BESIX Watpac

NSW GOVERNMENT | sydney METRO

Barangaroo Metro Station

Noise & Vibration Monitoring Report

April 2022 to September 2022

28 July 2023

Caption: Queensland Country Bank Stadium, Townsville

Project overview

Project Site Address:
Hickson Road
Barangaroo
NSW 2000

BESIX Watpac State Division Address:
Level 24, 44 Market Street
SYDNEY
NSW 2000

Project Commencement Date:
12 March 2021

BESIX Watpac ABN:
71 010 462 816

Document Control

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BESIX Watpac Approvals

Name	Role & Title	Signature	Date
[redacted]	Reviewer / Construction Manager	[redacted]	28/07/23
[redacted]	Reviewer / Project Director	[redacted]	28/07/23

Note: A controlled copy of the Noise and Vibration Monitoring Report will be distributed to the Sydney Metro Principal's Representative, Environmental Representative (ER), the Acoustic Advisor (AA) and other nominated stakeholders, and it will be made available to all BR COP employees and subcontractors in soft copy format through the project document control system.

This document, when printed, will be uncontrolled and it will the responsibility of each user to confirm the currency of the plan through the project document control system

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Acoustics
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BARANGAROO METRO STATION

Noise & Vibration Monitoring Report

April 2022 – September 2022

Besix Watpac

TM031-1-17F01 Barangaroo Noise and Vibration Monitoring, 6 Monthly Report (r5)

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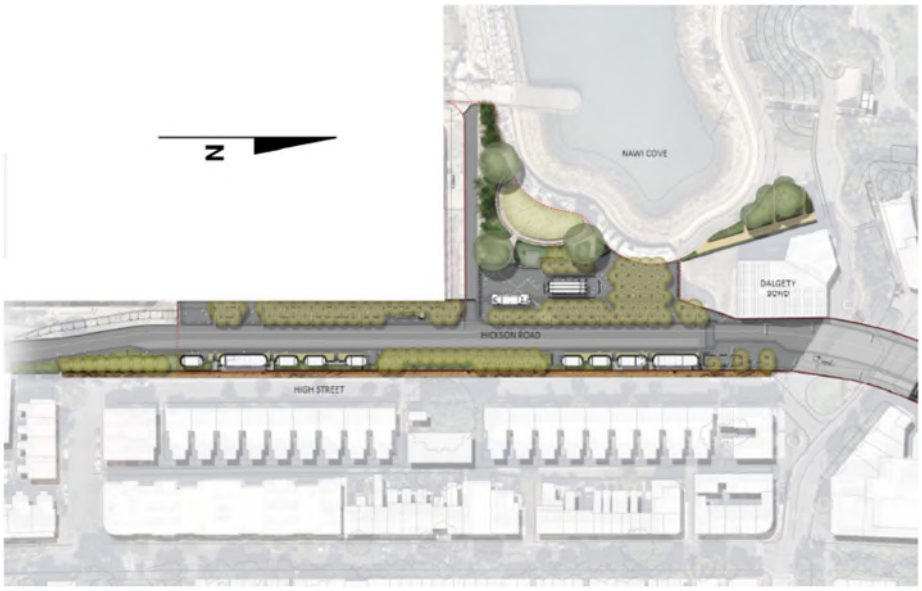
1 Introduction

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 Management Report (NVMR) is a summary of all noise and vibration monitoring conducted over the 6-month period from April 2022 to October 2022.

The 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 compromised the following:

- Deliveries;
- Removal of trees and relocation of sandstone blocks;
- Demolition of existing steel and concrete Hickson Rd ;
- 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;
- Fit-out of the station box including the installations of services station services, lifts, escalators, structural steelwork, block walls, sandstone and GRC cladding, aluminium wall cladding, platform screen doors, and wall and ceilings.

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.

It can be noted that the standard construction hours outlined in CoA E36 changed within the reporting period through MOD 9 of SSI7400 (determined on 30/6/2022) extending from 1:00pm to 6:00pm on Saturdays.

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-002.3	Station Works	E44(f), E48(e)	1 April 2022 – 30 June 2022
OOHWA-002.4	Station Works	E44(f), E48(e)	1 July 2022 – 30 September 2022
OOHWA-006	Civil Works Hickson Road	E44(f)	December 2021 – July 2022
OOHWA-008	Hickson Road night works for traffic switch	E44(f)	July 2022
OOHWA-009	Steel beam removal – Hickson Road Night Works	E44(f)	July 2022 – August 2022
OOHWA-010	Crane Lift – Excavators	E44(f)	August 2022

3.3 Emergency construction

No emergency works were undertaken 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 noise parameters are required to be measured when assessing construction noise 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 C.

Table 5-1 - 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
Sigicom Infra C22	Real-time vibration	25 Hickson Road, Barangaroo	#106847
Sigicom Infra C22	Real-time vibration	Hickson Road Wall	#102479
Rion NL-52	Attended noise	Various	#00553919
Rion NL-52	Attended noise	Various	#00553918
NTI-XL2	Attended noise	Various	#A2A-16217-E0
NTI-XL2	Attended noise	Various	#A2A-03167-D10
B&K Type 4231	Noise calibrator	Various	#2162834
B&K Type 4231	Noise calibrator	Various	#3009707

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

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 on the Hickson Road heritage wall and in the heritage building/site office at 25 Hickson Road, Barangaroo.

The heritage consultant confirmed that the proposed vibration monitoring installation on the Hickson road heritage wall was a *"reasonable approach which will ensure that there is minimal or no impact to the heritage values of the Hickson Road Retaining Wall or Millers Point and Dawes Point Village Precinct of which it is a part. "*

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.

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.

