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FAO: Gideon Whittingham
Camden Council

13th October 2017

Re: 13-15 St. John's Mews WC1N 2PA
Damage Assessment of Adjacent Structural Walls

Dear Gideon,

Following correspondence received from London Borough of Camden requesting that the category of damage be reduced from 'CAT 2' to 'CAT 1', Barrett Mahony Consulting Engineers (BMCE) re-examined proposals for the development at 13-15 John's Mews. BMCE have made modifications to the construction methodology and applied a more refined industry standard analysis method, the results of which predict a maximum damage level of CAT 1. Further details of this are explained below and comprehensively demonstrated in the Basement Impact Assessment undertaken by Chelmer.

BMCE were requested to carry out a damage assessment for the adjoining buildings to a proposed basement at 13-15 St. John's Mews. This assessment has been carried out to determine the damage category of the proposed development in relation to neighboring properties. Initial damage category class 2 was identified for the development. In our experience this damage class is not appropriate for such a development, and more refined analysis was undertaken as outlined below.

Oasys X-disp software has been used to model the proposed basement at 13-15 Johns Mews. This program is based on the ground movement curves set out in Ciria C580 and on case histories, many of which are from the London area. The settlement estimate produced by the curves is used by the program to calculate a damage category for adjacent structural walls using the Burland damage criteria which is based on tensile strains.

The process of underpinning is best modelled in X-disp by the 'Installation of planar diaphragm wall in stiff clay' setting. However, this only estimates movements during the installation process. To include the excavation process, the 'Excavation behind high stiffness wall in stiff clay' setting must be used. Running this setting for the basement and adjacent wall geometry at Johns Mews leads to a damage criteria of 1 (very slight).

The use of this setting is deemed appropriate as the underpinning process is similar to the geometry of a diaphragm wall, and the final solution with the reinforced liner wall poured against the underpin is a high stiffness retaining wall. The soil adopted here is described as 'stiff clay' and the temporary support provided is stiff. Made ground is found over most of the dig depth, which is likely to be lower strength. To overcome these inconsistencies, the following construction methodology is proposed:

- It is necessary to increase stiffness of the soil prior to the works so that the 'stiff' setting is more appropriate. To achieve this, compensation grouting should be carried out in the area near the adjoining walls which are at risk.
- Following underpinning, temporary works providing lateral support to the underpins should be installed to ensure that support equivalent to a 'high stiffness retaining wall' is provided.

A 3D view of the analysis undertaken in X-disp is shown below. The critical walls are the back walls of both properties. These adjoin the centre of the proposed basement which as proposed extends out behind the original back wall of the terrace.

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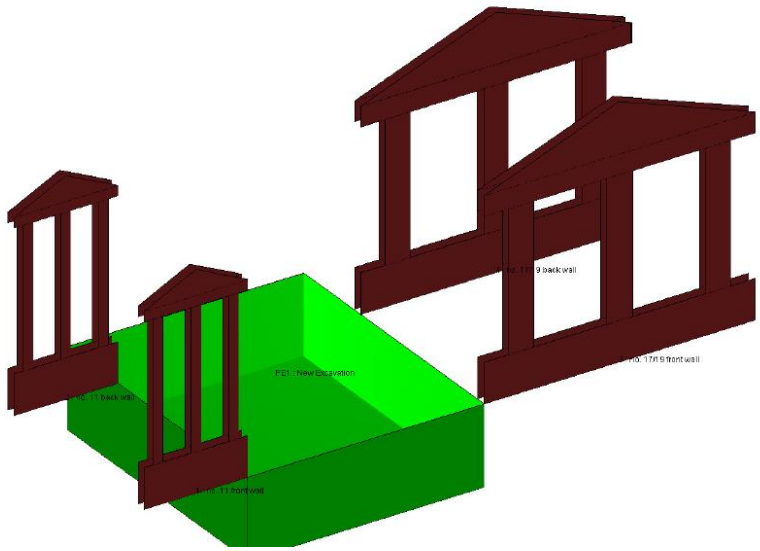

Figure 1: 3d view of the analysis in X-disp.

As stated, the analysis results in a damage catagory which is typically on the boundary between 0 and 1. Based on experience of similar works previously undertaken, BMCE believe this is an appropriate catagorisation, for the following reasons:

- It is proposed to carry out compensation grouting before underpinning to stiffen up the soil in the area near the adjoining walls which are at risk. It is further proposed to provide temporary lateral support to the underpins during construction of the permanent basement, ensuring a stiff support to soil outside the basement during the works.

- The beneficial effects of the adjoining walls being continuous through No.'s 13-15 is not modelled. This is a conservatism in the analysis. The integral effect of the continuous masonry walls will prevent relaxations in the ground below the foundations from having the magnitude of effect that is predicted.

This above analysis has been carried out by BMCE and coordinated with Chelmer Site Investigation. The results of the analysis determine a damage class which falls between categories 0 and 1. We therefore recommend that the above proposals of compensation grouting and suitably designed temporary works methodology and propping to underpins are appropriate justification for all parameters we have considered in our analysis, and conclude that the determination of a damage class between 0 and 1 is an accurate one for the development at 13-15 St Johns Mews.

Yours sincerely,

Vincent Barrett
Chartered Engineer
For Barrett Mahony Consulting Engineers