

APPENDIX F – Construction Vibration Monitoring, Manning Street Warwick Farm (July 2009)



30 July 2009

WM Project Number: 05032-CC
Our Ref: ARTC PH300709 WF2
Email: phodgson@artc.com.au

Prue Hodgson
Community Liaison Manager
Australian Rail Track Corporation
PO Box 14
SYDNEY NSW 2001

Dear Prue

Re: Southern Sydney Freight Line - Construction Vibration Monitoring, Manning Street Warwick Farm

Introduction

Wilkinson Murray has been engaged to conduct vibration monitoring at the construction site adjacent to Warwick Farm Train Station and neighbouring residences in Manning Street, Warwick Farm. The monitoring was in response to an enquiry regarding vibration levels from the operation of a vibratory roller adjacent to a residential/commercial property. This report details results of the monitoring which was conducted between Friday 24th and Thursday 30th July, 2009.

Measurement Location

Measurements were conducted at 9 Manning Street, Warwick Farm. The measurement location and proximity to works is shown in Figure 1.

A residential dwelling is located at the front of the property, towards Manning Street. At the rear of the property, adjacent to the construction site, are horse stables.

The vibration monitoring was conducted at the rear of the property, in a vacated horse stable.

Wilkinson Murray Pty Limited

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Figure 1 Measurement Locations

Site Specific Vibration Guidelines

Site specific vibration goals are not described in Environmental Protection License 12971, therefore relevant goals have been derived based on international standards.

For assessment of vibration impacts on structures German Standard DIN4150 specifies frequency-dependant vibration goals. For residential dwellings or buildings of similar construction these range from 5mm/s peak particle velocity (PPV) at 10Hz up to 15-20mm/s above 50Hz. Conservatively, a goal level of 5mm/s has been adopted for these works.

Higher vibration goals may be appropriate for the stables; however measured vibration levels during the survey were sufficiently low to not warrant any further discussion of relevant goals beyond the conservative goals for residential dwellings.

Goals for human comfort can be derived from British Standard 6472-1992. For continuous vibration BS6472-1992 specifies a frequency-dependant base curve and applies multiplying factors depending on the nature of the receiver. This results in the goals of 0.28mm/s (preferred) and 0.56mm/s (maximum) specified in the management sub-plan. This is considered overly stringent for works of limited duration such as this, where vibration emitting operations such as piling, compacting and drilling are only likely to occur in close proximity to a group of receivers for up to a week at a time. The DECC's *Environmental Noise Management: Assessing Vibration* (ENMAV) states that specifying vibration limits for human comfort due to short term works may be unduly stringent. In this case it is considered best practice to manage the vibration exposure to residents by using low vibration work methods and restricting the times in which high vibration activities occur.

Vibration Measurements

Unattended vibration monitoring was conducted using a Texcel ATM vibration monitor. The ATM holds a current NATA calibration certificate.

The ATM was set to record peak particle velocity (PPV) in each of the three orthogonal axes every minute. The geophone sensor was mounted to the concrete slab that forms the floor of the stable.

The measured vibration levels are shown graphically in the appendices of this report.

The measured vibration level was typically below 0.5mm/s. During the monitoring period there were several discrete peaks up to 0.8mm/s. These are not consistent with typical vibration producing construction activities such as rock hammering or vibratory rolling which would see an elevated level for a significant duration (minimum 10mins) rather than discretely elevated peaks in one logging period only. These peaks are consistent with short term vibration activity near the sensor, e.g. something being dropped in a neighbouring stable.

Throughout the monitoring period the measured vibration was well within the 5mm/s goal for structural damage specified in DIN4150 and thus is considered unlikely to have potential to cause cosmetic architectural damage.

With regard to human comfort from vibration the measured levels occasionally exceeded the site specific goal of 0.56mm/s. However, as discussed, this occurred for a very short duration (less than 1 minute) and may have been caused by something near the sensor, unrelated to the construction works.

You have informed us that during the monitoring period the vibratory roller was used on the adjoining site.

Conclusion

Wilkinson Murray has conducted vibration monitoring at 9 Manning Street, Warwick Farm.

Vibration levels were typically less than 0.5mm/s at the rear of the property. These levels are well within site specific vibration goal of 5mm/s for the effect of vibration on structures and according to DIN4150 are unlikely to have potential to cause cosmetic damage.

The measured levels slightly exceed the site specific human comfort vibration goal of 0.56mm/s at times, but as discussed this level is unlikely to have resulted from construction activities.

It should be noted that the receiver's enquiry was related to the potential for structural damage and not subjective annoyance.

We trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

WILKINSON MURRAY PTY LIMITED



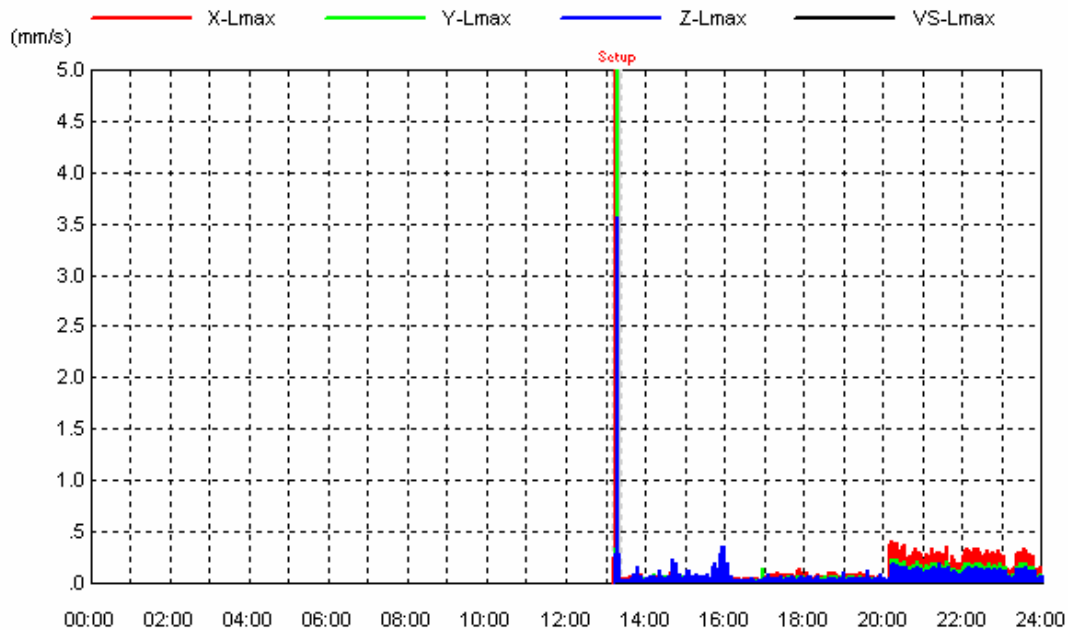
Adam Bioletti

Engineer

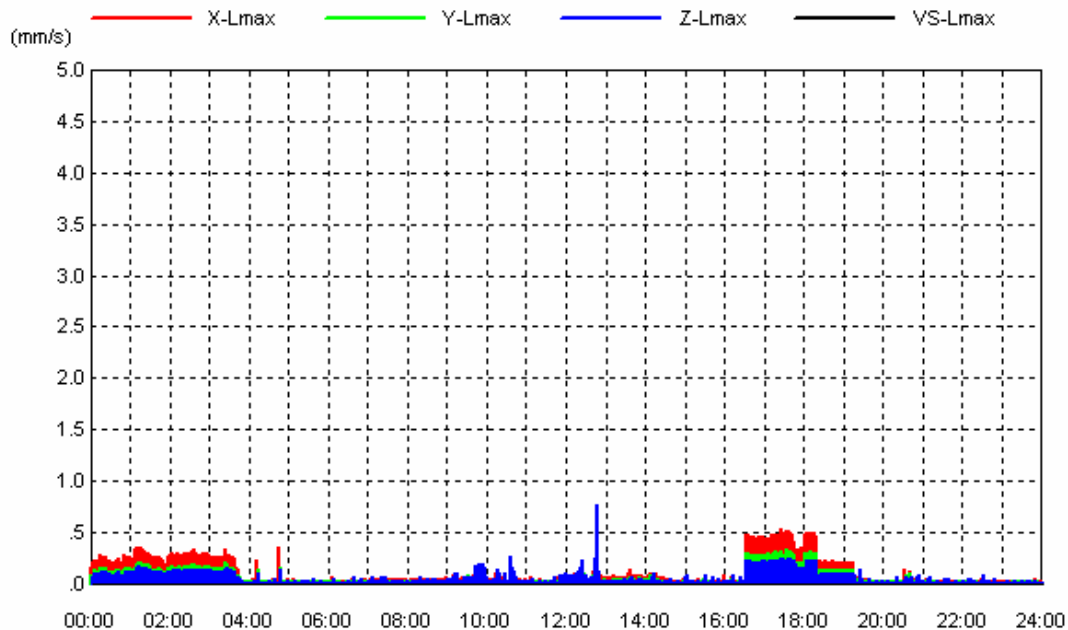
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Fri 24 Jul 09



