
Appendix K – Asbestos, Air, Dust & Vibration Monitoring

Memorandum

To	[REDACTED]	Hansen Yuncken Pty Ltd	[REDACTED]
From	[REDACTED]		Date 27 May 2020
Subject	Vibration Monitoring Report 19 Goulburn Base Hospital Redevelopment		Project No. 94054.07 Doc. No. 94054.07.R.019.Rev0

Installation and Monitoring

On 21 January 2020 Texcel Construction Vibration Monitors #7221, #7153 were relocated to the positions shown in the attached Monitoring Location Plan, before the start of augered piling. Both monitors were coupled to the ground with a surcharge, close to and at ground level of the adjacent building, which includes Pathology (upper floor) and the Mortuary (lower floor). The monitors were installed to manage vibrations generated during piling works. On 26 February 2020, Monitor #7221 was replaced with Omnidot Vibration Monitor "Vujaca". On 8 April 2020, Omnidot Vibration Monitor "Vujaca" was replaced with Monitor #7113.

With reference to the CNVMP (the Monitoring Plan), an "Allowed Vibration Limit" of 25 mm/s vector sum peak particle velocity (VSPPV) was assigned by DP based on the potential for damage to the adjacent structures and a Vibration Dose Value (VDV) of 0.20 m/s^{1.75} for comfort of the occupants (whole body vibration). The monitors were configured for continuous monitoring Mon - Sat, 6 am - 6 pm, with SMS (text message) alarms to be sent automatically to Eugene Godfrey and DP in the event of vibration exceedances (vibration levels exceeding 7 mm/s VSPPV, as a contingency for impulsive events).

The eVDV shown in the attached graphs is a calculated estimate of VDV from velocity data rather than acquired acceleration data. The Dose Rate and Maximum Values refer to accumulated vibration activity per day during daytime hours and includes summations of RMS velocities, wavelength durations and amplitudes (as detailed in NSW EPA Assessing Vibration: A Technical Guideline, February 2006). "Critical Areas" includes hospital operating theatres and precision laboratories where sensitive operations are occurring, and these criteria are indicative only, therefore consideration of continuous and impulsive vibrations is included (as recommended), see attached graphs. The table of acceptable daily Dose Values, Table 2.4, includes a "Preferred Value", being half of the "Maximum Value".

Outcome this period: 18 May to 25 May 2020

Location	Monitor	Exceedances		Time of maximum exceedance
		No.	Max (VSPPV)	
Monitoring Location A	7113	2*	27.7	25-May, 8:47 am
Monitoring Location B	7153	0	n/a	n/a

*All exceedances likely direct bumps to sensor. Exceedances were not included in eVDV calculations.

Douglas Partners Pty Ltd

[REDACTED]
[REDACTED]
Senior Geophysicist

Reviewed by

[REDACTED]
[REDACTED]
Principal

Attachments: Graphs of Vibration Levels, Monitor Location Plan, About This Report

Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for Hansen Yuncken Pty Ltd. The report is provided for the exclusive use of Hansen Yuncken Pty Ltd for this project only and for the purpose(s) described in the report. It should not be used for other projects or by a third party. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice may be based on observations, measurements, tests, or derived interpretations. The accuracy of the advice provided by DP in this report may be affected by unobserved features and variations in ground conditions and conditions affecting vibration across the site, between and beyond the testing locations or by variations with time. Vibration monitoring and advice may also be limited by budget constraints imposed by others or by site accessibility.

The results provided in the report are indicative of the vibration levels at the sensor location(s) only and only during the specified period of monitoring. Vibration levels in other locations may therefore differ from those reported herein.

