Quarterly Environment Construction Monitoring Report

Q2 – April to June 2021

Pitt Street Integrated Station Development

Project number:	N01070
Document number:	SMCSWSPS-CPB-STA-EM-REP-000006
TeamBinder:	SMCSWSPU-CPB-SPS-EM-REP-008819
Revision date:	27/07/2021
Revision:	**B**

Document approval

Rev.	Date	Prepared by	Reviewed by	Approved by	Remarks
A	25/07/21	O Cooper	E Eveleigh	A Zvirzdinas	For internal review
B	27/07/2021	O Cooper	E Eveleigh	K Evans	For issue to SM, ER, AA
Signature					

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1. Introduction

1.1 Project Summary

The Sydney Metro City and Southwest is the second portion of the new standalone rail network known as the Sydney Metro, which is Australia's largest public transport infrastructure project and a priority rail project for the NSW Government. CPB Contractors (CPB) have been contracted by Transport for New South Wales to design and construct the Integrated Station Development (ISD) component of the future Pitt Street Station.

Pitt Street is situated within the Sydney CBD, largely surrounded by high-rise commercial and residential buildings. The Station is a binocular cavern station with north and southbound platform caverns running beneath Pitt and Castlereagh Streets respectively. The Station has two entrance shafts from the surface one at Pitt Street North and Pitt Street South connected to the platform caverns via adit tunnels.

Pitt Street North is located on Park Street between Pitt and Castlereagh Street, with the station entrance facing onto Park Street. The Over Station Development (OSD) surrounds the station entrance and access is provided on Pitt, Park and Castlereagh Streets. Pitt Street South is located on the corner of Pitt and Bathurst Street. It is configured in an 'L' shape which wraps around the Edinburgh Castle Hotel with the station entrance opening onto Bathurst Street. Access to the OSD is provided from Pitt Street.

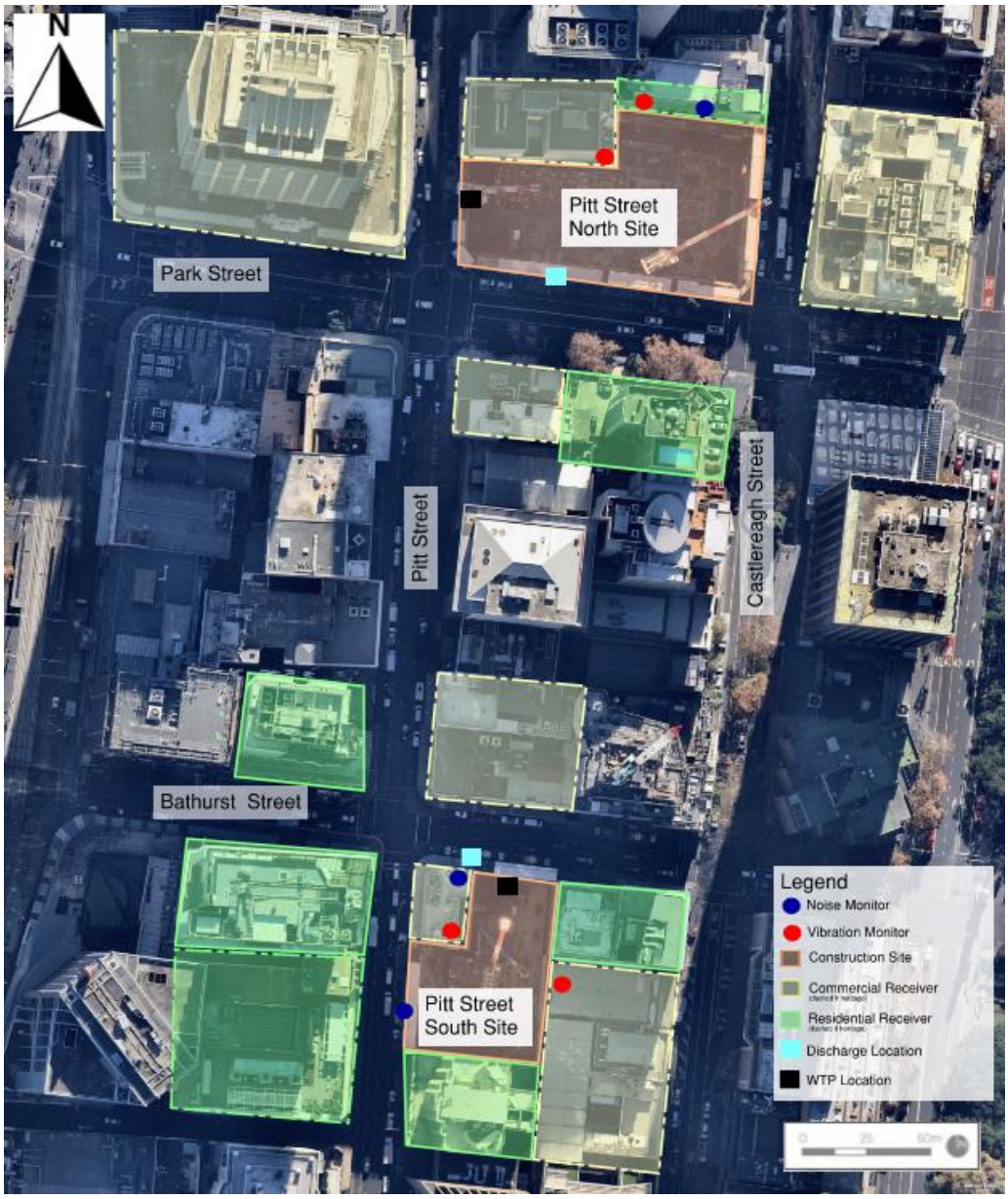

Figure 1-1 Pitt Street Station location and indicative monitoring layout

1.2 Site Activities

The Construction Environment Management Plan (CEMP) and associated sub-plans were approved by Department of Planning, Industry and Environment (DPIE) on 24 December 2020 and construction works commenced on the project on 6 January 2021. This is the second quarterly report and reflects the monitoring that was conducted from April to June 2021. **Table 1-1** outlines the site activities that occurred during the reporting period.

Table 1-1 Site Activities

Month	Site Activities
April 2021	**Pitt Street North** - Ongoing detailed excavation - Ongoing footing construction - Ongoing ground slab pours - Ongoing waterproofing works - Jump form system installation - Site shed installation - Hoarding works - Site deliveries - Commencement of earthing works at front of house adit - Scaffolding erection for Wall 4 excavation **Pitt Street South** - Ongoing detailed excavation - Ongoing footing construction - Ongoing ground slab pours - Ongoing waterproofing works - Jump form system installation - Hoarding works - Site deliveries - Commencement of earthing works at front of house adit **Caverns** - Minor works undertaken in tunnels for brackets and formwork - Commencement of platform slab pours
May 2021	**Pitt Street North** - Ongoing detailed excavation - Shotcreting on walls - Tree pruning and removal works - Site deliveries - Ongoing jump form pours - Ongoing earthing works - Scaffolding erection for Wall 4 excavation **Pitt Street South** - Removal of excavator from site - Hoarding works - Ongoing ground slab pours - Waterproofing works completed - Ongoing jump form pours - Site deliveries - Commencement of column cages - Ongoing earthing works **Caverns** - Minor works undertaken in tunnels for brackets and formwork - Ongoing platform slab pours
June 2021	**Pitt Street North**

Month	Site Activities
	- Ongoing detailed excavation - B05 ground slab pour completed - Ongoing jump form pours - Wall 4 excavation on columns 1 to 4 and scaffolding removal - Form, retain, pour works on central pour - Balance/install of structural steel ongoing - Waterproofing works largely completed - Site deliveries - Ongoing earthing works - Ongoing hoarding rectification works **Pitt Street South** - Stretchers on Bathurst Street elevation relocated to Pitt Street - Ongoing hoarding rectification works - Ongoing jump form pours, core walls at street level - B02, B03 and B04 perimeter walls completed - West B03 slab poured - Ongoing formwork for B02 - Waterproofing works completed - Site deliveries - Ongoing earthing works **Caverns** - Ongoing bracket installation and form, retain, pour works - Commencement of blockwork - Platform slabs poured - All precast blocks delivered and fixed in place - Commencement of topping slab pours

2. Reporting Requirements

A Planning Approval has been obtained to construct Sydney Metro City and Southwest Chatswood to Sydenham, which was identified as Critical State-Significant Infrastructure (CSSI) SSI 15_7400.

Conditions C9 to C16 of the Planning Approval describes monitoring and reporting requirements for the ISD Works.

Monitoring and reporting requirements are detailed in the Construction Environmental Management Plan (approved by NSW DPIE on 24 Dec 2020), and the following associated sub-plans:

- Soil, Water and Groundwater Management Sub-Plan; and
- Noise and Vibration Management Sub-Plan

The following report details environmental monitoring that was undertaken during this reporting period conducted as per the Planning Approval, the approved CEMP and its associated sub-plans.

A copy of the Planning Approval can be found by following the link below to the NSW DPIE website.

https://www.planningportal.nsw.gov.au/major-projects/project/3601

The results of the Construction Monitoring Program are included in this Construction Monitoring Report and will be submitted to the Acoustic Advisor (AA), Sydney Metro and the Environmental Representative (ER) who will endorse the document prior to submission to DPIE and being made publicly available on the project website located at https://pittstreetsydneymetroisd.com.au.

2.1 Inspections

Periodic environmental inspections are undertaken by CPB to verify the adequacy of all environmental mitigation measures. In addition, inspections are conducted before and following significant rainfall events that are predicted to be over 10mm in 24 hours.

The Site Environmental Plans (SEPs) identify the environmental control measures on both PSISD sites. SEPs and environmental controls are monitored through these periodic environmental

inspections and are updated as required to reflect the changing nature of the PSISD sites. All records of inspections are documented in the CPB Environmental Inspection Checklist. Pitt Street South and Pitt Street North are inspected independently and the caverns/ adits are included in those inspections. Internal CPB inspections are conducted by the CPB Environmental and Project Team. ER inspections are attended by Sydney Metro, CPB, the DPIE endorsed Acoustic Advisor (AA) and the ER.

Weather data for the period is included in **Appendix A**.

A total of six (6) ER inspections and twenty-nine internal inspections were completed during the reporting period. Internal inspections were conducted on a weekly basis at both North and South project sites, ER inspections occurred on a fortnightly basis during the period.

2.2 Water Quality Monitoring

2.2.1 Background

Water quality parameters were determined from the Discharge Impact Assessment (supporting the Construction Environmental Management Plan Rev 0) which was updated in May 2021 to include the TSS/NTU correlation following ER review of the first Construction Monitoring Report (Q1 2021) and clarification of the Discharge Management Protocol.

Water quality parameters for the discharge criteria for the Project are presented in **Table 2-1**.

Table 2-1 Water Quality Discharge Criteria Parameters

Parameter	Unit	Discharge Criteria
pH	pH	6.5 – 8.5
Total Suspended Solids	mg/L	50mg/L (TSS:NTU correlation equivalent of 50NTU)
Oil and Grease	Visual	No visible surface sheen
Copper	mg/L	0.0013mg/L (50 percentile limit) 0.005mg/L (100 percentile limit)
Zinc	mg/L	0.015mg/L (50 percentile limit) 0.043mg/L (100 percentile limit)

CPB have a temporary stormwater connection for both the North site and South sites approved by the City of Sydney Council (CoSC) since 4 December 2020. Water is discharged to the stormwater after treatment through Trident 2 water clarification systems located at the North and South sites. These systems automatically manage the pH and turbidity levels through monitoring and treatment of the water prior to discharging to stormwater. Since the commissioning of this system, these normal operation conditions of the water treatment plants enable a continuous discharge of treated water with daily field turbidity, pH and oil/ grease monitoring being undertaken plus laboratory testing via a grab sample once a month to confirm the criteria in **Table 2-1**.

Water discharged from the site is predominantly rainwater and construction water. Negligible groundwater is encountered which is evidenced by the frequency of discharge relating more to rainfall events than construction activities.

2.2.2 Water Quality Monitoring Methodology

Readings from the Trident systems pH and NTU meters are logged at the commencement of discharge as well as field tests conducted by CPB Environmental Team using the calibrated water quality probe to confirm the readings on the Trident System. The Trident System operator conducts regular checks on the system during operation to ensure all meters are reading accurate values during discharge.

Table 2-2 outlines the CPB water quality monitoring equipment that has been used during the reporting period.

Table 2-2 Water Quality Monitoring Equipment Details

Monitoring Type / Location	Equipment Details	Serial Number	Calibration Date
Water Quality Multi Parameter Meter	Yeo-Kal 611	426	28/01/2021

Laboratory testing is conducted monthly via grab samples to confirm the criteria in Table 2-1. Where limited rainfall events have occurred the grab samples are taken at the next available discharge. Laboratory Testing of water quality is undertaken at Eurofins Sydney Laboratory in Lane Cove West, a NATA accredited laboratory.

2.2.3 Water Quality Monitoring Results

Detailed discharge monitoring results for this reporting period are presented in **Table 2-3.**

Monthly laboratory samples are taken from the Trident System to validate the discharge criteria as per the Discharge Management Protocol. In the case of a monthly sampling event exceeding the Stage 2 protocol (exceedance of one of the parameters), the operator was notified, further discharge was stopped and an investigation into the exceedance was undertaken and actions were implemented. Subsequent samples were then taken at the next operation of the Trident System with acceptable results obtained prior to next discharge. No monthly samples exceeded the Stage 3 protocol exceedance (2 consecutive exceedances of the same parameter) during the reporting period. All discharges have been compliant with the Discharge Management Protocol.

