Resonate

Acoustics • EMF • Structural Dynamics • Vibration

Monday, 5 January 2026

Project number: S240427
Reference: S240427MR7

Cameron Smith
Richard Crookes Constructions Pty Limited
Level 3, 4 Broadcast Way
Artarmon NSW 2064

Dear Cameron,

Sydney Biomedical Accelerator
Noise and Vibration Monitoring Report – December 2025

1 Introduction

Resonate Consultants Pty Ltd (Resonate) was engaged to undertake unattended noise and vibration monitoring at the construction site of the Sydney Biomedical Accelerator, located within the University of Sydney Camperdown campus to monitor the effect of construction noise and vibration at nearby sensitive receivers.

This report presents the results of the unattended noise and vibration measurements in accordance with the Construction Noise and Vibration Management Plan (CNVMP). The following report details the results measured from the working period of 1 December to 19 December 2025.

2 Criteria

2.1 Noise management levels

Table 1 presents the noise management levels (NML) for the identified sensitive receivers surrounding the project site as determined in the CNVMP.

Table 1 Noise management levels for identified sensitive receivers surrounding project site

Receiver	Land use	NML for time period, dB(A)			
		Standard Working Hours	Out of Hours Day(1) (Saturday afternoon & Sundays)	Out of Hours Evening(2)	Out of Hours Night(3)
SWHB Susan Wakil Health Building to the north of the subject site	Educational	45(4)	45(4)	45(4)	45(4)
StAC St Andrew's College to the south of the subject site	Student accommodation(5)	57	52	50	48

Receiver	Land use	NML for time period, dB(A)			
		Standard Working Hours	Out of Hours Day(1) (Saturday afternoon & Sundays)	Out of Hours Evening(2)	Out of Hours Night(3)
H1 Royal Prince Alfred Hospital to the west of the subject site.	Hospital	45(4)	45(4)	45(4)	45(4)
WC Wesley College located to the east of the subject site	Student accommodation(5)	59	54	53	52

(1) Any out of hours work occurring between 7 am and 6 pm.

(2) Any out of hours work occurring between 6 pm and 10 pm.

(3) Any out of hours work occurring between 10 pm and 7 am.

(4) Internally - applies when property in use. Equivalent to 65 dB(A) externally if windows are closed.

(5) Residential land use has been applied to student accommodation.

The ICNG prescribes an internal NMLs of 45 dB(A) for classrooms and other educational institutions. However, confirmation is pending from relevant stakeholders regarding the appropriateness of this criterion for the Susan Wakil Health Building (SWHB). In the interim, an internal NML of 45 dB(A) has been adopted.

2.2 Vibration criteria

There is currently no Australian Standard or legislation that specifies vibration limits for the prevention of damage to buildings. Therefore, it is common to make reference to German Standard DIN 4150-3:2016 *Structural Vibration, Part 3 – Effects of Vibration on Structures* (DIN 4150-3), which is widely used for this purpose in NSW.

DIN 4150-3 states that exposing buildings to vibration levels higher than that recommended in the table below does not necessarily result in damage. Rather it suggests that these limits are the levels of vibration at which experience has shown that damage leading to a reduction in the serviceability will not occur. The most stringent DIN 4150-3 vibration limits for different types of building structure are presented in Table 2 with the frequency dependant criteria presented in Figure 1.

Table 2 DIN 4150-3 vibration limits

Type of building structure	Peak Particle Velocity (PPV) limit, mm/s
Commercial, industrial and similar buildings	20
Residential and similar structures	5
Heritage listed structures	3

It is noted that the Royal Prince Alfred Hospital, St. Andrews College, The Sibyl centre and Wesley College are all heritage listed buildings. The Susan Wakil Health Building has been identified as a “Commercial, industrial or similar building” structure. The vibration limits applicable are presented in Table 3.

DIN 4150-3 is also considered to be suitable for the assessment of both structural and cosmetic damage as the standard considers a reduction in serviceability of the structure to have occurred if:

- Cracks form in plastered surfaces of walls
- Existing cracks in the building are enlarged
- Partitions become detached from load bearing walls or floors.

