

Hoze Investments

F.A.O. Orly Weinberger
Our Ref: 17101/AL

26th February 2019

Dear Orly,

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RE: 74 Fortune Green Road, London NW6 1DS

We are writing in regard to the revision of the Basement Impact Assessment issued for the above site after receiving the comments in the Audit with reference number 12985-30, Revision D1, dated January 2019 and prepared by Campbell Reith on behalf of Camden Council.

Brief

The following letter was aimed to be read alongside with the Basement Impact Assessment Report with reference number 17101/BIA/Rev1.04, prepared by Soils Limited and dated February 2019. The letter provided information on where response to the queries and requests for information raised by Campbell Reith within Appendix 2 to the Audit could be found in the report.

For this purpose, a dedicated paragraph was written for each of the comments received on subjects Soils Limited was appointed for. No response was given to comments regarding documents or information to be provided by others.

Non-technical summary

Query No.1 stated that a non-technical summary was not included in the BIA report. This was not correct, as the non-technical summary was included in the report as Appendix D. In the current version of the BIA report, Rev1.04, the non-technical summary was attached as Appendix E.

Baseline conditions

Query No.2 of Appendix 2 of the Audit requested to provide information on the type and depth of neighbouring foundations and to reassess the impact with the information obtained.

Information on the foundations of the building for the proposed development were already reported in the BIA report. The intrusive investigation carried out at the site comprised the undertaking of 3No. hand dug trial pits for foundation exposure tests (FE1 – FE3), the results of which were already presented in paragraph 5.6 and the test locations in Figure 3 of the BIA report.

In particular, FE1 was located within the existing cellar, along the party wall with 76 Fortune Green Road at the corner with the front wall, FE2 was located along the rear wall and FE3 was located along the party wall with 72 Fortune Green Road.

Concrete stepped foundations were encountered within FE1. The cellar floor level was measured at 1550mm below the bottom of ceiling, the top of the first step was above the floor level of 100mm, while the bottom of the foundation was below floor level of 120mm. The foundation extended out from the brickworks by a total of 45mm to 165mm and was 220mm thick.

Concrete foundations were not observed within location FE2. The brick wall slightly stepped out below floor level and extended to a depth of 240mm.

Foundations could not be observed within location FE3 within a depth of 1.40m bgl. Further deepening of the hand dug pits was not possible, as this could pose risks to the safety of the site crew.

No confirmation of the presence of eventual basements was available at the time of the writing of the submitted report. As a consequence, it was assumed that no basements were present and that the neighbouring buildings were characterised by the presence of shallow strip foundations. The assumption was considered as conservative, because it maximised the differential depth between the proposed basement formation level and the neighbouring shallow foundations. It must be noted that the maximum ground movements due to the excavation and construction of the proposed basement were observed at basement formation level and that the assessment of the expected damage on the neighbouring buildings was carried out taking into account those movements and not the attenuated ones induced at the depth of the shallow foundations.

Following to the re-development of the BIA report, given the increase of the maximum excavated depth to 3.50m bgl, additional information was provided. The Client informed Soils Limited that no basements were present under the surrounding buildings.

The results of foundation exposure tests were still reported in paragraph 5.6 and the foundations sketched for FE1 and FE2 were presented in Appendix A.1.

Geotechnical parameters

Query No.3 of the Audit requested to clarify how the undrained strength of the cohesive soils of London Clay Formation was derived from the results of dynamic probing and to provide the values of effective stresses parameters.

The undrained strength of London Clay Formation was derived from the dynamic probing blowcounts, after being transformed into the equivalent SPT N60, by means of the correlation provided by Stroud and Butler (1975). Undrained cohesion, therefore, was directly proportional to SPT N60 via the coefficient β , ranging between 4.5 and 8 in function of soil plasticity index. The procedure was detailed in paragraph 6.1 of BIA report Rev1.04.

With regards to the friction angle and effective cohesion of the soils involved in the analyses, they were chosen with reference to the reference values reported within CIRIA SP200. The friction angle of the cohesive made ground was considered equal to 22° (reference values from CIRIA SP200 ranging between 22° and 35°), while a value of 24° was adopted for the London Clay Formation (reference values from CIRIA SP200 ranging between 24° and 28°). Effective cohesion was assumed as equal to zero for all the soils involved in the analysis, although values >0 were considered as possible within CIRIA SP200. The parameters adopted in the analyses were reported in paragraph 9.2 and Table 9.2 of the BIA report Rev1.04.

It must be noted that the definition of friction angle and effective cohesion is needed for the design of the retaining structures, but has negligible or very limited influence on the ground movement assessment because it is based, first of all, on stiffness parameters and, furthermore, develops in undrained conditions when in presence of cohesive soils as the ones of the London Clay Formation. The eventual development of drained conditions would represent a delay in the construction of the underpinning, with consequent risk of failure of the soils because of a lack in containment.

Ground movement assessment

Query No.4 requested the ground movement assessment to be reviewed considering the comments in section 4 of the Audit.

Comment 4.11 stated that the assessment of vertical movements did only considered the development of movements due to heave of the London Clay Formation due the excavation of the proposed basement and that no movements were calculated with reference to the application of structural loads.

