Query No	Query	Campbell Reith comments	Action / Response
1	Utility infrastructure information, outline construction programme	Points 1.6, 4.3	We note this is not a requirement of CPG4 but utility drawings were obtained for SI purposes and to assess infrastructure surrounding the basement and can be provided in a revision to our report.
2	Conceptual site model	Points 1.7, 1.8, 4.2, 4.4, 4.15	It is incorrect to state that a conceptual site model has not been presented, as it is presented in Section 2.0 of our report. There is no requirement within CPG4 or GSD for the conceptual model to be presented in any particular form and we feel our conceptual site model is appropriate. It is not in the exact format shown in the GSD but this has not been queried previously in any of numerous previous BIA applications; ll the essential information, such as site description, geology, hydrology, hydrogeology is present. It is incorrect to assume the Head Deposits described in our report are the Claygate Member, simply on the basis of the geological map, as the deposits encountered on site were logged by an experienced Chartered Geologist and differed sufficiently from those of the Claygate Member for us to reach our conclusion. Our report clearly states 'The presence of the significant thickness of made ground and underlying superficial deposits probably accounts for the absence of the Claygate Member, although it is likely that these deposits have been derived from re-worked materials of this stratum. It is also possible that soils that have been interpreted as the upper layers of the London Clay could in fact be the lowest part of the Claygate Member, although their appearance and consistency was more akin to typical soils of the upper London Clay'.
3	Geotechnical parameters to be provided as GSD Appendix G3, based on site investigation data and proposed development foundation level	Points 1.7, 1.10 and 4.7	Geotechnical parameters are presented in Sections 5.0, 7.0 and 8.0 and are derived from the site investigation. The factual data is included in the appendix and the strength data has been derived from on-site description by an experienced Chartered Geologist and insitu test data. Formation level of the proposed 4.1 m basement is within the firm London Clay and we have not found any reference in the report to this stratum being soft. The parameters used within the GMA reflect this, in that a lower bound Eu / E' of 20 MPa / 12.0 MPa equates to a Cu of 40. The derivation of these parameters is described in detail in paragraph 3 in Section 12.1.1 and is founded on published data and considered to be appropriately conservative. As stated in our report it is understood that the proposed loading regime will not exceed a maximum bearing pressure of 120 kN/m^2 and this is shown in the calculations provided by Richard Tant Associates. Line loads of 160 kN/m are expressed but when distributed over the proposed underpins the bearing pressure is below our recommended allowable bearing pressure..
4	Permanent and temporary works information, including loads, retaining wall design, dewatering to be clarified		For Richard Tant Associates to respond.
5	GMA and damage impact assessment, to be based on revised geotechnical parameters and actual site proposals	Points 4.7, 4.10 and 4.11,	As noted above, the geotechnical parameters used in the assessment are derived from the site investigation and are deemed appropriately conservative. The Pdisp assessment, which presents the predicted vertical movements, is the only analysis that requires input of the ground conditions. The Xdisp analysis uses case study data based on generic types of ground conditions. However, as mentioned in our report in Section 12.2.1, the Xdisp analysis was only used to predict the horizontal movements caused by the basement excavation. The vertical movements caused by the underpin installation and basement excavation were imported from Pdsip into Xdisp in order to derive the most

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			conservative Building Damage Assessment. The GMA does not assume that foundations will be formed in stiff clay - on the contrary, the ground conditions used in the Pdsip analysis indicate foundations to be founded in the firm London Clay, with a Cu of approximately 40 kPa. The GMA considers a maximum horizontal movement of 5 mm which is justified and referenced within the report in Section 12.2.1. The 'stiff clay' movement curve, presented in CIRIA C580, was used to assist in the prediction of how the movement diminishes with distance away from the wall only, for which we adopted the advised lateral distance of four times the maximum excavation depth . CIRIA C760, which updates the previously published C580, advises that lateral movement behind a retaining wall embedded in firm clay extends a distance of some three times the maximum excavation depth behind the wall. We would argue that as the data for firm clays is relatively inconclusive, and that the computing software does not include the movement curves for firm clays, for a relatively small excavation of 4.1 m by adopting a greater multiple for lateral movement behind the retaining wall, our assessment remains appropriate and conservative. We would like to reemphasise that the movement curves in C760, and C580 beforehand, are appropriate for specific retaining wall systems, none of which are being adopted on site and have been used as guidance only in order to establish the most accurate assessment possible. Our vertical settlement (Pdisp) assessment refers directly to the ground conditions on site and predicts movements to that effect, the Xdsip analysis, and the 5 mm horizontal movement, was established using published data as noted above and is deemed appropriate for the proposed construction method. With regard to the inclusion of Willow Cottages, we can include these in a revised GMA, but we would point out that as the movements to structures closer to the basement excavation are negligible, we are unsure of the reasoning for this request. We should also note that our method of analysis is consistent with the method that we have used on numerous occasions in Camden and other boroughs and it has been previously accepted by technical auditors.
