. This is accepted as reasonable.

4.30. A groundwater depth of 1m bgl has been assumed in wall design. This is likely to be conservative given the general absence of groundwater encountered during the GI but would allow for the possibility of perched water conditions at high level within the Made Ground.

4.31. Predictions of horizontal and vertical ground movements arising from contiguous pile wall installation (to 8m bgl) and subsequent basement excavation (to 5m bgl) have been undertaken in accordance with CIRIA C580 assuming a high level of support stiffness. Damage category assessments have been undertaken for 15 Middlefield and 19 Middlefield to either side of the development site and for the Metropolitan Line running tunnels below Finchley Road.

4.32. In all cases, a damage Category of less than 1 (Very Slight) has been determined. The revised BIA has confirmed that the GMA and building damage assessment will be reviewed at detailed design stage. They should be agreed as part of the party wall award.

4.33. The BIA states that due to the close proximity of 15 and 19 Middlefield, full procedures under the Party Wall Act are required. The revised BIA confirms that the nature and scope of monitoring to be undertaken will be discussed and agreed with the representatives of adjoining property owners.

4.34. An outline works programme only has been provided in the CMP. However, this is sufficient for planning purposes.

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 revised BIA are in compliance with the requirements of CPG4.

5.3. The revised BIA has confirmed that a UXO assessment to determine any potential risks to the works and the requirement for mitigation measures will be undertaken and included within a BCP. As a BCP is not being recommended, this assessment should be carried forward to the health and safety documentation for the scheme.

5.4. It has been confirmed in the revised BIA that there are no existing basements in the immediate vicinity of 17 Middlefield.

5.5. The revised BIA has confirmed that there are no obvious structural issues with the adjacent properties based on an external visual appraisal. It is further confirmed that formal condition surveys will be undertaken as part of the Party Wall process.

5.6. Ground conditions at the site comprise Made Ground overlying a thin layer of Head Deposits, overlying London Clay. Groundwater was not generally in evidence at the site during the GI or subsequent monitoring. The BIA states that expected low groundwater flows into the basement excavation should be adequately dealt with by sump pumping.

5.7. Further monitoring of the existing standpipes at the site should be undertaken to confirm groundwater levels and potential groundwater flow rates into the basement excavation prior to the commencement of construction.

5.8. The BIA has confirmed that there will be an increase in the areas of impermeable surfacing and hence an increase in rainfall run-off from the site. This is intended to be offset by the use of Sedum roofing over the basement. Surface water discharge will be into the local Thames Water sewer. Acceptable discharges should be agreed with Thames Water.

5.9. The BIA has confirmed that there is no evidence of ground movement induced damage e.g. shrink/swell effects in the site locality.

5.10. Appropriate procedures should be implemented to safeguard the root system of the large deciduous tree within the garden of 15 Middlefield during basement construction.

5.11. The BIA notes that Metropolitan Line running tunnels lie in proximity to the site beneath Finchley Road and that consultation with LUL is underway. It is recommended that LUL's requirements are clearly understood prior to the planning application being determined.

5.12. It is accepted following the screening exercise conducted within the BIA that there are no outstanding concerns at the site with regard to land/slope stability issues, surface water flow/flooding issues or groundwater flow issues.

5.13. The revised BIA has confirmed that the sidewalls to the basement excavation will be supported by a contiguous piled wall with a capping beam. A groundwater level of 1m bgl will be assumed in wall design. A bottom-up construction sequence will be adopted and temporary propping will be installed and maintained at capping beam level until the basement ground-bearing slab is complete. Tension piles are to be installed to resist hydrostatic and heave pressures acting upon the ground-bearing slab with calculations undertaken during the detailed design stage. A void former will not be used.

5.14. The revised BIA has confirmed that the support stiffness provided to the excavation sidewalls will comply with a 'High' level of support stiffness as defined in Table 2.3 of CIRIA C580.

5.15. A GMA and building damage category assessment have predicted a damage category of less than 1 (Very Slight) for 15 Middlefield, 19 Middlefield and the Metropolitan Line tunnels. The revised BIA has stated that the GMA and building damage assessment will be reviewed and confirmed during detailed design stage.

5.16. The revised BIA has confirmed that the nature and scope of monitoring to be undertaken for 15 and 19 Middlefield as required under the Party Wall Act will be discussed and agreed with the representatives of adjoining property owners.

5.17. An outline works programme only has been provided in the CMP. However, this is sufficient for planning purposes.

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	All references in the BIA to ground and groundwater conditions at 23 Middlefield should be deleted.	Closed. The previous request is withdrawn.	18/01/16
2	Stability.	A UXO assessment should be undertaken prior to basement construction.	Closed. The revised BIA has confirmed that a UXO assessment will be undertaken this should be included within the project health and safety documentation.	18/01/16
3	Stability	Confirmation is required from LUL that they have no objections/concerns regarding the proposed works.	Closed. Consultation with LUL is reported to be underway.	18/01/16
4	Hydrology & hydrogeology.	Likely rainwater run-off rates from the developed site should be determined and acceptable discharges agreed with Thames Water.	Open - to be agreed with TWUL	18/01/16
5	Stability.	The structural condition of nearby properties and the presence or otherwise of nearby basements should be confirmed.	Closed. It has been confirmed in the revised BIA that structural condition surveys will be undertaken as part of the Party Wall procedures. It is also confirmed that there are no existing basements in the immediate vicinity of 17 Middlefield.	18/01/16
6	Hydrology & hydrogeology.	Long-term groundwater monitoring should be undertaken at the site to confirm groundwater levels and the rate at which groundwater would be likely to enter the	Closed. Further monitoring of the existing standpipes at the site should be undertaken prior to the commencement of construction to confirm groundwater levels and potential groundwater	18/01/16