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

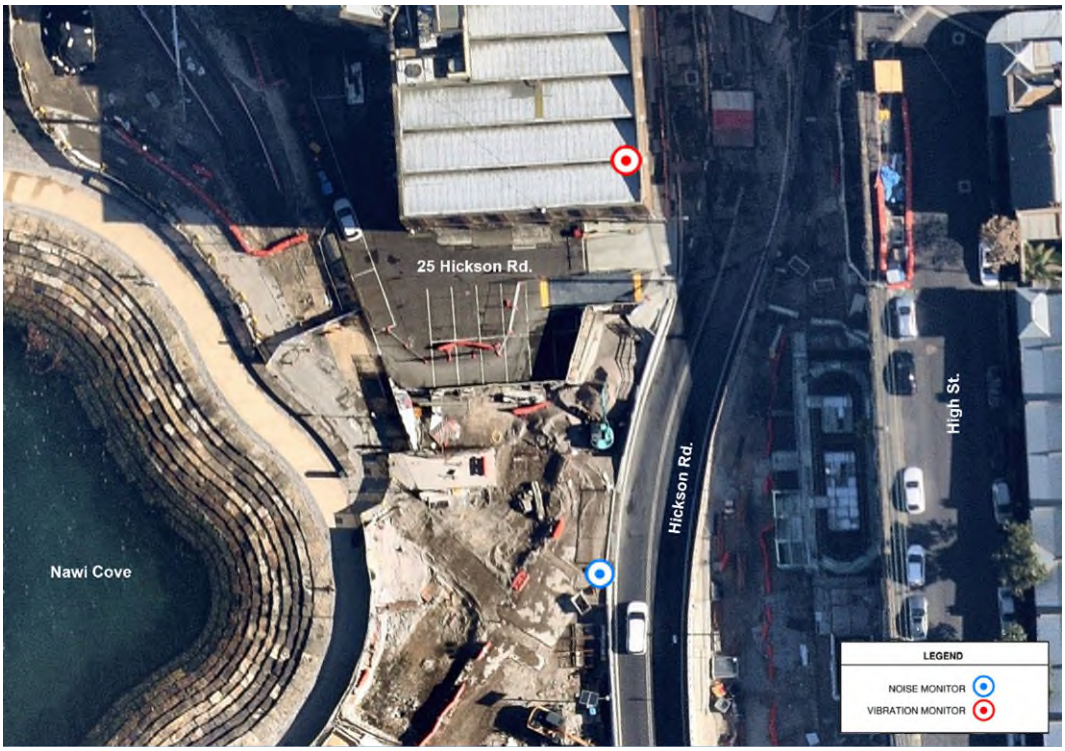


Table 5-2 – On-site monitoring equipment details

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
Sigicom Infra C22	Real-time vibration	25 Hickson Road, Barangaroo	#106847

5.3 Monitoring results (off-site)

5.3.1 Attended vibration monitoring

Attended vibration monitoring results are summarised in Table 5-3

Table 5-3 - Attended vibration monitoring results

Location / Receiver	Date & time	Tran (mm/s)	Vert (mm/s)	Long (mm/s)	Max PPV (mm/s)	Vibration criteria, ppv (mm/s)	Comments
Hickson Road Wall	15/07/2022 09:30am – 09:34am	2.2	1.8	1.4	2.2	25.0[1]	The 15t excavator with hammer attachment operating at approximately 2m from the Hickson Road wall produced vibration levels below the established vibration screening criterion
Hickson Road Wall	15/07/2022 10:39am - 10:40am	2.2	1.6	1.5	2.2	25.0[1]	The 15t excavator with hammer attachment operating at approximately 3m from the Hickson Road wall produced vibration levels below the established vibration screening criterion
Hickson Road Wall	15/07/2022 10:38am - 10:39am	3.6	2.5	2.1	3.6	25.0[1]	The 15t excavator with hammer attachment operating at approximately 1m from the Hickson Road wall produced vibration levels below the established vibration screening criterion
Hickson Road Wall	15/07/2022 10:41am - 10:43am	0.9	1.0	0.6	1.0	25.0[1]	The 15t excavator with hammer attachment operating at approximately 6m from the Hickson Road wall produced vibration levels below the established vibration screening criterion

Notes: 1) As stated in Section 3 of the Hickson Rd wall - vibration monitoring plan2, the relevant vibration criterion for the Hickson Road heritage wall is 25mm/s Peak Particle Velocity (PPV).

As can be noted from Table 5-3, vibration measurements were below the relevant vibration criteria.

[2] 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

5.3.2 Attended noise monitoring

Attended noise monitoring results are summarised in Table 5-4.

Table 5-4 - Attended noise monitoring results

Location / Receiver	Date	Main Activities	Noise Period	Noise targets			Measurements		dB above			Comment
				NML	RBL	Predicted levels	LAeq15min	LAmax	NML	RBL	Predicted levels	
50-52A High Street, Millers Point	18/06/2022 03:35pm - 03:50pm	General construction activities	Day OOH	60	55	60	58	68	-2	3	-2	Construction activity produced noise levels below the predicted levels.
14-14A High Street, Millers Point	18/06/2022 01:41pm - 01:56pm	General construction activities	Day OOH	60	55	60	60	68	0	5	0	Construction activity produced noise levels consistent with the predicted levels.
68-68A High Street, Millers Point	18/06/2022 02:02pm - 02:17pm	General construction activities	Day OOH	60	55	60	57	66	-3	2	-3	Construction activity produced noise levels below the predicted levels.
4 High Street, Millers Point	15.07.2022 10:55am – 11:10am	Rock hammering and general construction activities	Day standard	60	55	70	71 (66+5)[1]	79	11	16	1	At this monitoring location, the measured LAeq, 15 minute is marginally above the predicted level (i.e. 1dBA).
34 High Street, Millers Point	12/07/2022 10:47pm – 11:02pm	General construction activities	Night time	45	40	60	51	60	6	11	-9	Construction activity produced noise levels below the established vibration screening criterion

Notes 1) Penalty of 5dB due to annoying characteristics

As can be noted from Table 5-4, noise measurements were below the predicted levels (or marginally above).

