RENZO TONIN & ASSOCIATES
inspired to achieve

Acoustics
Vibration
Structural Dynamics

BARANGAROO METRO STATION

Noise & Vibration Monitoring Report

April 2024 – October 2024

Besix Watpac

TM031-1-08F01 Barangaroo Noise and Vibration Monitoring, 6 Monthly Report, April 2024 - September 2024 (r.2)

40 YEARS 1982 - 2022 ACOUSTIC ENGINEERING EXCELLENCE

Sydney Melbourne Brisbane Gold Coast Kuwait Singapore
Renzo Tonin & Associates ABN 29 117 462 861
Level 1/418A Elizabeth St SURRY HILLS NSW 2010 | PO Box 877 STRAWBERRY HILLS NSW 2012
P (02) 8218 0500 F (02) 8218 0501 sydney@renzotonin.com.au www.renzotonin.com.au

Document details

Detail	Reference
Doc reference:	TM031-1-08F01 Barangaroo Noise and Vibration Monitoring, 6 Monthly Report, April 2024 - September 2024 (r.2)
Prepared for:	Besix Watpac
Address:	25 Hickson Road, Barangaroo, Sydney, NSW, 2000
Attention:	[redacted]

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
22.10.2024	First Issue	0	1	[redacted]	[redacted]	[redacted]
26.02.2025	Addressing Comments	-	2	[redacted]	[redacted]	[redacted]

File Path: R:\AssocSydProjects\TM001-TM050\TM031 mt Barangaroo Metro Station\1 Docs\08 6 Monthly Noise Monitoring Report\05 April 2024 - Sept 2024\TM031-1-08F01 Barangaroo Noise and Vibration Monitoring, 6 Monthly Report, April 2024 - September 2024 (r.2).docx

Contents

List of tables

List of figures

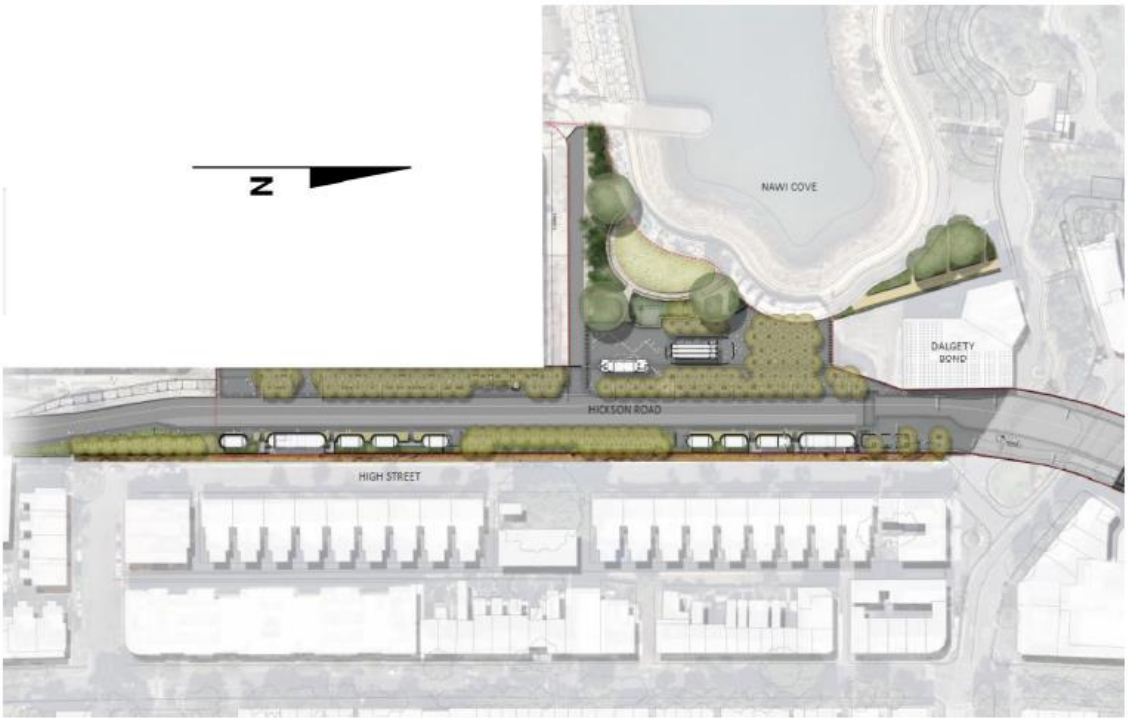
1 Introduction

The Sydney Metro City & Southwest Project is a 30-kilometre metro railway between Chatswood and Bankstown including 17 kilometres of new tunnels from Chatswood to Sydenham travelling under Sydney Harbour connecting 7 new underground stations at Crows Nest, Victoria Cross (North Sydney), Barangaroo, Pitt Street, Martin Place, Central and Waterloo. Upgrading 13 kilometres of the Bankstown line including 11 existing stations at Sydenham, Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park, Punchbowl and Bankstown plus service facilities.

BESIX Watpac have been engaged by Sydney Metro to build the Barangaroo Station Construct Only Package (BR COP), forming part of the broader Sydney Metro City & Southwest Chatswood to Sydenham project.

The project site is located North of the Barangaroo precinct below Hickson Road on the North-western edge of the Sydney CBD and adjacent to Nawi Cove as shown in Figure 1-1. The station is the most northerly of the CBD stations.

Figure 1-1 – Location of Barangaroo Station



2 Purpose

This Noise and Vibration Monitoring Report (NVMR) is a summary of all noise and vibration monitoring conducted over the 7-month period from April 2024 to October 2024.

The Construction Noise and Vibration Management Plan (CNVMP) outlines in Appendix E a Construction Noise and Vibration Monitoring Program which details the monitoring required by Condition of Approval (CoA) C10 and the frequency of reporting. The Construction Noise and Vibration Monitoring Program has been endorsed by the Acoustic Advisor (AA) and approved by the Secretary in accordance with CoA C13.

CoA C16 required the results of the monitoring program to be provided to the Secretary for information at the frequency identified in the program. The approved monitoring program states that the details of the noise and vibration monitoring will be reported on a six-monthly basis.

The independent Acoustic Advisor will be provided the report for endorsement prior to submission to the Secretary for information by Sydney Metro.

The applicable CoAs are shown in Table 2-1.

Table 2-1 - Conditions of Approval

Condition	Description	Besix Watpac actions
C9	The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each Construction Monitoring Program to compare actual performance of construction of the CSSI against predicted performance. Required Construction Monitoring Programs and (Relevant government agencies to be consulted for each Construction Monitoring Program):	
	Noise and Vibration (EPA and Relevant Council(s)	Noise and Vibration – refer to the Construction Noise and Vibration Management Plan
	Blasting (EPA and Relevant Council(s))	Blasting – Not applicable (Appendix A Staging Report)
	Water Quality – (EPA and Relevant Council(s))	Water Quality – Not applicable (Appendix A Staging Report)
	Groundwater – (DPI Water)	Groundwater – Not applicable (Appendix A – Staging Report)
C16	The results of the Construction Monitoring Programs must be submitted to the Secretary for information, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program	This report

3 Construction activities

Construction activities occurring on site during the reporting period have comprised the following:

- Deliveries;
- Removal of trees and relocation of sandstone blocks;
- Civil works including the excavation and installation of stormwater mains, condenser water lines and utility services installations;
- Backfilling and compaction of fill material to shark's fin area;
- Construction of the ventilation POD structures;
- Hickson Road realignment and pavement works;

3.1 Standard construction hours

Construction has been carried out in accordance with outlined hours in CoA E36 as follows:

- 07:00am to 6:00pm Mondays to Fridays;
- 08:00am to 6:00pm Saturdays;
- At no times on Sundays or public holidays.

3.2 Out of Hours construction summary

Construction has been undertaken out of hours under CoA E44 under the approved Out of Hours. Works Applications (OOHWA) listed in Table 3-1.