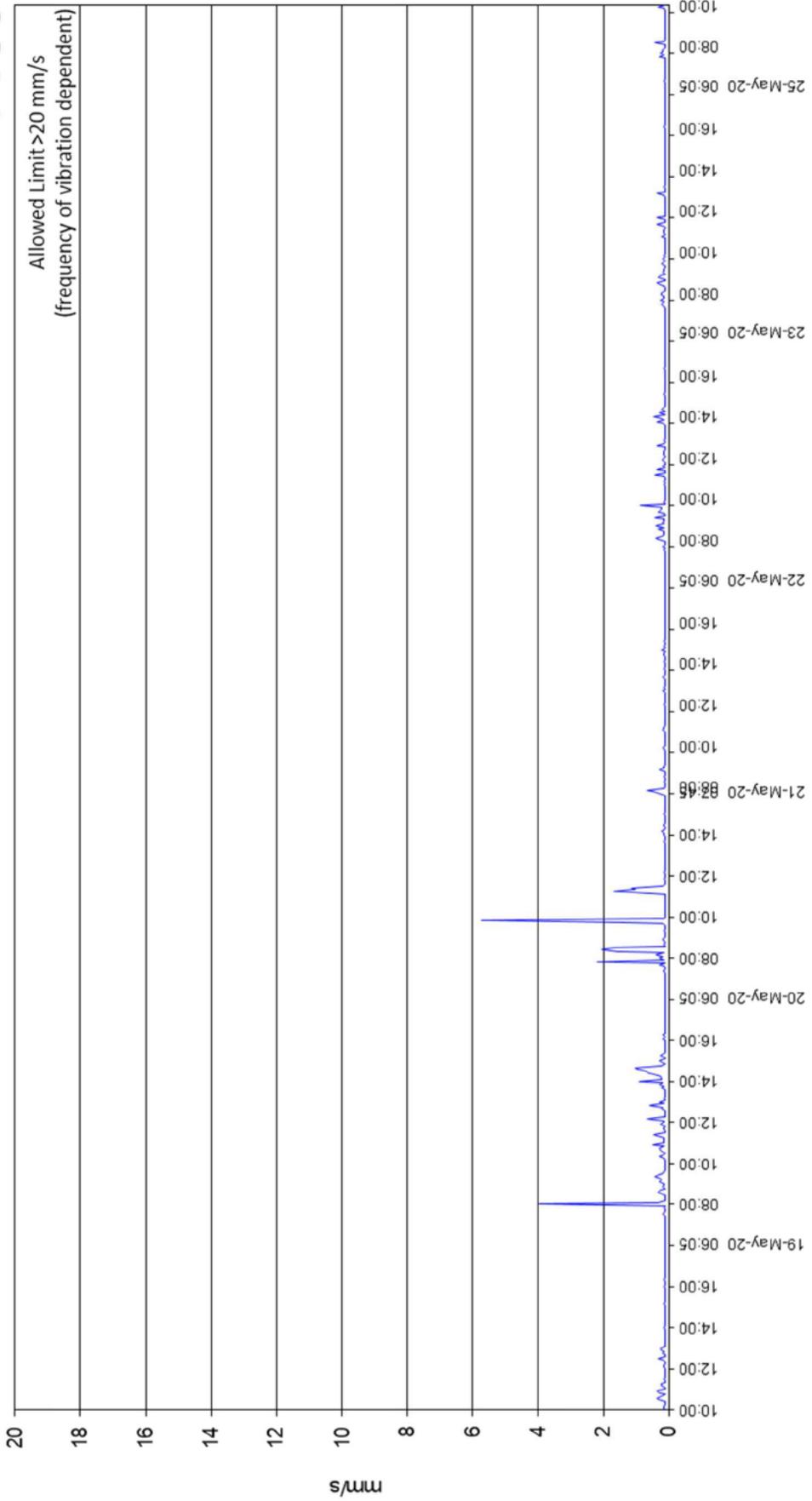
As neither estimations of safe operating distances for vibrations (if provided) nor the presence of an unattended vibration monitor can prevent exceedances, the real-time management of vibration remains the responsibility of Hansen Yuncken Pty Ltd and its plant operators. Interference with (e.g. movement or damage to) the monitoring equipment may influence readings and the Client is responsible for advising DP immediately to assess whether readings are affected, re-installation and/or repair is required.

This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion given in this report.

Vibration Levels - Goulburn Base Hospital Redevelopment
 (Monitoring Location B - NE-cnr of pathology-mortuary building)

Monitor
7153

— Vector Sum Peak Particle Velocity (maxima within 5 min contiguous windows) & triggered events > 7 mm/s — Allowed Limit