5.4 Monitoring results (on-site)

5.4.1 Real-time vibration monitoring

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 (Figure 5-2) mounted to an external wall nearest to where civil construction activities will occur.

As seen in APPENDIX B there was only one exceedance of the nominated vibration criteria, however after confirming with staff on site, it was found that this exceedance was caused by a worker inadvertently bumping the monitor and not by the works.

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

5.4.2 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).
- Up to 30th June 2022, standard construction hours on Saturdays are 08.00am to 1.00pm, so each Saturday there are at least 8 hours 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 tale 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 2022 to September 2022 are included in APPENDIX A. It can be noted that NIL events are due to no data being recorded for that period.

6 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 monitoring results

Notes: NIL refers to unavailable data for that reporting period (see section 5.4.2).

APRIL 2022 - Daily Monitoring Results					
Date	Classification	Total 15 minute Intervals (07.00 to 26.00)	Total Hours (07.00 to 26.00	LAeq(15min) < 65dBA for at least 3.25 hours. LAeq(15min) > 60dBA not more than 6.5 hours	Comments
1/04/2022	Below 65dBA	44	11	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
1/04/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
2/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
2/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
3/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
3/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
4/04/2022	Below 65dBA	43	10.75	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
4/04/2022	Above 60dBA	3	0.75	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
5/04/2022	Below 65dBA	38	9.5	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
5/04/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
6/04/2022	Below 65dBA	25	6.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
6/04/2022	Above 60dBA	5	1.25	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
7/04/2022	Below 65dBA	33	8.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
7/04/2022	Above 60dBA	6	1.5	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
8/04/2022	Below 65dBA	36	9	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
8/04/2022	Above 60dBA	9	2.25	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
9/04/2022	Below 65dBA	38	9.5	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
9/04/2022	Above 60dBA	10	2.5	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
10/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
10/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
11/04/2022	Below 65dBA	47	11.75	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
11/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
12/04/2022	Below 65dBA	23	5.75	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
12/04/2022	Above 60dBA	8	2	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
13/04/2022	Below 65dBA	27	6.75	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
13/04/2022	Above 60dBA	6	1.5	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
14/04/2022	Below 65dBA	38	9.5	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
14/04/2022	Above 60dBA	6	1.5	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
15/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
15/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
16/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
16/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
17/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
17/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
18/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
18/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
19/04/2022	Below 65dBA	53	13.25	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
19/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
20/04/2022	Below 65dBA	51	12.75	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
20/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
21/04/2022	Below 65dBA	46	11.5	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant
21/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
22/04/2022	Below 65dBA	39	9.75	Compliant - fits the at least 3.25 hours below 65dBA criteria	Compliant

22/04/2022	Above 60dBA	5	1.25	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
23/04/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
23/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
24/04/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
24/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
25/04/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
25/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
26/04/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
26/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
27/04/2022	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
27/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
28/04/2022	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
28/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
29/04/2022	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
29/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant
30/04/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dBA criteria	Compliant
30/04/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dBA" criteria	Compliant

May 2022 - Daily Monitoring Results				
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
2/05/2022	Below 55dBA	34	8.5	Compliant - fits the at least 3.25 hours below 55dB criteria
2/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
3/05/2022	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dB criteria
3/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
4/05/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
4/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
5/05/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
5/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
6/05/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
6/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
7/05/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
7/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
8/05/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
8/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
9/05/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
9/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
10/05/2022	Below 55dBA	33	8.25	Compliant - fits the at least 3.25 hours below 55dB criteria
10/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
11/05/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
11/05/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
12/05/2022	Below 55dBA	37	9.25	Compliant - fits the at least 3.25 hours below 55dB criteria
12/05/2022	Above 60dBA	7	1.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
13/05/2022	Below 55dBA	2	0.5	Compliant - fits the at least 3.25 hours below 55dB criteria
13/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
14/05/2022	Below 55dBA	NIL	NIL	No data recorded during this period
14/05/2022	Above 60dBA	NIL	NIL	No data recorded during this period
15/05/2022	Below 55dBA	NIL	NIL	No data recorded during this period
15/05/2022	Above 60dBA	NIL	NIL	No data recorded during this period
16/05/2022	Below 55dBA	15	3.75	Compliant - fits the at least 3.25 hours below 55dB criteria
16/05/2022	Above 60dBA	3	0.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
17/05/2022	Below 55dBA	47	11.75	Compliant - fits the at least 3.25 hours below 55dB criteria
17/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
18/05/2022	Below 55dBA	37	9.25	Compliant - fits the at least 3.25 hours below 55dB criteria
18/05/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
19/05/2022	Below 55dBA	32	8	Compliant - fits the at least 3.25 hours below 55dB criteria