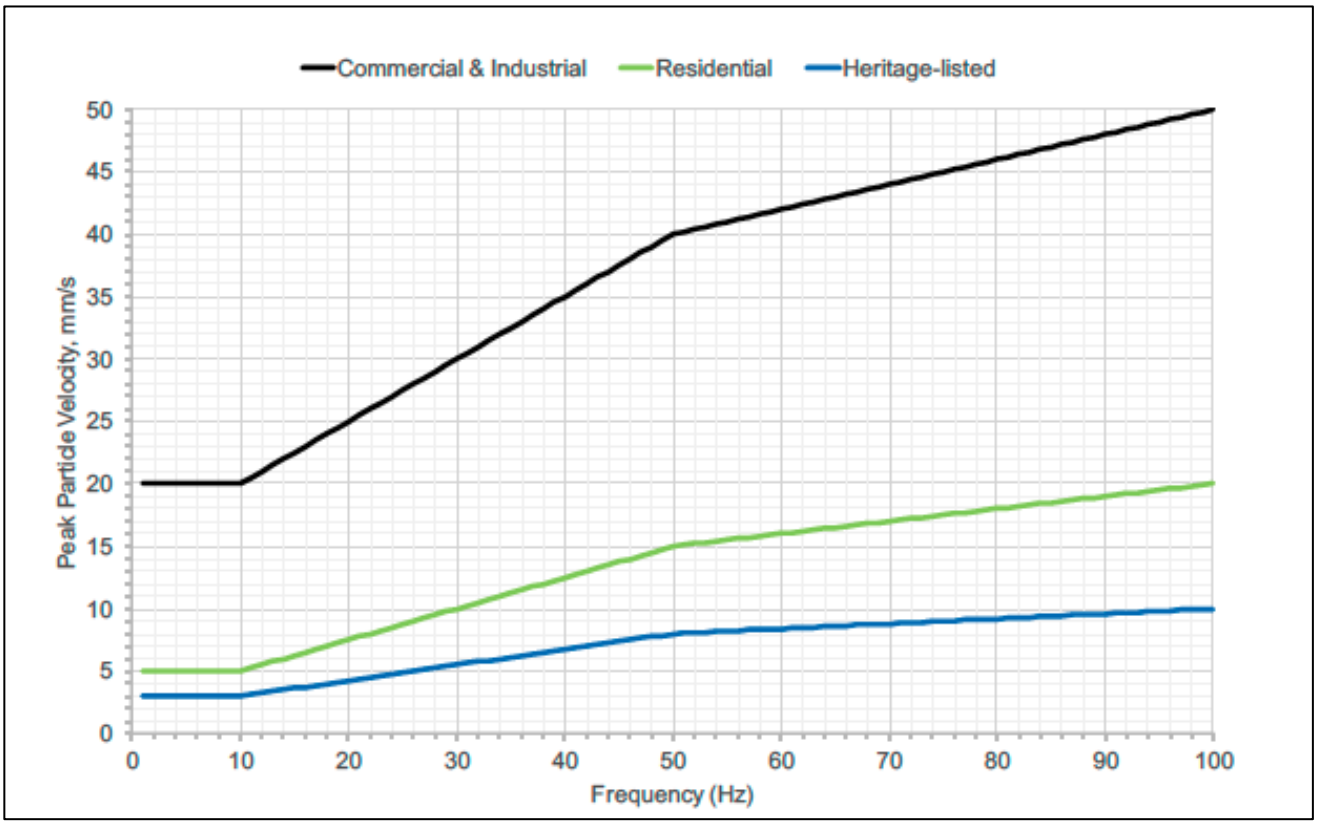


Figure 1: DIN 4150-3 Guideline Values

It should also be noted that the SWHB houses specialised medical equipment that may require more stringent criteria. In the absence of manufacturer specifications, the Vibration Criterion (VC) curves (as per ANSI S2.71/ISO 2631) will be used to define default vibration criteria, these are shown in Figure 2. These curves provide conservative RMS vibration limits, ranging from VC-A (0.050 mm/s) suitable for general labs to VC-E (0.003 mm/s) for ultra-sensitive instruments such as atomic force microscopes (AFMs).

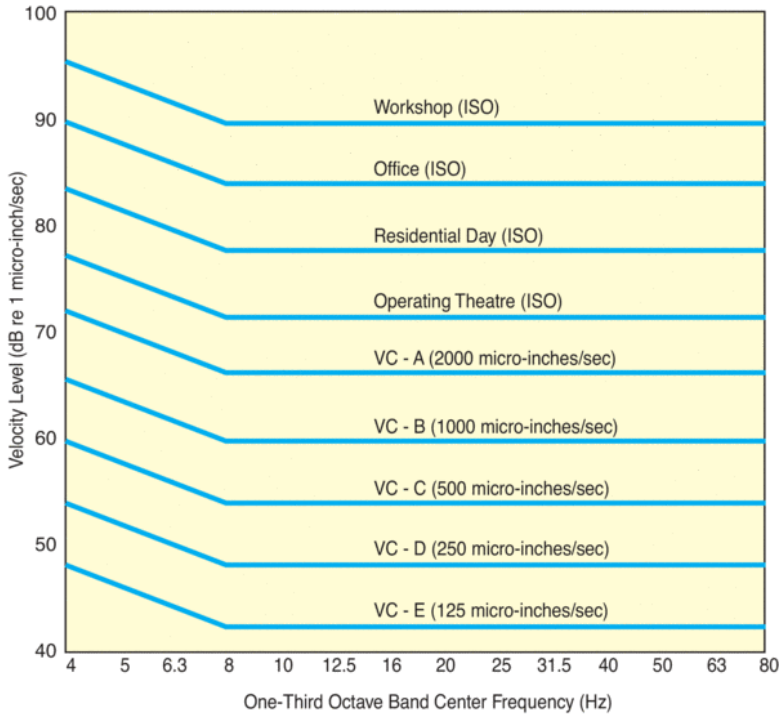


Figure 2 VC curves

In consideration of the above, the assigned criteria for each vibration monitor listed below in Table 3. To allow early indication of exceedance, the monitors' alert levels have been set to 75% of their criteria. These alert levels allow ample time to address any potential vibration inducing activities. It is important to note that these alert levels represent the threshold below which even minor cosmetic damage has not been previously observed to structures.

