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Pollyshire Ltd

Via email only: michael.green@dp9.co.uk

30th September 2024

Our Ref.: J21109/AL

Dear Michael

Re: The Garages, Frognal Lane, London NW3 6DN

This Accompanying Letter (AL) was prepared following to the issuing of Basement Impact Assessment Rev2.2 (report ref. 21109/BIA Rev2.2, dated September 2024) and subsequent comments from Campbell Reith, received by email only on 26th September 2024.

General

The scope of this AL is to answer the additional queries raised by Campbell Reith to the contents of BIA Rev2.2 and provide further explanations to clarify elements identified as unclear.

The comments from Campbell Reith in the above mentioned email are summarised below.

After reviewing the updated BIA we can confirm that most of the queries can be closed out. However, there are a few points relating to the updated Ground Movement Assessment that we require further clarification on as follows:

1. *A surcharge load of 120kN/m^2 had been applied at a depth of -4m in the WALLAP input data for CS1. However, it is understood that the excavation is considered to be 2m deep near CS1. Section 10.4 does not discuss this loading or the elevation at which it is applied. Clarifications are requested.*
2. *The construction stages of the excavation presented in the WALLAP input data for the 2m excavation (CS1_2m) indicates the permanent props (assumed to be the basement and ground floor slabs) are installed at elevations of -1.90m and -0.10m. This doesn't leave much headroom for the basement level so could this be revisited/clarified?*
3. *Figures 19,20 and 21 show the lateral wall displacements from WALLAP analysis. However, it is unclear how these lateral movements are translated into 'vertical movements from horizontal deflection' in Figures 22, 24 and 26. The magnitude of vertical movements expected from lateral wall deflections presented does not appear to reflect the curves shown in the plot of vertical movements (Figures 22, 24 and 26).*
4. *Table 10.6 of the BIA lists the L/H ratios for CS1 and CS2. The damage categories are shown on the plot for L/H=1, despite the L/H ratio of CS2 being 0.64. It is requested that the damage category plot for CS2 use the category boundaries for L/H=0.5.*

5. *The Horizontal strain and deflection ratio values presented in Table 10.7 appear to have been plotted on the wrong axes in Figure 28.*
6. *Just as a note, a damage category has been produced for CS3, which is understood to represent the Frognal Lane road pavements (presented in Table 10.7). For future reference, the Burland damage category is not applicable for the assessment of roads because there is no building wall along this section to be modelled.*

In the following of this AL each comment was assessed and where required, updates were provided.

Comments 1 and 2

The geometry of the retaining wall at CS1 was not correct, as it was presented in Comment 2, because the excavation was circa 2m deep on average, but the total height of the wall had to remain circa 4m (i.e. 2m above ground and 2m below ground). The Wallap analysis was therefore re-run considering temporary props applied at 0.0m and 1.9m bgl and permanent props at 1.8m bgl and 1.9m above ground level (agl).

In addition, a foundation load was introduced for CS2, as explained in paragraph 10.5. This was left in the Wallap analyses also for CS1 but applied at a depth of -4.0m due to the sloping nature of the site. Albeit the introduction of a surcharge load on the active side of the wall represented a conservative approach, this was not explained in paragraph 10.4.

In Rev2.3 the Wallap analyses were re-run considering a revised basement wall height (2.0m above ground and 2.0m below ground), revised permanent prop elevations (1.8m bgl and 1.9m agl) and a foundation load of 120kN/m2 applied at a depth of 2.0m bgl to represent the effects of the lower ground floor at 18-28 Palace Road, which was observed to have similar depth to the proposed one at The Garages site. Paragraph 10.4 was also updated to explain the presence of the mentioned foundation load. The effects on the horizontal deflections can be anticipated to be marginal, as also evident from the updated Figure 19 of BIA Rev2.3.

Comment 3

The vertical movements due to lateral wall deflections in BIA Rev2.2 were estimated using the plot in CIRIA C760, Figure 6.15b, as explained in paragraph 10.7.5. It is acknowledged, however, that the mentioned plot from CIRIA C760 was not directly linked to the horizontal movements calculated using Wallap.

To take that into account and consider a direct link between the calculated lateral wall displacements and the corresponding vertical movements, in BIA Rev2.3 this was changed considering the semi-empirical method in CIRIA C760, Figure 6.17. The summaries of vertical deflections in Figures 22, 24 and 26 were updated to take into account the change in the approach, which caused a reduction in the vertical deflections due to settlements.

Albeit the vertical deflections remained unchanged or even reduced, the values used in the assessment of damage category remained unchanged, because the maximum vertical deflections used in that assessment were associated to the case of long-term heave.

Comment 4
The average height of the building at Ashely court was evaluated considering the change in elevation between front and rear of the building and estimated as circa 22.5m. The L/H ratio was therefore amended as 1.24. In that case, the assessment of the damage category could be done using the plot for L/H = 1.0 and presented in Figure 28 of BIA Rv2.3.

However, just as an example, in Figure 1 at the end of this AL the evaluation of the damage category for CS2 only was presented using the plot for L/H =0.5, where it can be observed that the expected damage could be restrained to fall in Burland category 1 (very slight damage) despite of the various conservative assumptions adopted in the calculations.

Comment 5
The issue depended on typing errors in Table 10.7, where the vertical and horizontal deflections were erroneously swapped. The correct values of vertical and horizontal deflections were respectively presented in Table 10.3 and Table 10.4 and then correctly referred to in Figure 28. In BIA Rev2.3 the above issues were sorted and the corresponding values in Table 10.3, 10.4 and 10.7 did not present any mismatch.