Table 2-3 Discharge Water Monitoring Data

	Parameter, Criteria or Measured Value							
Identifier	**Dates Sampled**	**pH (6.5-8.5)**	**Turbidity (<50NTU)**	**Copper (0.005mg/L)**	**Zinc (0.043mg/L)**	**Oil & Grease (visible)**	**Testing Method**	**Status**
PSS01	1/04/2021	7.3	3.9	*	*	Nil	Field	Compliant
PSN01	1/04/2021	7.8	19.8	*	*	Nil	Field	Compliant
PSN01	7/04/2021	6.9	5.1	*	*	Nil	Field	Compliant
PSS01	8/04/2021	7.6	49	*	*	Nil	Field	Compliant
PSN01	8/04/2021	7.6	45.9	*	*	Nil	Field	Compliant
PSS01	16/04/2021	7.2	0	*	*	Nil	Field	Compliant
PSN01	14/04/2021	7.4	1.6	0.017	0.015	Nil	Laboratory	Stage 2 Exceedance*
PSN01	21/04/2021	8.5	13	0.001	0.005	Nil	Laboratory	Compliant**
PSN01	22/04/2021	7.2	12.4	*	*	Nil	Field	Compliant
PSN01	28/04/2021	7.1	4.8	*	*	Nil	Field	Compliant
PSN01	29/04/2021	7.28	11.1	*	*	Nil	Field	Compliant
PSN01	30/04/2021	7.3	25.6	*	*	Nil	Field	Compliant
PSN01	3/05/2021	7.4	2.8	*	*	Nil	Field	Compliant
PSS01	3/05/2021	7.73	37.2	*	*	Nil	Field	Compliant
PSN01	5/05/2021	8.06	17.4	*	*	Nil	Field	Compliant
PSS01	5/05/2021	7.02	17.7	*	*	Nil	Field	Compliant
PSS01****	5/05/2021	7	23	0.006	0.36	Nil	Laboratory	Stage 2 Exceedance*
PSS01	6/05/2021	*	*	0.004	0.005	Nil	Laboratory	Compliant**

Parameter, Criteria or Measured Value								
Identifier	**Dates Sampled**	**pH (6.5-8.5)**	**Turbidity (<50NTU)**	**Copper (0.005mg/L)**	**Zinc (0.043mg/L)**	**Oil & Grease (visible)**	**Testing Method**	**Status**
PSN01	7/05/2021	7.1	31	*	*	Nil	Field	Compliant
PSS01	7/05/2021	7.4	44	*	*	Nil	Field	Compliant
PSS01	11/05/2021	7.4	2.1			Nil	Field	Compliant
PSN01	6/05/2021	6.9	13	0.005	0.048	Nil	Laboratory	Stage 2 Exceedance*
PSN01	10/05/2021	*	*	*	0.027	Nil	Laboratory	Compliant**
PSN01	11/05/2021	7.6	1.4	*	*	Nil	Field	Compliant
PSN01	21/05/2021	7.4	1.3	*	*	Nil	Field	Compliant
PSS01	21/05/2021	7.3	10.5	*	*	Nil	Field	Compliant
PSN01	25/05/2021	7.9	3	*	*	Nil	Field	Compliant
PSN01	28/05/2021	6.7	4	*	*	Nil	Field	Compliant
PSN01	2/06/2021	7.88	6.6	*	*	Nil	Field	Compliant
PSN01	4/06/2021	8	18	*	*	Nil	Field	Compliant
PSN01	8/06/2021	7.07	17.9	*	*	Nil	Field	Compliant
PSN01	8/06/2021	7.1	8.5	0.005	0.025	Nil	Laboratory	Compliant
PSN01	16/06/2021	7.2	20.1	*	*	Nil	Field	Compliant
PSN01	18/06/2021	7.2	20.1	*	*	Nil	Field	Compliant
PSS01	18/06/2021	7.4	21.7	*	*	Nil	Field	Compliant
PSS01	18/06/2021	7.1	31	0.003	0.064	Nil	Laboratory	Stage 2 Exceedance***
PSN01	29/06/2021	7.8	3.3	*	*	Nil	Field	Compliant

*Stage 2 exceedance of 1 criterion – Monthly lab sample taken during discharge. When exceedance of criteria was received, the operator was notified, further discharge was stopped and an investigation into the exceedance was undertaken. Samples taken in site excavations prior to treatment identified acceptable limits of metals therefore exceedance was due to localized contamination inside the WTP.

**Samples taken after the WTP was cleaned out and water held in the discharge tank until results confirmed. Additional metal sample results were acceptable. Monthly laboratory samples confirmed.

*** Stage 2 exceedance of 1 criterion – Monthly lab sample taken during discharge. When exceedance of criteria was received, the operator was notified, further discharge was stopped and an investigation into the exceedance was undertaken. Discharge has not occurred since laboratory samples were taken.

****Laboratory samples were taken at the end of March, when laboratory samples were due at the end of April there were no discharges until early May at Pitt Street South.

2.2.4 Groundwater Monitoring Results

Water discharged from the site is predominantly rainwater collected and water used for dust suppression which is evident from the relation between rainfall events and the discharge dates. It is therefore determined that less than 7kL/day of groundwater seepage is being captured and discharged.

Monthly settlement monitoring of the buildings adjacent to the PSISD sites have been undertaken to monitor for any settlement due to groundwater seepage. Total Survey Solutions are engaged by CPB to monitor movement of structures over the entire Pitt Street Metro Project. This includes monitoring of the external buildings adjacent to the North and South sites, walls of the North and South station boxes and through the caverns/ adits between them. The monitoring uses total station instruments to take direct measurements to reference targets on and inside adjacent buildings and walls to calculate any movement measured as an angle of tilt that is recorded live on Geomotion. The angles that trigger concern have been determined by Structural Engineers and alarms have been set to activate text messages if the triggers are reached. During the reporting period there were two settlement monitoring triggers on the 13 April 2021 and 27 May 2021. Following investigation, these triggers were caused by the tilt meters being knocked during Wall 4 excavation works and not building settlement. The tiltmeters automatically reinstate themselves once they move, therefore no further action was required.

2.3 Noise and Vibration Monitoring

2.3.1 Background

The Main Works Construction Noise and Vibration Impact Statement (CNVIS) is regularly reviewed to ensure it captures all works being undertaken prior to works commencing. **Table 2-4** outlines the CNVIS developed during the reporting period. The current CNVIS is provided on the project website at https://pittstreetsydneymetroisd.com.au.

Table 2-4 CNVIS' developed and approved during the reporting period.

CNVIS*	Details
CNVIS – Station Box Main Works	01/04/2021 – Revision 5 issued to Sydney Metro
CNVIS – Station Box Main Works	08/04/2021 – Revision 6 issued to Sydney Metro
CNVIS – Station Box Main Works	28/04/2021 – Revision 7 issued to Sydney Metro
CNVIS – Station Box Main Works	30/04/2021 – Revision 8 issued to Sydney Metro
CNVIS – Station Box Main Works	04/05/2021 – Revision 9 issued to Sydney Metro endorsed by AA on 07/05/2021
CNVIS – Station Box Main Works	28/06/2021 – Revision 10 issued to Sydney Metro endorsed by AA on 29/06/2021

* Rev 5 to Rev 8 were updates working towards the endorsement of Rev 9.

Out of Hours works were conducted during the reporting period in accordance with the Sydney Metro Out of Hours Protocol and subsequent approved Out of Hours Works Applications (OOHWA).

2.3.2 Noise and Vibration Criteria

Relevant criteria relating to noise and vibration are outlined in the PSISD Construction Noise and Vibration Management Sub Plan and respective CNVIS. These are outlined in **Table 2-5**.

Table 2-5 Construction noise management levels at receivers[1, 2]

Receiver type	Time of Day[2]	EIS Chapter 10 Requirements				CSSI Approval Requirements	
		ICNG*	Ground Bourne Noise	Sleep Disturbance	Construction Traffic	Condition E37[3]	Condition E41[4]
Pitt Street South							
Residential	Day (Standard – 7am-6pm)	74dB(A)$L_{eq15min}$) 75dB(A)$L_{eq15min}$) – Highly Noise Affected Threshold	45dB(A)L_{eq} 5min) (internal noise level)	N/A	60dB(A)$L_{eq(15hr)}$	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**	N/A
	Day (OOH)***	69dB(A)$L_{eq15min)}$	45dB(A)L_{eq} 5min) (internal noise level)	N/A	60dB(A)$L_{eq(15hr)}$	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**	N/A
	Evening (OOH)	66dB(A)$L_{eq15min)}$	40dB(A)L_{eq} 5min) (internal noise level)	N/A	60dB(A)$L_{eq(15hr)}$	N/A	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**
	Night (OOH)	63dB(A)$L_{eq15min)}$	35dB(A)L_{eq1} 5min) (internal noise level)	65dB(A)L_{max} (external noise level)	55dB(A)$L_{eq(15hr)}$	N/A	45dB(A)$L_{eq(15Min)}$ (internal noise level)

							65dB(A)$L_{eq(15Min)}$ (external noise level)**
Commercial	When in use	70dB(A)$L_{eq15min)}$	N/A	N/A	N/A	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**	N/A
Pitt Street North							
Residential	Day (Standard – 7am-6pm)	73dB(A)$L_{eq15min)}$ (weekdays) 75dB(A) – Highly Noise Affected Threshold	45dB(A)L_{eq} [1] $_{5min)}$ (internal noise level)	N/A	60dB(A)$L_{eq(15hr)}$	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**	N/A
	Day (OOH)***	68dB(A)$L_{eq15min)}$	45dB(A)L_{eq} [1] $_{5min)}$ (internal noise level)	N/A	60dB(A)$L_{eq(15hr)}$	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**	N/A
	Evening	66dB(A)$L_{eq15min)}$	40dB(A)L_{eq} [1] $_{5min)}$ (internal noise level)	N/A	60dB(A)$L_{eq(15hr)}$	N/A	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**
	Night	64dB(A)$L_{eq15min)}$	35dB(A)L_{eq} [1] $_{5min)}$ (internal noise level)	65dB(A)L_{max} (external noise level)	55dB(A)$L_{eq(15hr)}$	N/A	45dB(A)$L_{eq(15Min)}$ (internal noise level) 65dB(A)$L_{eq(15Min)}$ (external noise level)**
Commercial	When in use	70dB(A)$L_{eq15min)}$	N/A	N/A	N/A	60dB(A)$L_{eq(15Min)}$ (internal noise level) 80dB(A)$L_{eq(15Min)}$ (external noise level)**	N/A

* ICNG noise management levels for residential receivers based on the background noise levels presented in Section 4.

**External noise target determined by assuming a 20dB(A) noise reduction between outside and inside (closed windows).

1. Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level unless stated otherwise. .
2. Noise management levels apply when receiver areas are in use only.
3. Exceedance of this level triggers the need for consideration of respite periods as per Condition of Approval E38.
4. Exceedance of this level triggers the need to consider additional mitigation methods as detailed in *Sydney Metro City and South West Noise and Vibration Strategy*

As a conservative approach, and in accordance with *British Standard BS 7385-2*, the vibration screening criteria has been applied to buildings at Pitt Street:

- Screening criteria – 2.5 mm/s (Peak Particle Velocity (PPV))

2.3.3 Attended Monitoring Methodology

Attended noise monitoring was undertaken during this reporting period with details provided in Section 2.3.4.

Attended monitoring will also be undertaken when required for OOH works and complaints.

All attended short-term noise monitoring was recorded over 15-minute sample intervals at the closest affected sensitive receiver. The recordings were taken from a height of 1.2 m from the ground, at least 1m from the walls or other major reflecting surfaces. The noise monitor was paused when there were high levels of traffic and pedestrian movement.

No attended vibration monitoring was required in this reporting period.

Table 2-6 CNVIS Requirements

Plan	Requirements
CNVIS - Section 7.2	In the event that use of hydraulic hammers or vibratory rollers is required, vibration monitoring will be conducted a receivers R1 and R3 in addition to those detailed above. Given these buildings are not heritage buildings, this can potentially be done in the event of complaint by occupants or by attended vibration measurement.

2.3.4 Attended Monitoring Results

Attended noise monitoring results during the reporting period are provided in Table 2-7 below and photos of monitoring can be seen in Appendix C. No attended vibration monitoring was undertaken during the monitoring period.

Table 2-7 Attended Noise Monitoring Data

Monitoring Location	Date	Time	Receiver Type	Measured Value L_{Aeq} (15min)	Predicted Value (dBA) from CNVIS	Work Activity	Comments
R1	13/04/21	8:52	Residential	82.4	90[1]	Hammering	ISD Compliant Supplementary attended monitoring due to complaint
R1	13/04/21	9:09	Residential	84.5	90[1]	Hammering	ISD Compliant
R1	13/04/21	9:24	Residential	83.2	90[1]	Saw cutting	ISD Compliant
R1	13/04/21	9:56	Residential	74	80[1]	Crane	ISD Compliant
R1	13/04/21	10:11	Residential	76.8	80[1]	Crane	ISD Compliant
R4	29/04/21	15:20	Residential	46.7	95[1]	Hammering & Saw cutting	ISD Compliant Supplementary attended monitoring due to complaint
R4	30/04/2021	11:55	Residential	50.2	95[1]	Hammering & Saw cutting	ISD Compliant Supplementary attended monitoring due to complaint
R4	30/04/2021	11:37	Residential	83.5	95[1]	Hammering & Saw cutting	ISD Compliant Supplementary attended monitoring due to complaint
R4	30/04/2021	12:13	Residential	67.5	95[1]	Hammering & Saw cutting	ISD Compliant Supplementary attended monitoring due to complaint
R4	30/04/2021	11:38	Residential	64.2	95[1]	Hammering & Saw cutting	ISD Compliant

Monitoring Location	Date	Time	Receiver Type	Measured Value L_{Aeq} (15min)	Predicted Value (dBA) from CNVIS	Work Activity	Comments
							Supplementary attended monitoring due to complaint
R4	4/05/2021	9:22	Site	68	80[2]	Rattle Gun	ISD Compliant Supplementary attended monitoring to verify noise levels
C5	4/05/2021	14:24	Commercial	65.6	85[2]	Hammering & Saw cutting	ISD Compliant Supplementary attended monitoring to verify noise levels
R5	19/05/2021	11:34	Residential	44.7	85[2]	Hammering & Saw cutting	ISD Compliant Supplementary attended monitoring due to complaint

[1]Predicted value as per CNVIS r4

[2]Predicted value as per CNVIS r9

2.3.5 Real-Time Monitoring Methodology

Real-time noise and vibration monitoring equipment has been maintained and monitored by Acoustic Consultants Renzo Tonin since November 2020. The real-time links to the monitoring data have been submitted to Sydney Metro, DPIE and EPA and all records stored. Locations of these monitors are depicted in **Figure 2-1**. It is noted that the noise monitoring locations are measuring external noise levels, and not internal noise levels. The noise and vibration consultant have provided advice to CPB that a 25 dB(A) (for the North) and 20dB(A) (for the South) noise reduction between the external noise level and internal noise level has been determined following on-site outside/inside noise level measurements. This has been adopted by the project in assessing performance against the CoA E38 as approved in the CNVMP.

