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10th January 2018

Our ref. G1701/18A10/AK1
Your ref.

Mr Anthony Kay,
The Hall School Opposition Group
26 Crossfield Road
London NW3 4NU

Dear Mr Kay,

Planning Application 2016/1639/P - 23 Crossfield Road NW3 4NU

You asked me to summarise those aspects of this application that I still consider unsatisfactory. They are as follows.

1. It has not been satisfactorily demonstrated that the risk of damage to Nos 24 and 25 Crossfield Road and the sub station is no greater than Category 1.

2 It has not been satisfactorily demonstrated that the risk of damage to the Eton Court Garages is no greater than Category 1.

3 It has not been satisfactorily demonstrated that the risk of damage to the temporary classroom of Hereward House is no greater than Category 1.

4. It has not been satisfactorily demonstrated that the construction of the piled foundation for the new building from within the existing basement is feasible.

5 It has not been satisfactorily demonstrated that construction of the piled retaining wall adjacent to Hereward House School is feasible.

I raised issues 1 to 3 in my 8th February 2017 report. Since then, new information has been submitted at intervals and has prompted you to request 5 further responses to date. The issues have not been satisfactorily resolved.

With respect to item 1, a fresh approach to ground movement assessment, a computer assisted retaining wall design, was submitted in October. Campbell Reith & Partners and I criticised the design, CRP pointing out that it contained errors, including understatement of natural pre-existing ground pressures that would affect the design.

In December, a revised design was submitted. This allowed for larger piles and the use of a secant rather than contiguous pile arrangement. The

difference between the two is most easily explained by the following illustrations copied from the former CIRIA C580 guidance.

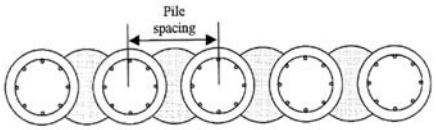

Figure A3.7 *Hard/soft secant pile wall* (see Table A3.2)

Secant solid wall arrangement

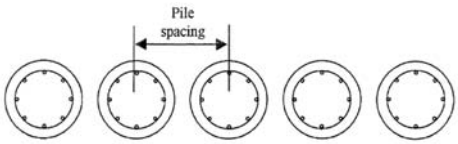

Figure A3.5 *Contiguous pile wall* (see Table A3.1)

Contiguous spaced arrangement

In support of the revised submission GEA opined that their value for pre-existing ground pressures was reasonable. I agree with that insofar as assessment of the movement caused by the basement excavation is concerned. Those pressures are relieved and cause ground movement as the piled wall is installed.

But no account has been taken by GEA of installation movement and, as I pointed out in November, the movement caused by insertion of a secant wall is likely to be about twice as much as that due to a contiguous pile arrangement. Also, water pressure on the wall arising from ground movement has been specifically and quite wrongly excluded from the retaining wall analysis, and a decimal point error within the computer input has caused the top temporary strut to be calculated to have 10 times the resistance to movement that it would really exert. The analysis is not satisfactory.

CIRIA Report C760 recommends that potential ground movements due to excavation should, in the first instance be based upon databases of case histories and provides charts for that purpose. Supposing both that temporary struts can be arranged to provide stiff support and that shrinkage and creep of the final floor slabs may be considered inconsequential, industry experience is that lateral ground movements to be expected at the ground surface are:

Due to secant pile installation	0.08%x18m	14.14
Due to basement excavation	0.14%x8m	11.20
Total lateral movement immediately behind the wall		25.34 mm.

Even ignoring the added contribution that might be made by vertical ground movement, this results in a category 2-3 risk of damage in No.24 and the substation and category 2 risk for No.25.

Considering issue 2, there has been a consistent attempt to ignore the importance of accounting for the historical ground and building movement that must have been caused by the construction of the existing basement. It is partly that which has resulted in the very low risk of damage reported by GEA. The need for the new damage risk assessment to allow for historical movement has been endorsed by CRP.

There is also the construction sequence near the garages to consider. When the roof and upper part of the sports hall are demolished, the tops of the existing basement retaining walls are to be propped. I have asked

(issue 4 raised in August 2017) how piling equipment is to access the existing basement to install foundation piles and how it is to avoid disturbing these props in the process. There has been no response to date. I have asked also, how this equipment is to access the existing basement without cutting away ground so as to diminish lateral support for the Crossfield Road properties (issue 1). Again, there has been no response.

In August, I raised other questions concerning the practicality of achieving the engineers' design intent for what, on completion, would be an 8m high retaining wall without mid height support and about the possibility of additional deflection caused by ground heave. They have yet to be answered satisfactorily.

Regarding issue 3, I have found no reference to the engineering assessment of ground movement behind this hybrid part of the basement wall apart from the GEA Pdisp and Xdisp presentations, which do not consider the wall. Irrespective of temporary support, the effectiveness of the permanent lateral support provided by the adjacent stairwell seems questionable and over the length occupied by the smoke well, the piled wall appears to cantilever for its full height, which would result in considerably greater movement than elsewhere. The ground movement and thus damage risk for the temporary classroom remain in doubt: the planning requirement has not been demonstrated.

The initial response to issue 5, raised in August, was that the contractor would provide temporary staging to allow access for a piling rig above the existing basement. In November I stated my opinion that this is fundamental to the viability of the existing scheme and safety of construction and should be considered further at this stage. CRP concurred.

I trust this summary of essential points provides the information you require.

Yours sincerely

Michael Eldred
Eldred Geotechnics Ltd