19/05/2022	Above 60dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
20/05/2022	Below 55dBA	35	8.75	Compliant - fits the at least 3.25 hours below 55dB criteria
20/05/2022	Above 60dBA	8	2	Compliant - fits the "less than 6.5 hours above 60dB" criteria
21/05/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
21/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
22/05/2022	Below 55dBA	NIL	NIL	No data recorded during this period
22/05/2022	Above 60dBA	NIL	NIL	No data recorded during this period
23/05/2022	Below 55dBA	NIL	NIL	No data recorded during this period
23/05/2022	Above 60dBA	NIL	NIL	No data recorded during this period
24/05/2022	Below 55dBA	NIL	NIL	No data recorded during this period
24/05/2022	Above 60dBA	NIL	NIL	No data recorded during this period
25/05/2022	Below 55dBA	NIL	NIL	No data recorded during this period
25/05/2022	Above 60dBA	NIL	NIL	No data recorded during this period
26/05/2022	Below 55dBA	15	3.75	Compliant - fits the at least 3.25 hours below 55dB criteria
26/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
27/05/2022	Below 55dBA	41	10.25	Compliant - fits the at least 3.25 hours below 55dB criteria
27/05/2022	Above 60dBA	3	0.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
28/05/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
28/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
29/05/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
29/05/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria

June 2022 - Daily Monitoring Results				
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
1/06/2022	Below 55dBA	1	0.25	Compliant - fits the at least 3.25 hours below 55dB criteria
1/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
2/06/2022	Below 55dBA	26	6.5	Compliant - fits the at least 3.25 hours below 55dB criteria
2/06/2022	Above 60dBA	12	3	Compliant - fits the "less than 6.5 hours above 60dB" criteria
3/06/2022	Below 55dBA	22	5.5	Compliant - fits the at least 3.25 hours below 55dB criteria
3/06/2022	Above 60dBA	11	2.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
4/06/2022	Below 55dBA	47	11.75	Compliant - fits the at least 3.25 hours below 55dB criteria
4/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
5/06/2022	Below 55dBA	1	0.25	Compliant - fits the at least 3.25 hours below 55dB criteria
5/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
6/06/2022	Below 55dBA	19	4.75	Compliant - fits the at least 3.25 hours below 55dB criteria
6/06/2022	Above 60dBA	21	5.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
7/06/2022	Below 55dBA	1	0.25	Compliant - fits the at least 3.25 hours below 55dB criteria
7/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
8/06/2022	Below 55dBA	15	3.75	Compliant - fits the at least 3.25 hours below 55dB criteria
8/06/2022	Above 60dBA	15	3.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
9/06/2022	Below 55dBA	25	6.25	Compliant - fits the at least 3.25 hours below 55dB criteria
9/06/2022	Above 60dBA	12	3	Compliant - fits the "less than 6.5 hours above 60dB" criteria
10/06/2022	Below 55dBA	28	7	Compliant - fits the at least 3.25 hours below 55dB criteria
10/06/2022	Above 60dBA	14	3.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
11/06/2022	Below 55dBA	2	0.5	Compliant - fits the at least 3.25 hours below 55dB criteria
11/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
12/06/2022	Below 55dBA	46	11.5	Compliant - fits the at least 3.25 hours below 55dB criteria
12/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
13/06/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
13/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
14/06/2022	Below 55dBA	2	0.5	Compliant - fits the at least 3.25 hours below 55dB criteria
14/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
15/06/2022	Below 55dBA	NIL	NIL	No data recorded during this period
15/06/2022	Above 60dBA	NIL	NIL	No data recorded during this period
16/06/2022	Below 55dBA	13	3.25	Compliant - fits the at least 3.25 hours below 55dB criteria
16/06/2022	Above 60dBA	2	0.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
17/06/2022	Below 55dBA	28	7	Compliant - fits the at least 3.25 hours below 55dB criteria

17/06/2022	Above 60dBA	15	3.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
18/06/2022	Below 55dBA	24	6	Compliant - fits the at least 3.25 hours below 55dB criteria
18/06/2022	Above 60dBA	10	2.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
19/06/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
19/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
20/06/2022	Below 55dBA	22	5.5	Compliant - fits the at least 3.25 hours below 55dB criteria
20/06/2022	Above 60dBA	10	2.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
21/06/2022	Below 55dBA	NIL	NIL	No data recorded during this period
21/06/2022	Above 60dBA	NIL	NIL	No data recorded during this period
22/06/2022	Below 55dBA	NIL	NIL	No data recorded during this period
22/06/2022	Above 60dBA	NIL	NIL	No data recorded during this period
23/06/2022	Below 55dBA	11	2.75	Compliant - fits the at least 3.25 hours below 55dB criteria
23/06/2022	Above 60dBA	17	4.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
24/06/2022	Below 55dBA	14	3.5	Compliant - fits the at least 3.25 hours below 55dB criteria
24/06/2022	Above 60dBA	8	2	Compliant - fits the "less than 6.5 hours above 60dB" criteria
25/06/2022	Below 55dBA	35	8.75	Compliant - fits the at least 3.25 hours below 55dB criteria
25/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
26/06/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
26/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
27/06/2022	Below 55dBA	42	10.5	Compliant - fits the at least 3.25 hours below 55dB criteria
27/06/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
28/06/2022	Below 55dBA	33	8.25	Compliant - fits the at least 3.25 hours below 55dB criteria
28/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
29/06/2022	Below 55dBA	40	10	Compliant - fits the at least 3.25 hours below 55dB criteria
29/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
30/06/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
30/06/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria

July 2022 - Daily Monitoring Results				
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
1/07/2022	Below 55dBA	51	12.75	Compliant - fits the at least 3.25 hours below 55dB criteria
1/07/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
2/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
2/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
3/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
3/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
4/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
4/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
5/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
5/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
6/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
6/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
7/07/2022	Below 55dBA	24	6	Compliant - fits the at least 3.25 hours below 55dB criteria
7/07/2022	Above 60dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
8/07/2022	Below 55dBA	45	11.25	Compliant - fits the at least 3.25 hours below 55dB criteria
8/07/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
9/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
9/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
10/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
10/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
11/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
11/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
12/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
12/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
13/07/2022	Below 55dBA	19	4.75	Compliant - fits the at least 3.25 hours below 55dB criteria
13/07/2022	Above 60dBA	9	2.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
14/07/2022	Below 55dBA	0	0	Compliant - fits the at least 3.25 hours below 55dB criteria
14/07/2022	Above 60dBA	9	2.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
15/07/2022	Below 55dBA	25	6.25	Compliant - fits the at least 3.25 hours below 55dB criteria
15/07/2022	Above 60dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
16/07/2022	Below 55dBA	28	7	Compliant - fits the at least 3.25 hours below 55dB criteria
16/07/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
17/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
17/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period

