1 Spencer Rise
G&W response to CF Audit 3

Based on the previous audit and discussions with Graham we provided everything that was asked for and we also double checked this with Graham about its validity.

Technical queries were communicated via emails exchanged between G&W and CF between 22nd February- 25th March. We received an e-mail from Graham on the 11.02.19 with some queries. We replied on the 11.03.19. Graham replied on the 13.03.19 We check on the 25.03.19 that CF had no further outstanding issues and we confirmed on the same day that we would reply with the additional comments on this basis.

Campbell Reith's audit report (dated May 2019) states under Item 1.16 that "the queries and matters requiring further information and clarification are discussed in Section 4 and summaries in Appendix 2". We provide the following response below.

Section 4 Response

4.1- Noted, no further issues/ actions required
4.2- Agreed, no further issues/ actions required
4.3 (Utilities information missing/ GMA not accepted)
The structural report has already been revised to take into account the impact on utilities in the road. As the impact on utilities is contingent upon the acceptance of the GMA, please see the answers below regarding the GMA (4.12)
4.4 (Shallower soils review)
Yes noted, a review of shallower soils was undertaken during the additional site investigation (Specific sections with in the BIA- section 5.1 and 7.1 discuss the shallow soils, their classification and impact on the design)
4.5- Noted, no further issues/ actions required
4.6- Noted, no further issues/ actions required
4.7- Noted, no further issues/ actions required
4.8- Noted, no further issues/ actions required
4.9- Noted, no further issues/ actions required
4.10 (Soil strength)
First point: Bearing Capacity
- Proposed bearing capacity: CR incorrectly understand that the proposed bearing capacity as "up to 130kPa". This is the limit state as referred to in Eurocode 7

- The proposed bearing capacity not reasonably conservative: Our proposed bearing capacity is between 50-75kPA (as per the tables on page 28 of the attached report/33 of the pdf) which is in fact reasonably conservative.

- SPT result at 6m: As explained previously to CR the bearing capacity provided has been determined using Geostru software. The programme uses the in-situ strength data obtained from BH1 and splits the borehole up into 1m thick layers. Literature based values for undrained shear strength, elastic and consolidation moduli are then applied and bearing capacity/settlement analysis undertaken within those 1m layer. The reduction in shear strength at depth is therefore present and has been analysed. Therefore, it is considered that we have been reasonably conservative with respect to the proposed bearing capacity.

- Unknown shear strength: in 2 areas, we have shear strength data below proposed foundation level (BH1 and DP1) and in 3 areas, we have samples below the base level (BH1, WS1 and WS2). Therefore it is considered that we have been reasonably conservative with respect to the proposed bearing capacity, please see above.

Second point: Soft spots and foundation design

- Overstressing underlying soft spots: CF accepts in item 4.3 that the site investigation and BIA has been informed by a desktop study broadly in accordance with the GSD appendix G1.

- Limited site investigation: The site investigation undertaken is suitable for a project of this size. Guidance requires 3 number boreholes which is the amount undertaken in this BIA and therefore is in accordance with relevant guidance (ARUP report reference 213923, November 2010).

- Soft clay encountered:
- Unknown soil strength immediately below foundation level
- Suitability of current foundation design

Third point: Settlement calculations

- Bearing in mind the depths of excavation (4m), the bearing pressure can be calculated as 4m x 15-20kPa = 60- 80kPa. Therefore the settlement calculations are perfectly realistic as one is simply imposing the same load in the design as has been removed by the excavation. In this situation, it is perfectly reasonable that settlement is calculated as less than 1mm. (page 28 of report/33 of PDF attached).

4.11 (Heave calculations)

- The heave of 5-8mm quoted by CR in item 4.10 is derived from page 31 of the BIA/page 36 of the PDF which shows the predicted vertical displacement although we are not sure how the precise number ranges of 5-8mm is arrived at by CR.

Although heave under the slab is expected following overburden removal, analysis of the underpin is probably better undertaken through review of the load analysis in on page 28 of report/33 of PDF attached.

Please note that this will be a hit and miss underpin approach. Therefore, there will be no long term heave under the underpins as they will be formed quickly at alternative locations, with the stages of construction being either existing or with underpin formed and load transferred. We would agree that a long term heave approach would be relevant to more of a concrete box approach, where it is dug as a whole, left, with retaining form and slab cast. But this is not the case with this site.

4.12 (GMA not accepted)

The GMA is based on sound engineering principles and up to date methodologies and we have undertaken it in line with previously accepted methodologies. We respond to the CR's specific reasons listed under section 4.12 as to why the GMA is not accepted below:

First point: inconsistent/incorrect calculations and deflections

- Yes there is a typo identified within the calculations. This has now been corrected and the overall results remain the same. Please find the attached revised GMA which addresses this issue. In view of this, the strains are not underestimated.

Second point: Settlement of underpinned foundations

- The stated settlement is realistic as per our response in 4.11 above

Third point: Heave at party walls

- The stated heave at party walls is accounted for as per our response in 4.11 above

4.13 – Noted, no further issues/ action required as the council cannot expect the applicant to repair the neighbour's damaged walls.
4.14- See response to 4.12 above
4.15- see response to 4.12 above
4.16- Noted, no further issues/ action required
4.17- Noted, no further issues/ action required
4.18- Noted, no further issues/ action required

Appendix 2 Response

Query no 1- See responses to 4.3 above
Query no 2- See responses to 4.10 above
Query no 3- closed, no further issues/ actions required
Query no 4- See responses to 4.10 above
Query no 5- See responses to 4.12 above
Query no 6- See responses to 4.12 above
Query no 7- closed, no further issues/ actions required
Query no 8- See responses to 4.12 above

In summary, the BIA provided is in line with the requirements set out by the Camden CPG guidance, the core of which is the following;

Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance: Basements.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water.
- The Local Plan (2017): Policy A5 (Basements).

The BIA should demonstrate that schemes:
a) maintain the structural stability of the building and neighbouring properties;
b) avoid adversely affecting drainage and run off or causing other damage to the water environment; and,
c) avoid cumulative impacts upon structural stability or the water environment in the local area;

The BIA and structural methodology provided demonstrates the scheme is develop-able without adverse impacts to the above.