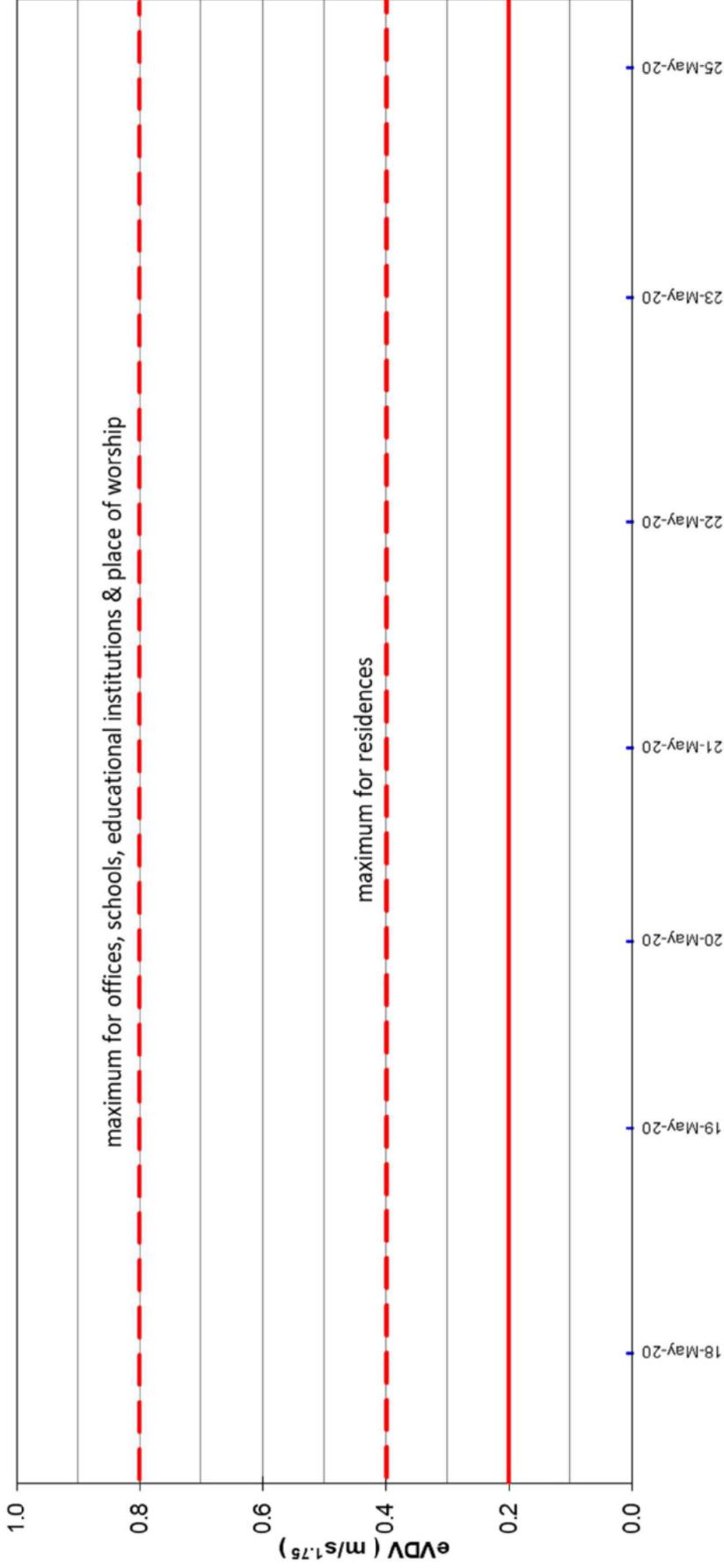


Date and Time
 Duty Cycle Mon - Sat 6am - 6pm
 (for display purposes, time axis is stretched where triggered events occur)

Vibration Dose Values - Goulburn Base Hospital Redevelopment
(Monitoring Location B - NE-cnr of pathology-mortuary building)

Monitor
7153

— Estimated Vibration Dose Value (maximum component) - - - Allowed Vibration Dose (maximum for critical areas)