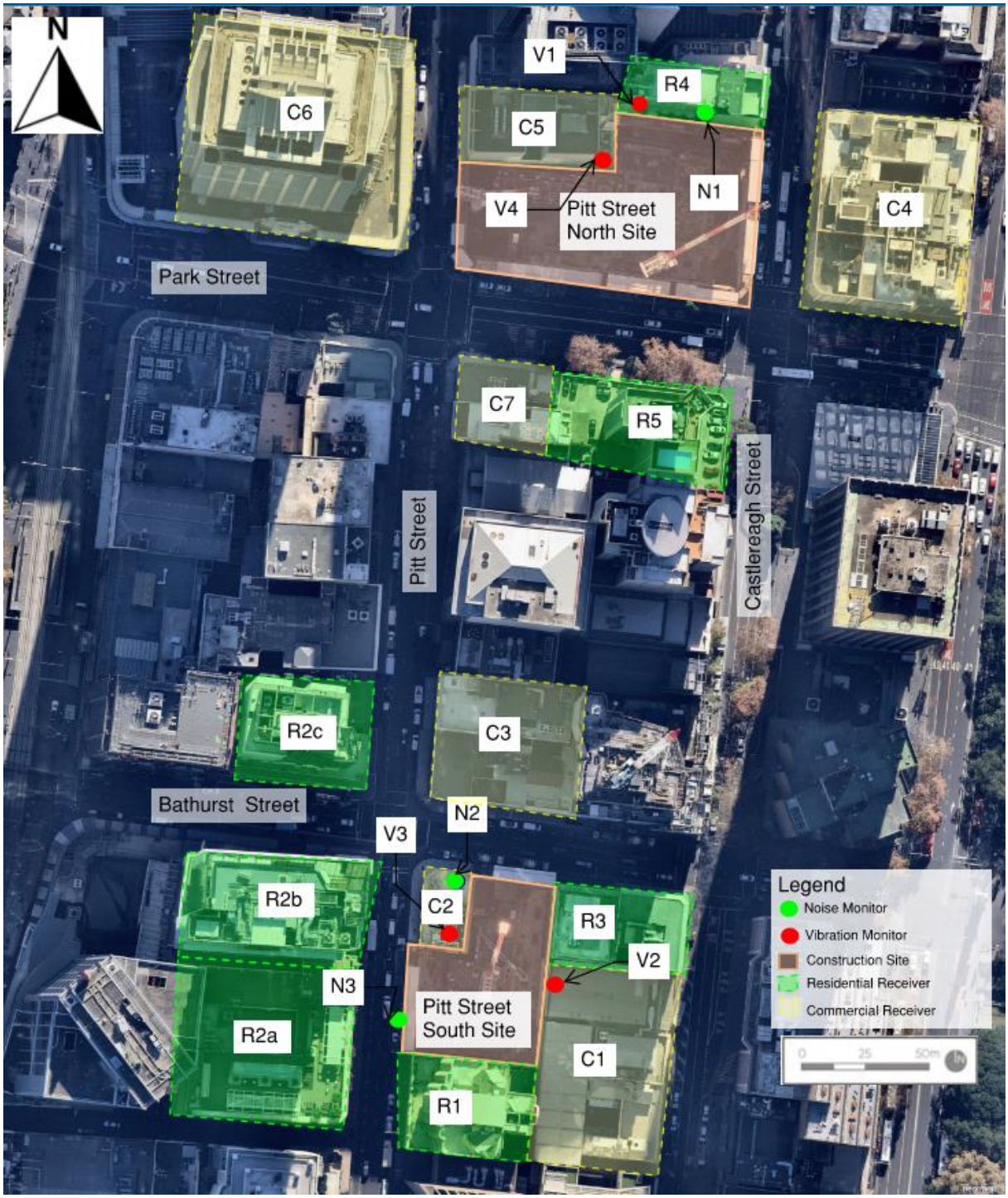

Figure 2-1 Pitt Street Station real time monitoring locations during reporting period.

Condition E28 of the CSSI 15_7400 requires that *vibration from construction activities does not exceed the vibration limits set out in the British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings: Guide to damage levels from groundborne vibration* which was interpreted in the CNVIS to set a limit of 2.5 mm/s peak component particle velocity as a conservative approach for the project.

Condition E38 of the CSSI 15_7400 requires that internal noise levels be less than L_{eq}(15 minute) 60 dB(A) for at least 6.5 hours between 7am and 8pm (Upper Limit), of which at least 3.25 hours must be below L_{aeq}(15 minute) 55 dB(A) (Lower Limit). Within these hours, works are 'permitted' to generate noise greater than 60dB(A) for up to 6.5 hours (the equivalent of 26x15 minute periods), and 'requires' 3.25 hours of noise generated to be less than 55dB(A) (the equivalent of 13x15 minute periods). A SMS/Email alert system has been set up to notify the project team that CoA E38 limits are approaching. Following receipt of an SMS / Email, site activities are reviewed and works with high

noise are ceased. Compliance during the reporting period with this condition are shown below in **Tables 2-10, 2-11 and 2-12.**

The equipment used for noise measurements was an NTi Audio Type XL2 precision sound level analyser which is a class 1 instrument having accuracy suitable for field and laboratory use. The instrument was calibrated prior and subsequent to measurements using a Bruel & Kjaer Type 4231 calibrator. No significant drift in calibration was observed. All instrumentation complies with IEC 61672 (parts 1-3) '*Electroacoustics - Sound Level Meters*' and IEC 60942 *'Electroacoustics - Sound calibrators'* and carries current NATA certification (or if less than 2 years old, manufacturers certification). **Table 2-8** outlines the noise and vibration monitoring equipment that has been used during the reporting period.

Photos of the real -time equipment are shown in **Appendix B** and calibration certificates for the equipment in Table 2-8 can be seen in **Appendix D.**

Table 2-8 Monitoring Equipment Details

Monitoring Type / Location	Equipment Details	Serial Number	Last Calibration Date
Attended Noise	Rion NL-20	00143337	29/01/2021
Noise calibrator	Pulsar Model 106	93277	29/01/2021
Real Time Noise – N1	NTi Audio Type XL2	RTA07-020	22/01/2020
Real Time Noise – N2	NTi Audio Type XL2	RTA07-022	20/12/2019
Real Time Noise – N3	NTi Audio Type XL2	RTA07-021	20/12/2019
Real Time Vibration – V1	Sigicom C12	70190	25/02/2021
Real Time Vibration – V2	Sigicom C12	70250	25/02/2021
Real Time Vibration – V3	Sigicom C12	70130	25/02/2021
Real Time Vibration – V4	Sigicom C12	61860	01/12/2020

2.3.6 Real-Time Monitoring Results

Real-time noise and vibration monitors were operating at Pitt Street North and Pitt Street South during the reporting period. Summarised real-time noise monitoring results outlining compliance with CoA E38 are presented for the North site in **Table 2-9** and for the South site in **Tables 2-10 and 2-11**.

Figures 2-2 to 2-4 below illustrates a sample of the unattended noise monitoring results obtained during the reporting period.

Table 2-9 Condition E38 Compliance North Site (Pitt Street)

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
Pitt Street (North)	1/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	2/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	3/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	4/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	5/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	6/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	7/04/2021	7am	8pm	13	10.25	Yes	Yes
Pitt Street (North)	8/04/2021	7am	8pm	13	12.5	Yes	Yes
Pitt Street (North)	9/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	10/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	11/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	12/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	13/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	14/04/2021	7am	8pm	13	12.5	Yes	Yes
Pitt Street (North)	15/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	16/04/2021	7am	8pm	13	12.75	Yes	Yes
Pitt Street (North)	17/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	18/04/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
Pitt Street (North)	19/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	20/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	21/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	22/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	23/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	24/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	25/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	26/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	27/04/2021	7am	8pm	11	9.25	Yes	Yes
Pitt Street (North)	28/04/2021	7am	8pm	12.5	7.5	Yes	Yes
Pitt Street (North)	29/04/2021	7am	8pm	12.75	9.25	Yes	Yes
Pitt Street (North)	30/04/2021	7am	8pm	11.25	7.75	Yes	Yes
Pitt Street (North)	26/04/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	27/04/2021	7am	8pm	11	9.25	Yes	Yes
Pitt Street (North)	28/04/2021	7am	8pm	12.5	7.5	Yes	Yes
Pitt Street (North)	29/04/2021	7am	8pm	12.75	9.25	Yes	Yes
Pitt Street (North)	30/04/2021	7am	8pm	11.25	7.75	Yes	Yes
Pitt Street (North)	1/05/2021	7am	8pm	13	11.75	Yes	Yes
Pitt Street (North)	2/05/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
Pitt Street (North)	3/05/2021	7am	8pm	10	6.75	Yes	Yes
Pitt Street (North)	4/05/2021	7am	8pm	13	9.75	Yes	Yes
Pitt Street (North)	5/05/2021	7am	8pm	13	12.75	Yes	Yes
Pitt Street (North)	6/05/2021	7am	8pm	12.25	9.75	Yes	Yes
Pitt Street (North)	7/05/2021	7am	8pm	12.5	9.5	Yes	Yes
Pitt Street (North)	8/05/2021	7am	8pm	13	11.25	Yes	Yes
Pitt Street (North)	9/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	10/05/2021	7am	8pm	13	10.5	Yes	Yes
Pitt Street (North)	11/05/2021	7am	8pm	13	9.75	Yes	Yes
Pitt Street (North)	12/05/2021	7am	8pm	13	12	Yes	Yes
Pitt Street (North)	13/05/2021	7am	8pm	13	9.5	Yes	Yes
Pitt Street (North)	14/05/2021	7am	8pm	13	12	Yes	Yes
Pitt Street (North)	15/05/2021	7am	8pm	13	10.25	Yes	Yes
Pitt Street (North)	16/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	17/05/2021	7am	8pm	13	12	Yes	Yes
Pitt Street (North)	18/05/2021	7am	8pm	13	9	Yes	Yes
Pitt Street (North)	19/05/2021	7am	8pm	13	10.25	Yes	Yes
Pitt Street (North)	20/05/2021	7am	8pm	13	11	Yes	Yes
Pitt Street (North)	21/05/2021	7am	8pm	13	11.75	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
Pitt Street (North)	22/05/2021	7am	8pm	13	11.75	Yes	Yes
Pitt Street (North)	23/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	24/05/2021	7am	8pm	13	12	Yes	Yes
Pitt Street (North)	25/05/2021	7am	8pm	13	11.75	Yes	Yes
Pitt Street (North)	26/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	27/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	28/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	29/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	30/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	31/05/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	1/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	2/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	3/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	4/06/2021	7am	8pm	13	12.5	Yes	Yes
Pitt Street (North)	5/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	6/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	7/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	8/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	9/06/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
Pitt Street (North)	10/06/2021	7am	8pm	13	12.75	Yes	Yes
Pitt Street (North)	11/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	12/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	13/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	14/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	15/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	16/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	17/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	18/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	19/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	20/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	21/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	22/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	23/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	24/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	25/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	26/06/2021	7am	8pm	13	12.75	Yes	Yes
Pitt Street (North)	27/06/2021	7am	8pm	13	13	Yes	Yes
Pitt Street (North)	28/06/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
Pitt Street (North)	29/06/2021	7am	8pm	13	12	Yes	Yes
Pitt Street (North)	30/06/2021	7am	8pm	13	12.5	Yes	Yes

Table 2-10 Condition E38 Compliance South Site (Bathurst Street)

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	1/04/2021	7am	8pm	13	12.5	Yes	Yes
South Site (Bathurst Street)	2/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	3/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	4/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	5/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	6/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	7/04/2021	7am	8pm	13	11.25	Yes	Yes
South Site (Bathurst Street)	8/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	9/04/2021	7am	8pm	13	9.25	Yes	Yes
South Site (Bathurst Street)	10/04/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	11/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	12/04/2021	7am	8pm	13	9	Yes	Yes
South Site (Bathurst Street)	13/04/2021	7am	8pm	13	11.5	Yes	Yes
South Site (Bathurst Street)	14/04/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	15/04/2021	7am	8pm	13	12.25	Yes	Yes
South Site (Bathurst Street)	16/04/2021	7am	8pm	13	12	Yes	Yes
South Site (Bathurst Street)	17/04/2021	7am	8pm	13	11.5	Yes	Yes
South Site (Bathurst Street)	18/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	19/04/2021	7am	8pm	13	11.5	Yes	Yes
South Site (Bathurst Street)	20/04/2021	7am	8pm	13	11	Yes	Yes
South Site (Bathurst Street)	21/04/2021	7am	8pm	13	9.75	Yes	Yes
South Site (Bathurst Street)	22/04/2021	7am	8pm	13	12.25	Yes	Yes
South Site (Bathurst Street)	23/04/2021	7am	8pm	13	12.75	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	24/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	25/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	26/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	27/04/2021	7am	8pm	13	11	Yes	Yes
South Site (Bathurst Street)	28/04/2021	7am	8pm	13	11.75	Yes	Yes
South Site (Bathurst Street)	29/04/2021	7am	8pm	13	10.75	Yes	Yes
South Site (Bathurst Street)	30/04/2021	7am	8pm	13	11.75	Yes	Yes
South Site (Bathurst Street)	1/05/2021	7am	8pm	11.75	9	Yes	Yes
South Site (Bathurst Street)	2/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	3/05/2021	7am	8pm	6.75	4	Yes	Yes
South Site (Bathurst Street)	4/05/2021	7am	8pm	9.75	6.5	Yes	Yes
South Site (Bathurst Street)	5/05/2021	7am	8pm	12.75	7.75	Yes	Yes
South Site (Bathurst Street)	6/05/2021	7am	8pm	13	11.5	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	7/05/2021	7am	8pm	13	12.5	Yes	Yes
South Site (Bathurst Street)	8/05/2021	7am	8pm	13	11.25	Yes	Yes
South Site (Bathurst Street)	9/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	10/05/2021	7am	8pm	13	11.5	Yes	Yes
South Site (Bathurst Street)	11/05/2021	7am	8pm	13	11.25	Yes	Yes
South Site (Bathurst Street)	12/05/2021	7am	8pm	13	9.75	Yes	Yes
South Site (Bathurst Street)	13/05/2021	7am	8pm	13	11.25	Yes	Yes
South Site (Bathurst Street)	14/05/2021	7am	8pm	13	12.25	Yes	Yes
South Site (Bathurst Street)	15/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	16/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	17/05/2021	7am	8pm	13	11	Yes	Yes
South Site (Bathurst Street)	18/05/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	19/05/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	20/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	21/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	22/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	23/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	24/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	25/05/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	26/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	27/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	28/05/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	29/05/2021	7am	8pm	13	12.5	Yes	Yes
South Site (Bathurst Street)	30/05/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	31/05/2021	7am	8pm	13	10.5	Yes	Yes
South Site (Bathurst Street)	29/05/2021	7am	8pm	13	12.5	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	30/05/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	31/05/2021	7am	8pm	13	10.5	Yes	Yes
South Site (Bathurst Street)	1/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	2/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	3/06/2021	7am	8pm	13	12.75	Yes	Yes
South Site (Bathurst Street)	4/06/2021	7am	8pm	13	12	Yes	Yes
South Site (Bathurst Street)	5/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	6/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	7/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	8/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	9/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	10/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	11/06/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	12/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	13/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	14/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	15/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	16/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	17/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	18/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	19/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	20/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	21/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	22/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	23/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	24/06/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Bathurst Street)	25/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	26/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	27/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	28/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	29/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Bathurst Street)	30/06/2021	7am	8pm	13	13	Yes	Yes

Table 2-11 Condition E38 Compliance South Site (Pitt Street)