The vibration monitor located within the CT room of SWHB adheres to the much stricter criteria of VC-A, which is equivalent to approximately 0.05 mm/s.

Table 3 Vibration monitors and criteria

Monitor	Building structure	Criteria	Alert level (75% criteria)
VM01 RPAH external	Heritage listed structure	3 mm/s PPV	2.25 mm/s PPV
VM02 SWHB speech clinic	Commercial, industrial and similar buildings	20 mm/s PPV	15 mm/s PPV
VM03 SWHB CT room	Specialised medical equipment	0.05 mm/s RMS	0.05 mm/s RMS[1]

(1) Due to the highly sensitive nature of this monitor, it is likely that the criteria will be exceeded by non-construction related activities such as vibration generated by footfall, and thus it may not be practical to assign an alert level.

3 Predicted noise levels

Appendix U of the EIS presents the *SSDA Noise and Vibration Impact Assessment* developed by Acoustic Logic dated 28 August 2023. Section 5.3 of the document presents predicted noise levels of the main construction activities, during the construction of the SBA. The predicted noise levels for each construction stage are summarised below in Table 4.

Table 4 Predicted noise levels for construction activities

Construction stage	Equipment / process	Maximum predicted noise level for all sensitive receivers ($L_{Aeq\ 15\ minute}$)	Comment
Detailed excavation	Excavator with bucket attachment	52-74 (externally) 32-46 (internally)	May exceed NML when working close to site boundary at SWHB and Royal Prince Alfred Hospital. Likely to exceed NML at St. Andrews College and Wesley College.
	Trucks	52-66 (externally) 32-46 (internally)	
Erection of structure	Concrete pump	57-79 (externally) 37-51 (internally)	Likely to exceed NML when working close to site boundary at SWHB, Royal Prince Alfred Hospital, St. Andrews College and Wesley College.
	Concrete vibrator	57-79 (externally) 37-51 (internally)	
	Site crane	52-74 (externally) 32-46 (internally)	May exceed NML when working close to site boundary at SWHB and Royal Prince Alfred Hospital. Likely to exceed NML at St. Andrews College and Wesley College.
	Trucks	52-74 (externally) 32-46 (internally)	
General & landscaping	Bobcat	52-74 (externally) 32-46 (internally)	May exceed NML when working close to site boundary at SWHB and Royal Prince Alfred Hospital. Likely to exceed NML at St. Andrews College and Wesley College.
	Powered hand tools	47-69 (externally) 27-41 (internally)	

4 Noise measurement locations

Resonate attended site on 10 and 12 June 2025 to install unattended vibration and noise monitors respectively. Two vibration monitors were installed, and three noise monitors were installed at locations representative of the potentially affected receivers. On 12 August 2025, Resonate attended site to relocate the previous SWHB external noise monitor to inside the speech clinic (Room 552). Resonate also relocated the previous SWHB external vibration monitor to inside the speech clinic (outside room 552) and installed a vibration monitor within the CT room (Room 313). These locations are presented in Figure 3. The vibration monitor in Room 313 is currently in the server room adjacent to the CT room to reduce the effect of footfall induced exceedances.

The noise monitors were installed to continuously record 15-minute measurement periods, recording L_{Aeq}, L_{10}, L_{90}, and L_{Max} for each measuring period. The vibration monitors were installed to continuously measure peak particle velocity (PPV) in three orthogonal orientations (transversal, vertical, longitudinal) for the duration of the works.

Table 5 Noise and vibration monitor locations

ID	Monitor	Location
NM01	SiteHive Hexanode noise monitor	South-East boundary of Royal Prince Alfred Hospital
NM02	SiteHive Hexanode noise monitor	East boundary of construction side, North of St. Andrew's College
NM03	SiteHive Hexanode noise monitor	Inside the Susan Wakil Health Building Speech Clinic (Room 552)
VM01	Avatrace vibration monitor	South-East boundary of Royal Prince Alfred Hospital
VM02	Avatrace vibration monitor	Inside the Susan Wakil Health Building Speech Clinic (Outside Room 552)
VM03	DataFlex vibration monitor	Inside the Susan Wakil Health Building adjacent to CT Room (Room 313)

Figure 3 Unattended noise and vibration monitor locations

5 Instrumentation

Airborne noise measurements were conducted using SiteHive *Hexanode Noise Monitor* sound level meter (serial numbers: HEX-001050, HEX-001047, HEX-001052). Ground vibration measurements were conducted using Avatrace *M80* vibration monitors (serial numbers: 12040, 12068) and Dataflex Vibration monitor (serial number: DF-024). The sound level meters, and vibration monitors hold current calibration certifications which may be provided upon request.