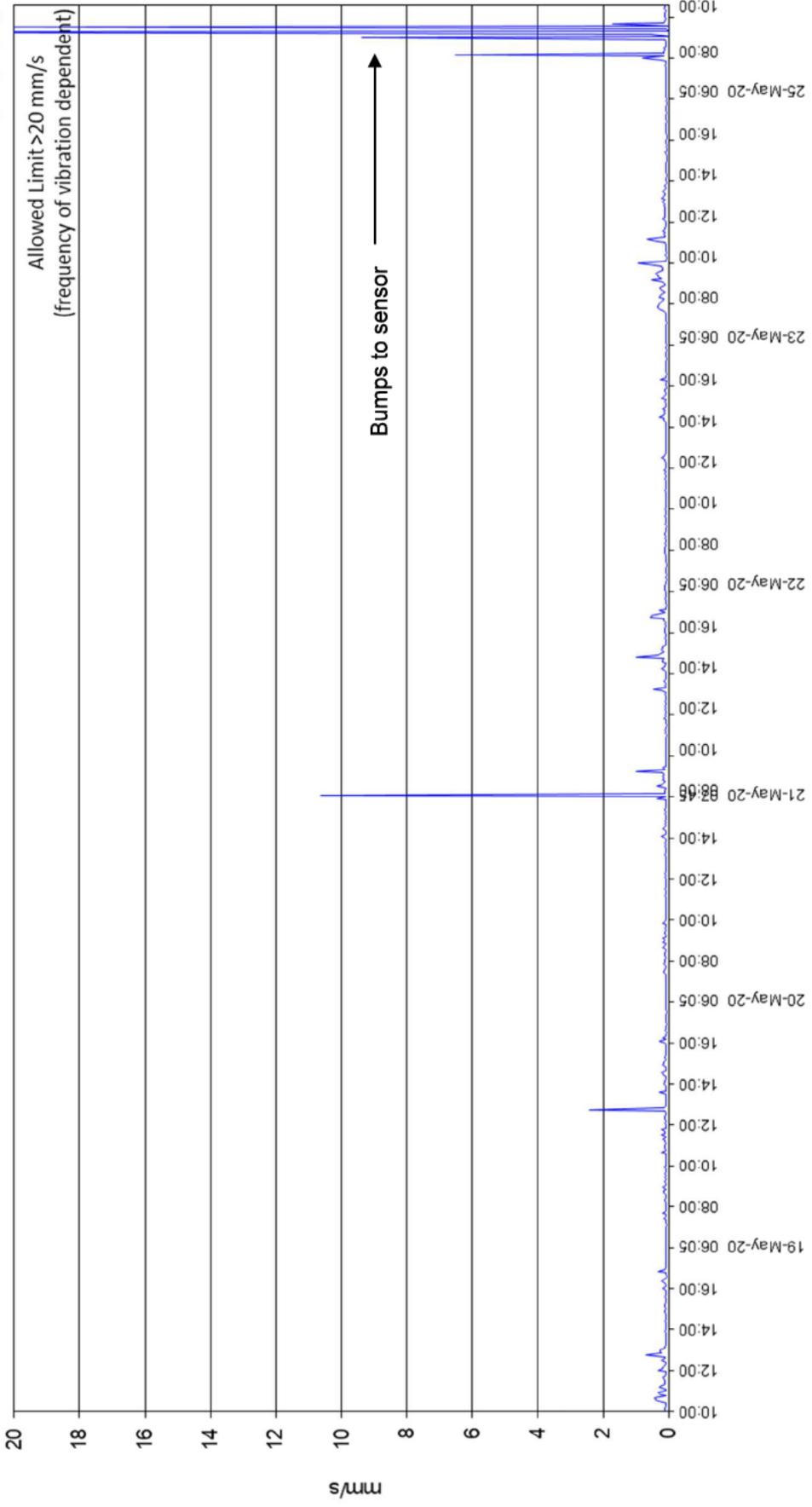


Date
Duty Cycle Mon - Sat 6am - 6pm (not continuous overnight)

Vibration Levels - Goulburn Base Hospital Redevelopment
(Monitoring Location A - SE-cnr of pathology-mortuary building)

Monitor 7113

— Vector Sum Peak Particle Velocity (maxima within 5 min contiguous windows) & triggered events > 7 mm/s — Allowed Limit



Date and Time
Duty Cycle Mon - Sat 6am - 6pm
(for display purposes, time axis is stretched where triggered events occur)