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	1/04/2021	7am	8pm	11.5	7.25	Yes	Yes
South Site (Pitt Street)	2/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	3/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	4/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	5/04/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	6/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	7/04/2021	7am	8pm	10.25	6.25	Yes	Yes
South Site (Pitt Street)	8/04/2021	7am	8pm	12	8.75	Yes	Yes
South Site (Pitt Street)	9/04/2021	7am	8pm	8.25	6.75	Yes	Yes
South Site (Pitt Street)	10/04/2021	7am	8pm	12	11.75	Yes	Yes
South Site (Pitt Street)	11/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	12/04/2021	7am	8pm	7	5.5	Yes	Yes
South Site (Pitt Street)	13/04/2021	7am	8pm	11.75	6.75	Yes	Yes
South Site (Pitt Street)	14/04/2021	7am	8pm	10.75	5.25	Yes	Yes
South Site (Pitt Street)	15/04/2021	7am	8pm	10.75	5.25	Yes	Yes
South Site (Pitt Street)	16/04/2021	7am	8pm	10.5	7.25	Yes	Yes
South Site (Pitt Street)	17/04/2021	7am	8pm	10.50	9	Yes	Yes
South Site (Pitt Street)	18/04/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	19/04/2021	7am	8pm	9	6.75	Yes	Yes
South Site (Pitt Street)	20/04/2021	7am	8pm	9	7.5	Yes	Yes
South Site (Pitt Street)	21/04/2021	7am	8pm	8.5	7.5	Yes	Yes
South Site (Pitt Street)	22/04/2021	7am	8pm	11.25	7.5	Yes	Yes
South Site (Pitt Street)	18/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	19/04/2021	7am	8pm	9	6.75	Yes	Yes
South Site (Pitt Street)	20/04/2021	7am	8pm	9	7.5	Yes	Yes
South Site (Pitt Street)	21/04/2021	7am	8pm	8.5	7.5	Yes	Yes
South Site (Pitt Street)	22/04/2021	7am	8pm	11.25	7.5	Yes	Yes
South Site (Pitt Street)	23/04/2021	7am	8pm	9.5	4.5	Yes	Yes
South Site (Pitt Street)	24/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	25/04/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	26/04/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	27/04/2021	7am	8pm	6.75	5	Yes	Yes
South Site (Pitt Street)	28/04/2021	7am	8pm	7.25	5.5	Yes	Yes
South Site (Pitt Street)	29/04/2021	7am	8pm	7.75	5	Yes	Yes
South Site (Pitt Street)	30/04/2021	7am	8pm	11	6	Yes	Yes
South Site (Pitt Street)	1/05/2021	7am	8pm	11.75	7.75	Yes	Yes
South Site (Pitt Street)	2/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	3/05/2021	7am	8pm	11.75	7	Yes	Yes
South Site (Pitt Street)	4/05/2021	7am	8pm	10.25	7.25	Yes	Yes
South Site (Pitt Street)	5/05/2021	7am	8pm	12.5	7.75	Yes	Yes
South Site (Pitt Street)	6/05/2021	7am	8pm	9.25	8.75	Yes	Yes
South Site (Pitt Street)	7/05/2021	7am	8pm	11	7.75	Yes	Yes
South Site (Pitt Street)	8/05/2021	7am	8pm	11.75	8.5	Yes	Yes
South Site (Pitt Street)	9/05/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	10/05/2021	7am	8pm	11	4.5	Yes	Yes
South Site (Pitt Street)	11/05/2021	7am	8pm	10.5	6.5	Yes	Yes
South Site (Pitt Street)	12/05/2021	7am	8pm	8	4.25	Yes	Yes
South Site (Pitt Street)	13/05/2021	7am	8pm	9	6.25	Yes	Yes
South Site (Pitt Street)	14/05/2021	7am	8pm	12.5	7.5	Yes	Yes
South Site (Pitt Street)	15/05/2021	7am	8pm	13	8.25	Yes	Yes
South Site (Pitt Street)	16/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	17/05/2021	7am	8pm	12.5	8.25	Yes	Yes
South Site (Pitt Street)	18/05/2021	7am	8pm	12.75	8.25	Yes	Yes
South Site (Pitt Street)	19/05/2021	7am	8pm	13	11.25	Yes	Yes
South Site (Pitt Street)	20/05/2021	7am	8pm	13	12.25	Yes	Yes
South Site (Pitt Street)	21/05/2021	7am	8pm	13	9	Yes	Yes
South Site (Pitt Street)	22/05/2021	7am	8pm	13	13	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	23/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	24/05/2021	7am	8pm	13	9.25	Yes	Yes
South Site (Pitt Street)	25/05/2021	7am	8pm	12.75	10.25	Yes	Yes
South Site (Pitt Street)	26/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	27/05/2021	7am	8pm	12.75	10	Yes	Yes
South Site (Pitt Street)	28/05/2021	7am	8pm	13	10.25	Yes	Yes
South Site (Pitt Street)	29/05/2021	7am	8pm	9.5	6.5	Yes	Yes
South Site (Pitt Street)	30/05/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	31/05/2021	7am	8pm	10.25	7.25	Yes	Yes
South Site (Pitt Street)	1/06/2021	7am	8pm	13	9.25	Yes	Yes
South Site (Pitt Street)	2/06/2021	7am	8pm	13	7.25	Yes	Yes
South Site (Pitt Street)	3/06/2021	7am	8pm	12	9.75	Yes	Yes
South Site (Pitt Street)	4/06/2021	7am	8pm	11	7.75	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	5/06/2021	7am	8pm	13	9.5	Yes	Yes
South Site (Pitt Street)	6/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	7/06/2021	7am	8pm	13	9.5	Yes	Yes
South Site (Pitt Street)	8/06/2021	7am	8pm	13	7.25	Yes	Yes
South Site (Pitt Street)	9/06/2021	7am	8pm	13	9	Yes	Yes
South Site (Pitt Street)	10/06/2021	7am	8pm	13	11	Yes	Yes
South Site (Pitt Street)	11/06/2021	7am	8pm	13	8.75	Yes	Yes
South Site (Pitt Street)	12/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	13/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	14/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	15/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	16/06/2021	7am	8pm	13	11.5	Yes	Yes
South Site (Pitt Street)	17/06/2021	7am	8pm	12.75	7	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	18/06/2021	7am	8pm	13	8.5	Yes	Yes
South Site (Pitt Street)	19/06/2021	7am	8pm	13	11	Yes	Yes
South Site (Pitt Street)	20/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	21/06/2021	7am	8pm	13	10	Yes	Yes
South Site (Pitt Street)	22/06/2021	7am	8pm	13	10	Yes	Yes
South Site (Pitt Street)	23/06/2021	7am	8pm	13	9.75	Yes	Yes
South Site (Pitt Street)	24/06/2021	7am	8pm	13	6.75	Yes	Yes
South Site (Pitt Street)	25/06/2021	7am	8pm	13	7	Yes	Yes
South Site (Pitt Street)	26/06/2021	7am	8pm	13	8.75	Yes	Yes
South Site (Pitt Street)	27/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	28/06/2021	7am	8pm	13	9.5	Yes	Yes
South Site (Pitt Street)	29/06/2021	7am	8pm	13	10.5	Yes	Yes
South Site (Pitt Street)	30/06/2021	7am	8pm	13	6.5	Yes	Yes

Monitoring Location (Address)	Monitoring Date	Start Time	End Time	Period below 60 $L_{eq(15minute)}$ dB(A) - (Hours)	Period below 55 $L_{eq(15minute)}$ dB(A) - (Hours)	Min 6.5 hrs below 60dB(A)$L_{eq(15min)}$	Min 3.25 hrs below 55dB(A)$L_{eq(15min}$
South Site (Pitt Street)	23/06/2021	7am	8pm	13	9.75	Yes	Yes
South Site (Pitt Street)	24/06/2021	7am	8pm	13	6.75	Yes	Yes
South Site (Pitt Street)	25/06/2021	7am	8pm	13	7	Yes	Yes
South Site (Pitt Street)	26/06/2021	7am	8pm	13	8.75	Yes	Yes
South Site (Pitt Street)	27/06/2021	7am	8pm	13	13	Yes	Yes
South Site (Pitt Street)	28/06/2021	7am	8pm	13	9.5	Yes	Yes
South Site (Pitt Street)	29/06/2021	7am	8pm	13	10.5	Yes	Yes
South Site (Pitt Street)	30/06/2021	7am	8pm	13	6.5	Yes	Yes
South Site (Pitt Street)	28/06/2021	7am	8pm	13	9.5	Yes	Yes

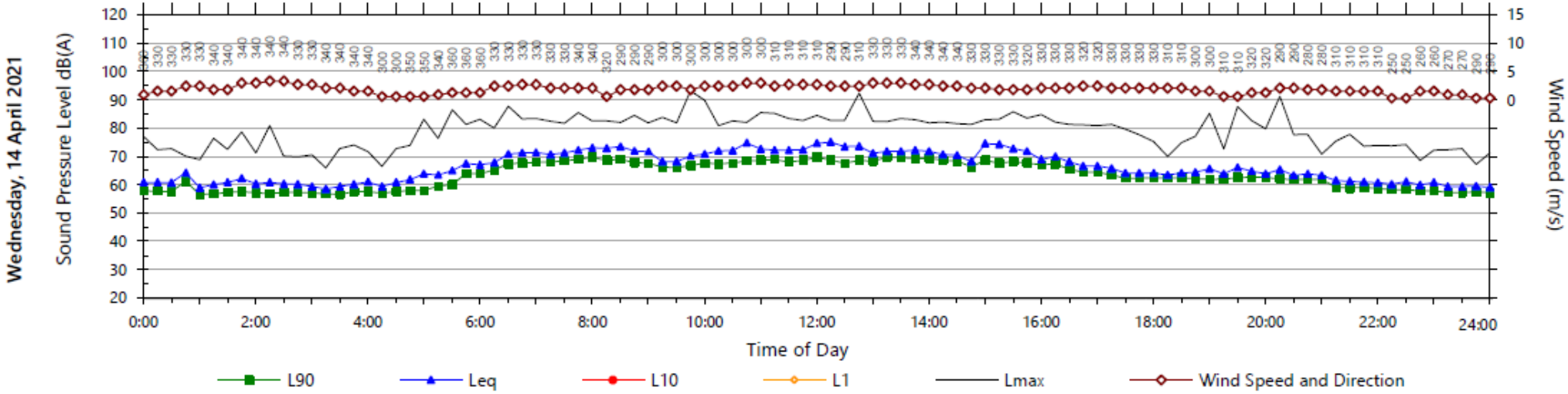

Figure 2-2 Unattended noise monitoring at Pitt Street South

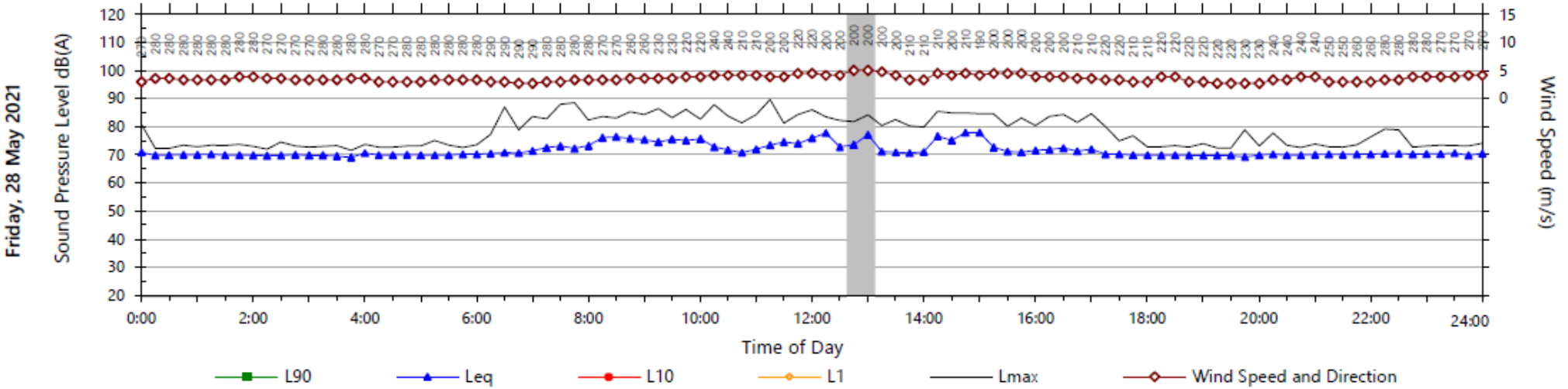

Figure 2-3 Unattended noise monitoring at Pitt Street South

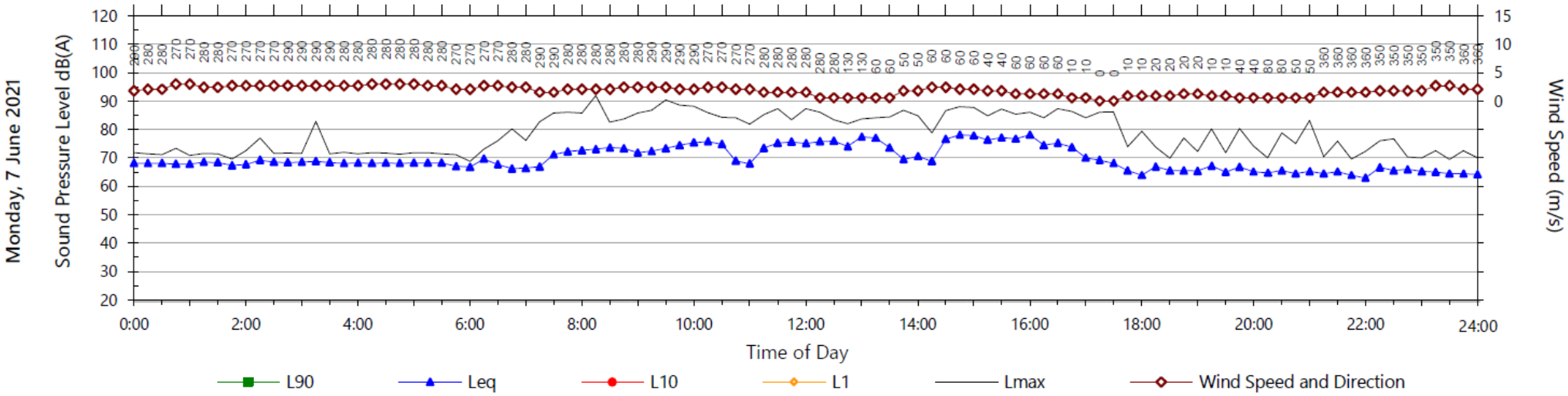

Figure 2-4 Unattended noise monitoring at Pitt Street North

Noise levels in this reporting period were generally compliant with the predicted noise levels set out in the CNVIS. As indicated in **Tables 2-9 to 2-11**, compliance with condition E38 has been achieved during the reporting period.

It is noted that the Pitt Street noise monitor (N3) lost connection from 12 April 22:00 to 13 April 09:30. There were no noise exceedances recorded from the Bathurst Street monitor during the Pitt Street monitor outage period. Investigation into the cause found that this was because of the noise monitor being unplugged.