Comment 6
Soils Limited agree that the procedure for determining the Burland damage category is not applicable to road pavements. This was also anticipated in BIA Rev2.2, Introduction, Utility Search and then repeated in paragraph 10.6. However, albeit clarified that it was not applicable to the case of roads, it was included in the BIA because of the contents of point 5.10 of the Audit. In that part of the Audit it was actually requested to revise the damage category assessment “to include all neighbouring structures/roads”. The damage category for CS3 is no longer present in BIA Rev2.3.

Conclusions
It can be concluded that all the comments raised by Campbell Reith were answered. Where required, amendments were applied and explanations provided that confirmed that the expected damage on the neighbouring properties will not exceed Burland category 1 (very slight damage).

It must be reminded that the damage category for both CS1 and CS2 were calculated considering the vertical deflection caused by long-term heave. This is a conservative assumption, because the development of long-term heave is mitigated by the application of foundation loads. A more realistic approach would be to consider the vertical deflection caused by the short-term heave or by long-term settlements, which ranged between circa 20% and 60% of the values used in the BIA.

In addition, despite recommending the use of CFA piles in order to reduce the movements due to pile installation to near zero, the ground movement assessment was carried out considering as a conservative approach 50% of the total movements due to pile installation.

The above considerations, therefore, should clarify that the ground movements used in the evaluation of the potential damage induced onto the neighbouring properties led to an over-estimation of the Burland damage category, as a worst-case approach was always chosen where possible.

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

Yours sincerely,

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For and on behalf of Soils Limited

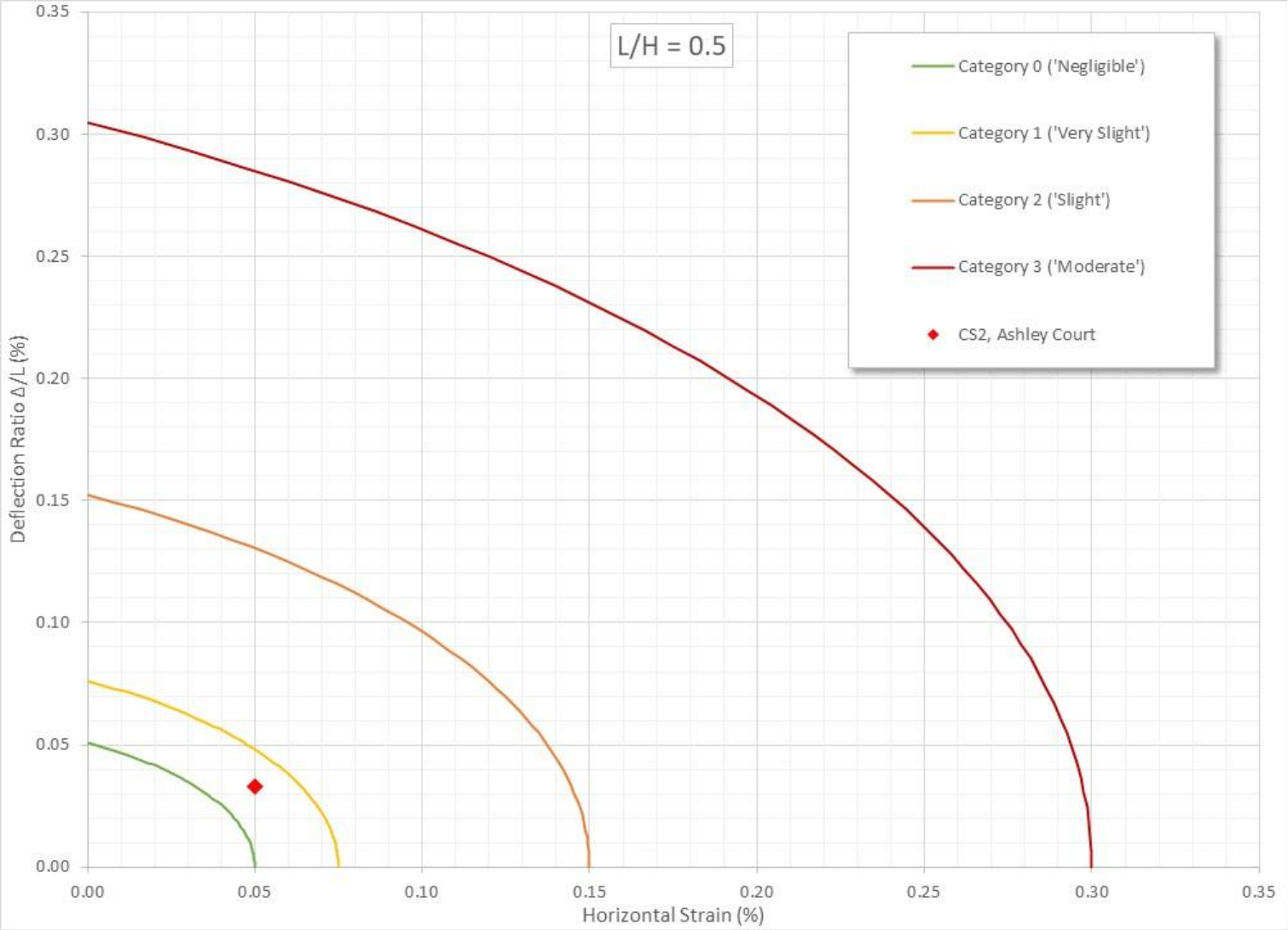

Figure 1 – Damage Category, L/H = 0.5

Project
The Garages, Frognal Lane, London NW3 6DN

Client
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