Table 3-1 - Approved out of hours applications

OOHWA	Work Description	Approval	Approved Duration
OOHWA-032	Vivid Road Works	E44(f)	5 May 2024 - 5 July 2024
OOHWA-033	Hickson Road Completion Works	E44(f)	18 August 2024 – 8 October 2024

3.3 Emergency construction

No emergency works were undertaken during this reporting period.

4 Monitoring criteria

4.1 Noise monitoring criteria

The following noise parameters are required to be measured when assessing construction noise levels:

- $L_{A1(1minute)}$ - The typical 'maximum noise level for an event', used in the assessment of potential sleep disturbance during night-time periods. Alternatively, assessment may be conducted using the LAmax or maximum noise level.

- $L_{Aeq(15minute)}$ - The "energy average noise level" evaluated over a 15-minute period. This parameter is used to assess the potential construction noise impacts and to assess compliance with the relevant internal or external NMLs.

- L_{A90} – The "background noise level" or Rating Background Level" (RBL) in the absence of construction activities. This parameter represents the average minimum noise level during the daytime, evening and night-time periods respectively. The LAeq (15 minute) construction noise management levels (NMLs) are based on the RBLs.

- The subscript "A" indicates that the noise levels are filtered to match normal hearing characteristics (A weighted).

The NSW EPA Interim Construction Noise Guideline (ICNG) requires project specific Noise Management Levels (NMLs) to be established for noise affected receivers. Two site-specific Construction Noise and Vibration Impact Statements (CNVISs) have been prepared in accordance with CoA E33. Each CNVIS was prepared prior to the commencement of construction before noise and vibration impacts commenced and included specific mitigation measures adopted and predict noise impacts to nearby sensitive receivers. One CNVIS has been prepared for above-ground civil and landscaping construction activities (Civil CNVIS) and a second for construction activities taking place within the station box itself (Station CNVIS). In the event construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices are investigated to minimise noise emissions.

Environmental noise monitoring (excluding spot checks of plant and equipment) have been recorded over 15-minute sample intervals, excluding periods of extraneous noise until a representative sample has been obtained. A representative sample will be determined by the operator, who will be competent, suitability trained and experienced in undertaking noise measurements and familiar with the relevant Australian Standards.

For spot checks of noise intensive plant and equipment, duration of monitoring will depend on the source of noise being monitored. Sources of continuous noise (such as generators or fans), measurements will be monitored over one-to-two-minute intervals. For dynamic plant, such as front-end loaders, spot checks will capture a representative activity, such as one truck-and-trailer load cycle.

Table 4-1 below which is reproduced from Addendum A of Sydney Metro CNVS sets out the internal noise criteria for residential and other sensitive receivers. The Barangaroo Metro station falls within an Identified Precinct in accordance with CoA E37.

Table 4-1 - Internal construction noise criteria levels (Conditions of Approval)

Area	Receiver Type	Approved Condition	Time Period	Criteria (internal)
Identified Precincts	All	E38	7am to 8pm	Noise levels are required to be less than $L_{Aeq\ (15\ minute)}$ 60 dB(A) for at least 6.5 hours between 7am and 8pm, of which at least 3.25 hours must be below $L_{Aeq\ (15\ minute)}$ 55 dB(A). Noise equal to or above $L_{Aeq\ (15\ minute)}$ 60 dB(A) is allowed for the remaining 6.5 hours between 7am and 8pm.
Non-residential zones	Residential	E41	8pm to 9pm, 9pm to 7am	$L_{Aeq\ (15\ minute)}$ 60 dB(A) $L_{Aeq\ (15\ minute)}$ 45 dB(A)
Residential Zones	Residential	E42	8pm to 7am	$L_{Aeq\ (15\ minute)}$ 45 dB(A)
All	All	E43	All	$L_{Aeq\ (8\ hours)}$ 85 dB(A) (external) near the CSSI

Notes:

1. *Identified precincts are provided in CoA E37 and include Crows Nest, Victoria Cross, Barangaroo, Martin Place and Pitt Street*
2. *These are identified by the applicable Local Environmental Plan land zoning of the receiver*
3. *Criteria as described in CoA E38*
4. *A 5 dB penalty shall be applied if rock breaking or any other annoying activity likely to result in ground-borne noise or a perceptible level of vibration is planned*

4.2 Vibration monitoring criteria

The following vibration parameters are required to be measured when assessing construction vibration levels:

- Peak Particle Velocity (ppv) in mm/s to assess compliance with the relevant cosmetic damage criteria;

- Root-Mean-Square acceleration (a) in m/s^2 to estimate the Vibration Dose Value (eVDV) and determine compliance with relevant human annoyance management levels (if relevant).

All short term attended vibration monitoring will be recorded over a representative sampling interval where the worst-case vibration levels can be captured. Where unattended vibration monitoring is proposed, monitoring will be undertaken continuously whilst the vibrating plant is operational to capture the worst-case vibration impacting on the structure.

The following vibration screening criteria have been applied:

- Reinforced or frame structures – 25.0mm/s ppv;
- Unreinforced or light framed structures – 7.5mm/s ppv;
- Heritage structures – 2.5mm/s ppv.

Notes:

1. *If a heritage structure is predicted to be exposed to vibration levels above the conservative vibration screening level of 2.5mm/s, further investigation would be undertaken to determine whether the structure is structurally sound.*
2. *As stated in Section 3 of the Hickson Rd wall - vibration monitoring plan[1], the relevant vibration criterion for the Hickson Road heritage wall is 25mm/s Peak Particle Velocity (PPV).*

[1] Barangaroo Sydney Metro Station, Hickson Rd wall – Vibration monitoring plan, document reference TM031-06F01 Heritage wall vibration monitoring plan (r1), dated 19 July 2022, revision 1

5 Methodology

The Construction Noise and Vibration Monitoring Program is designed to compare actual performance of construction of the CSSI against predicted performance and to assess the effectiveness of the mitigation measures applied during construction of the Project. The program has been executed in accordance with Appendix E of the CNVMP. The Construction Monitoring Program commenced 16 September 2021 at Construction commencement and will continue for the duration of the project.

5.1 Off-site monitoring locations

The monitors used for the various monitoring completed during the reporting period are outlined in Table 5-1 below. Attended monitors were field calibrated before each field measurement. Calibration certificates are included in Appendix D.

Table 5-1 – Off-site monitoring equipment details

Equipment Details	Monitoring Type	Location	Serial No.
Rion NL-52	Attended noise	Various	#00553918
NTI-XL2	Attended noise	Various	#A2A-19156-E0
NTI-XL2	Attended noise	Various	#A2A-20889-E0
NTI-XL2	Attended noise	Various	#A2A-17502-E0
NTI-XL2	Attended noise	Various	#A2A-16217-E0
B&K Type 4231	Noise calibrator	Various	#3009707
B&K Type 4231	Noise calibrator	Various	#2677710
B&K Type 4231	Noise calibrator	Various	#3027924
B&K Type 4231	Noise calibrator	Various	#3016756
Sinus Soundbook	Attended Vibration	25 Hickson Road	#09194
Endevco 61C13	Attended Vibration	25 Hickson Road	#10764

5.2 On-site real-time monitoring locations

Real-time noise and vibration monitors have been established on site as shown in the Construction Noise and Vibration Management Plan (CNVMP). The locations of these noise and vibration monitors are shown below in Figure 5-1 and details are presented in Table 5-2.

Vibration monitoring data for the Barangaroo Metro station has been based on real-time monitoring results as these are considered to best represent the most impacted structure, being 25 Hickson Road, and group of receivers, being the personnel working within 25 Hickson road as this is the closest heritage structure, at risk of cosmetic damage per CoA E29, in the vicinity of the works.

The vibration monitor is located on the ground floor of the building mounted to the wall nearest to where civil construction activities will occur.