6 Measurement results

6.1 Noise monitoring results

Detailed results of the noise monitoring for the period 1 December to 19 December 2025 are located in Appendix A. Measured noise levels were confirmed to be in general alignment with the predicted noise levels stated in the EIS documentation *(Acoustic Logic- SSDA Noise & Vibration Impact Assessment 20221419.4) as* outlined in Section 3. Weather conditions during the noise monitoring are presented in Appendix A.

Table 6 presents selected construction noise events which were identified as having considerable noise level which may have contributed to NML exceedances. The list below presents only the highest noise events identified and is not exhaustive.

Table 6 Selected construction noise events and sounds levels

Monitor	Date and time	Sound level, dB(A)	Equipment / noise source
NM02	15:11 pm, 1 December 2025	86	Metal crashing
NM02	14:01 pm, 5 December 2025	86	Metal crashing

It should be noted that multiple NML exceedances within the SWHB internal monitor were recorded, however, upon audio analysis it was determined that the source of noise was from classroom activity within the clinic and not the construction site.

6.2 Vibration monitoring results

Detailed results of the vibration monitoring for the period 1 December to 19 December are presented in Appendix B.

Frequent exceedances of the VC-A vibration criteria in Room 313 were recorded throughout the month. Considering the highly stringent criteria of the room it is unlikely that all exceedances were induced by construction activities. Resonate has recommended to RCC that stakeholder engagement should be undertaken to determine whether the vibration levels experienced in the room have impacted operation and/or imaging of the CT scanner. If no issues are raised or identified, we recommended increasing the criteria to reduce the number of false alerts.

There were no exceedances of the vibration criteria at VM01 or VM02.

7 Summary

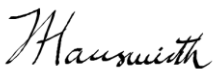
Resonate conducted unattended noise and vibration monitoring for the Sydney Biomedical Accelerator construction site for the period from 1 December to 19 December 2025. Three noise monitors were installed at locations representative of noise sensitive receivers, and three vibration monitors were installed to continuously monitor PPV.

Detailed charts for all monitoring locations are presented in Appendix A and Appendix B, which offer specific information on instances where NMLs or vibration criteria may have been exceeded. Alternatively, a compete record

of all logged data is available to access on the Sydney Biomedical Accelerator Avanet web portal (vibration) or the Sydney Biomedical Accelerator SiteHive (noise) web portals.

Please let me know if you have any queries or wish to discuss the above.

Yours sincerely,



Justin Hauswirth
Acoustic Consultant
p +61 2 8355 4888
m +61 416 345 878
justin.hauswirth@resonate-consultants.com

