



08 April 2011

PTI Architects  
Level 10, 263 Clarence Street,  
Sydney NSW 2000

Our ref: 21/20171/169034  
Your ref:

Dear Sir/Madam

**Lindfield Shopping Centre, 23-37 Lindfield Avenue  
Update Letter for Vibration and Vibration Monitoring in the EA.**

Further to our previous letter dated 12<sup>th</sup> October 2010, we have received revised DA drawings from PTI Architects.

One of the major changes to these drawings that will affect the EA is the addition of an extra basement level B3. The basement excavation will now be considerably deeper than previously so we would expect the excavation contractor to encounter higher strength sandstone which will require hydraulic rock breakers.

The EA should address the likely vibrations and any requirements for monitoring, particularly in relation to the neighbouring heritage item at 1-21 Lindfield Avenue, and any recommendations for a dilapidation survey.

The anticipated ground conditions at depth are:

- Weathered shale bedrock at relatively shallow depths of approximately 1m to 2m. We note that the weathered shale is likely to be of very poor quality, generally no stronger than very low to low strength and is likely to contain significant thicknesses of extremely weathered shale and shaly clay, but with stronger sandstone, siltstone and ironstone seams and bands.
- Shale bedrock of medium and high strength from depths of possibly 3m to 4m below the existing surface levels.

If very low to low or low strength shale is encountered then this will probably required some light ripping with possibly a ripping tyne fitted to a large excavator. Shale or sandstone of medium or higher strength is likely to prove effectively unrippable and will require the use of hydraulic rock breakers fitted to excavators. Vibration effects must be considered with general excavation, but more critically are sandstone excavations where we have adjoining structures. We expect large hydraulic rock breakers will be used and therefore full-time quantitative vibration monitoring should be undertaken to confirm vibrations on adjoining structures are within tolerable limits.

As the buildings from 1-21 Lindfield Avenue are heritage listed structures, limiting the peak particle velocity to a threshold of 3mm/s for 10Hz to 30Hz and 3-5 for 30-60 Hz within these buildings is appropriate. Access will need to be made available to place monitors in number 21 Lindfield Avenue (the closest heritage building) fitted with a real time alarm as well as vibration logging, so that demolition can



be ceased if the vibration threshold limit is exceeded. To aid the demolition contractor, a warning alarm set at a lower vibration limit is also recommended, but is not a specific requirement.

Prior to any works commencing on site we consider that it would be prudent to carry out dilapidation reports on the adjoining buildings and roads. Dilapidation reports provide a benchmark for assessing any damage claims and it is recommended that the owners of the adjoining structures be asked to sign the reports before commencement of the project to confirm that they present a fair assessment of existing conditions.

Yours faithfully  
GHD Pty Ltd

A handwritten signature in black ink, appearing to read 'L. Taylor', is written over the printed name.

**Leigh Taylor**  
Principal Structural Engineer  
02 9239 7113