Figure 5-1 - Location of on-site real-time noise and vibration monitors

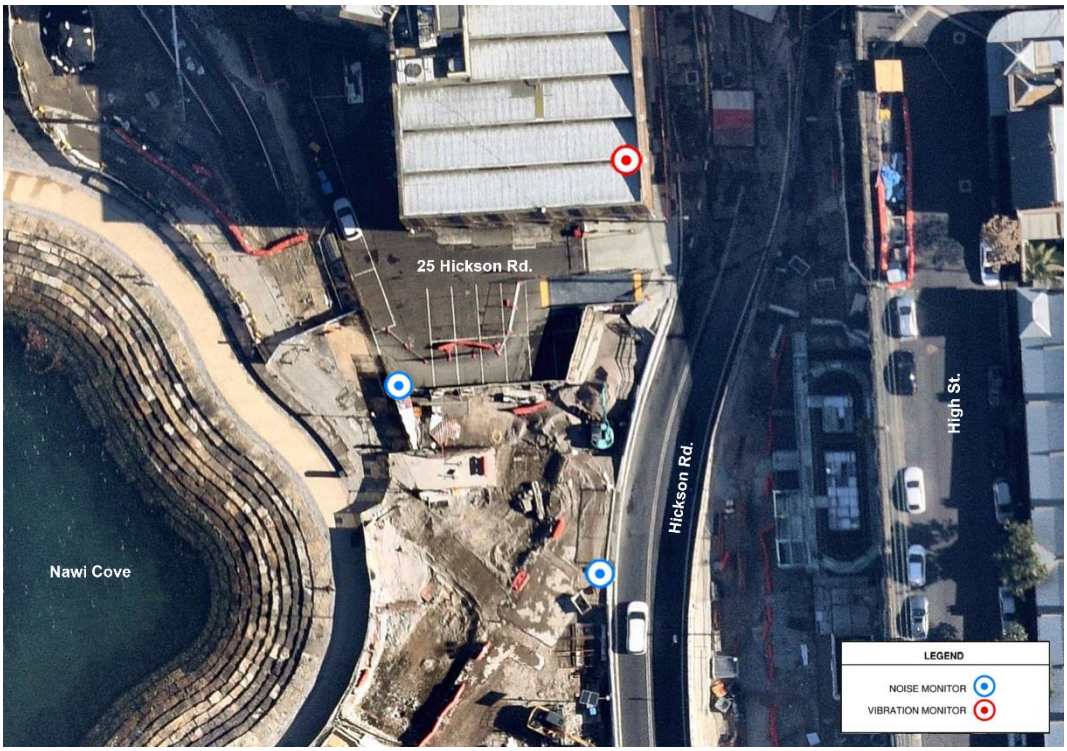


Table 5-2 – On-site monitoring equipment details

Equipment Details	Monitoring Type	Location	Serial No.
SiteHive Hexanode 85	Real-time noise	On site, 40 metres to the south of 25 Hickson Road, Barangaroo	#000053
SiteHive Hexanode 85	Real-time noise	On site, 20 metres to the south of 25 Hickson Road, Barangaroo	#000599
Sigicom Infra C22	Real-time vibration	25 Hickson Road, Barangaroo[1]	#106847

Notes: 1) Advice of a heritage specialist was sought for monitoring on this heritage structure.

It should be noted that the SiteHive Hexanode real-time noise monitor (#000053) was switched out with an upgraded unit (#000599) and relocated to a new location (20 meters to the south of 25 Hickson road) on the 16th of July 2024. Additionally, this real-time noise monitor was decommissioned and removed from site on the 10th of October 2024 due to reaching the conclusion of the project. Note that the calibration certificate of the old monitor (#000053) was out of date from 11th May 2024. Upon return to the SiteHive office, this monitor was calibrated on 19th August 2024 where it was found that there was negligible deviation from the previous calibration.

In accordance with CoA E31 and 1.3.4 of the N&V monitoring Program, advice of a heritage specialist (Mike Hincks, Senior Historical Heritage Consultant of Ambs Ecology & Heritage) was sought for the installation and location of the vibration monitors in the heritage building/site office at 25 Hickson Road, Barangaroo.

Heritage advice has also confirmed that the installation of the vibration monitor in the site office has had a negligible impact on significant fabric, and no impact on the heritage significance of the Dalgety's Group of Bond Stores A, B and C nor the Millers Point & Dawes Point Village Precinct.

Figure 5-2 - On site real-time vibration monitor at 25 Hickson Road

6 Monitoring results

6.1 Off-site

6.1.1 Attended vibration monitoring

Attended vibration monitoring was conducted to assess potential vibration impacts for the 25 Hickson Road building from the nearby rock hammering works. It can be noted that the unattended vibration monitor within 25 Hickson road is installed on the eastern side of the building. The rock hammering works were located along the southern façade of 25 Hickson road, hence the requirement for attended vibration monitoring.

Results from the attended vibration monitoring are summarised in Table 6-1.

Table 6-1: Measured vibration levels

Location	Date & Time	Activity	Distance from source	95th percentile PPV (mm/s)			Maximum PPV (mm/s)			Comments
				X	Y	Z	X	Y	Z	
25 Hickson Road, Barangaroo	23.05.2024 09:27am – 09:30am	Baseline vibration monitoring	N/A	0.05	-	-	0.12	-	-	Baseline monitoring was conducted to establish the baseline vibration levels on site (i.e. with no construction activity on the worksite)
25 Hickson Road, Barangaroo	23.05.2024 10:43am – 10:58am	12t excavator with hammer attachment	1.5m	1.96	0.71	1.35	2.40	0.97	1.56	At 1.5m away, the 12t excavator with hammer attachment produced vibration levels below the screening criterion of 7.5mm/s.

As can be noted from Table 6-1, the 12t excavator with hammer attachment produced vibration levels below the screening criterion of 7.5mm/s. Therefore, the risk of cosmetic damage from the measured rockhammering works is considered low.

6.1.2 Attended noise monitoring results

Attended noise monitoring results are summarised in Table 6-2.

Table 6-2 – Attended noise monitoring results

Location / Receiver	Date & Time	Main Activities	Noise Period	Noise targets			Measurements		dB above			Comment
				NML	RBL	Predicted levels	$L_{Aeq15min}$	L_{Amax}	NML	RBL	Predicted levels	
2-2A High Street, Millers Point	19.08.2024 07:52pm – 08:07pm (WC)	General construction activities & road profiling	OOHW Period 1	55	50	74	64 (59+5)[3]	74	+9	+14	-10	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
1-5 Towns Place, Millers Point	19.08.2024 08:13pm – 08:28pm (WC)	General construction activities & road profiling	OOHW Period 1	55	50	86	76 (71+5)[3]	82	+21	+26	-10	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
21-21A Hickson Road, Millers Point	19.08.2024 08:31pm – 08:46pm (WC)	General construction activities & road profiling	OOHW Period 1	55	50	76	68 (63+5)[3]	90	+13	+18	-8	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
8 Windmill Street, Millers Point	19.08.2024 08:51pm – 09:06pm (WC)	General construction activities & road profiling	OOHW Period 1	55	50	96	66 (61+5)[3]	72	+11	+15	-30	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
2-2A High Street, Millers Point	19.08.2024 09:16pm – 09:31pm (WC)	General construction activities & road profiling	OOHW Period 1	55	50	74	70 (65+5)[3]	76	+15	+20	-4	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
2-2A High Street, Millers Point	19.08.2024 09:56pm – 10:11pm (RT)	General construction activities & road profiling	OOHW Period 1	55	50	74	62 (57+5)[3]	73	+7	+12	-12	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)