18/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
18/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
19/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
19/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
20/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
20/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
21/07/2022	Below 55dBA	1	0.25	Compliant - fits the at least 3.25 hours below 55dB criteria
21/07/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
22/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
22/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
23/07/2022	Below 55dBA	32	8	Compliant - fits the at least 3.25 hours below 55dB criteria
23/07/2022	Above 60dBA	7	1.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
24/07/2022	Below 55dBA	27	6.75	Compliant - fits the at least 3.25 hours below 55dB criteria
24/07/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
25/07/2022	Below 55dBA	16	4	Compliant - fits the at least 3.25 hours below 55dB criteria
25/07/2022	Above 60dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
26/07/2022	Below 55dBA	15	3.75	Compliant - fits the at least 3.25 hours below 55dB criteria
26/07/2022	Above 60dBA	11	2.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
27/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
27/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
28/07/2022	Below 55dBA	20	5	Compliant - fits the at least 3.25 hours below 55dB criteria
28/07/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
29/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
29/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period
30/07/2022	Below 55dBA	NIL	NIL	No data recorded during this period
30/07/2022	Above 60dBA	NIL	NIL	No data recorded during this period

August 2022 - Daily Monitoring Results				
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
1/08/2022	Below 55dBA	NIL	NIL	No data recorded during this period
1/08/2022	Above 60dBA	NIL	NIL	No data recorded during this period
2/08/2022	Below 55dBA	NIL	NIL	No data recorded during this period
2/08/2022	Above 60dBA	NIL	NIL	No data recorded during this period
3/08/2022	Below 55dBA	7	1.75	Compliant - fits the at least 3.25 hours below 55dB criteria
3/08/2022	Above 60dBA	6	1.5	Compliant - fits the at least 3.25 hours below 55dB criteria
4/08/2022	Below 55dBA	NIL	NIL	No data recorded during this period
4/08/2022	Above 60dBA	NIL	NIL	No data recorded during this period
5/08/2022	Below 55dBA	3	0.75	Compliant - fits the at least 3.25 hours below 55dB criteria
5/08/2022	Above 60dBA	14	3.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
6/08/2022	Below 55dBA	NIL	NIL	No data recorded during this period
6/08/2022	Above 60dBA	NIL	NIL	No data recorded during this period
7/08/2022	Below 55dBA	NIL	NIL	No data recorded during this period
7/08/2022	Above 60dBA	NIL	NIL	No data recorded during this period
8/08/2022	Below 55dBA	NIL	NIL	No data recorded during this period
8/08/2022	Above 60dBA	NIL	NIL	No data recorded during this period
9/08/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
9/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
10/08/2022	Below 55dBA	32	8	Compliant - fits the at least 3.25 hours below 55dB criteria
10/08/2022	Above 60dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
11/08/2022	Below 55dBA	51	12.75	Compliant - fits the at least 3.25 hours below 55dB criteria
11/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
12/08/2022	Below 55dBA	34	8.5	Compliant - fits the at least 3.25 hours below 55dB criteria
12/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
13/08/2022	Below 55dBA	55	13.75	Compliant - fits the at least 3.25 hours below 55dB criteria
13/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
14/08/2022	Below 55dBA	54	13.5	Compliant - fits the at least 3.25 hours below 55dB criteria
14/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
15/08/2022	Below 55dBA	74	18.5	Compliant - fits the at least 3.25 hours below 55dB criteria
15/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
16/08/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
16/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
17/08/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
17/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria

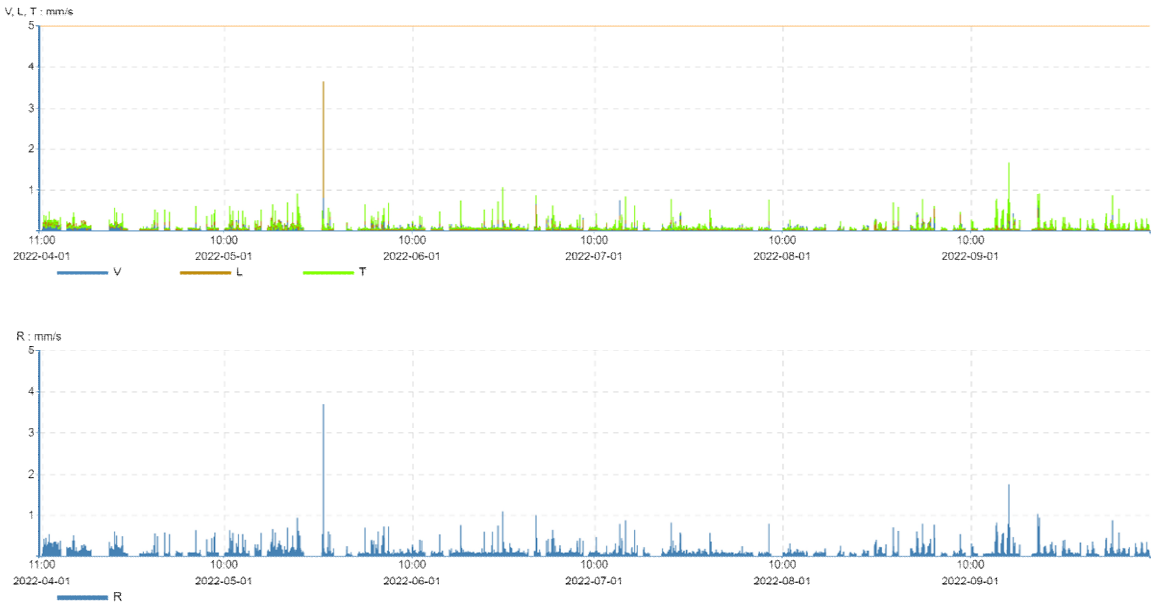
18/08/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
18/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
19/08/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
19/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
20/08/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
20/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
21/08/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
21/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
22/08/2022	Below 55dBA	30	7.5	Compliant - fits the at least 3.25 hours below 55dB criteria
22/08/2022	Above 60dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
23/08/2022	Below 55dBA	41	10.25	Compliant - fits the at least 3.25 hours below 55dB criteria
23/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
24/08/2022	Below 55dBA	33	8.25	Compliant - fits the at least 3.25 hours below 55dB criteria
24/08/2022	Above 60dBA	5	1.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
25/08/2022	Below 55dBA	47	11.75	Compliant - fits the at least 3.25 hours below 55dB criteria
25/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
26/08/2022	Below 55dBA	47	11.75	Compliant - fits the at least 3.25 hours below 55dB criteria
26/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
27/08/2022	Below 55dBA	54	13.5	Compliant - fits the at least 3.25 hours below 55dB criteria
27/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
28/08/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
28/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
29/08/2022	Below 55dBA	35	8.75	Compliant - fits the at least 3.25 hours below 55dB criteria
29/08/2022	Above 60dBA	12	3	Compliant - fits the "less than 6.5 hours above 60dB" criteria
30/08/2022	Below 55dBA	66	16.5	Compliant - fits the at least 3.25 hours below 55dB criteria
30/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
31/08/2022	Below 55dBA	58	14.5	Compliant - fits the at least 3.25 hours below 55dB criteria
31/08/2022	Above 60dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria

September 2022 - Daily Monitoring Results				
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
1/09/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
1/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
2/09/2022	Below 55dBA	29	7.25	Compliant - fits the at least 3.25 hours below 55dB criteria
2/09/2022	Above 60 dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
3/09/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
3/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
4/09/2022	Below 55dBA	54	13.5	Compliant - fits the at least 3.25 hours below 55dB criteria
4/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
5/09/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
5/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
6/09/2022	Below 55dBA	52	13	Compliant - fits the at least 3.25 hours below 55dB criteria
6/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
7/09/2022	Below 55dBA	32	8	Compliant - fits the at least 3.25 hours below 55dB criteria
7/09/2022	Above 60 dBA	8	2	Compliant - fits the "less than 6.5 hours above 60dB" criteria
8/09/2022	Below 55dBA	33	8.25	Compliant - fits the at least 3.25 hours below 55dB criteria
8/09/2022	Above 60 dBA	7	1.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
9/09/2022	Below 55dBA	40	10	Compliant - fits the at least 3.25 hours below 55dB criteria
9/09/2022	Above 60 dBA	7	1.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
10/09/2022	Below 55dBA	57	14.25	Compliant - fits the at least 3.25 hours below 55dB criteria
10/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
11/09/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
11/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
12/09/2022	Below 55dBA	29	7.25	Compliant - fits the at least 3.25 hours below 55dB criteria
12/09/2022	Above 60 dBA	13	3.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
13/09/2022	Below 55dBA	28	7	Compliant - fits the at least 3.25 hours below 55dB criteria
13/09/2022	Above 60 dBA	17	4.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
14/09/2022	Below 55dBA	34	8.5	Compliant - fits the at least 3.25 hours below 55dB criteria
14/09/2022	Above 60 dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
15/09/2022	Below 55dBA	24	6	Compliant - fits the at least 3.25 hours below 55dB criteria
15/09/2022	Above 60 dBA	13	3.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria

16/09/2022	Below 55dBA	21	5.25	Compliant - fits the at least 3.25 hours below 55dB criteria
16/09/2022	Above 60 dBA	16	4	Compliant - fits the "less than 6.5 hours above 60dB" criteria
17/09/2022	Below 55dBA	50	12.5	Compliant - fits the at least 3.25 hours below 55dB criteria
17/09/2022	Above 60 dBA	2	0.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
18/09/2022	Below 55dBA	56	14	Compliant - fits the at least 3.25 hours below 55dB criteria
18/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
19/09/2022	Below 55dBA	42	10.5	Compliant - fits the at least 3.25 hours below 55dB criteria
19/09/2022	Above 60 dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
20/09/2022	Below 55dBA	19	4.75	Compliant - fits the at least 3.25 hours below 55dB criteria
20/09/2022	Above 60 dBA	17	4.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
21/09/2022	Below 55dBA	42	10.5	Compliant - fits the at least 3.25 hours below 55dB criteria
21/09/2022	Above 60 dBA	4	1	Compliant - fits the "less than 6.5 hours above 60dB" criteria
22/09/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
22/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
23/09/2022	Below 55dBA	47	11.75	Compliant - fits the at least 3.25 hours below 55dB criteria
23/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
24/09/2022	Below 55dBA	49	12.25	Compliant - fits the at least 3.25 hours below 55dB criteria
24/09/2022	Above 60 dBA	1	0.25	Compliant - fits the "less than 6.5 hours above 60dB" criteria
25/09/2022	Below 55dBA	53	13.25	Compliant - fits the at least 3.25 hours below 55dB criteria
25/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
26/09/2022	Below 55dBA	45	11.25	Compliant - fits the at least 3.25 hours below 55dB criteria
26/09/2022	Above 60 dBA	2	0.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
27/09/2022	Below 55dBA	34	8.5	Compliant - fits the at least 3.25 hours below 55dB criteria
27/09/2022	Above 60 dBA	7	1.75	Compliant - fits the "less than 6.5 hours above 60dB" criteria
28/09/2022	Below 55dBA	51	12.75	Compliant - fits the at least 3.25 hours below 55dB criteria
28/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria
29/09/2022	Below 55dBA	43	10.75	Compliant - fits the at least 3.25 hours below 55dB criteria
29/09/2022	Above 60 dBA	2	0.5	Compliant - fits the "less than 6.5 hours above 60dB" criteria
30/09/2022	Below 55dBA	44	11	Compliant - fits the at least 3.25 hours below 55dB criteria
30/09/2022	Above 60 dBA	0	0	Compliant - fits the "less than 6.5 hours above 60dB" criteria