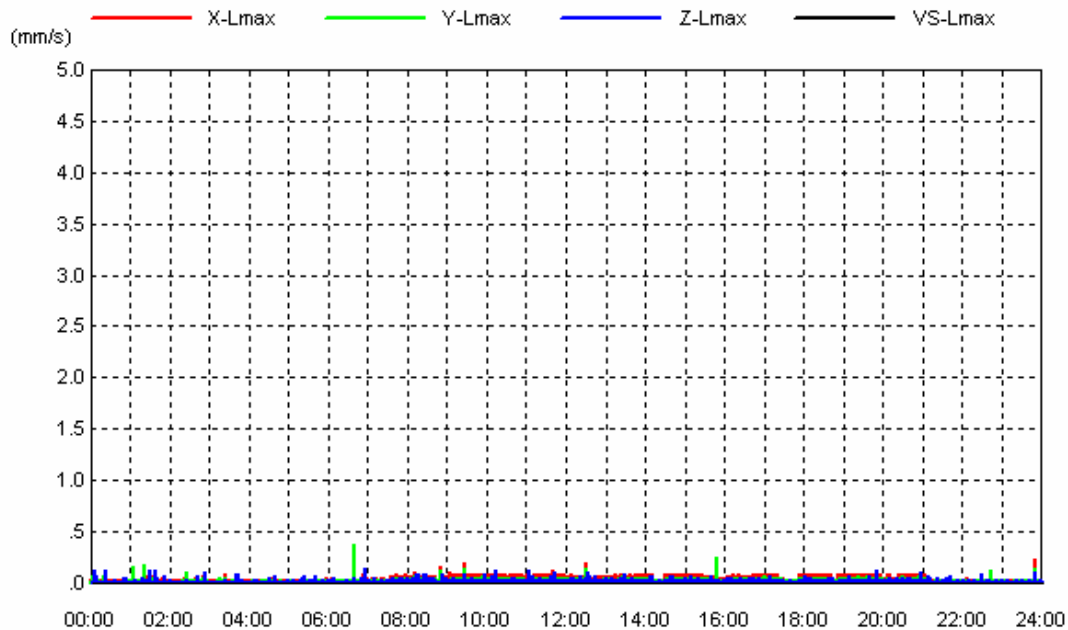
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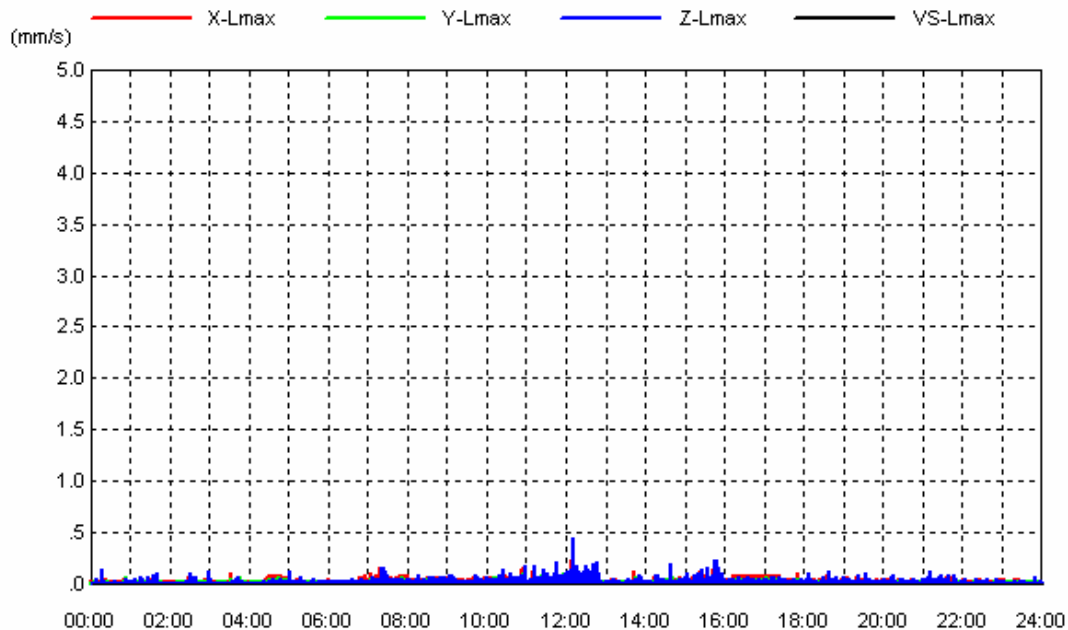
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Sun 26 Jul 09