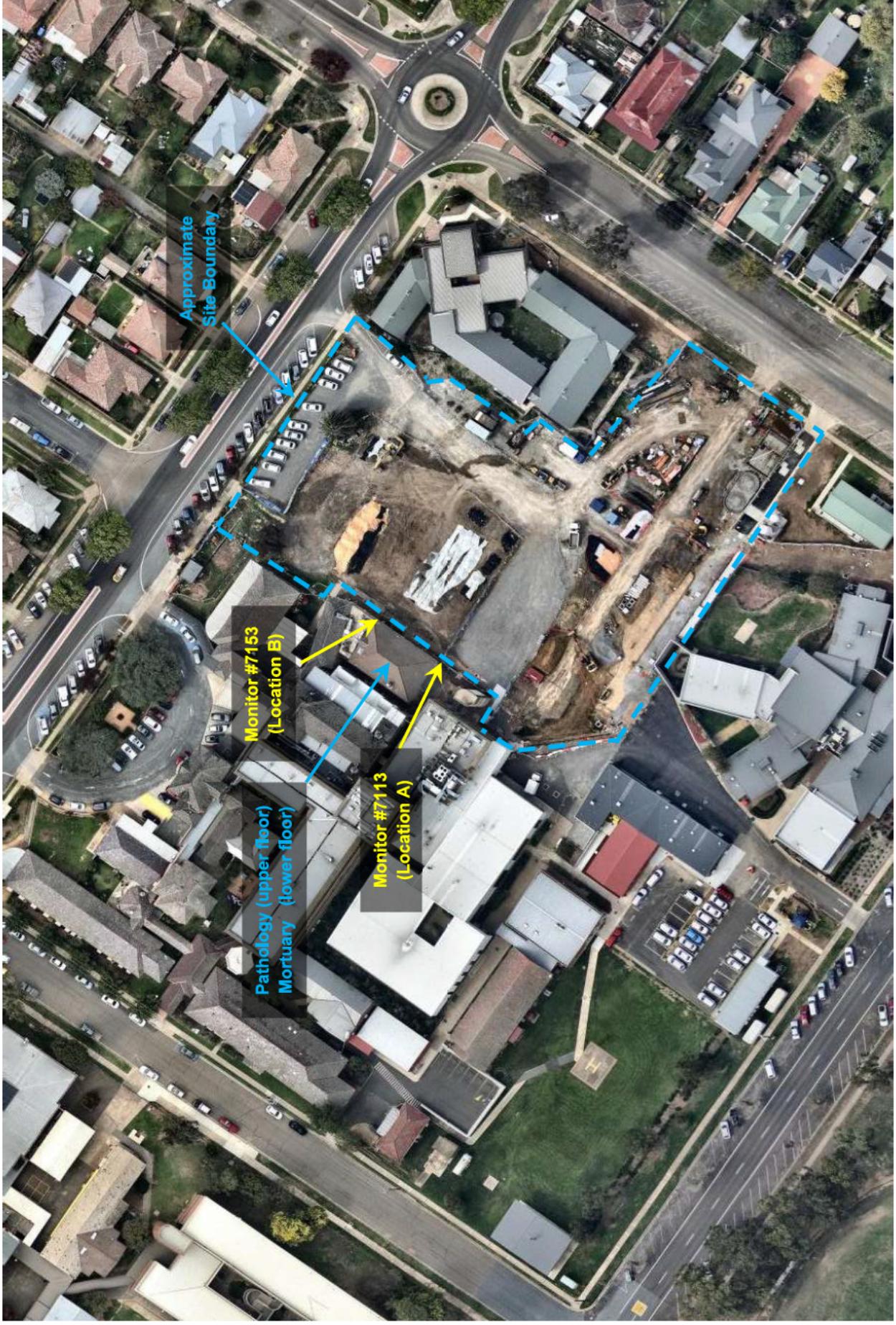
Vibration Dose Values - Goulburn Base Hospital Redevelopment
(Monitoring Location A - SE-cnr of pathology-mortuary building)

**Monitor
7113**

— Estimated Vibration Dose Value (maximum component) — Allowed Vibration Dose (maximum for critical areas)



Date
Duty Cycle Mon - Sat 6am - 6pm (not continuous overnight)



About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Memorandum

To	[REDACTED]	Hansen Yuncken Pty Ltd	[REDACTED]
From	[REDACTED]		Date 03 Jun 2020
Subject	Vibration Monitoring Report 20 Goulburn Base Hospital Redevelopment		Project No. 94054.07 Doc. No. 94054.07.R.020.Rev0

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Outcome this period: 25 May to 1-June 2020

Location	Monitor	Exceedances		Time of maximum exceedance
		No.	Max (VSPPV)	
Monitoring Location A	7113	0	n/a	n/a
Monitoring Location B	7153	0	n/a	n/a

Douglas Partners Pty Ltd

Senior Geophysicist

Reviewed by

Principal

Attachments: Graphs of Vibration Levels, Monitor Location Plan, About This Report