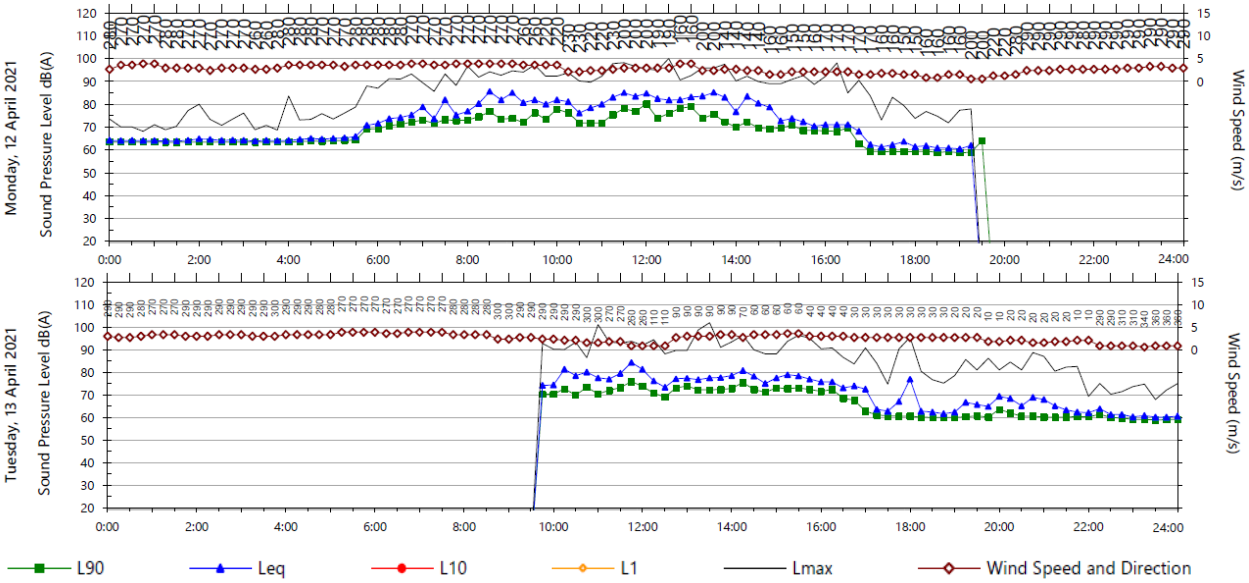

Figure 2-5 Unattended noise monitoring at Pitt Street N3 following the loss of connection on 12-13 April 2021

Nine (9) exceedances of the relevant vibration criteria were recorded during the reporting period as detailed below in **Table 2-12**. None of these exceedances are linked to PSISD works. No building damage has been observed to be the result of any PSISD works.

Monthly vibration monitoring results over the reporting period are presented below in **Figures 2-6 to 2-17** for each of the four (4) monitoring sites. It is noted the graphs show the unweighted results.

Table 2-12 Real-Time Vibration Data Exceedances

Date	Location	Recorded Vibration (mm/s)	Screening level (mm/s)	Investigation Results
09/04/2021	Castlereagh Boutique Hotel	5.34mm/s (14:00)	2.5 mm/s	During the vibration exceedance at the Boutique Hotel, the corresponding vibration levels measured at the 250 Pitt Street are less than 0.2mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within proximity to each other (approximately 24m) it is expected that noticeable vibration levels should have been measured at the 250 Pitt Street. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration level at 250 Pitt Street and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
28/04/2021	250 Pitt Street	6.8 mm/s (09:17) 8.15 mm/s	2.5 mm/s	During the vibration exceedances at the 250 Pitt Street, the corresponding vibration levels measured at the Boutique Hotel are typically less than 1mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that higher

Date	Location	Recorded Vibration (mm/s)	Screening level (mm/s)	Investigation Results
		(09:18) 31.07 (09:28)		levels of vibration should have been measured at the Boutique Hotel. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration level at Boutique Hotel and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
29/04/2021	250 Pitt Street	19.23 mm/s (12:15)	2.5 mm/s	During the vibration exceedance at the 250 Pitt Street, the corresponding vibration levels measured at the Boutique Hotel are approximately 0.5mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that a noticeable vibration event should have been measured at the Boutique Hotel. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration event at Boutique Hotel and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
07/05/2021	250 Pitt Street	72.65 mm/s (12:50)	2.5 mm/s	During the vibration exceedance at the 250 Pitt Street, the corresponding vibration levels measured at the Boutique Hotel are typically below 1.5mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that a noticeable vibration event should have been measured at the Boutique Hotel, especially since the level measured at 250 Pitt Street was significantly high. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration event at Boutique Hotel and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
25/05/2021	Castlereagh Boutique Hotel	3.48 mm/s (11:42)	2.5 mm/s	During the vibration exceedance at the Boutique Hotel, the corresponding vibration levels measured at the 250 Pitt Street are less than 0.4mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that noticeable vibration levels should have been measured at the 250 Pitt Street. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration level at 250 Pitt Street and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
07/06/2021	Castlereagh Boutique Hotel	4.50 mm/s (13:58)	2.5 mm/s	During the vibration exceedance at the Boutique Hotel, the corresponding vibration levels measured at the 250 Pitt Street are less than 0.4mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that noticeable vibration levels should have been measured at the 250 Pitt Street. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration level at 250 Pitt Street and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped.

Date	Location	Recorded Vibration (mm/s)	Screening level (mm/s)	Investigation Results
				The vibration exceedance is not due PSISD construction works.
11/06/2021	250 Pitt Street	45.8 mm/s (16:37)	2.5 mm/s	During the vibration exceedance at the 250 Pitt Street, the corresponding vibration levels measured at the Boutique Hotel are typically below 1.5mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that a noticeable vibration event should have been measured at the Boutique Hotel, especially since the level measured at 250 Pitt Street was significantly high. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration event at Boutique Hotel and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
16/06/2021	250 Pitt Street	5.25 mm/s (18:36)	2.5 mm/s	During the vibration exceedance at the 250 Pitt Street, the corresponding vibration levels measured at the Boutique Hotel are typically below 1.5mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that a noticeable vibration event should have been measured at the Boutique Hotel, especially since the level measured at 250 Pitt Street was significantly high. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration event at Boutique Hotel and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**
29/06/2021	250 Pitt Street	5.70 mm/s (12:59)	2.5 mm/s	During the vibration exceedance at the 250 Pitt Street, the corresponding vibration levels measured at the Boutique Hotel are typically below 1.5mm/s. Given that the vibration monitors at the Boutique Hotel and 250 Pitt Street are within close proximity to each other (approximately 24m) it is expected that a noticeable vibration event should have been measured at the Boutique Hotel, especially since the level measured at 250 Pitt Street was significantly high. Furthermore, a singular peak event in vibration is not typical for construction works. Given that there is not a noticeable corresponding vibration event at Boutique Hotel and the atypical nature of the exceedance, it is expected that the vibration exceedance is due to a localised event such as the equipment being bumped. **The vibration exceedance is not due PSISD construction works.**

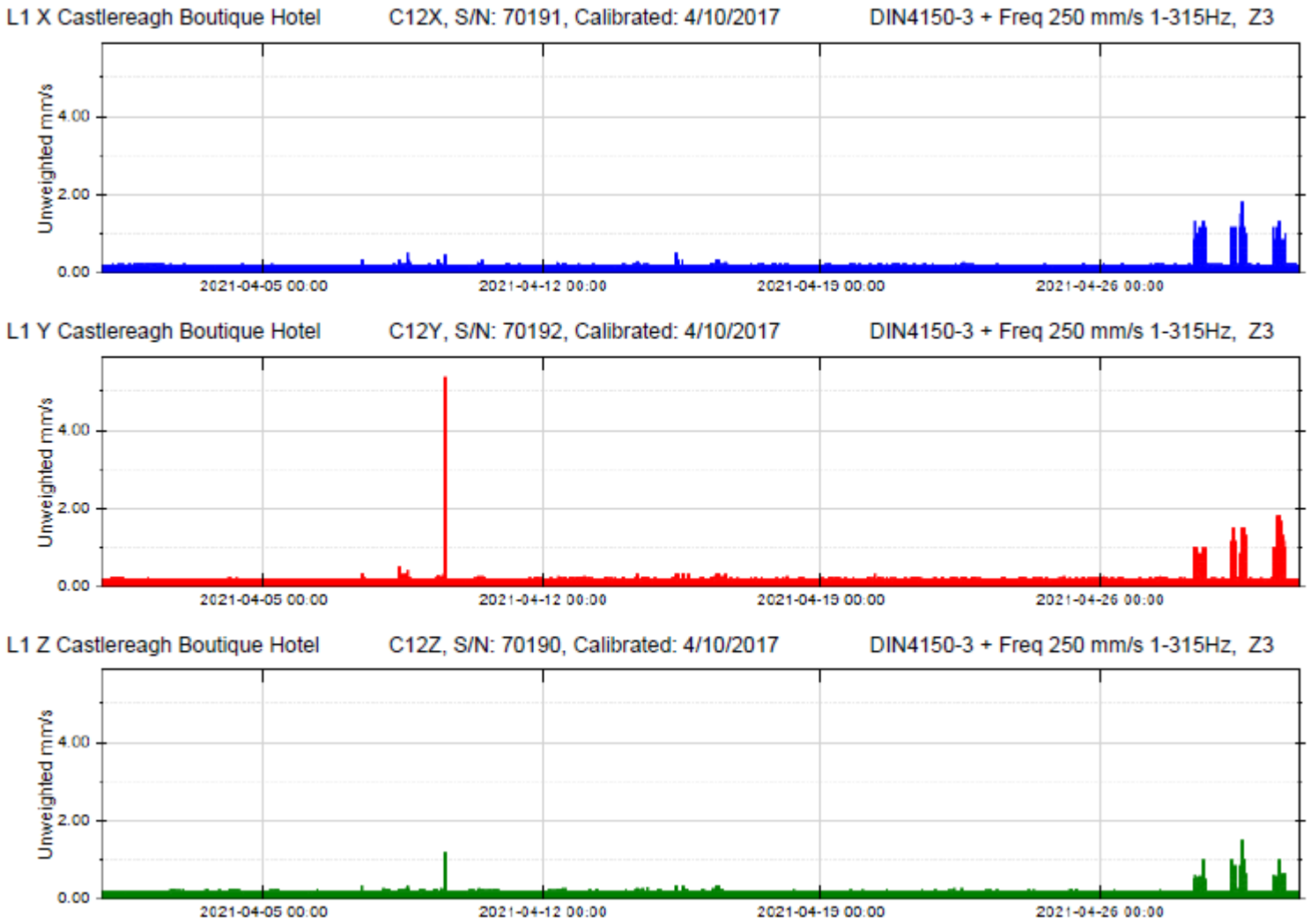

Figure 2-6 Monthly Vibration Monitoring Results for Castlereagh Boutique Hotel - 01/04/2021 – 30/04/2021

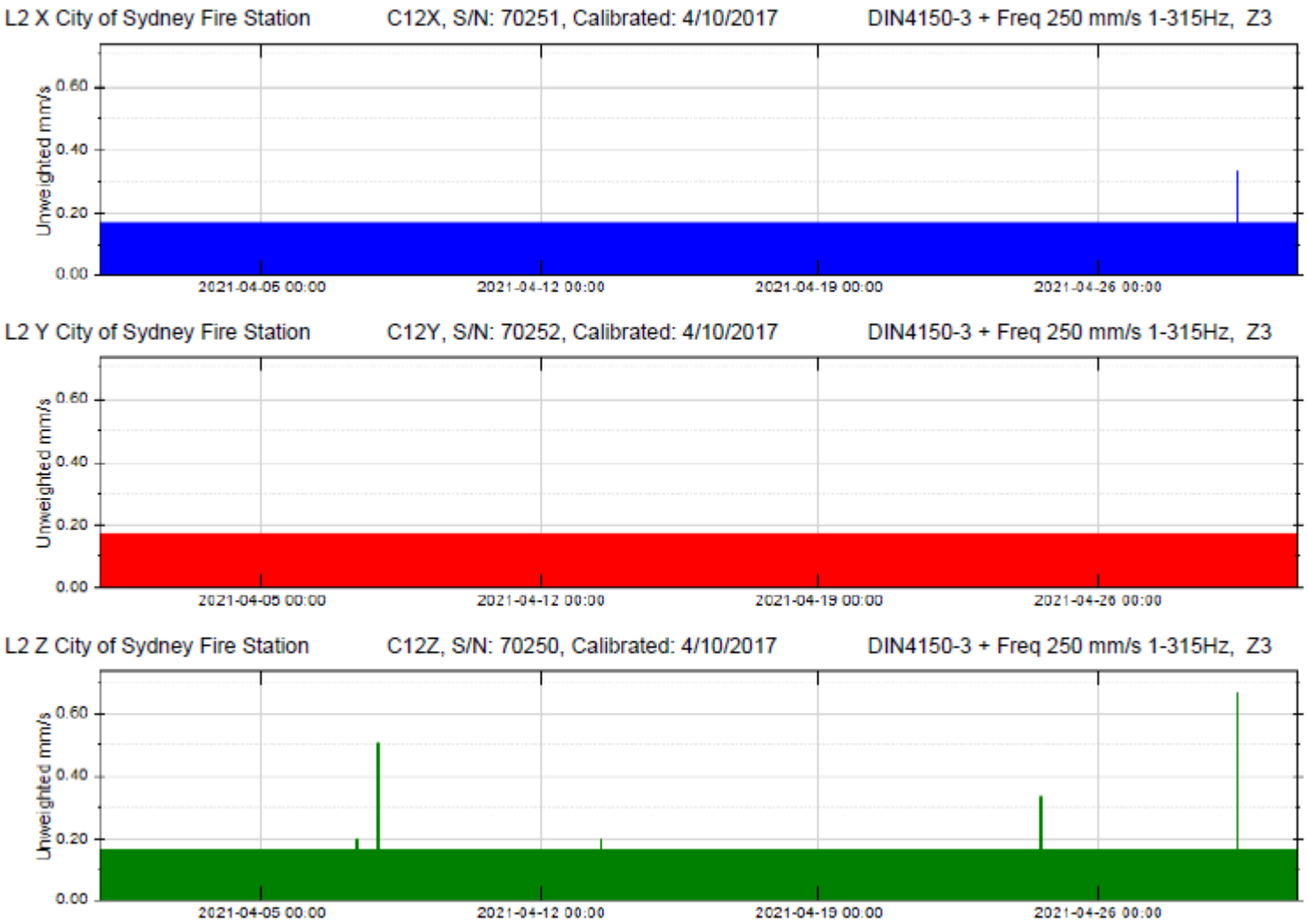

Figure 2-7 Monthly Vibration Monitoring Results for City of Sydney Fire Station - 01/04/2021 – 30/04/2021

