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Your ref:

Our ref: CG/18157

Please reply to: Nick Langdon

Dear Paul

## Phase 2 Basement, Kidderpore Avenue

Further to correspondence with Mark Ryan at Gravity Consulting Engineers Ltd and our receipt of the drawings GSK001 - GSK004 we have reviewed the latest revised proposals for the basement for Phase 2.

### *The 2012 BIA*

CGL undertook a basement impact assessment in 2012 CG/5946 *Basement Impact Assessment* Kidderpore Avenue Rev3.0 November 2012. For the purposes of impact, that included ground movements, slope (land stability) and subterranean (groundwater/hydrology). This report considered the basement of the same or very similar size as is now proposed excavated to 84.50mOD with propping at the 92.50m on the road side where retention is greatest.

The report concluded firstly that the basement would not have a detrimental effect on groundwater flow through the site, and secondly that ground movements would even with the conservative parameter assumptions made be kept to within Category 1 (very slight) movement in accordance with recognised criteria as typified by Burland, Boscardin and Cording<sup>1</sup>.

### *Updated proposal 2015*

The new drawing sequence provided sets out basement construction sequencing as envisaged by Gravity Consulting which we have now reviewed. It is probable that any contractor's construction approach will be similar in broad engineering terms and as such these conclusions as to the basement impact based on the approach shown will remain valid provided that the works are correctly implemented on site.

These revised drawings show that the basement bottom of blinding level (BBL) to be 84.635m OD generally with a localised raising of this level to 85.285mOD nearest to the highest retained section adjacent to the road. Comparing this to the assumptions of excavation depth in the 2012 BIA WALLAP analyses on which ground movements were originally assessed, 84.50mOD, these are slightly higher, implying less wall retention. As a consequence the wall movements can be expected to be marginally smaller than those predicted in the 2012

<sup>1</sup> Boscardin, M.D., and Cording, E.G., (1989). *Building response to excavation induced settlement*. J Geotech Eng, ASCE, 115 (1); pp 1-21



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BIA. However, such minor changes can be considered insignificant in engineering terms and will not alter the damage category predictions made in the original impact assessment.

The originally analysis considered the wall at the highest section to have support at two levels in the temporary condition before the floor slab is constructed. The revised construction proposal maintains these two levels of support at top of the wall and about 88.25mOD to 88.50mOD. Again the minor variation shown between the current proposal and original 2012 analysis is not considered to be significant in engineering terms for the prediction of movements nor will it alter the predicted Damage Category assessment. It can be anticipated that a properly formed berm could have an equal support capability to a prop and that such a consideration would be within the remit of the eventual contractor to justify in terms of final movements.

Similarly the minor changes in excavation levels on the greatest retained section would give rise to predictions of very slightly reduced ground heave from the excavation and these are not significant in engineering terms or their impact on adjacent structures.

Differences of pile wall construction techniques, secant compared to contiguous, can lead to differing amounts of movement from pile installation. Reference to CIRIA C580 *Embedded retaining walls* confirms that within some 2.5m or so of the wall the difference between the two wall installation techniques is insignificant for this height of wall. Therefore such a choice of construction technique has little impact of significance on the road and services infrastructure that would be the potentially vulnerable elements for concern for the particular basement consideration.

Groundwater monitoring assessed for the 2012 report indicated that the water within the slope is contained within isolated pockets and a regional and continuous water flow down slope is not being seen on this site. The proposed basement construction in its current form will also not have a detrimental impact on the current groundwater regime on the site and the original conclusions remain valid.

In due course, following the planning process, it will be necessary to get confirmation from the contractor's that their favoured methodology when implemented will satisfy the criteria predicted by the basement impact assessment of 2012 and this additional review, such that damage category criteria remain Category 1 (very slight).

Yours sincerely

A solid black rectangular box used to redact the signature of Nick Langdon.

Nick Langdon, Director  
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cc Mark Ryan (Gravity)