

Review of Appendix 2 to Birketts Response to DBCP for Application 2014/6485/P

CampbellReith has been asked by the Royal Free Charity to undertake a high level review of Appendix 2 to Birketts response to the DBCP for the proposed extension to the Royal Free Hospital, known as the Pears Building. Appendix 2 of the response comprises a joint report by Messrs Eldred and de Freitas of Eldred Geotechnics Ltd and First Steps Ltd respectively. It was provided to CampbellReith on 12 December 2017 and this review was requested on 18 December 2017.

Messrs de Freitas and Eldred raise a number of questions on the validity of the ground modelling contained within the DBCP and the scrutiny it received. Having reviewed their report, our comments are presented below:

The role of CampbellReith in the DBCP

CampbellReith was employed by the Royal Free Charity to act as the 'Certifying Engineer' required by the Section 106 Agreement between the Royal Free London NHS Foundation Trust, the Royal Free Charity and the London Borough of Camden. The role of the Certifying Engineer is described in clause 2.16(4)(iv) and is summarised as follows

- (1) To review the design plans
- (2) To offer a 2 page report confirming
 - the design has been formulated in accordance with the S106 agreement
 - the design has incorporated
 - reasonable endeavours to prepare condition surveys of neighbouring structures
 - a method statement to ensure the stability of neighbouring properties including temporary works sequences, drawings, appropriate monitoring and mitigation measures
 - detailed design drawings incorporating conservative modelling of local ground and groundwater conditions for the substructure with specifications and supporting calculations
 - the retention of an engineer on the scheme
 - measures to ensure ongoing maintenance and upkeep
 - measures to ensure groundwater monitoring equipment is maintained on site
 - amelioration and monitoring of traffic associated with construction activities.
 - Design plans are sufficient to achieve the objectives of the DBCP
 - Any errors, omissions or discrepancies are identified.

An extensive review process was undertaken over a period of many months during which CampbellReith was provided with, and commented on, documents including site investigation specifications, the GIR and GDR, groundwater pump test specification and report, the GMA and building damage assessment, the design of the substructure and associated specifications and drawings, temporary works sequencing plans and calculations, a draft water collection strategy, and an impact assessment of tree removal. The documents reviewed and commented on also included the Monitoring Action Plan which outlines the strategy for monitoring air quality, noise, vibration, ground movements and groundwater fluctuations during and beyond the construction period. The results of condition surveys of neighbouring properties and the Construction Management Plan, previously agreed with Camden, were also provided.

During the review period a number of errors, omissions, discrepancies and requests for clarification were notified to and discussed with Basement Design Engineer (BDE) and his specialist team. Where justified and agreed, the documents, calculations and/or drawings were amended. This process was extensively tracked via spreadsheets maintained by Willmott Dixon.

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Once CampbellReith was satisfied that the contents of the DBCP met with requirements of the Section 106 Agreement, we duly prepared a short report confirming that to be the case. This was issued to the Royal Free Charity on 12 October 2017.

It is suggested by Messrs de Freitas and Eldred that either the review described above was not undertaken and the process is a 'sham' or that, if it did take place, CampbellReith is incompetent. Not only do we strongly refute these allegations, which are based on numerous misunderstandings of the work that has been carried out by the BDE, his team and CampbellReith, but we believe that the making of such statements contravenes the Codes of Conduct of the professional institutions of which Messrs Eldred and de Freitas are members, namely the IStructE and the Geological Society of London. We require these allegations to be withdrawn and reserve the right to bring them to the attention of the IStructE and the GSL.

Whilst we understand that the geotechnical engineer for the project, A-squared Studio Engineers Ltd, is providing a separate response to the comments made on the ground modelling, we have taken this opportunity to point out some of the gross errors in the report presented by Eldred and de Freitas. Parts 1 to 5 of the report, which cover technical aspects, are considered below.

Part 1 Confidence in the numerical model

Messrs de Freitas and Eldred assert that the only basis on which the validity of the modelling carried out can be assessed is its ability to recreate the known history of the site. Whilst we concur that all numerical models must be calibrated against actual recorded behaviour, we would point out that whilst the history of the site is known in broad terms, there will have been numerous localised influences on the ground and causes of movement to St Stephens Church and the school that cannot be either known or modelled definitively, such as tree planting/removal, small scale regrading of slopes and periods of heavy precipitation/drought.

With all modelling it is important to recognise its limitations and evaluate the input and output data accordingly to reflect potential variability and risk. This evaluation has been undertaken. Additionally, the model will be validated by extensive monitoring during and after the construction activities.

It is not true to say that the GMA provides no commentary on the calculated historic displacements (refer to GMA Section 5.3). It is also not true to say that historic movements are reported as 'nil'.

It is stated that the modelling suggests the current hospital buildings have experienced 40 to 50mm heave since construction and moved towards the George public house. This is a misunderstanding of the output. Displacements within the footprint of the hospital are not shown.

It is also stated that the soil profile is not adequately described and differences in the engineering properties of the various layers has not been considered. Reference to the GMA and GDR (in particular section 6.5 of the GDR) shows this not to be the case.

Part 2 Assessment of damage levels

Whilst the Burland model may not be strictly applicable to the complex structure of the church, it must be noted that the predicted movements resulting from the basement proposals are near negligible. It is therefore evident that, no matter what model is used to predict damage, the impact of the proposed construction activities associated with the Pears Building is negligible.

Part 3 Review of issues revealed by BH213

It is not true to say that there has been no discussion or consideration of the polished surfaces and potential shear surfaces noted in BH213 in particular. A-squared Studio and CampbellReith visited Soil Consultants offices to inspect the core in detail.

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The GDR contains a considerable discussion of the geology of the London Clay in this area and how the findings of the ground investigation relate to the known geological history and characteristics. In particular, p37 of the GDR shows that the presence of a possible slip plane at depth was considered but found not to be significant. This was confirmed by CampbellReith's own analysis.

Contrary to the opinion stated by Messrs Eldred and de Freitas, the conceptual model is clearly defined and has been approved by a UK Registered Ground Engineering Professional. It is described in text and tables in the GDR (e.g. Section 4) as well as in a series of 'pictures and cartoons'.

In addition to the above, it should be noted that the site and surrounding area have been subject to a carefully designed phased ground investigation, sanctioned by Dr de Freitas, and soil properties have been measured or derived on the basis of site specific GI information.

Part 4 Management of groundwater

It should be noted that groundwater monitoring is continuing and the drainage scheme is to be subject to detailed design. However, again this section of the report contains a number of apparent misunderstandings. For example, it is not true to say that the groundwater data have clearly shown the presence of two independent water systems that require to be managed.

Part 5 Baseline values

Many of the misunderstandings described above with respect to groundwater and its control, the ground model and historic ground movements are repeated in this section.

Going forward, there is a comprehensive monitoring plan in place with lines of communication, trigger levels and mitigation measures clearly described.

The allegation that there is a lack of preparedness is therefore unwarranted.

Final comments

The numerical modelling has been carried out on the basis of a conceptual site model and engineering parameters derived from site specific ground investigation and detailed in the GDR. A detailed scope of monitoring of ground movements and groundwater levels has been agreed which will be used to validate the modelling. If any significant departures are noted, the model and construction methodology will be reviewed to determine whether mitigation measures are required to safeguard the neighbouring properties.