Response to Campbell Reith's Audit Query Tracker (Appendix 2)

The following provides a supplementary note in connection with the updated Ground Investigation Basement Impact Assessment (GI BIA) report prepared by Ground and Water Limited. The note directly responds to Campbell Reith's Audit Query Tracker at Appendix 2 of the BIA Audit (dated 12 September 2022. The list below responds to each query listed in turn and a reference to the relevant section of the updated GI BIA Report is provided in bold.

1. (Query 1): The BIA has been carried out by Ground and Water Limited with contributions from Water Environment Limited on the surface water flow assessment. The qualifications of the individuals concerned with the production of the land stability have not been demonstrated to meet the requirements of CPG Basements.

   See title page with relevant qualifications

2. (Query 2): Screening and scoping assessments are presented and informed by desk study information. Most relevant figures/maps from the ARUP GSD and other guidance documents are referenced within the BIA to support responses to screening questions. However, Question 6 of the land stability assessment should be brought forward to scoping and the impact assessed as, according to the arboricultural report, two trees are going to be removed.

   See question 6 on Land Stability

3. (Query 3): As groundwater may be close to basement level, there is the potential for the proposed development to locally cause an increase in the groundwater level which can be exacerbated due to the presence of neighbouring basements/lower ground floors. In addition, as the site is located downhill of a spring line, the BIA should demonstrate that underground streams or spring lines are not diverted in accordance with Redington Frognal Neighbourhood Plan. The BIA should present an assessment of this.

   See Section 2.9 and Figure 16

4. (Query 4): A PDisp model has been produced to mainly estimate heave occurring due to basement excavation and to inform basement design. It is noted that the long term analysis has been undertaken by assuming a Poisson's ratio of 0.45 which is normally assumed in the short term and may have underestimated ground movements. This should be clarified.

   See Section 7.2

5. (Query 5): An XDisp model has been produced to estimate ground movements due to basement construction by underpinning in accordance with CIRIA C760, with the underpinned sections being treated as bored piles. Whilst the CIRIA approach is intended for embedded retaining walls, it is accepted that the predicted ground movements are within the range typically anticipated for underpinning techniques carried out with good control of workmanship. The results of the Building Impact Assessment currently indicate damage to neighbouring buildings will not exceed Category 1 (Very Slight). However, it is understood that the new loads imposed on the proposed underpins have not been presented in the BIA and

not considered in the GMA. The GMA should be revised to include ground movements (settlement) due to the new imposed loads.

See Section 7.2.3 and Section 7.4.2

6. (Query 6): The structural report presents an outline ground movement monitoring strategy including equipment recommended, survey control, frequency, trigger levels and monitoring procedure. It states that the final monitoring points shall be agreed between the party wall surveyor and consulting engineer. It is noted that the trigger values are not in line with those predicted in the GMA and those should be revised to reflect the maximum ground movements anticipated in the GMA.

   See Section 7.5

7. (Query 7): The Arboricultural Survey & Impact Assessment recommends two trees being removed as part of the development, while the BIA states that no trees are going to be removed. Clarifications are requested regarding the removal of trees. As there is the potential for soils with shrink-swell potential to be present close to the surface, the BIA should confirm whether the neighbouring properties will be impacted by the tree removal (i.e. due to potential for change in moisture content of the soil to cause shrink / swell movements) and, if so, an assessment should be provided along with recommendations for mitigation measures.

   See Section 7.2.2

8. (Query 8): Note regarding Hydrogeology. No response required.