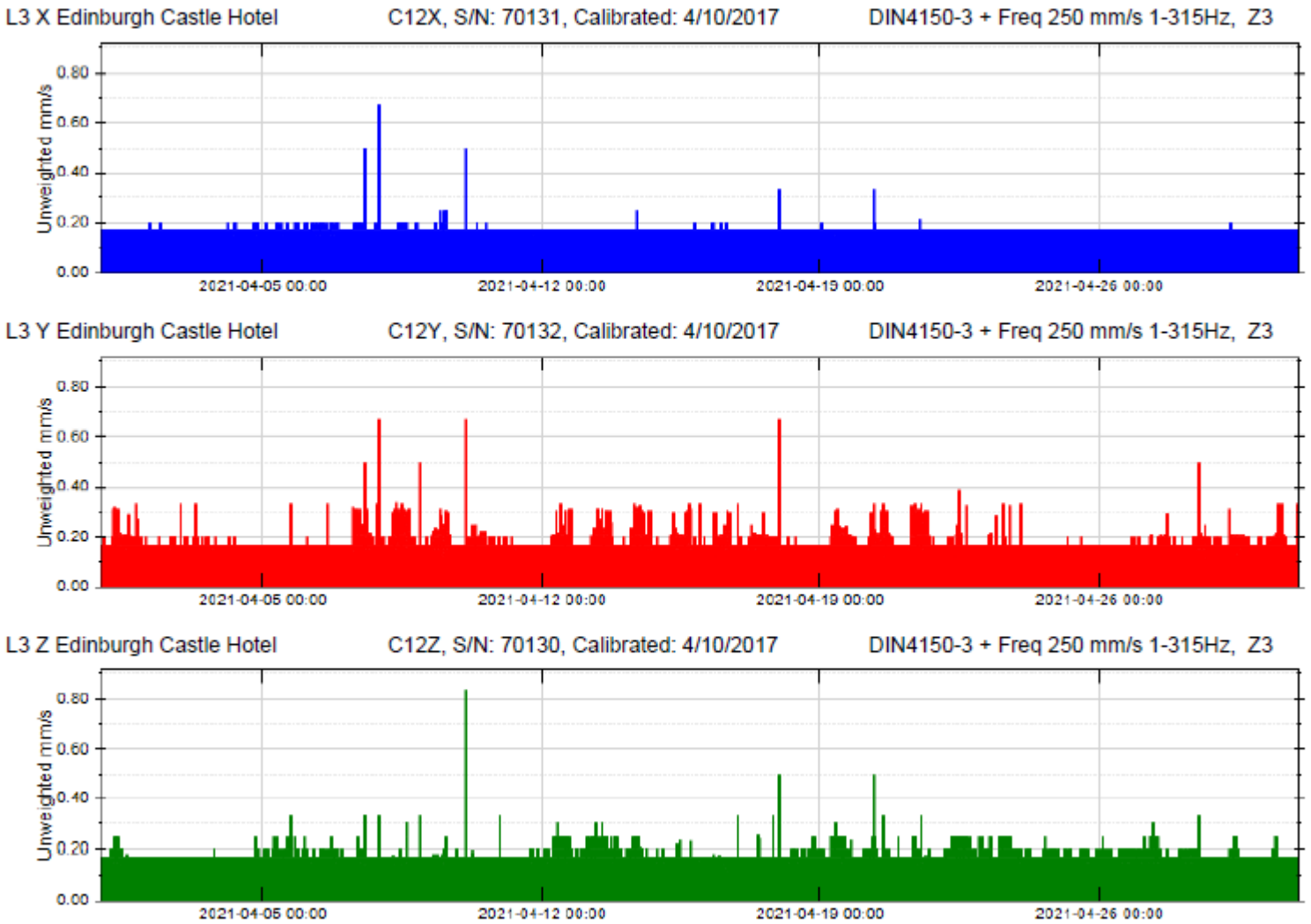

Figure 2-8 Monthly Vibration Monitoring Results for Edinburgh Castle Hotel - 01/04/2021 – 30/04/2021

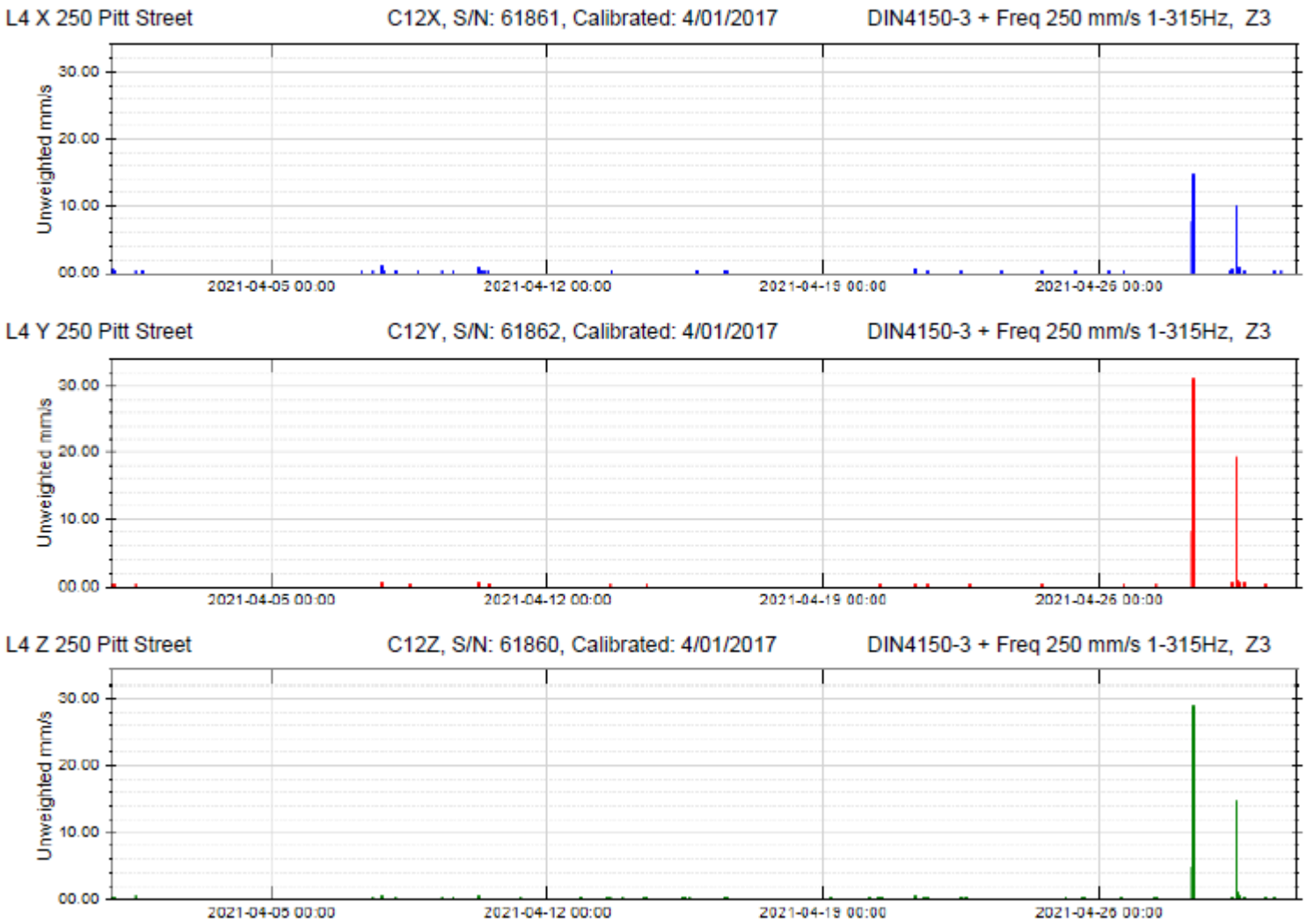

Figure 2-9 Monthly Vibration Monitoring Results for 250 Pitt Street - 01/04/2021 – 30/04/2021

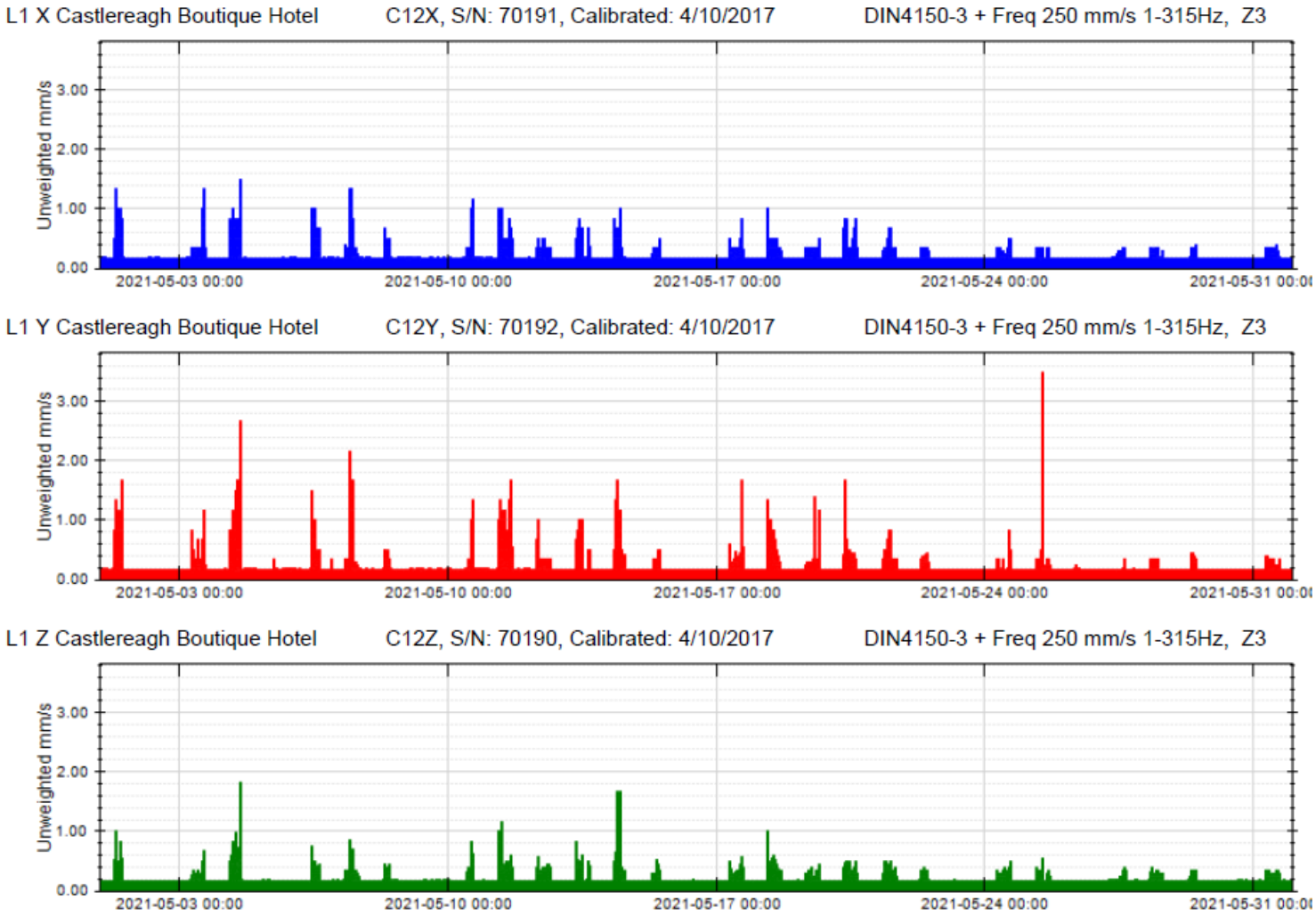

Figure 2-10 Monthly Vibration Monitoring Results for Castlereagh Boutique Hotel - 01/05/2021 – 30/05/2021

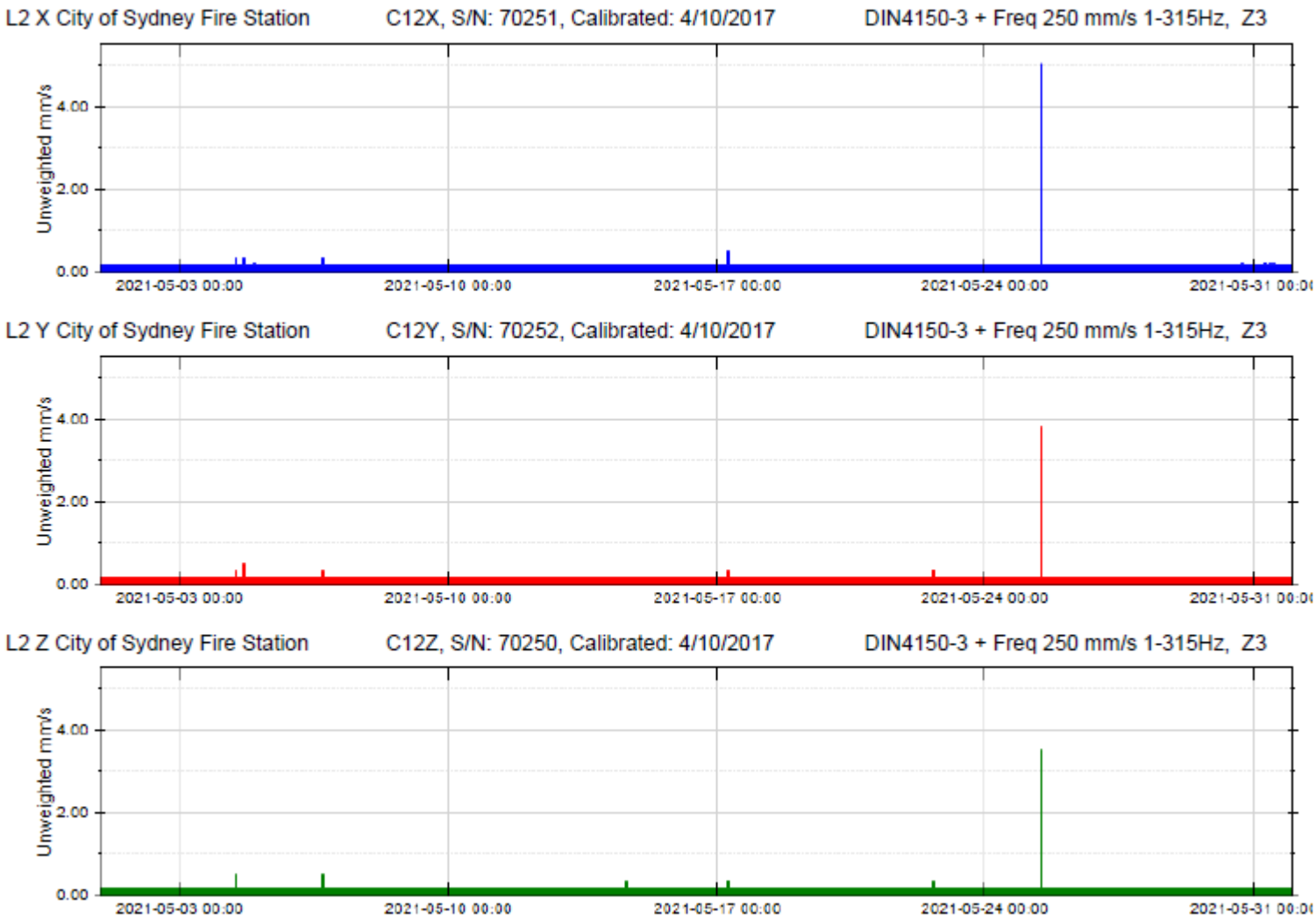

Figure 2-11 Monthly Vibration Monitoring Results for City of Sydney Fire Station - 01/05/2021 – 30/05/2021