Appendix A – Noise monitoring results

December 2025 Full report

Sydney Biomedical Accelerator

Resonate Consultants

Noise Monitoring Statistics

NM01

LAeq	66	Day dB
LAeq	51	Evening dB
LAeq	47	Night dB

Average value across selected time period

NM02

LAeq	67	Day dB
LAeq	57	Evening dB
LAeq	58	Night dB

Average value across selected time period

Susan Wakil Internal

LAeq	48	Day dB
LAeq	36	Evening dB
LAeq	38	Night dB

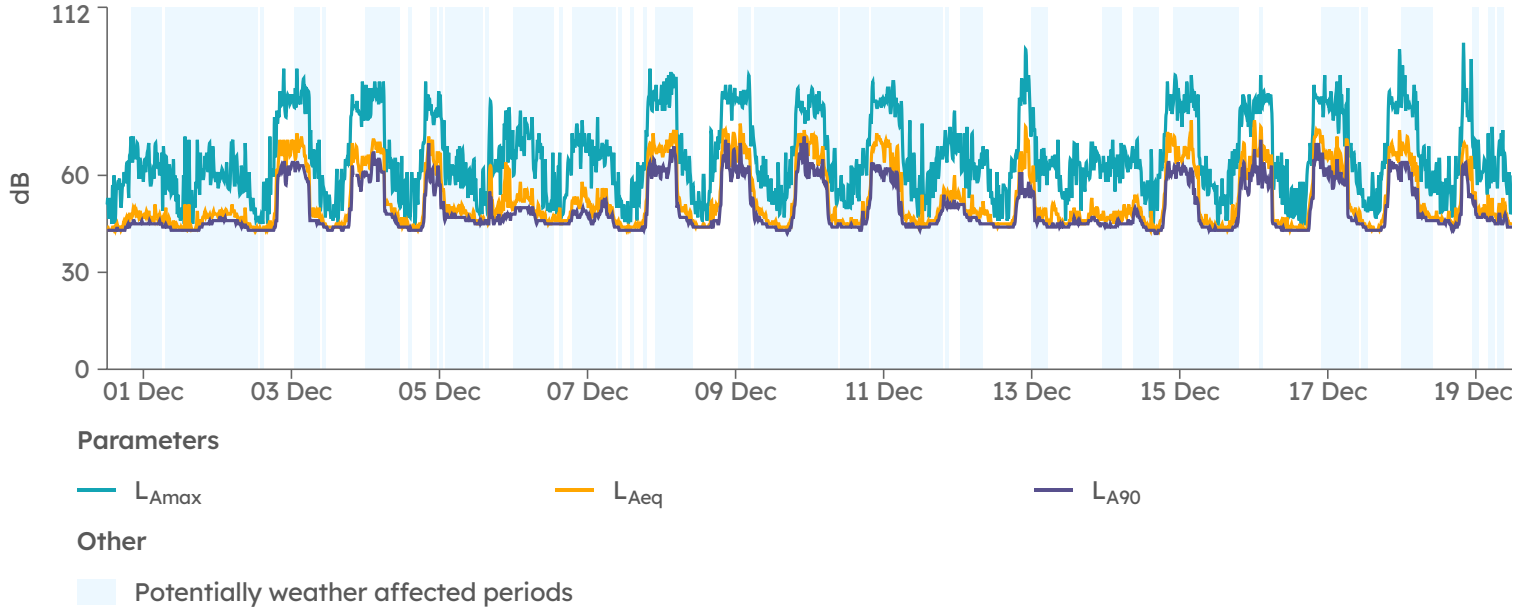
Average value across selected time period

Average value across selected time period. Time of Day Periods: Day (7am to 6pm) Evening (6pm to 10pm) Night (10pm to 7am).