Location / Receiver	Date & Time	Main Activities	Noise Period	Noise targets			Measurements		dB above			Comment
				NML	RBL	Predicted levels	$L_{Aeq15min}$	L_{Amax}	NML	RBL	Predicted levels	
21-21A Hickson Road, Millers Point	19.08.2024 10:00pm – 10:15pm (WC)	General construction activities & road profiling	OOHW Period 2	45	40	76	68 (63+5)[3]	75	+23	+28	-8	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
1-5 Towns Place, Millers Point	19.08.2024 10:19pm – 10:34pm (WC)	General construction activities	OOHW Period 2	45	40	70	70	83	+25	+30	0	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
1-5 Towns Place, Millers Point	19.08.2024 10:24pm – 10:39pm (RT)	General construction activities & road profiling	OOHW Period 2	45	40	86	75 (70+5)[3]	85	+30	+35	-11	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
2-2A High Street, Millers Point	19.08.2024 10:37pm – 10:52pm (WC)	General construction activities	OOHW Period 2	45	40	74	60	74	+15	+20	-14	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
21-21A Hickson Road, Millers Point	19.08.2024 10:53pm – 11:08pm (RT)	General construction activities & road profiling	OOHW Period 2	45	40	76	65 (60+5)[3]	77	+20	+25	-11	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
8 Windmill Street, Millers Point	19.08.2024 11:02pm – 11:17pm (WC)	General construction activities	OOHW Period 2	45	40	80	67	76	+22	+27	-13	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
1-5 Towns Place, Millers Point	19.08.2024 11:09pm – 11:24pm (RT)	General construction activities	OOHW Period 2	45	40	70	66	73	+21	+26	-4	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)
1-5 Towns Place, Millers Point	19.08.2024 11:25pm – 11:40pm (WC)	General construction activities	OOHW Period 2	45	40	70	66	82	+21	+26	-4	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 1)

Location / Receiver	Date & Time	Main Activities	Noise Period	Noise targets			Measurements		dB above			Comment
				NML	RBL	Predicted levels	$L_{Aeq15min}$	L_{Amax}	NML	RBL	Predicted levels	
46-46A High Street, Millers Point	22.09.2024 08:49pm – 09:04pm (RT)	General construction activities & road profiling	OOHW Period 1	55	50	78	66 (61+5)[3]	78	+11	+16	-12	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 3)
50-50A High Street, Millers Point	22.09.2024 09:28pm – 09:43pm (RT)	General construction activities	OOHW Period 1	55	50	62	61	67	+12	+17	-1	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 3)
56-56A High Street, Millers Point	22.09.2024 09:45pm – 10:00pm (RT)	General construction activities & road profiling	OOHW Period 1	55	50	78	69 (64+5)[3]	69	+14	+19	-9	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 3)
60-60A High Street, Millers Point	22.09.2024 10:05pm – 10:20pm (RT)	General construction activities	OOHW Period 2	45	40	62	58	71	+13	+18	-4	Construction activity produced noise levels below the predicted levels. It is noted that Project activities were audible. (OOHWA-033, Stage 3)

Notes:

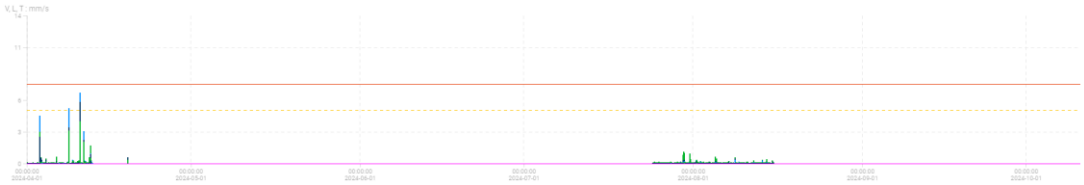
1) RT = Measurement conducted by Renzo Tonin
2) WC = Measurement conducted by Ward Civil
3) +5dB penalty due to annoying characteristics as per ICNG
4) No attended noise monitoring was undertaken during the works detailed in OOHWA-032. It should be noted that no high noise impact activities occurred during these works and typical impact activities were minimal. Similar works detailed in OOHWA-027 were measured and reported in the October 2023 to March 2024, Noise and Vibration 6 Monthly Report. It is noted that no noise related complaints were received during the OOHWA-032 works.

6.2 On-site

6.2.1 Real-time vibration monitoring

Vibration monitoring at 25 Hickson Road confirmed that vibration levels associated with construction works complied with relevant vibration criteria of 25mm/s p.p.v. As shown in Figure 6-1, there was data missing for this reporting period due to a battery error within the monitor from April 15th to July 20th and again from August 15th through to October 10th. During these periods, no vibration intensive works were undertaken near 25 Hickson Road, except for rock hammering which occurred near the southern façade of the building (monitor installed on eastern façade) on 23rd May 2024. Attended vibration monitoring was conducted during rock hammering near the southern façade of the building it was confirmed that vibration levels were below relevant vibration criteria (see results in Table 6-1).

Figure 6-1 - On-site real-time vibration monitoring results, 25 Hickson Road (#106847)



6.2.2 Real-time noise monitoring

CoA E37 requires that receivers be identified who are likely to experience internal noise levels greater than $L_{Aeq,15min}$ 60 dB(A) inclusive of a 5 dB penalty, if rock breaking or any other annoying activity likely to results in regenerated (ground-borne) noise or a perceptible level of vibration is planned, between 7am – 8pm at Barangaroo. These receivers are listed in the CNVIS for above ground Civil Works in Appendix D.2 of the CNVIS

CoA E38 requires that between the hours of 7am and 8pm, the following internal noise criteria apply:

- Criteria 1a - Noise levels be less than $L_{Aeq,15min}$ 60 dB(A) for at least 6.5 hours;
- Criteria 1b - Noise levels be less than $L_{Aeq,15min}$ 55 dB(A) for 3.25 hours;
- Criteria 2 – Noise level can be above $L_{Aeq,15min}$ 60 dB(A) for 6.5 hours.

The condition also requires that consultation be undertaken with the receivers identified in CoA E37 with the objective of determining appropriate hours of respite so that construction noise (including ground-borne noise, does not exceed the internal noise levels described above.

Consultation in relation to CoA E38 has been undertaken and documented in the CNVMP and Civil CNVIS in Appendix D. Consultation with receivers is documented in Section 4.1.2. BESIX Watpac have carried out consultation with the following community organisations, to agree respite periods:

- The Millers Point Residents Action Group;
- The Walsh Bay Precinct association;

- KU Lance Children's Centre, Miller's Point;
- The Langham Hotel, Miller's Point.

It has been agreed with the above groups that the same respite periods as were adopted by the preceding TSE Contractor, who carried out the excavation of the station box, be adopted by the BR Contractor. These respite periods are between 09.30am to 10.30am and 12.30pm to 1.30pm Monday to Friday.

To monitor compliance with CoA E38 and the requirement that noise levels between 7am and 8pm be less than LAeq,15min 55 dB(A) for 3.25 hours (Criteria 1b) the following should be considered:

- The hours worked on site are between 7am and 6pm Monday to Friday so each day there are at least 2 hours (6pm to 8pm) where no construction activities take place and the noise levels generated by default are less than $L_{Aeq,15min}$ 55 dB(A).
- From 30th June 2022, the hours worked on site are between 7am and 6pm on Saturdays so each Saturday there are at least 2 hours (6pm to 8pm) where no construction activities take place and the noise levels generated by default are less than $L_{Aeq,15min}$ 55 dB(A).
- No works take place on Sundays, or public holidays.
- The BR Contractor implements a noise respite period each day (Mon – Fri) between 09.30am to 10.30am and 12.30pm to 1.30pm meaning that for 2 hours during the day noise levels generated on site are less than $L_{Aeq,15min}$ 55 dB(A).

In total, the noise levels generated by construction activities between 7am and 8pm occurring on site will be less than LAeq,15min 55 dB(A) for at least 4 hours between Monday to Friday, 8 hours on Saturdays and 13 hours on Sundays and Public Holidays due to the construction hours worked and respite periods implemented.