6	Condition surveys, structural monitoring, to be undertaken in accordance with BIA recommendations plus suitable proposed scheme		We can provide a monitoring regime in a revised report.
7	Groundwater flow rate and direction should be ascertained and considered with reference to the proposed structure and the potential impacts on neighbouring structures. Seasonal groundwater levels should be considered and further monitoring undertaken, as required.	Points 4.6 and 5.1	As stated in our report in Section 2.5 at desk study phase 'Any groundwater flow in the area will be restricted to these sandier horizons (within the Claygate Member) and will generally follow the local topography with a flow direction to the northeast, towards the former tributary of the River Fleet. As the Claygate Member and underlying London Clay are likely to comprise predominantly clay soils, they cannot support groundwater flow over any significant distance, nor can they be considered to support a "water table" such as would be found within a porous and permeable saturated stratum'. This clearly identifies that groundwater flow was unlikely to be present and any groundwater encountered would not represent a water table. Given that Head Deposits were encountered on site (comprising re-worked soils of the Claygate Member), it is reasonable to assume that any structures present within the original materials, such as horizontal partings of more permeable soil that could bear water, are unlikely to have remained intact, be consistent across site or to be of significant size that could bear a significant amount of water. This was demonstrated by the site investigation in that no consistent horizon of more permeable material was encountered within the boreholes and no significant inflows were encountered. Groundwater has been monitored within the standpipes on site, but in view of the varying depths at which it has been recorded, it is considered that these levels do not represent a consistent

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			groundwater table. Drawing on past experience within this area of London and our engineering judgement, it is more likely that the water within the boreholes in fact represents limited inflows from the more permeable layers within the predominantly clay soils. In Section 8.1 of our report we state 'The Superficial (Head) Deposits and underlying London Clay include thin partings of sand and silt and the occurrence of groundwater into the basement will to some extent be determined by the presence of these more permeable materials. Shallow inflows of perched water may also be encountered from within the made ground, particularly within the vicinity of the existing house. Whilst the predominantly clayey nature of the surrounding soil suggests that flow rates are likely to be slow, groundwater mitigation measures will still be required and we have recommended to this effect in Section 8.1. We have recommended that trial excavations are carried out when access become available. We also point out that the initial stages of the development will comprise internal underpinning works which will allow the actual groundwater conditions to be established and allow a robust scheme to be put in place before underpinning of the party walls and excavation below the existing garden takes place. In the meantime, we can carry out additional monitoring during which rising / falling head tests could be carried out to confirm permeability.
8	Attenuation SUDS assessment	Point 4.13	Given the impermeable nature of the ground, attenuation SUDs are not deemed to be appropriate. Furthermore, our report clearly states the site is at a very low risk of groundwater flooding and surface water flooding, with a low to moderate risk of flooding from sewers, for which we recommend a non-return valve.
9	Non-technical summaries		Included in Section 9.1 of our report in a form that has been acceptable to the technical assessors previously on numerous occasions..