Noise Monitoring Graphs

Sound Levels | NM01

15 min periods 01 Dec 2025 - 19 Dec 2025



Parameters

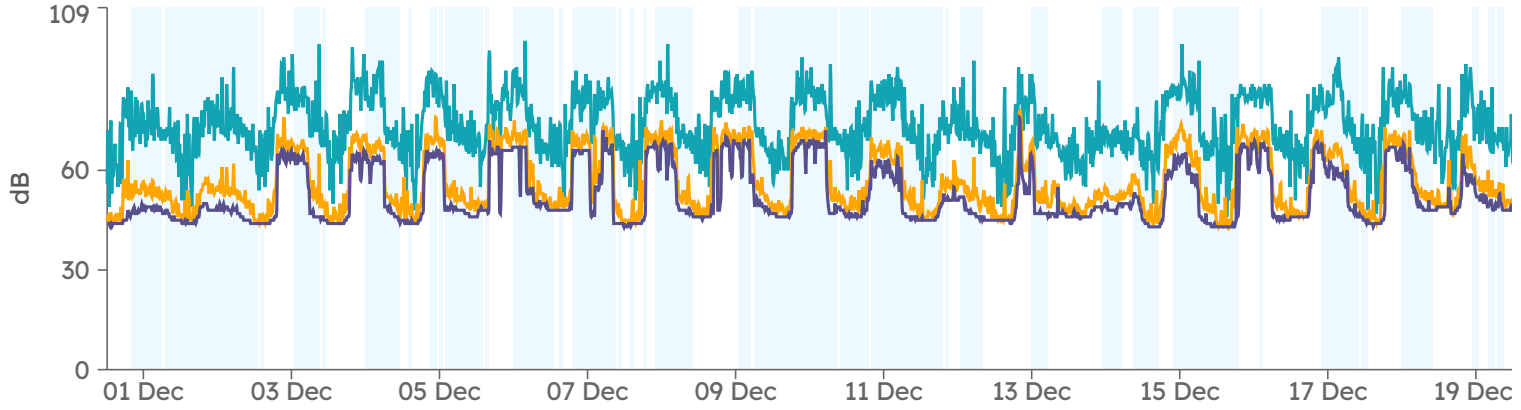
L_{Amax} L_{Aeq} L_{A90}

Other

Potentially weather affected periods

Sound Levels | NM02

15 min periods 01 Dec 2025 - 19 Dec 2025



Parameters

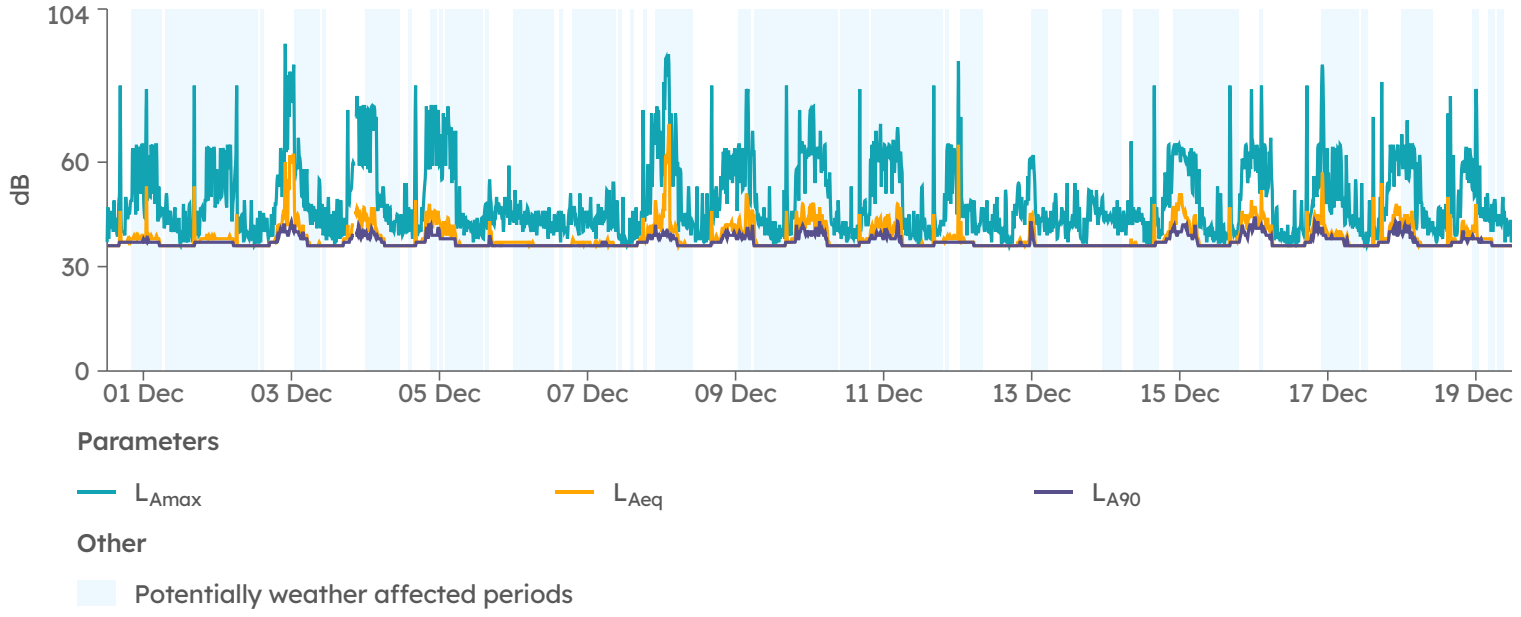
L_{Amax} L_{Aeq} L_{A90}

Other

Potentially weather affected periods

Sound Levels | Susan Wakil Internal

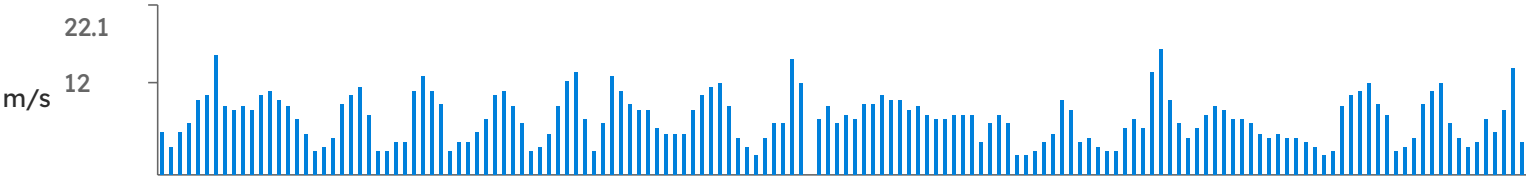
15 min periods 01 Dec 2025 - 19 Dec 2025



