



12 October 2010

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

Our ref: 21/19509/164346
Your ref:

Dear Sir/Madam

**Lindfield Shopping Centre, 23-37 Lindfield Avenue
Inclusion of Vibration and vibration monitoring in the EA.**

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 about 1m to 2m or so. 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 say 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 (associated with general excavation but more critically sandstone excavations) on adjoining structures must be considered. 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 wise to carry out dilapidation reports on 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 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 "Richard Addison", is enclosed within a large, hand-drawn oval.

Richard Addison
Principal Structural Engineer
02 9239 7186