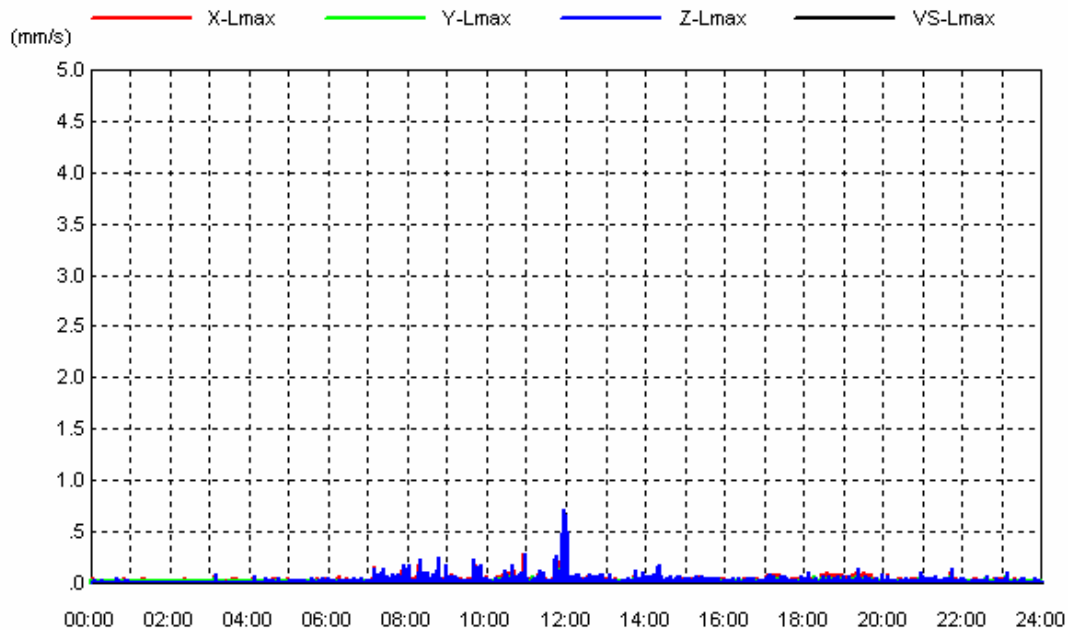
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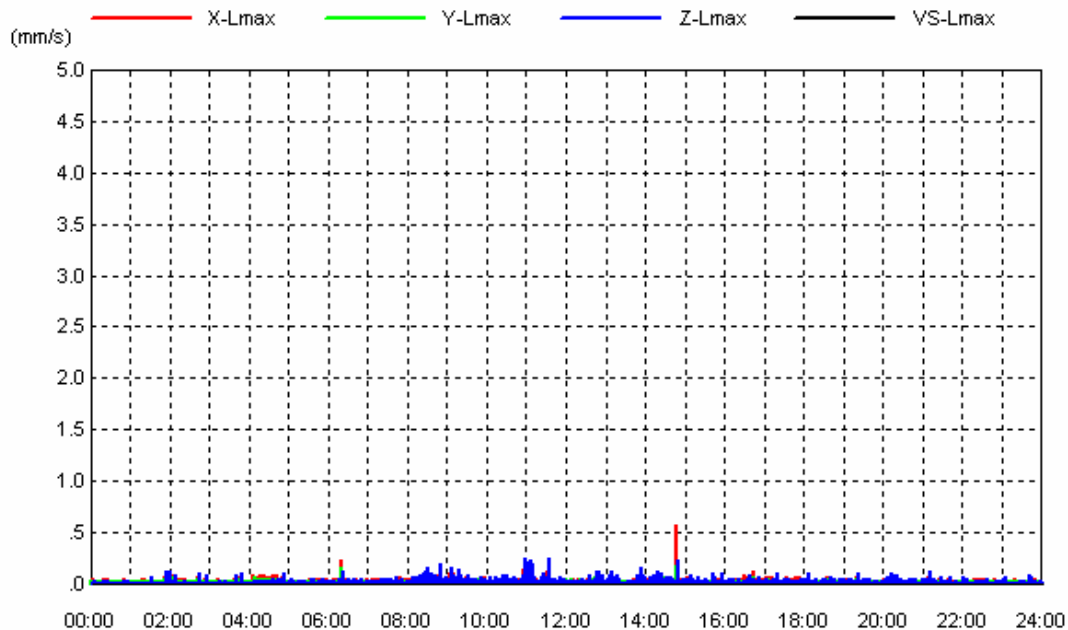
Location: 1. 9 Manning Street, Warwick Farm

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Tue 28 Jul 09



Wed 29 Jul 09



Location: 1. 9 Manning Street, Warwick Farm

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Thu 30 Jul 09