		basement excavation.	flow rates into the basement excavation.	
7	Stability.	Impacts on the deciduous tree at 15 Middlefield should be confirmed.	Closed. Appropriate procedures should be implemented to safeguard the root system of the tree during basement construction.	18/01/16
8	Stability	Disconnects between the GEA and SJ&P sections of the BIA are to be resolved as noted in Sections 4 & 5. Design assumptions/ construction issues/methodology are to be confirmed as discussed in Sections 4 & 5.	Closed. Full resolution/explanations have been provided in the revised BIA - see Section 4.	18/01/16
9	Stability.	The GMA should be reviewed and confirmed as appropriate following clarification of the design assumptions/construction issues/ methodology.	Closed. The revised BIA has clarified the design assumptions/construction issues/methodology to be adopted. It has been confirmed that the GMA and building damage assessment will be reviewed at detailed design stage.	18/01/16
10	Stability.	Details to be provided on the nature and scope of movement monitoring required before, during and after basement construction.	Closed. The revised BIA has confirmed that the nature and scope of monitoring to be undertaken for 15 and 19 Middlefield will be discussed and agreed with the representatives of adjoining property owners as part of the Party Wall procedures.	18/01/16

Appendix 3: Supplementary Supporting Documents

Query No	Subject	Query	Status	Date closed out	SJP Comments
1	BIA	All references in the BIA to ground and groundwater conditions at 23 Middlefield should be deleted.	Open.		The works and ground conditions at 17 Middlefield are virtually identical to the proposals at 23 Middlefield. The investigations at 23 Middlefield are therefore relevant to the BIA for 17 Middlefield. There is no justification for amending the report.
2	Stability.	A UXO assessment should be undertaken prior to basement construction.		To be included in the BCP.	Presumably this is not required for planning.
3	Stability	Confirmation is required from LUL that they have no objections/concerns regarding the proposed works.	Open.	N/A	We have spoken to LUL. We would assume that LUL will formally comment on the application. I imagine that they will have concerns regarding the proposed works and that we will need undertake a correlation survey, pre-construction and post-construction tunnel condition surveys and a ground and tunnel movement analysis. These items will be dealt with post-planning.
4	Hydrology & hydrogeology.	Calculations of relative surface water run-off between the existing and new situations should be provided and acceptable discharges agreed with Thames Water.	-	N/A	Presumably this is not required for planning.
5	Stability.	The structural condition of nearby properties and the presence or otherwise of nearby basements should be confirmed.	Open.		Please can you confirm whether either of the neighbouring properties have applied for consent for basements. We have no right of access in order to assess the structural condition of the adjoining properties. To assess their condition would require access and intrusive investigations. The structural condition of the neighbouring properties will be dealt with as part of the party wall process, however we are not aware of any structural concerns.
6	Hydrology & hydrogeology.	Long-term groundwater monitoring should be undertaken at the site to confirm groundwater levels and the rate at which groundwater would be likely to enter excavations.	Open.		The client will need to instruct GEA to return to site check the standpipes.
7	Stability.	Impacts on the deciduous tree at 15 Middlefield to be confirmed.	Open.		Refer to Arboriculturalist report.
8	Stability	Disconnects between the GEA and SJ&P sections of the BIA to be resolved as noted in Sections 4 & 5. Design assumptions/ construction issues/methodology to be confirmed as discussed in Sections 4 & 5.	Open.		The contiguous piled walls will be stiffly propped at high level in the temporary condition and will be propped at low level by the lower basement slab. This is moderate support stiffness in accordance with the description in CIRIA C580 Table 2.3. However the detailed design of the piles will limit the deflection at the capping beam to 10mm in order to be consistent with the high support stiffness assumed, hence the 600mm pile diameters proposed. The surcharge pressure of 20kN/m^2 relates the Finchley Road. This is the value recommended in the DMRB for 45 units of HB loading and is more onerous than the surcharge elsewhere. Recommendations for hydrostatic pressures are given in 8.1.1 of the BIA. A detailed heave analysis will be undertaken as part of the detailed design. The lower basement raft slab and tension piles will be designed for heave and hydrostatic pressures, therefore no void former is proposed beneath the basement slab. The sequence of construction of the outer basement structure (contiguous piles and lower basement slab) will be bottom up.
9	Stability.	The GMA should be reviewed and confirmed as appropriate following clarification of the design assumptions/ construction issues/ methodology.	Open.		The GMA is considered appropriate on the basis of the current design and assumptions. The GMA will be reviewed and confirmed during detailed design.
10	Stability.	Details to be provided on the nature and scope of movement monitoring before, during and after basement construction.	Open.		Details of the nature and scope of the movement monitoring will be agreed with the Adjoining Owners' representatives as part of the party wall process.

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