Weather Graphs 01 Dec 2025 - 19 Dec 2025

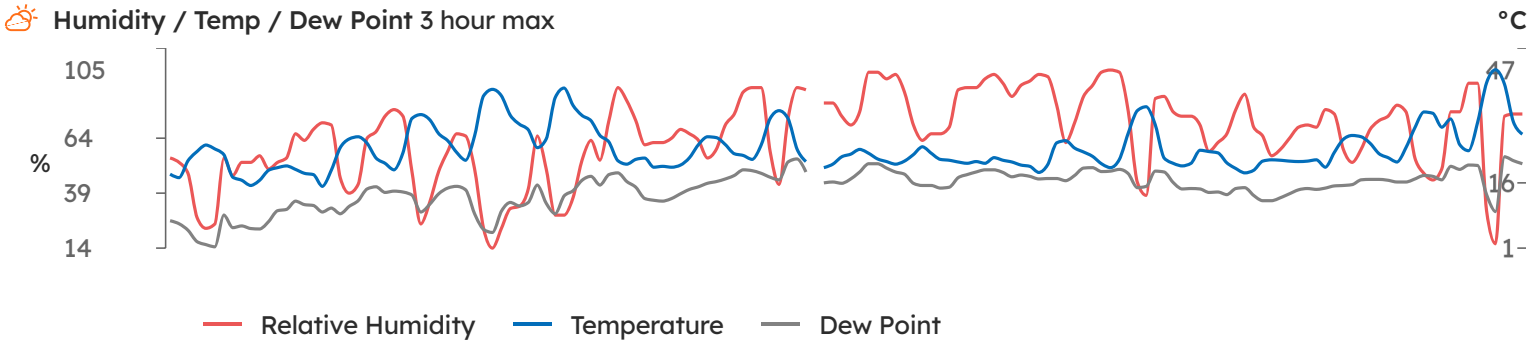
Source Sydney Airport - 6km

Wind 3 hour max speed and dominant direction



Rainfall 3 hour cumulative

Humidity / Temp / Dew Point 3 hour max



Device Details

Device Serial	Monitoring Points	Model	Calibration Date	Calibration Due
HEX-001047	NM02	SiteHive Hexanode	26 May 2025	26 May 2027
HEX-001050	NM01	SiteHive Hexanode	28 May 2025	28 May 2027
HEX-001052	Susan Wakil Internal	SiteHive Hexanode	28 May 2025	28 May 2027

Resonate Consultants

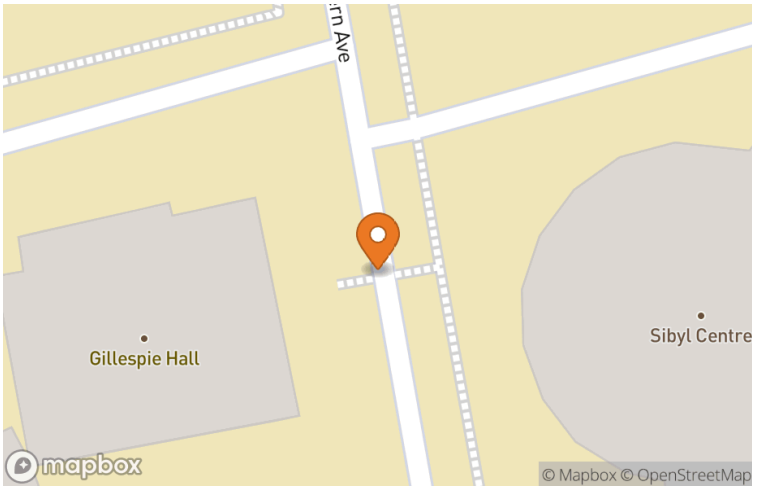
Sydney Biomedical Accelerator
Attended Summary Report