This was absolutely not correct. The ground movement assessment was carried out in the previous BIA report considering the development of undrained heave (paragraph 9.2.1), of drained heave (paragraph 9.2.2) and of drained ground movements due to the application of loads related to the construction of the basement (paragraph 9.2.2). In addition, settlements due to workmanship (paragraph 9.2.3) were calculated considering a maximum value of 5mm but applied only to the critical scenarios with party walls (SC1 at 76 Fortune Green Road and SC3 at 72 Fortune Green Road).

All the above components of the expected ground movements were re-calculated in the current BIA report Rev1.04, due to the changes in geometry and maximum excavated depth.

Comment 4.12 requested the output of the software Wallap to be appended to the BIA report in order to allow a check of the horizontal deflections calculated. This was done and the output for each of the four scenarios considered was attached to the BIA report Rev1.04 as Appendix C.

It must be noted that the analyses of horizontal deflections were calculated considering the underpinning propped at the base (basement ground floor) and at the top (ground floor slab) in the permanent stage. The Client's structural consultant confirmed that this solution was adopted and is the reason for horizontal deflections <1mm, as observed in the plots of horizontal movements.

Comment 4.12 also requested to clarify how the calculated horizontal deflection corresponded to associated ground movements behind the wall. Considering the uncertainties on this subject, for which a clear and univocally accepted model was not available, reference was given to the model presented in CIRIA C760, Section 6.2.2, Figure 6.17. In the presence of propped walls, the vertical movements behind the wall can assume a maximum value equal to the calculated horizontal deflection.

Comment 4.13 was related to the calculation of differential settlements presented in the report. In BIA report Rev1.04 the settlements were calculated considering the variation of loads across the foundations (ranging between 44.5kPa and 76.5kPa according to data provided by the Client). Considering the change in the solution adopted for the foundations of the basement, the expected differential settlements should not exceed 5mm.

Comment 4.14 of the Audit recommended to re-develop the building damage assessment and to include the output of the software analysis for each scenario. This was done for the revised basement geometry and depth and the output was added to Appendix C of the BIA report Rev1.04, demonstrating that the assumptions in the report were realistic, as based on conservative mechanical parameters and on structural schemes confirmed by the Client's consultants.

Utility search and programme of works

Soils Limited was not appointed for the undertaking of a utility search and for the production of a programme of the works and they were both provided by the Client. The Full Utility Search, prepared by Apogee Property Utility Consultants with job reference number 420301, and the programme of works were added to Appendix D of the BIA report Rev1.04.

Additional comments

Further queries and comments were reported within the Audit, although not summarised in Appendix 2 as the previous ones. Response was given within the revised report and summarised in the following of the letter.

Dewatering of the excavation

The Audit commented that no mitigation measures against the potential development of unwanted settlements due to the dewatering of the excavations were indicated within the report.

The revised report clarified that water seeping through eventual granular deposits present at the site could potentially enter the excavations during the construction stage and the lifetime of the basement.

At construction stage any water eventually entering the excavations must be pumped out for allowing a safe and comfortable working environment, but the interventions must be carried out on a local basis, to avoid any unwanted changes of groundwater levels within the London Clay Formation, as this could trigger the development of consolidation phenomena and of consequent, uncontrolled settlements.

In the long term, active and passive measures must be used for preventing the ingress of water into the premises and include the waterproofing of the structures and the presence of pumps within sumps.

For stressing that the interventions must not be systemic but have to take place on a very local basis, the term “dewatering” used in the previous report was replaced with “pumping out”.

The above clarification was also reported within paragraphs 7.3.2, 7.6, 8.1 and 11.1 of BIA report Rev1.04.

Consultation with Thames Water

Soils Limited was not appointed for the design of site drainage and did not have part in the consultations with Thames Water. The evidence of the consultations was provided by the Client and reported in Appendix D of BIA report Rev1.04.

Site walkover

Evidence from the site walkover undertaken by Soils Limited was provided in Appendix A.2. of the BIA report Rev1.04, by providing a selection of the photos taken on site.

Mitigation of residual impacts

The structural scheme adopted by the Client's consultants considered RC underpinning 500mm thick under the party wall at 76 Fortune Green Road, 420mm thick under the party wall at 72 Fortune Green Road and 300mm thick for the walls of the front and rear lightwells. In addition, the structural designer informed Soils Limited that permanent propping was to be provided by the basement and ground floor slabs.

Temporary propping was considered at the top, the middle and the base of the underpinning, plus an additional level to be considered at the $\frac{1}{4}$ of walls height within the soils of London Clay Formation. This was done because the details of temporary works reported in the Basement Construction Plan provided by JMS was to be considered preliminary and a dedicated Construction Method Statement must be prepared by the chosen contractor.

Considering the above scheme, an expected damage category 0 (negligible damage) was obtained for the critical scenarios considered and, as a consequence, no mitigation of the residual impacts was needed.

The values presented in BIA report Rev1.04 must be considered as limit values not to be exceeded and it will be the responsibility of the contractor to choose suitable methods and practices for containing the ground movements deriving from the excavation and construction of the proposed basement within the above mentioned limits.

The monitoring of ground movements and structures is essential in order to assess the conditions prior to the commencement, during the development and after the completion of the proposed excavation and construction works.

The above clarification was also reported within paragraphs 9.3, 10.2, 11.1 and Appendix E of BIA report Rev1.04.

Should you have any further questions please do not hesitate to contact the undersigned.

Yours Sincerely



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