To verify this and to monitor compliance with Criteria 1a (that noise levels be less than $L_{Aeq,15min}$ 60 dB(A) for at least 6.5 hours) and Criteria 1b (that noise levels be less than LAeq,15min 55 dB(A) for 3.25 hours), the number of 15 minute periods between 7am and 8pm that internal noise levels were observed to be above 60dBa ($L_{Aeq,15min}$) and below 55dBA, respectively have been counted. Within these periods works are allowed to generate noise levels above 60dBA for 6.5 hours (26 x 15-minute periods) and must be below 55dBA for at least 3.25 hours (13 x 15-minute periods).

The real-time noise monitor is located externally so a conservative 20dB(A) noise reduction has been applied to compare the measured noise levels at the real-time monitor with internal E38 noise levels. This reduction contemplates a 10dB reduction for façade loss (open window), a 5dB reduction for the screening provided by the Hickson Road Wall and a 5dB reduction for distance difference between location of the monitor and the nearest residential receivers. In addition, 5dB penalty was added to noise measurements from plant and equipment with annoying characteristics (i.e. rockhammers).

The results of the daily real-time noise monitoring carried out for the reporting period show that Criteria 1a and Criteria 1b requirements were not observed to have been exceeded during the reporting period demonstrating compliance with CoA E38.

Real-time monitoring results for April 2024 to October 2024 are included in Real-time monitoring results.

7 Conclusion

Measured noise and vibration levels are generally in accordance with, or below, the predictions presented in the Construction Noise and Vibrations Impact Statements (CNVIS), or in noise impact assessments prepared for Out of Hours Works applications (OOHWA).

Based on the monitoring results and site investigations, noise and vibration associated with the construction activities being undertaken at the BR COP was compliant with the project approvals and requirements during the monitoring period.

APPENDIX A Real-time noise monitoring results

April 2024 – Daily Monitoring Results (Monitor #000053)

Date	Classification	Total 15 minute intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/04/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
11/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
12/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
13/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
14/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
15/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
16/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
16/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
17/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
18/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
19/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
20/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
21/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
21/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant

22/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/04/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/04/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

May 2024 – Daily Monitoring Results (Monitor #000053)

Date	Classification	Total 15 minute intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/05/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
11/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
12/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
13/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
14/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
15/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
16/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
16/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
17/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
18/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
19/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
20/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
21/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
21/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant

22/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
31/05/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
31/05/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

June 2024 – Daily Monitoring Results (Monitor #000053)

Date	Classification	Total 15 minute intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/06/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
11/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
12/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
13/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
14/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
15/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
16/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
16/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
17/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
18/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
19/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
20/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
21/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
21/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant

22/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/06/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/06/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

July 2024 – Daily Monitoring Results (Monitor #000053)

Date	Classification	Total 15 minute Intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/07/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
11/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
12/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
13/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
14/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
15/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

July 2024 – Daily Monitoring Results (Monitor #000599)

16/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
16/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
17/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
18/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
19/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
20/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
21/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
21/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant

22/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
31/07/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
31/07/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

August 2024 – Daily Monitoring Results (Monitor #000599)

Date	Classification	Total 15 minute intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/08/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
11/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
12/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
13/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
14/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
15/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
16/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
16/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
17/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
18/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
19/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
20/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
21/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
21/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant

22/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
31/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
31/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

September 2024 – Daily Monitoring Results (Monitor #000599)

Date	Classification	Total 15 minute Intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/09/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/09/2024	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
11/09/2024	Above 60dBA	2	0.5	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/09/2024	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
12/09/2024	Above 60dBA	2	0.5	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
13/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
14/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
15/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
16/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
16/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
17/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
18/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
19/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
20/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

21/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
21/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
22/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/09/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/09/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

October 2024 – Daily Monitoring Results (Monitor #000599)

Date	Classification	Total 15 minute intervals (07.00 to 20.00)	Total Hours (07.00 to 20.00	LAeq(15min) < 55dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
1/08/2024	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
2/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
3/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
4/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
5/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
6/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
7/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
8/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
9/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/08/2024	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
10/08/2024	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

APPENDIX B Calibration Certificates

Hexanode Calibration Certificate

21 Jul 2022

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device noted below.

Noise

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 2 Foveaux Street, Surry Hills, NSW, 2010.

Serial Number	Calibration Date	Calibration Value
HEX-000053	11 May 2022	3.160758

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source

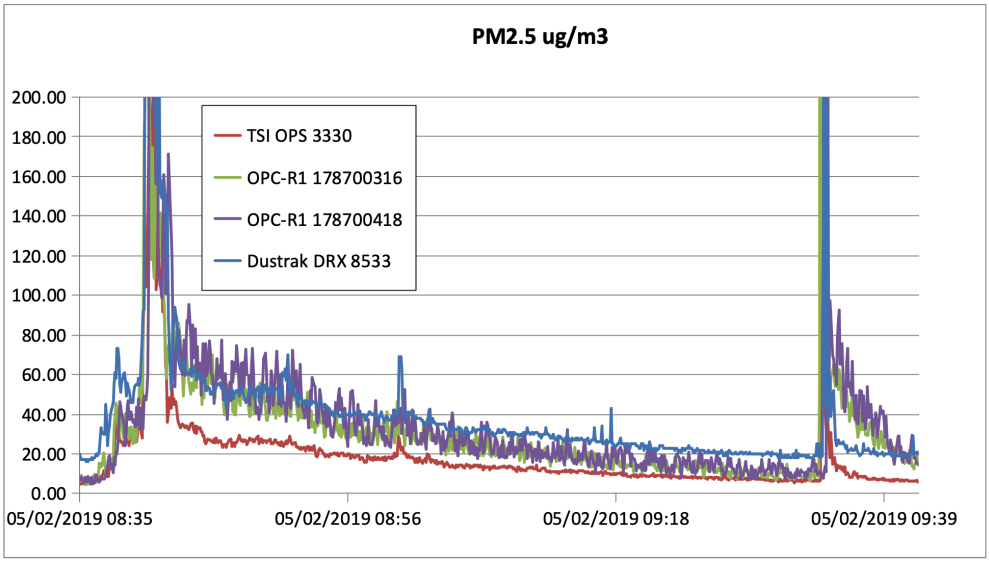
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National Measurement Institute (NMI), the division of the Australian Federal Government Department of Industry, Science, Energy & Resources responsible for providing world-class measurement services to support a fair, safe, healthy and competitive Australia. The National Measurement Institute's (NMI) acoustic, ultrasound and vibration measurement services are the most accurate in Australia, and include providing the certification for NATA (National Association of Testing Authorities) testing facilities, who provide class certification for noise meters. NMI undertook all of the possible tests outlined in IEC 61672-2, with the Hexanode passing all precision requirements within the criteria of a class 2 device.

Dust

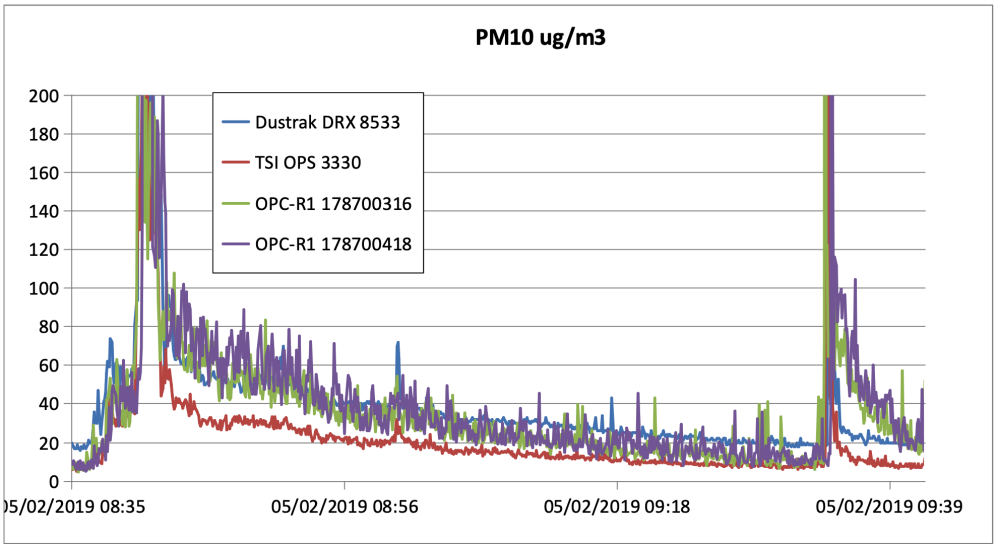
The Hexanode utilises the Alphasense R2 Optical Particle Sensor, to provide real-time dust measurements. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense R2 is available here.