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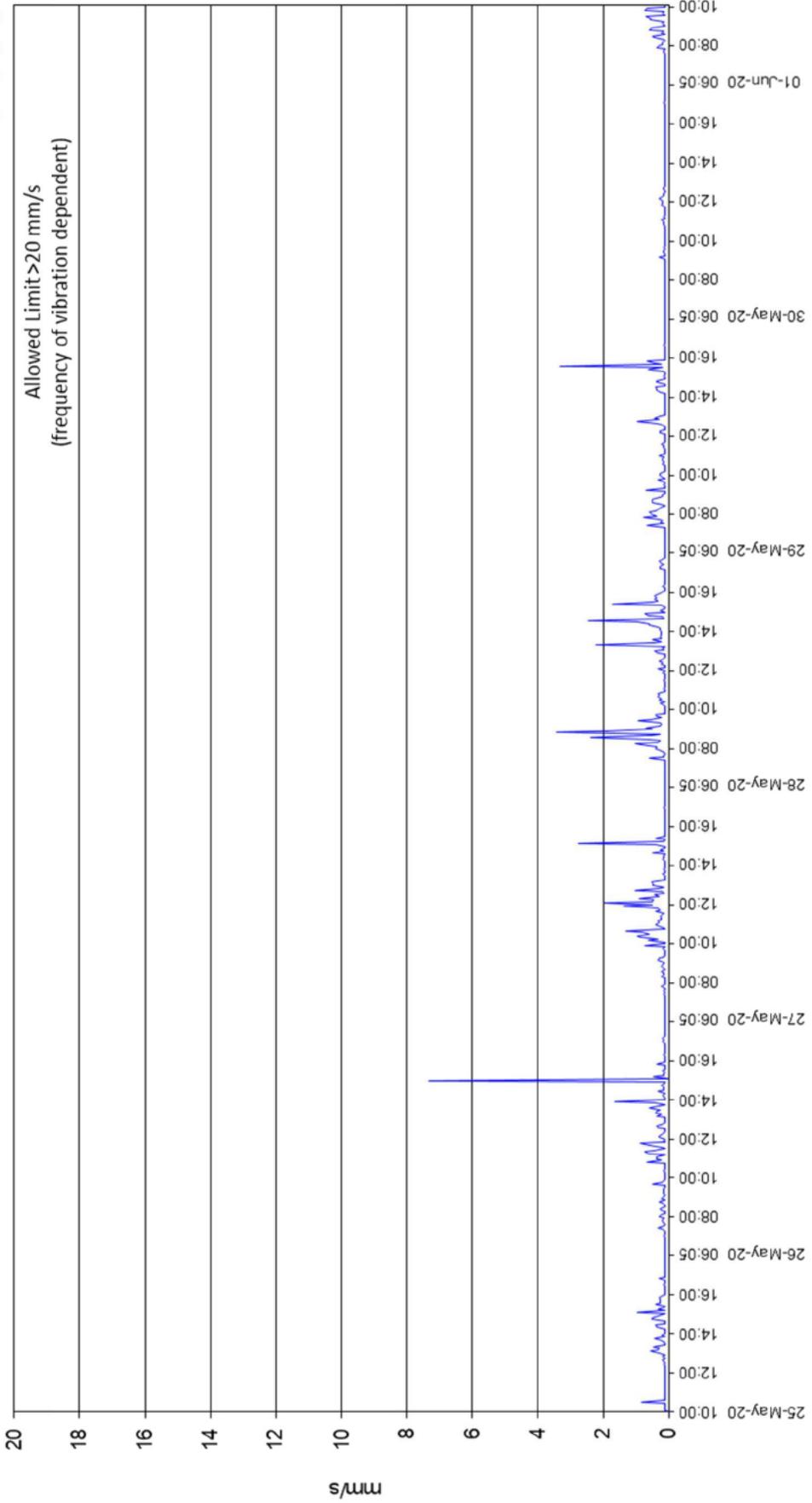
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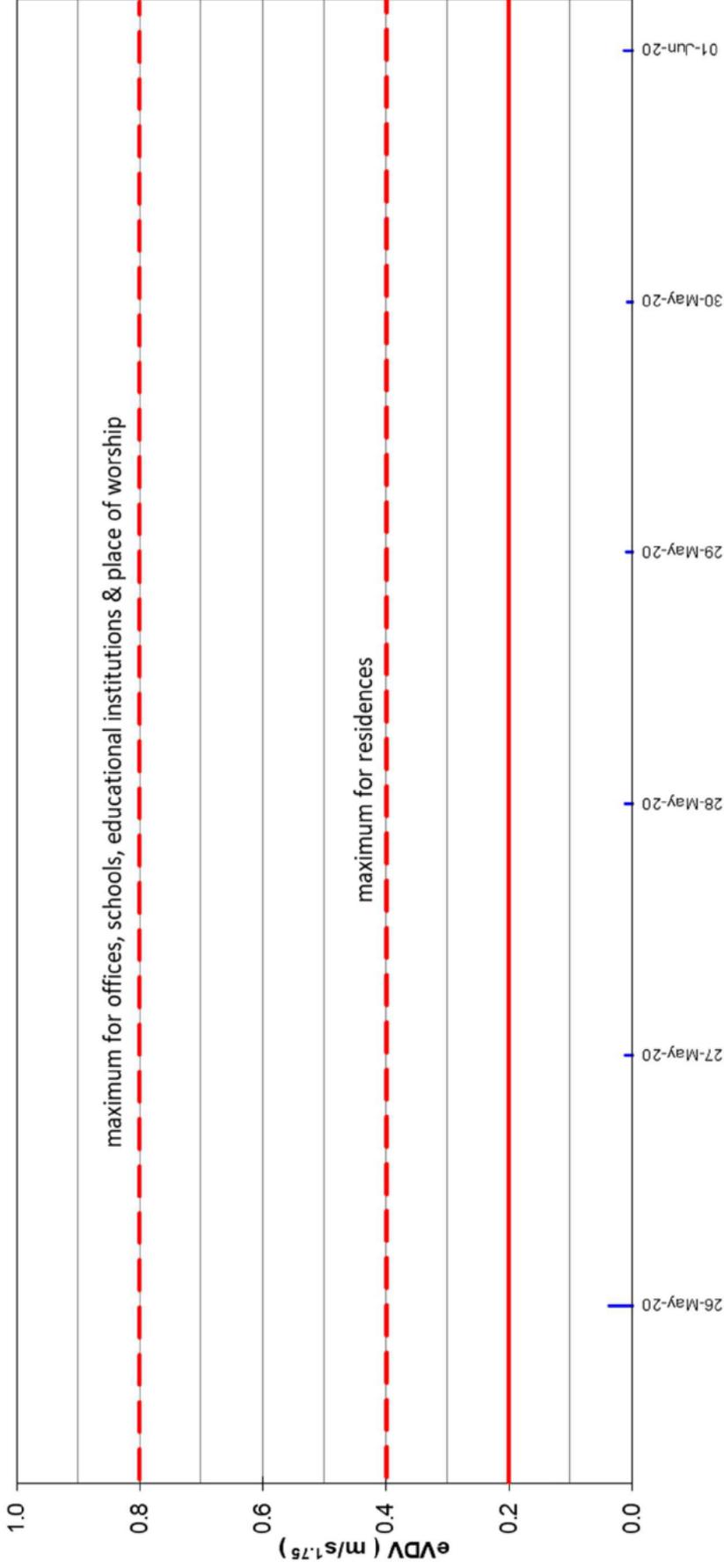