APPENDIX B Real-time vibration monitoring results

Figure 6-1 - Real-time vibration monitoring results



Notes: The one exceedance after confirming with staff on site was found to be caused by a worker inadvertently bumping the monitor and not by construction activity (see Section 5.4)

APPENDIX C Calibration Certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: SLM31165

EQUIPMENT TESTED: Sound Level Meter

Manufacturer:	Rion		
Type No:	NL-52	**Serial No:**	00553919
Mic. Type:	UC-59	**Serial No:**	08077
Pre-Amp. Type:	NH-25	**Serial No:**	43963

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	1002	hPa ±1 hPa	**Date of Receipt :**	15/11/2021
Temperature	24	°C ±1° C	**Date of Calibration :**	16/11/2021
Relative Humidity	32	% ±5%	**Date of Issue :**	16/11/2021

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

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

Hoa Soe

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%.

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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

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

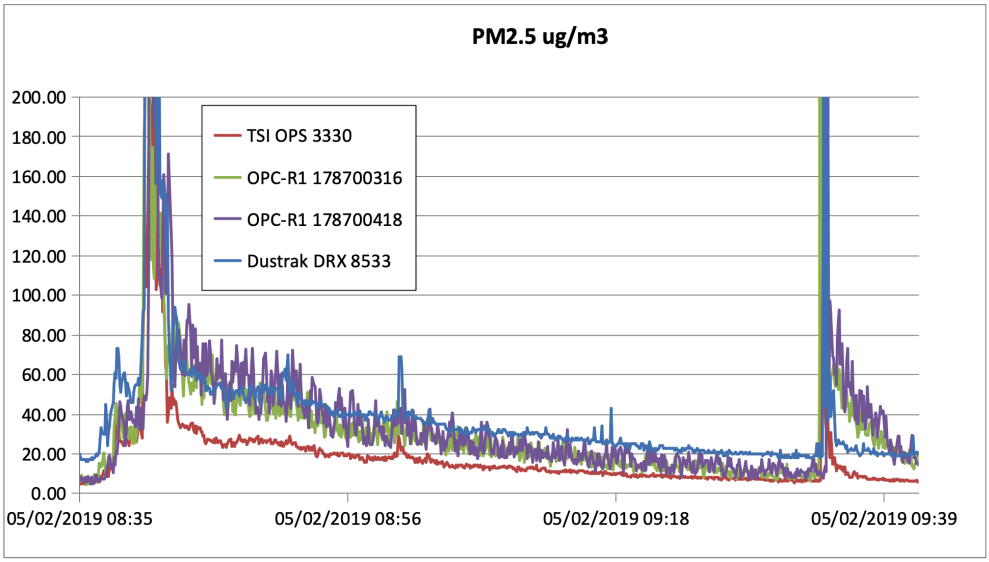
The SiteHive Hexanode uses innovative digital MEMS microphones, and as such cannot achieve full pattern approval in line with international standard IEC 61672, which is written for analogue condenser microphones. However, the SiteHive Hexanode sound level meter has been rigorously tested by the the National 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

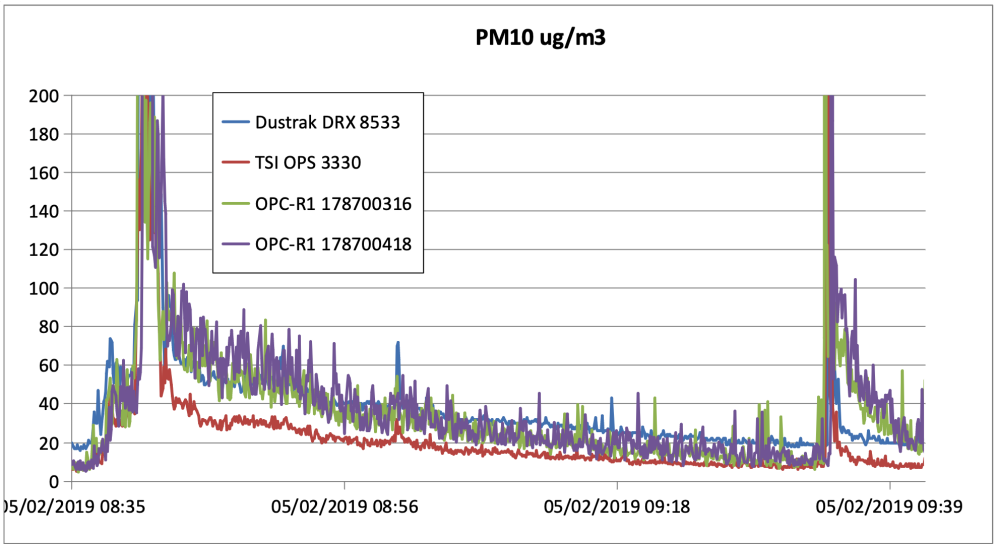
The Hexanode utilises the Alphasense R2 Optical Particle Sensor, to provide real-time dust measurements. Whilst the R2 does not have any gravimetric sampling capabilities, measurements can be adjusted using a K-Factor if one is available. SiteHive software will also provide measurements from the nearest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