Particle range	µm spherical equivalent size (based on RI of 1.5)	0.30 to 12.4
Size categorisation	Number of software bins	16
Sampling interval	Histogram period (seconds)	2 to 30
Total flow rate	L/min (typical)	0.24
Max particle count rate	particles/second	10,000
Max coincidence probability	% concentration at 10^6 particles/L	0.7

Prior to deployment, the R2 is tested against TSI Optical Particle Sizer 3330 and DustTrak instruments.



Left: Comparison of PM2.5 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.



Left: Comparison of PM10 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.

Hexanode Calibration Certificate

07 Nov 2024

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

Noise

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 104 Commonwealth Street, Surry Hills, NSW, 2010.

Serial Number	Calibration Date	Calibration Value
HEX-000053	19 Aug 2024	2.932717

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source

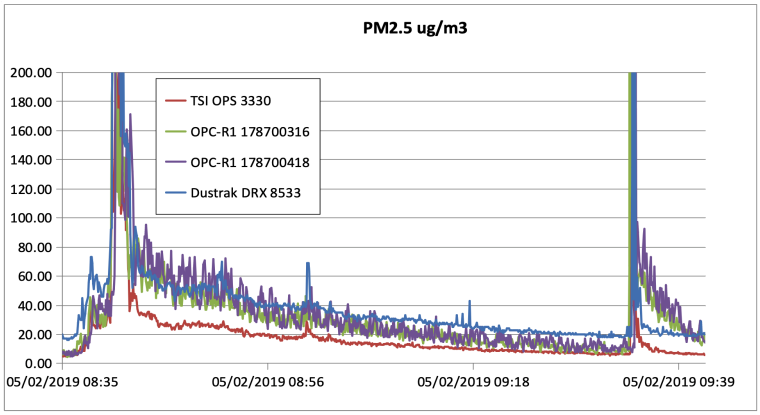
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National Measurement Institute (NMI), the division of the Australian Federal Government Department of Industry, Science, Energy & Resources responsible for providing world-class measurement services to support a fair, safe, healthy and competitive Australia. The National Measurement Institute's (NMI) acoustic, ultrasound and vibration measurement services are the most accurate in Australia, and include providing the certification for NATA (National Association of Testing Authorities) testing facilities, who provide class certification for noise meters. NMI undertook all of the possible tests outlined in IEC 61672-2, with the Hexanode passing all precision requirements within the criteria of a class 2 device.

Dust

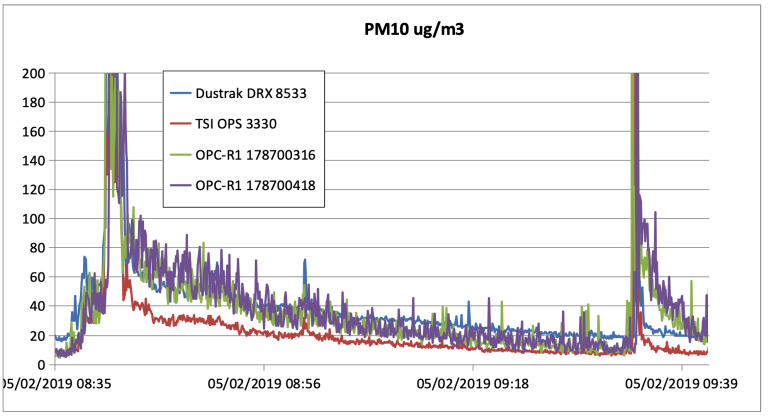
The Hexanode utilises the Alphasense R2 Optical Particle Sensor, to provide real-time dust measurements. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense R2 is available here.

Particle range	µm spherical equivalent size (based on RI of 1.5)	0.30 to 12.4
Size categorisation	Number of software bins	16
Sampling interval	Histogram period (seconds)	2 to 30
Total flow rate	L/min (typical)	0.24
Max particle count rate	particles/second	10,000
Max coincidence probability	% concentration at 10^6 particles/L	0.7

Prior to deployment, the R2 is tested against TSI Optical Particle Sizer 3330 and DustTrak instruments.



Comparison of PM2.5 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.



Comparison of PM10 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.

Hexanode Calibration Certificate

15 Jul 2024

Thank you for choosing SiteHive for your realtime environmental management. This calibration certificate is valid for the device below.

Noise

The Hexanode sound level meter has been pressure calibrated by SiteHive using a NATA Certified (IEC 60942: Sound calibrators) Sound Level Calibrator, at 2 Foveaux Street, Surry Hills, NSW, 2010.

Serial Number	Calibration Date	Calibration Value
HEX-000599	04 Jun 2024	2.828135

Accuracy:	Complies with precision requirements of IEC 61672 for Class 2
Acoustic overload point:	135 dBSPL
Frequency Range:	20 Hz ~ 12.5 kHz
Frequency Rating:	Z, A and C weighting
Parameters (dB):	Frequency & time weighted integrations, statistical levels, and more
Direction of Arrival:	Device angle & cartesian angle (0°-360°) of dominant noise source

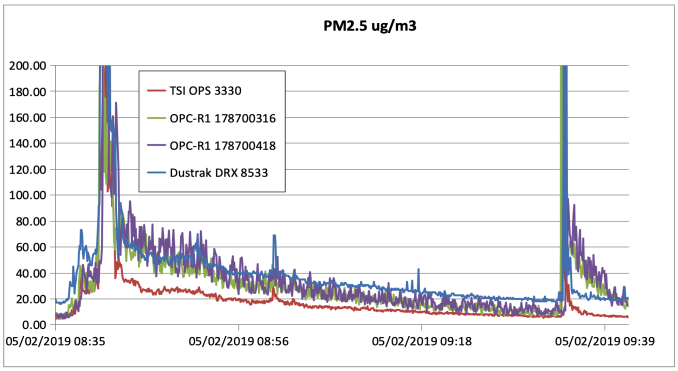
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National Measurement Institute (NMI), the division of the Australian Federal Government Department of Industry, Science, Energy & Resources responsible for providing world-class measurement services to support a fair, safe, healthy and competitive Australia. The National Measurement Institute's (NMI) acoustic, ultrasound and vibration measurement services are the most accurate in Australia, and include providing the certification for NATA (National Association of Testing Authorities) testing facilities, who provide class certification for noise meters. NMI undertook all of the possible tests outlined in IEC 61672-2, with the Hexanode passing all precision requirements within the criteria of a class 2 device.

Dust

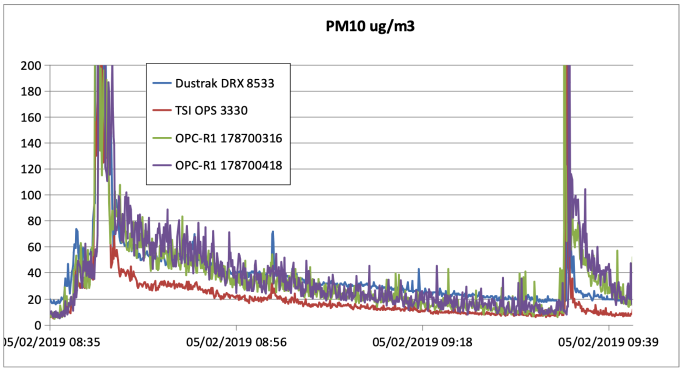
The Hexanode utilises the Alphasense R2 Optical Particle Sensor, to provide real-time dust measurements. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest Government air quality station for reference. The full data sheet for the Alphasense R2 is available here.