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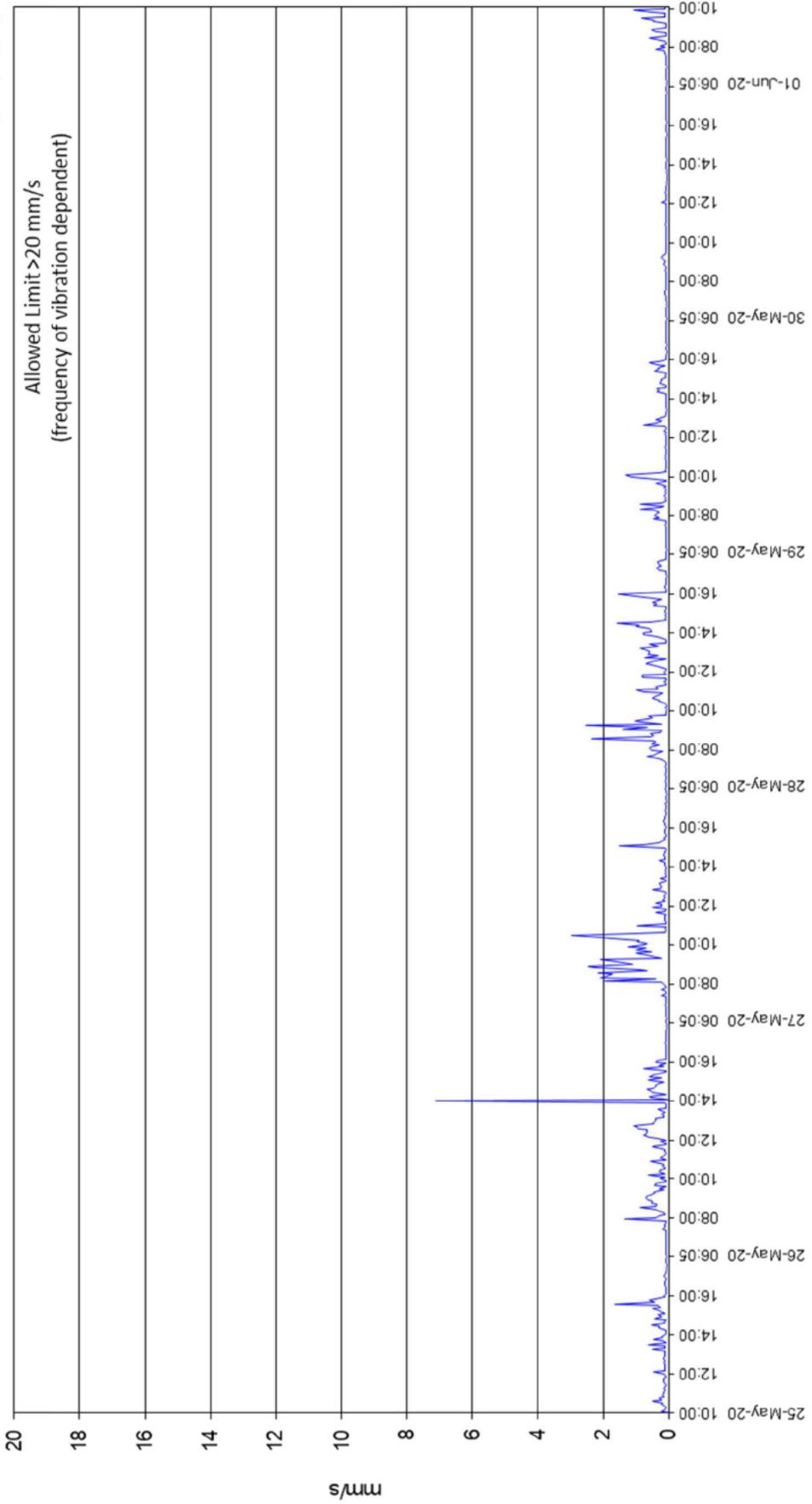