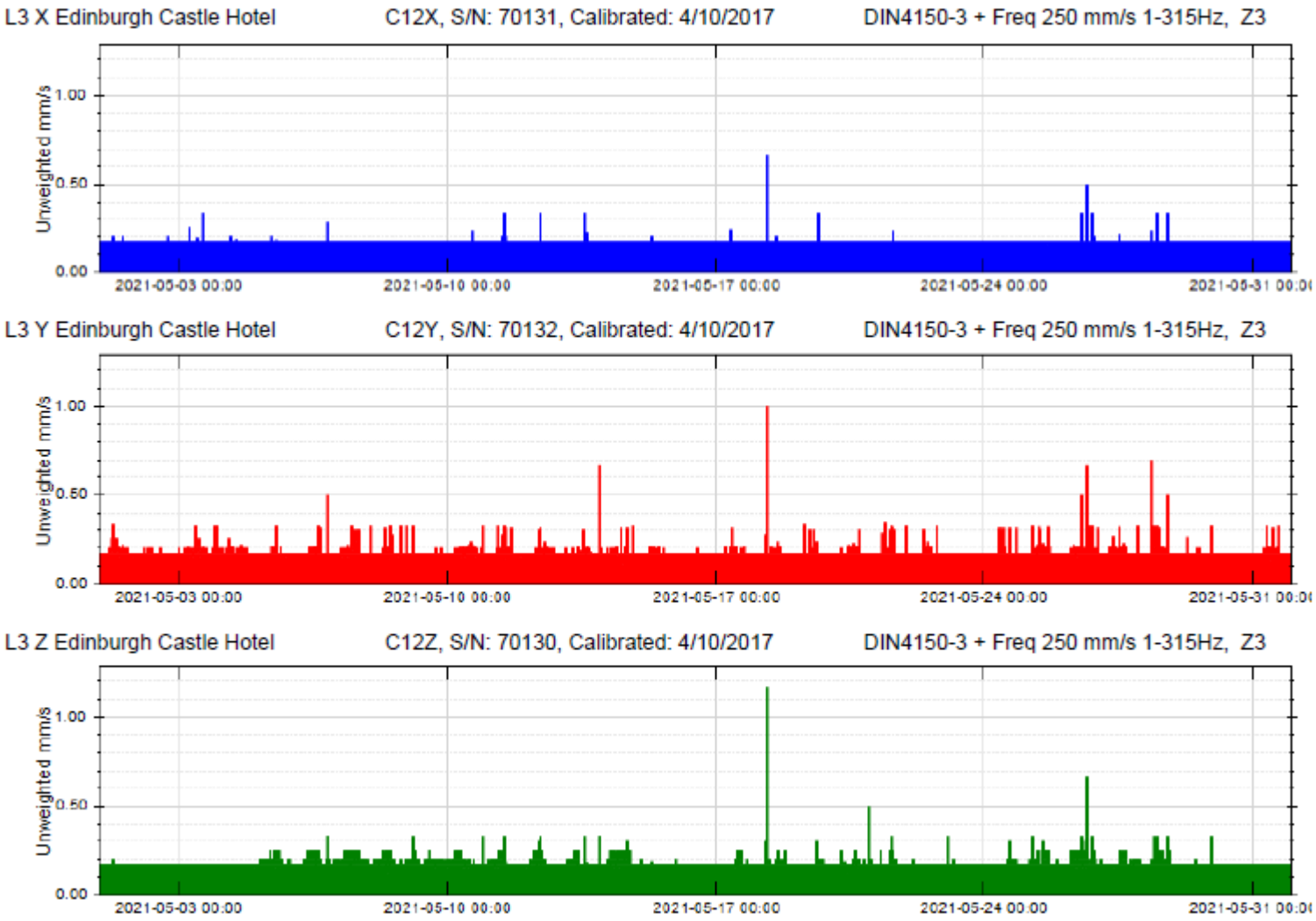

Figure 2-12 Monthly Vibration Monitoring Results for Edinburgh Castle Hotel - 01/05/2021 – 30/05/2021

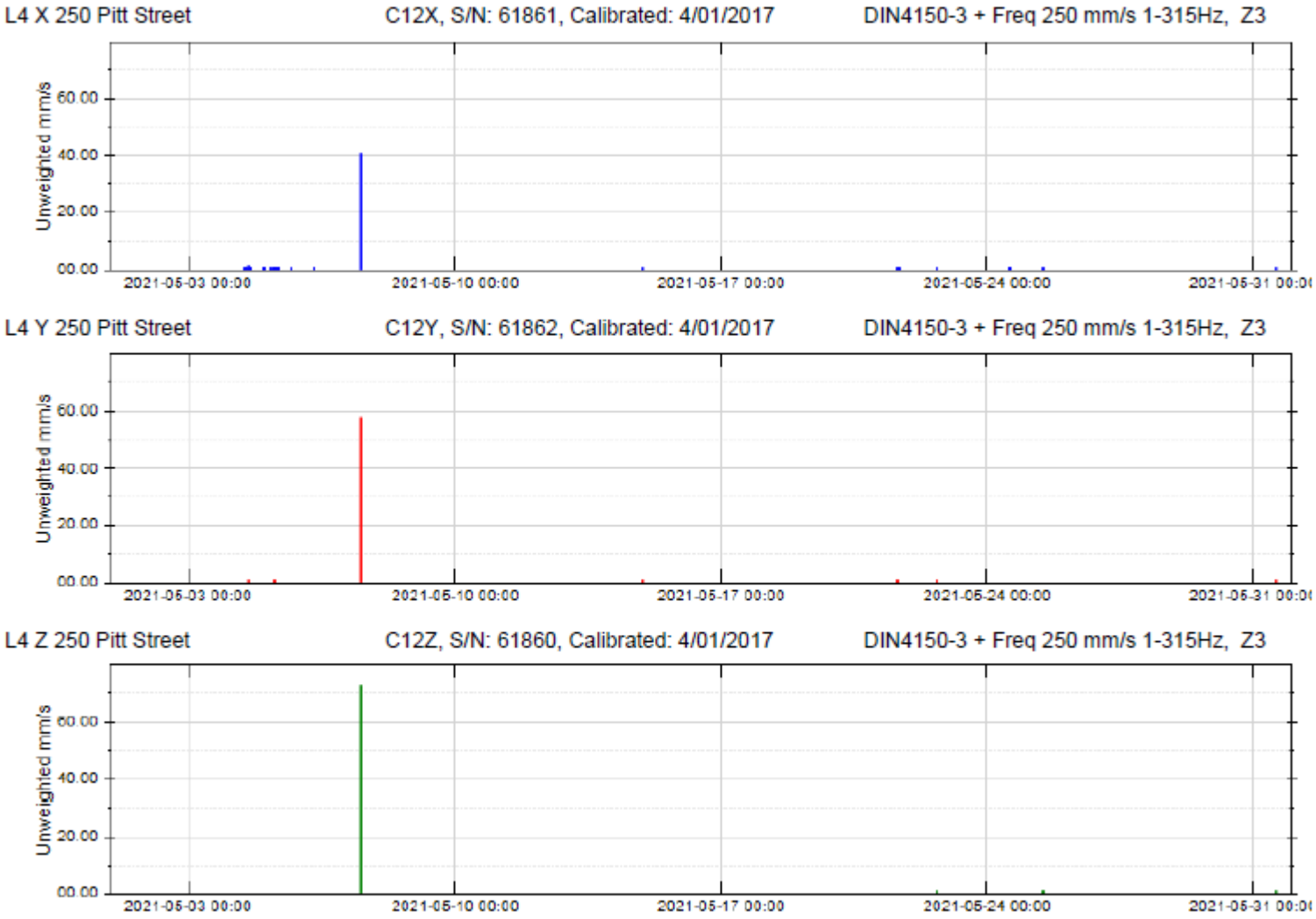

Figure 2-13 Monthly Vibration Monitoring Results for 250 Pitt Street - 01/05/2021 – 30/05/2021

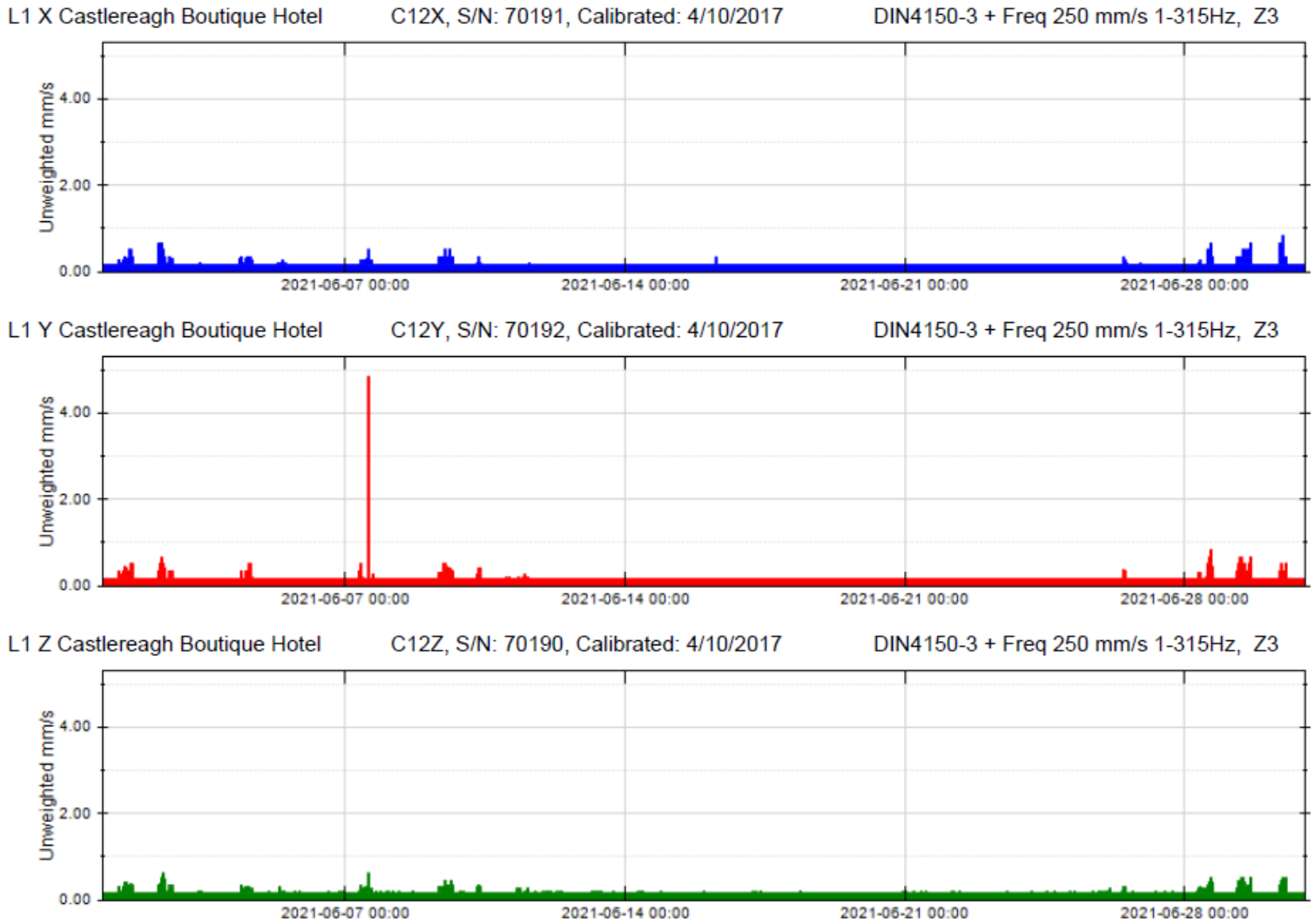

Figure 2-14 Monthly Vibration Monitoring Results for Castlereagh Boutique Hotel - 01/06/2021 – 30/06/2021

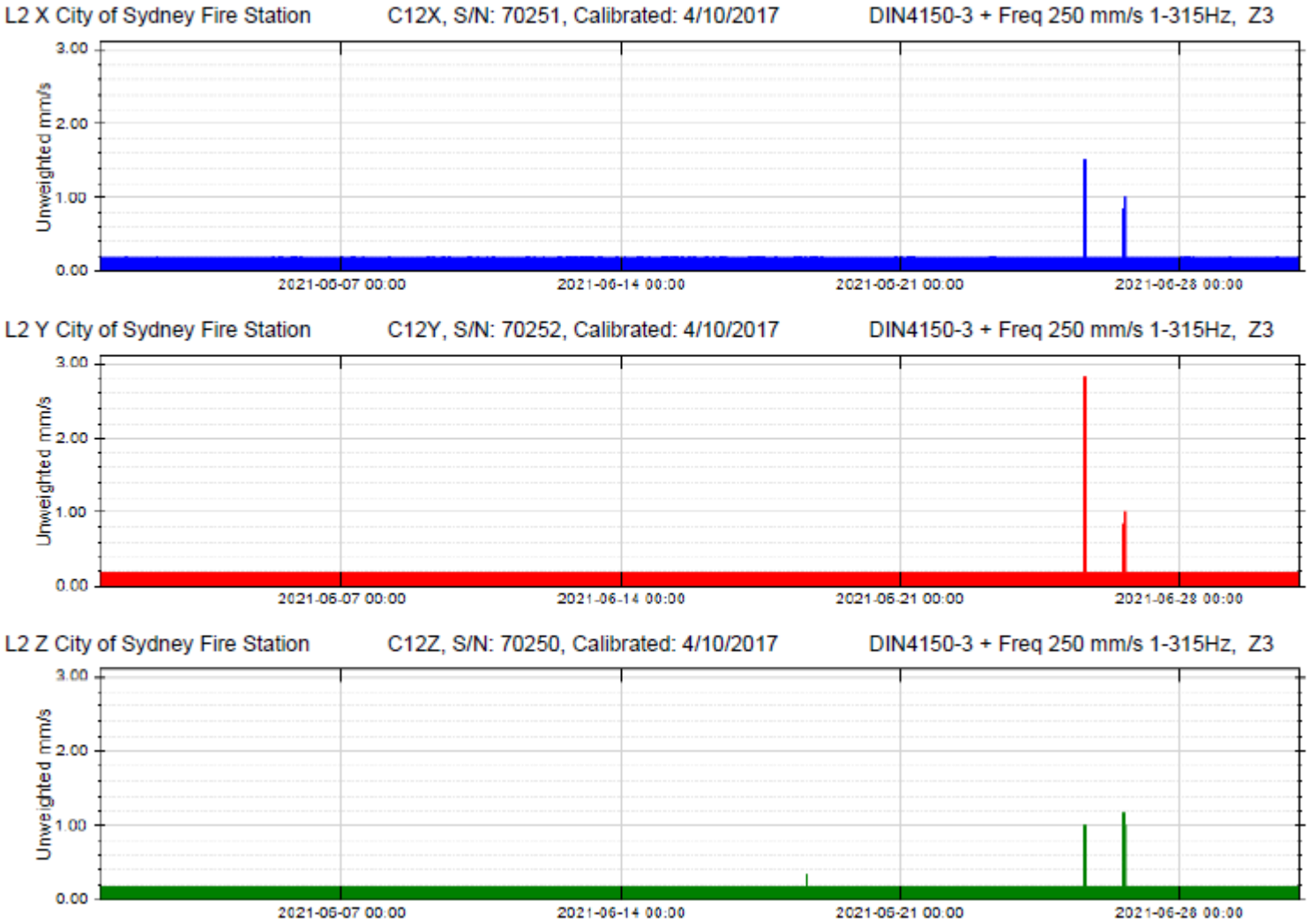

Figure 2-15 Monthly Vibration Monitoring Results for City of Sydney Fire Station - 01/06/2021 – 30/06/2021