Particle range	µm spherical equivalent size (based on RI of 1.5)	0.30 to 12.4
Size categorisation	Number of software bins	16
Sampling interval	Histogram period (seconds)	2 to 30
Total flow rate	L/min (typical)	0.24
Max particle count rate	particles/second	10,000
Max coincidence probability	% concentration at 10^6 particles/L	0.7

Prior to deployment, the R2 is tested against TSI Optical Particle Sizer 3330 and DustTrak instruments.



Comparison of PM2.5 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.



Comparison of PM10 monitoring by OPC-R2 sensor and TSI OPS 3330 and DustTrak instruments. All are set at 5s averaging and are sampling the ambient air of a workshop, the raw 3330 data has been used to calculate a PM figure.

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Calibrator

Calibration Date 11/01/2023 **Job No** RC035 **Operator** AM EF
Client Name RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010

Test Item

Calibrator Make B&K **Model** 4231 **Serial No** 2677710
Accessories N/A

Class (1 or 2)	1

Environmental Conditions	Measured	
	Start	End
Temperature (degC)	23.4	23.4
Rel. Humidity (%)	52.2	53
Air Pressure (kPa)	100.8	100.7

Applicable Standards:
IEC 60942:2017 "Electroacoustics - Sound calibrators"

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
GRAS Power Module type 12AK SN 1551616
GRAS 1/2" Pressure Microphone 40AD SN 252620 and preamplifier SN 292045
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Digital Multimeter Model 34401A SN MY41004386
Audio Tester AUDT30 v3.0 software
Behringer UCA222 USB Audio Interface U-Control

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test, and by the use of the above equipment, which has been calibrated by NATA accredited calibration facilities.

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Calibrator Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:

Calibration Statement:
The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed. However, as public evidence was not available, from a testing organization responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2017, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements of IEC 60942:2017.

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 11/01/2023

Template Document Name: RQT-03 (rev 70) Calibrator Verification

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Calibrator

Calibration Date	16/01/2024	**Job No**	RD045	**Operator**	KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Calibrator Make	B&K	**Model**	4231	**Serial No**	#3009707 #XL2-B
Accessories	N/A				

Class (1 or 2)	1

Environmental Conditions	Measured	
	Start	End
Temperature (degC)	24.5	24.4
Rel. Humidity (%)	59.9	60.5
Air Pressure (kPa)	101.2	101.12

Applicable Standards:
IEC 60942:2017 "Electroacoustics - Sound calibrators"

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
GRAS Power Module type 12AK SN 1551616
GRAS 1/2" Pressure Microphone 40AD SN 252620 and preamplifier SN 292045
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Digital Multimeter Model 34401A SN MY41004386
Vitrins Analyser Multi Instrument Pro V3.9 software
Behringer UCA222 USB Audio Interface U-Control

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).
This document shall not be reproduced, except in full.

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Calibrator Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed. However, as public evidence was not available, from a testing organization responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2017, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements of IEC 60942:2017.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 16/01/2024

Template Document Name: RQT-03 (rev 76) Calibrator Verification

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Calibrator

Calibration Date	3/07/2023	**Job No**	RD001	**Operator**	AM / KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Calibrator Make	B&K	**Model**	#4231	**Serial No**	#3016756 #BOX 1
Accessories	N/A				

Class (1 or 2)	1

Environmental Conditions	Measured	
	Start	End
Temperature (degC)	22.8	22.7
Rel. Humidity (%)	51.5	51.7
Air Pressure (kPa)	102.1	102.13

Applicable Standards:
IEC 60942:2017 "Electroacoustics - Sound calibrators"

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
GRAS Power Module type 12AK SN 1551616
GRAS 1/2" Pressure Microphone 40AD SN 252620 and preamplifier SN 292045
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Digital Multimeter Model 34401A SN MY41004386
Vitrins Analyser Multi Instrument Pro V3.9 software
Behringer UCA222 USB Audio Interface U-Control

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test, and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Calibrator Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed. However, as public evidence was not available, from a testing organization responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2017, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements of IEC 60942:2017.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 05/07/2023

Template Document Name: RQT-03 (rev 70) Calibrator Verification

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Calibrator

Calibration Date	2/06/2023	**Job No**	RC077	**Operator**	AM / KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Calibrator Make	B&K	**Model**	4231	**Serial No**	#3027924 #XL2-C
Accessories	N/A				

Class (1 or 2)	1

Environmental Conditions	Measured	
	Start	End
Temperature (degC)	23.9	24.2
Rel. Humidity (%)	56.7	56.4
Air Pressure (kPa)	101.75	101.76

Applicable Standards:
IEC 60942:2017 "Electroacoustics - Sound calibrators"

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
GRAS Power Module type 12AK SN 1551616
GRAS 1/2" Pressure Microphone 40AD SN 252620 and preamplifier SN 292045
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Digital Multimeter Model 34401A SN MY41004386
Vitrins Analyser Multi Instrument Pro V3.9 software
Behringer UCA222 USB Audio Interface U-Control

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Calibrator Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed. However, as public evidence was not available, from a testing organization responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2017, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements of IEC 60942:2017.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 02/06/2023

Template Document Name: RQT-03 (rev 70) Calibrator Verification

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	4/8/2023	**Job No**	RD015	**Operator**	KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Instrument Make	NTI	**Model**	XL2	**Serial No**	#A2A-16217-E0 #XL2-B
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A17363
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#8388
Ext'n Cable Make	Nil	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	V4.80

SLM Class	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	24.0	24.0
Rel. Humidity (%)	49.5	51.7
Air Pressure (kPa)	102.3	102.4

Applicable Standards:
Periodic tests were performed in accordance with procedures from IEC 61672-3 :2013 and IEC 61260-3 :2016

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Function Generator Model 33511B SN MY59001831
Agilent Digital Multimeter Model 34401A SN MY41004386

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).
This document shall not be reproduced, except in full.

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Meter Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 and IEC 61260-1:2014 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and IEC 61260-1:2014 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016 cover only a limited subset of the specifications in IEC 61672-1:2013 and IEC 61260-1:2014.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 07/08/2023

Template Document Name: RQT-05 SLM IEC61672 Verification (r88)

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	29/03/2023	**Job No**	RC061	**Operator**	EF
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Instrument Make	NTI	**Model**	XL2	**Serial No**	#A2A-17502-E0 #RTA07-049
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A17766
Preamplifier Make	NTI	**Model**	M2230	**Serial No**	#008684
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	V4.6

SLM Class	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	24.7	24.7
Rel. Humidity (%)	50.9	50.1
Air Pressure (kPa)	101.2	100.0

Applicable Standards:
Periodic tests were performed in accordance with procedures from IEC 61672-3 :2013 and IEC 61260-3 :2016

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Function Generator Model 33511B SN MY59001831
Agilent Digital Multimeter Model 34401A SN MY41004386

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).
This document shall not be reproduced, except in full.