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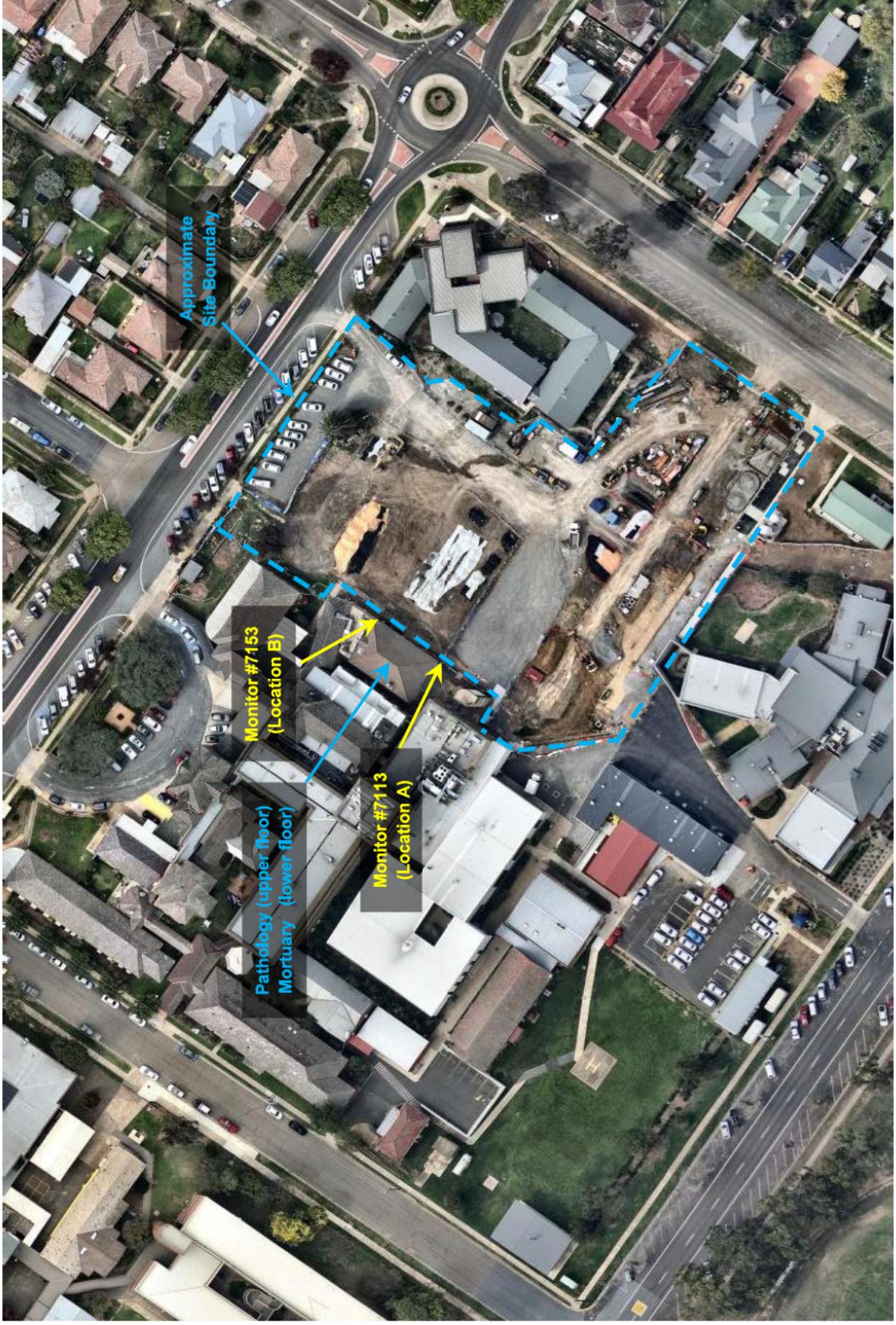
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Appendix L – Waste Register