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
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**	#2162834 #SB1
Accessories	N/A				

Class (1 or 2)	1

Environmental Conditions	Measured	
	Start	End
Temperature (degC)	23.5	24
Rel. Humidity (%)	55.2	54.6
Air Pressure (kPa)	100.76	100.76

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
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:

[redacted]

Print Name: [redacted] Date: 11/01/2023

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

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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 17/01/2023 **Job No** RC035 **Operator** AM
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)	23.4	24
Rel. Humidity (%)	55.6	57.1
Air Pressure (kPa)	101.1	101.07

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:

[redacted]

Print Name: [redacted] Date: 17/01/2023

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

NATacoustic
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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	22/02/2022	**Job No**	RB949	**Operator**	AM
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-03167D1 #RTA05-001
Microphone Make	NTI	**Model**	MC230	**Serial No**	#8565
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#2394
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.80

SLM Type	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	25.0	25.1
Rel. Humidity (%)	61.0	63.0
Air Pressure (kPa)	101.2	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 33220A SN MY43004013
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 has been calibrated by NATA accredited calibration facilities.
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.

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.

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WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Accredited for compliance with ISO/IEC 17025 - Calibration

Authorized Signatory:

[redacted]

Print Name: [redacted] Date: 23/02/2022

Template Document Name: RQT-05 SLM IEC61672 Verification (r75)

NATacoustic
Acoustic Calibration & Testing Laboratory
Level 1, 418A Elizabeth Street., Surry Hills NSW 2010 AUSTRALIA
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A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	10/08/2021	**Job No**	RB893	**Operator**	AH
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
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A17363
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#8388
Ext'n Cable Make	N/A	**Model**	N/A	**Serial No**	N/A
Accessories	N/A			**Firmware**	V4.20

SLM Type	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	23.2	23.1
Rel. Humidity (%)	40.8	40.8
Air Pressure (kPa)	101.1	101.1

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 33220A SN MY43004013
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 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 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.

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:

[redacted]

Print Name: [redacted] Date: 13/08/2021

Template Document Name: RQT-05 SLM IEC61672 Verification (r73)

NATacoustic
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Certificate of Calibration
Accelerometer / Vibration Monitor

Calibration Date 2/05/2022 **Operator** AH
Client Name RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address LEVEL 1, 418A, ELIZABETH ST, SURRY HILLS, NSW, 2010

Test Item

Manufacturer Sigicom **Serial No** #102479
Instrument Model Infra c22

Applicable Work Instruction:
WiTC-100 Sigicom 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 16063-21:2003 Methods for the calibration of vibration and shock transducers - Part 21: Vibration calibration by comparison to a reference transducer

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:
Sensitivity of reference accelerometer and measurement chain was verified using a BK 4294 field accelerometer. The measured rms vibration level was within 0.1 dB of the reference level at 1000 rad/s.

Calibration Checked and Approved:

[redacted]

Print Name: [redacted] Date: 2/05/2022

Sigicom

CALIBRATION DOCUMENT

Document No:	Print Date:	Location of Calibration:	Page No:
Cal 83877	2021 -06 -01	Älvsjö, Sweden	1 / 1

Customer: Osterman

Device under Test: INFRA C22 Triaxial Vibration Monitor
SN: **106847**
Software Version: 2.5.0

Date of Calibration: 2021-06-01

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

Method of Measurement: C311xB.
(Reference frequency: 80Hz (16Hz), frequency sweep: 1-1000 Hz)

Equipment:
Climate Sensor: Comet T7510 #12963113
Reference Accelerometer: B&K 4381 #30964
Reference Amplifier: B&K 2525 #1899363
Climate Sensor: Comet T7510 #16962473
Signal Generator: Keysight 33521B #MY52703295
Digital Multimeter: Keysight 34465A #MY57505160
Vibration System: Modal Shop K2075E040 #753
Vibration System: Modal Shop K2075E-HT #638
Signal Generator: Keysight 33521B #MY57700911
Digital Multimeter: Agilent 34411A #MY48003408
Reference Amplifier: B&K 2525 #2837570
Reference Accelerometer: B&K 4381 #30849

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

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

Recommended Interval of Calibration: 12 months.

Calibration performed by: [redacted]

Signature: [redacted]

APPROVAL
CITY & SOUTHWEST ACOUSTICS ADVISOR

Review of:	Barangaroo Metro Station Noise & Vibration Monitoring Report April 2022 to September 2022	**Document reference:**	SMCSWSBR-BWC-SBR-EM-REP-006657
Prepared by:	[redacted] Acoustics Advisor		Version 02
Date of issue:	1 August 2023		28 July 2023

As approved Acoustics Advisor for the Sydney Metro City & Southwest project, I have reviewed and provided comment on the Noise and Vibration Monitoring Report April 2022 to September 2022 for the Barangaroo Metro Station, as required under A27 (d) of the project approval conditions.

This report is to be submitted to the NSW Department of Planning and Environment in accordance with Condition of Approval C16 and the Barangaroo Metro Station Construction Noise and Vibration Management Plan (CNVMP).

I have reviewed the report and am satisfied that my comments have been adequately addressed and that it meets the requirements of the Barangaroo Metro Station CNVMP. I endorse the report.

[redacted]

[redacted], City & Southwest Acoustics Advisor