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Meter Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 and IEC 61260-1:2014 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and IEC 61260-1:2014 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016 cover only a limited subset of the specifications in IEC 61672-1:2013 and IEC 61260-1:2014.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 30/03/2023

Template Document Name: RQT-05 SLM IEC61672 Verification (r86)

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	28/02/2024	**Job No**	RD075	**Operator**	KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Instrument Make	NTi	**Model**	XL2	**Serial No**	#A2A-19156-E0 #XL2-C
Microphone Make	NTi	**Model**	MC230A	**Serial No**	#A21889
Preamplifier Make	NTi	**Model**	MA220	**Serial No**	#10617
Ext'n Cable Make	Nil	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	V4.50

SLM Class	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	23.4	24.3
Rel. Humidity (%)	61.6	57.3
Air Pressure (kPa)	101.5	101.3

Applicable Standards:
Periodic tests were performed in accordance with procedures from IEC 61672-3 :2013 and IEC 61260-3 :2016

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Function Generator Model 33511B SN MY59001831
Agilent Digital Multimeter Model 34401A SN MY41004386

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Meter Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 and IEC 61260-1:2014 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and IEC 61260-1:2014 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016 cover only a limited subset of the specifications in IEC 61672-1:2013 and IEC 61260-1:2014.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 29/02/2024

Template Document Name: RQT-05 SLM IEC61672 Verification (r93)

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	26/10/2023	**Job No**	RD032	**Operator**	KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Instrument Make	NTi	**Model**	XL2	**Serial No**	#A2A-20889-E0 #XL2-A
Microphone Make	NTi	**Model**	MC230A	**Serial No**	#A23418
Preamplifier Make	NTi	**Model**	MA220	**Serial No**	#7230
Ext'n Cable Make	Nil	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	V4.82

SLM Class	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	24.0	24.7
Rel. Humidity (%)	49.4	46.3
Air Pressure (kPa)	101.8	101.7

Applicable Standards:
Periodic tests were performed in accordance with procedures from IEC 61672-3 :2013 and IEC 61260-3 :2016

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Function Generator Model 33511B SN MY59001831
Agilent Digital Multimeter Model 34401A SN MY41004386

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Meter Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 and IEC 61260-1:2014 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and IEC 61260-1:2014 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016 cover only a limited subset of the specifications in IEC 61672-1:2013 and IEC 61260-1:2014.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 26/10/2023

Template Document Name: RQT-05 SLM IEC61672 Verification (r88)

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	11/09/2023	**Job No**	RD027	**Operator**	KW
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Instrument Make	SINUS	**Model**	SOUNDBOOK	**Serial No**	#09194
Microphone Make	B&K	**Model**	4189	**Serial No**	#2887448
Preamplifier Make	B&K	**Model**	2669	**Serial No**	#2299609
Ext'n Cable Make	Nil	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	SAMURI 3.0

SLM Class	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	23.2	23.7
Rel. Humidity (%)	42.3	45.8
Air Pressure (kPa)	102.4	102.3

Applicable Standards:
Periodic tests were performed in accordance with procedures from IEC 61672-3 :2013 and IEC 61260-3 :2016

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Function Generator Model 33511B SN MY59001831
Agilent Digital Multimeter Model 34401A SN MY41004386

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described under each test,
and by the use of the above equipment, which through an unbroken chain of calibrations, is ultimately traceable to the International System of Units (SI).

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.
See "Sound Level Meter Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.04.

Calibration Statement:
The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 and IEC 61260-1:2014 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and IEC 61260-1:2014 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 and IEC 61260-3:2016 cover only a limited subset of the specifications in IEC 61672-1:2013 and IEC 61260-1:2014.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

Print Name: Ariel Michael Date: 26/09/2023

Template Document Name: RQT-05 SLM IEC61672 Verification (r88)

Sigicom

CALIBRATION DOCUMENT

Document No:	Print Date:	Location of Calibration:	Page No:
Cal 106517	2023-08-01	Älvsjö, Sweden	1 / 1

Customer: Osterman

Device under Test: INFRA C22 Triaxial Vibration Monitor
SN: **106847**
Software Version: 2.10.1

Date of Calibration: 2023-08-01

Ambient Conditions: 23° C ± 2° C (73.4° F ± 3.6° F)

Method of Measurement: C311xC.
(Reference frequency: 80Hz (16Hz), frequency sweep: 1-1250 Hz)

Equipment:
Reference Amplifier: B&K 2692 #3011756
Vibration System: Modal Shop K2075E040 #937
Digital Multimeter: Agilent 34411A #MY48004824
Digital Multimeter: Agilent 34411A #MY48003408
Vibration System: Modal Shop K2075E040 #866
Reference Accelerometer: B&K 4381V #30916
Reference Amplifier: B&K 2525 #2281187
Reference Accelerometer: B&K 4381 #31013
Signal Generator: Agilent 33521A #MY50000892
Climate Sensor: Comet T7510 #16962465
Climate Sensor: Comet T7510 #17961338
Signal Generator: Keysight 33521B #MY52702380

Traceability: Reference equipment is calibrated at accredited laboratories, traceable to NIST, PTB or other National Metrology Laboratory.

Result of Measurement: Calibrated with no corrective actions.

Results are within specification limits of the method, which includes the hardest demands of all standards available in the geophone.

Recommended Interval of Calibration: 24 months.

Calibration performed by: Jesper Blomqvist **Signature:** Jesper Blomqvist

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
Ph: (02) 8218 0570 email: service@natacoustic.com.au website: www.natacoustic.com.au
A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Accelerometer

Calibration Date 19/10/2023 **Operator** AM
Client Name RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010

Test Item

Manufacturer Endevco **Serial No** #10764 #1
Instrument Model 61C13

Applicable Work Instruction:
WiTC-99 Accelerometer and Geophone Calibration

Reference Standards:
International Standard ISO8041:2005 Human response to vibration -Measuring instrumentation
International Standard ISO 16063-1:1998 Methods for the calibration of vibration and shock transducers - Part 1: Basic concepts
International Standard ISO 14837-1:2005 Mechanical vibration Ground-borne noise and vibration arising from rail systems - Part 1: General guidance
International Standard ISO 16063-21:2003 Methods for the calibration of vibration and shock transducers - Part 21: Vibration calibration by comparison to a reference transducer
British Standard BS6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings - Part 1: Vibration sources other than blasting
British Standard BS7385-2:1993 Evaluation and measurement for vibration in buildings
German Standard DIN 4150-3:2016 Vibrations in buildings - Part 3: Effects on structures
International Society of Explosives Engineers ISEE Performance Specifications for Blasting Seismographs 2017

Laboratory Equipment :
Electrodynamic shaker - Ground Zero GZNW 18XSPL
Power Amplifier – Behringer Model NU3000DSP
Signal generator
DT 9837A 4-channel data acquisition card
SpectraPLUS software
Reference accelerometer

Traceability:
The results of the tests and measurements included in this document are traceable via the test methods described in the applicable work instruction which references the listed international standards.
And by the use of the above lab equipment, which has been calibrated where required using reference equipment calibrated by NATA accredited calibration facilities.

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification.

Calibration Notes:

Calibration Checked and Approved:

Print Name: Ariel Michael Date: 20/10/2023

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: SLM35110

EQUIPMENT TESTED: Sound Level Meter

Manufacturer:	Rion		
Type No:	NL-52	**Serial No:**	00553918
Mic. Type:	UC-59	**Serial No:**	08076
Pre-Amp. Type:	NH-25	**Serial No:**	43962

Owner: Ward Civil & Environmental Engineering
Suite 2, Level 4, 65 Epping Rd
North Ryde, NSW 2113

Tests Performed: IEC 61672-3:2013

Comments: All Tests passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	999	hPa ±1 hPa	**Date of Receipt :**	10/02/2023
Temperature	23	°C ±1° C	**Date of Calibration :**	14/02/2023
Relative Humidity	48	% ±5%	**Date of Issue :**	14/02/2023

Acu-Vib Test Procedure: AVP10 (SLM) based on IEC 61672-3.

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....

Jack Kielt

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

NATA
WORLD RECOGNISED ACCREDITATION
Accredited Lab No. 9262
Acoustic and Vibration Measurements

Acu-Vib Electronics
CALIBRATIONS SALES RENTALS REPAIRS

Head Office & Calibration Laboratory
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	*Clause*	*Result*
Absolute Calibration	10	Pass
Acoustical Frequency Weighting	12	Pass
Self-Generated Noise	11.1	Observed
Electrical Noise	11.2	Observed
Long Term Stability	15	Pass
Electrical Frequency Weightings	13	Pass
Frequency and Time Weightings	14	Pass
Reference Level Linearity	16	Pass
Range Level Linearity	17	Not Available
Toneburst	18	Pass
Peak C Sound Level	19	Pass
Overload Indicator	20	Pass
High Level Stability	21	Pass

Statement of Compliance: The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC61672-1:2013.

A full technical report is available on request.