Attended Monitoring Summary

Date Range 01 Dec 2025 - 19 Dec 2025

Monitoring Locations

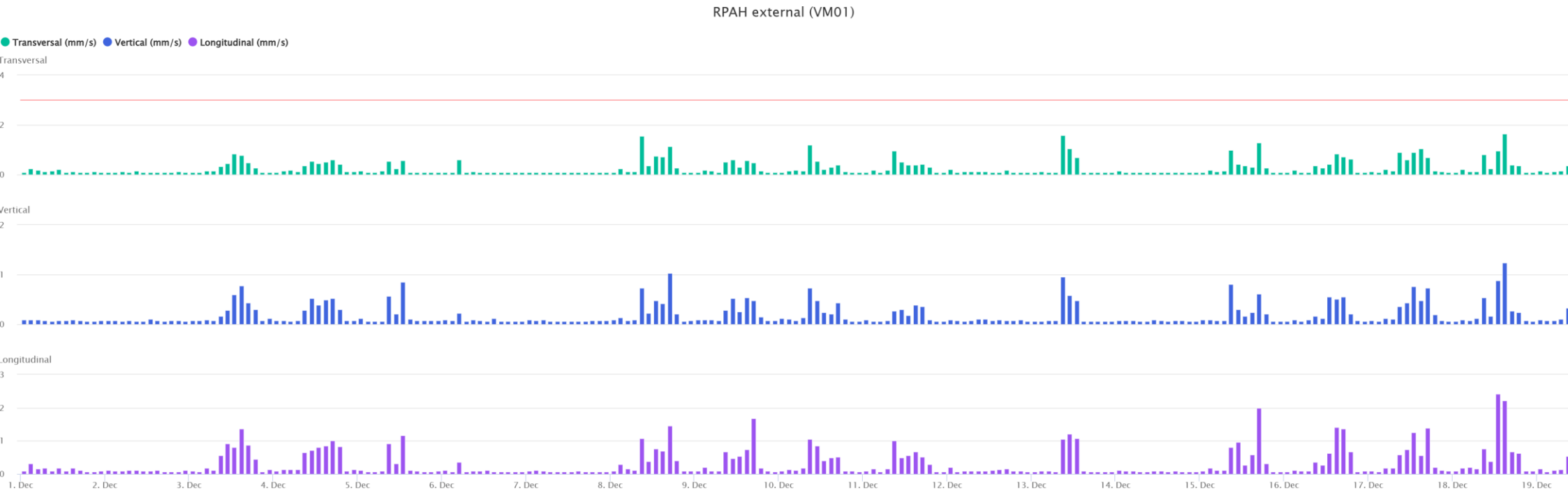
Location Name	Lat	Long



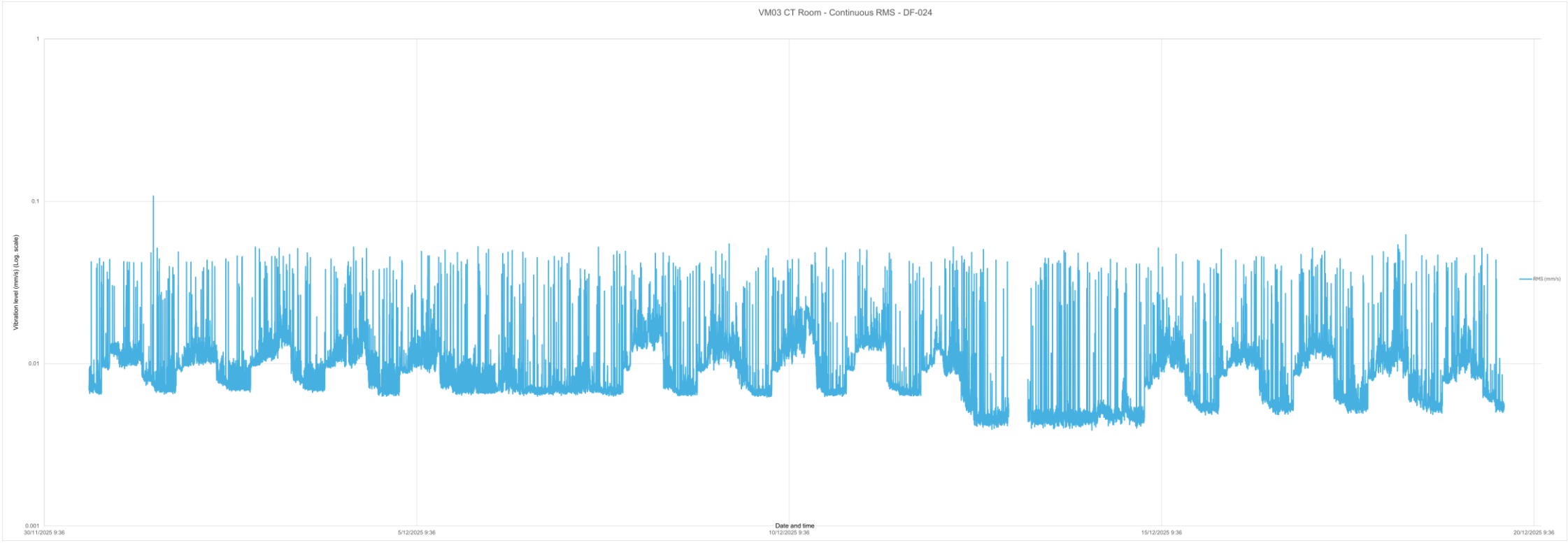
Attended Monitoring Results Summary Table

No measurements for this period

Appendix B – Vibration monitoring results


RPAH external (VM01)
Transversal (mm/s)
Vertical (mm/s)
Longitudinal (mm/s)
Transversal
4
2
0
Vertical
2
1
0
Longitudinal
3
2
1
0
1. Dec
2. Dec
3. Dec
4. Dec
5. Dec
6. Dec
7. Dec
8. Dec
9. Dec
10. Dec
11. Dec
12. Dec
13. Dec
14. Dec
15. Dec
16. Dec
17. Dec
18. Dec
19. Dec


SWHB Internal (VM02)
Transversal (mm/s)
Vertical (mm/s)
Longitudinal (mm/s)
Transversal
20
10
0
Vertical
20
10
0
Longitudinal
2
1
0
1. Dec
2. Dec
3. Dec
4. Dec
5. Dec
6. Dec
7. Dec
8. Dec
9. Dec
10. Dec
11. Dec
12. Dec
13. Dec
14. Dec
15. Dec
16. Dec
17. Dec
18. Dec
19. Dec
20.


VM03 CT Room - Continuous RMS - DF-024
1
0.1
0.01
0.001
Vibration level (mm/s) (Log scale)
30/11/2025 9:36
5/12/2025 9:36
10/12/2025 9:36
15/12/2025 9:36
20/12/2025 9:36
Date and time
RMS (mm/s)