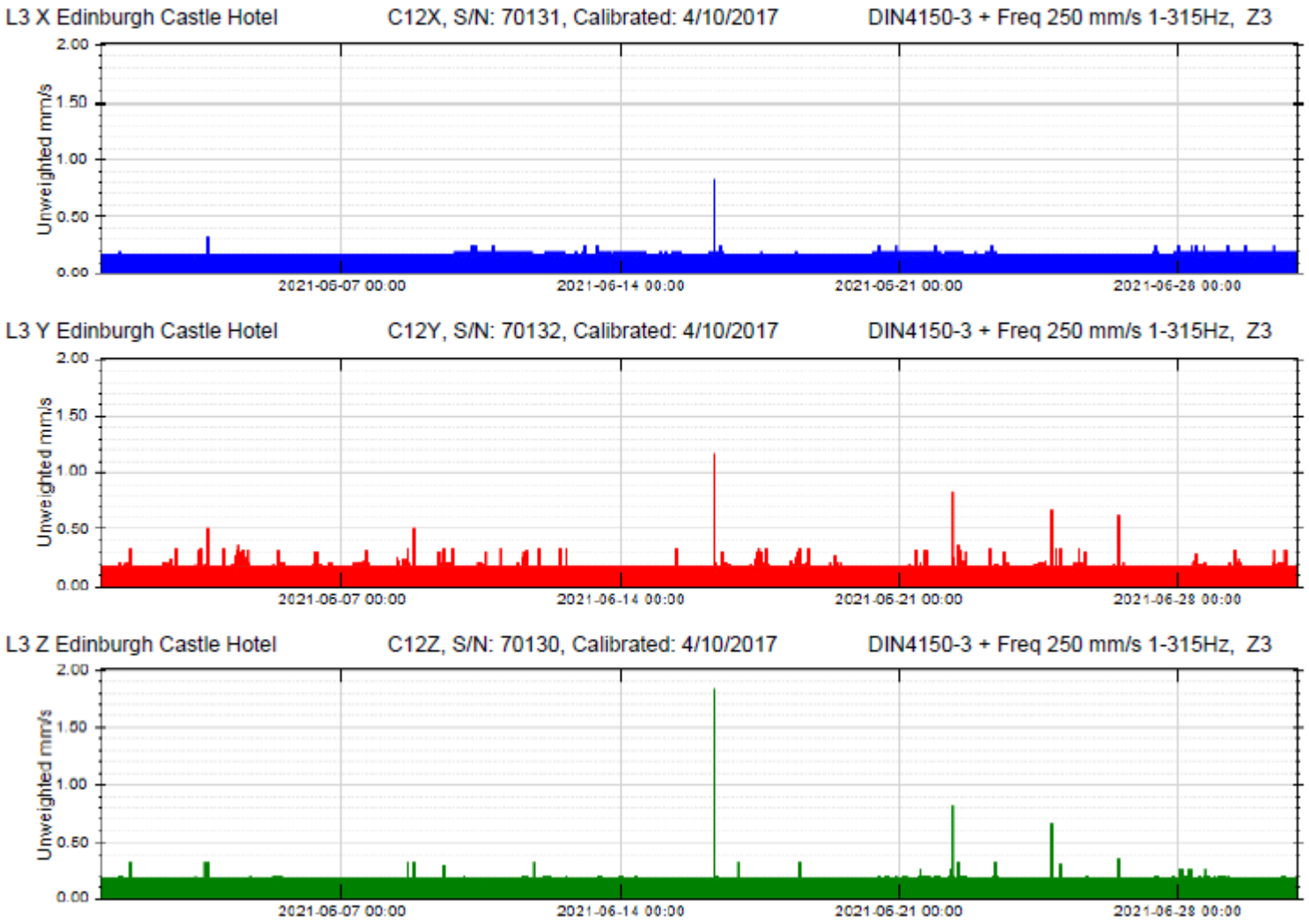

Figure 2-16 Monthly Vibration Monitoring Results for Edinburgh Castle Hotel - 01/06/2021 – 30/06/2021

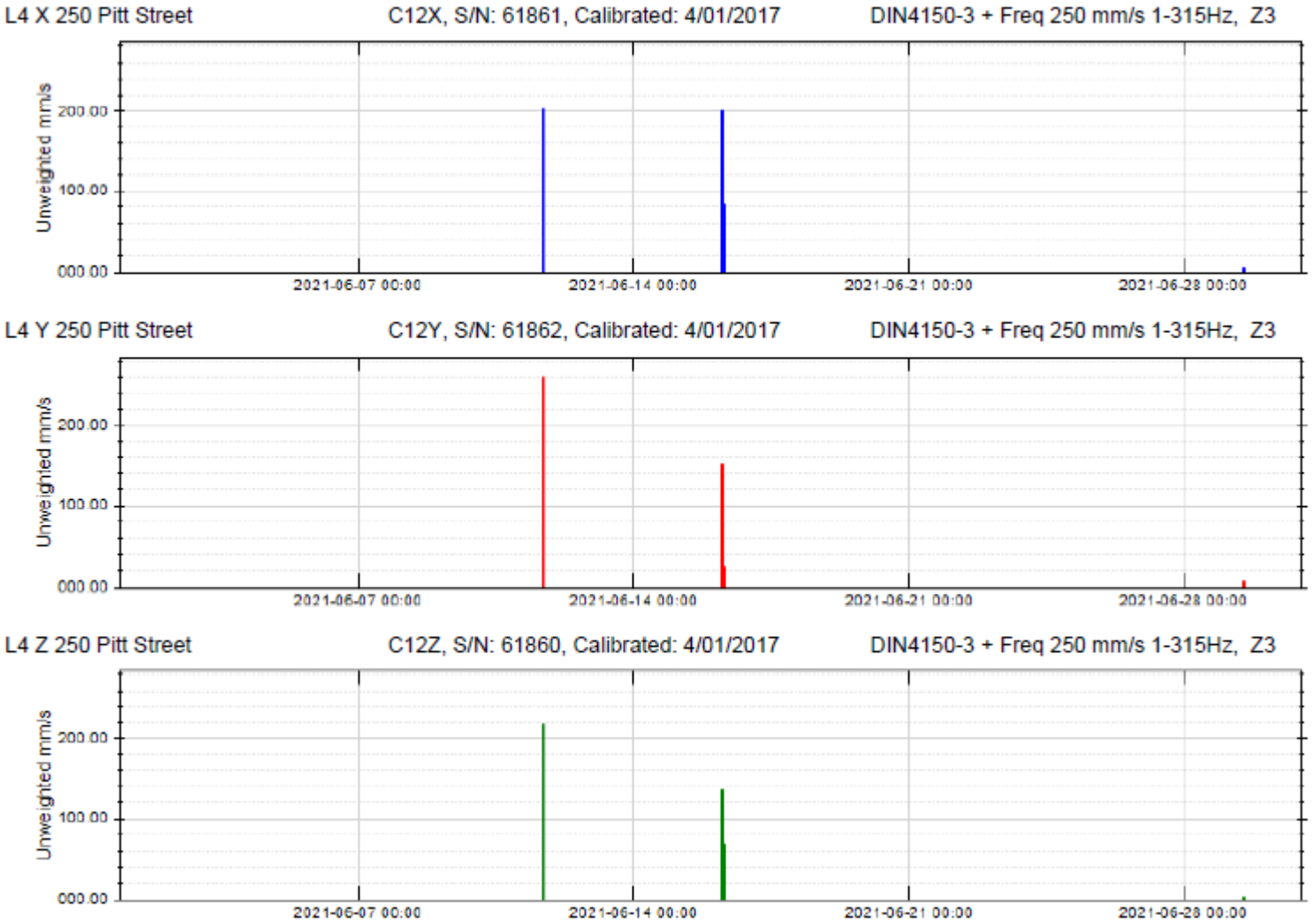

Figure 2-17 Monthly Vibration Monitoring Results for 250 Pitt Street - 01/06/2021 – 30/06/2021

3. Conclusion

Based on the monitoring results presented in this report, compliance with the monitoring programs and criteria for Water Quality and Groundwater has been verified.

Observed noise and vibration levels do not exceed the forecasted levels presented in the project CNVIS Rev 9 Based on the monitoring results and site investigations, CPB considers that the noise and vibration associated with the stated construction works was compliant with the project approvals and requirements during the monitoring period.

4. Appendices

A - Weather Data

Sydney, New South Wales
April 2021 Daily Weather Observations

Most observations from Observatory Hill, but some from Fort Denison and Sydney Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	14.6	27.3	6.6	4.8	9.8	W	26	01:36	15.9	92	1	W	17	1025.0	26.7	58	2	E	13	1023.2
2	Fr	15.9	27.3	0	2.8	10.8	ESE	20	13:18	17.5	98	3	WNW	15	1026.5	26.3	60	1	ESE	15	1025.7
3	Sa	16.0	26.9	0	4.0	10.8	NE	30	12:50	17.3	97	1	WNW	19	1026.2	26.6	58	1	ENE	20	1022.3
4	Su	16.7	27.3	0	7.2	9.9	NNE	31	16:17	20.4	86	1	WNW	11	1019.8	25.0	71	6	E	11	1015.8
5	Mo	17.8	28.3	0	5.6	10.2	SSE	31	08:55	23.1	86	2	S	19	1019.5	28.2	64	2	SSE	19	1018.3
6	Tu	19.2	27.5	0.6	3.3	7.7	ESE	31	16:44	22.4	96	2	WNW	9	1021.9	24.3	77	6	ESE	20	1019.8
7	We	18.6	26.5	1.2	4.4	6.5	ENE	37	19:12	21.9	98	5	ESE	13	1019.3	23.7	77	7	SE	17	1015.7
8	Th	18.4	26.8	6.8	3.2	10.0	N	22	03:06	20.7	99	2	WNW	9	1014.0	26.7	64	2	E	13	1009.9
9	Fr	17.2	28.8	0	4.8	6.4	SSE	52	18:24	20.2	87	2	W	13	1005.3	28.6	51	1	W	4	1001.5
10	Sa	16.5	24.5	0.2	6.4	8.0	W	48	20:15	16.9	74	7	W	19	1006.9	23.9	34	1	W	26	1004.0
11	Su	13.5	19.7	0	5.8	10.6	W	67	10:04	16.5	42	1	W	31	1009.3	18.5	31	1	WSW	31	1010.2
12	Mo	9.6	20.5	0	6.8	10.9	WSW	37	08:20	13.7	54	1	W	24	1019.4	19.4	36	1	SSE	9	1018.2
13	Tu	10.3	22.9	0	4.0	10.2	W	31	06:58	14.5	71	1	WNW	15	1022.9	22.5	53	2	ENE	20	1018.1
14	We	14.1	27.8	0	5.4	8.5	NW	28	10:58	20.3	49	6	WNW	11	1015.0	26.0	31	5	NNW	13	1011.8
15	Th	16.3	26.7	0	6.4	10.2	W	33	23:26	19.8	51	1	WNW	11	1016.1	26.4	31	3	WNW	4	1012.1
16	Fr	15.7	21.9	0	6.4	5.8	SSE	44	11:06	18.4	50	5	WNW	15	1020.7	19.3	60	6	SSE	24	1021.4
17	Sa	14.6	18.5	0	4.0	0.1	SE	19	00:04	16.0	80	8	WNW	7	1023.3	18.2	60	8	ENE	7	1021.6
18	Su	10.9	23.1	0	4.0	9.6	W	24	05:03	14.4	86	4	W	15	1022.2	22.5	58	2	E	11	1018.9
19	Mo	11.8	24.2	0	1.6	10.5	WNW	22	04:09	14.9	86	1	WNW	17	1019.1	22.2	59	0	E	19	1014.4
20	Tu	11.2	22.9	0	4.0	6.8	WNW	28	00:14	15.9	67	2	WNW	13	1016.0	22.1	46	6	NNE	11	1010.7
21	We	14.1	20.9	0	5.2	10.4	SW	44	09:34	15.6	54	1	SW	20	1013.4	19.5	45	1	SSE	22	1013.0
22	Th	10.3	21.3	0	6.0	10.6	WSW	46	17:59	14.0	63	1	W	19	1013.5	20.3	33	1	WSW	17	1010.8
23	Fr	9.2	23.1	0	5.4	10.6	W	46	10:27	14.0	63	1	W	9	1018.0	22.4	41	1	ESE	17	1016.1
24	Sa	10.5	23.5	0	4.0	10.0	W	24	09:00	13.6	72	3	W	20	1022.7	21.7	53	5	ENE	15	1019.5
25	Su	11.3	23.8	0	3.2	9.7	W	30	07:00	14.9	67	1	WNW	20	1024.2	21.1	66	5	SE	19	1022.3
26	Mo	11.9	23.3	0	3.4	10.1	ENE	24	13:05	15.3	86	1	WNW	15	1025.7	21.6	58	2	E	11	1023.2
27	Tu	13.2	24.4	0	3.0	9.8	W	24	07:55	16.4	86	0	WNW	17	1027.8	21.8	61	1	ESE	15	1025.1
28	We	13.9	22.9	0	4.0	6.2	E	20	14:35	17.1	87	6	WNW	11	1026.5	21.7	63	7	ENE	13	1023.5
29	Th	12.8	22.8	0	2.6	9.8	E	24	13:05	15.7	90	0	W	13	1025.1	21.8	63	1	E	19	1022.8
30	Fr	13.0	24.1	0	3.6	7.9	ESE	24	14:59	15.4	94	6	WNW	17	1029.1	22.9	67	3	ESE	19	1026.9
Statistics for April 2021																					
Mean		14.0	24.3		4.5	8.9				17.1	77	2		15	1019.8	23.1	54	3		15	1017.2
Lowest		9.2	18.5		1.6	0.1				13.6	42	0	WNW	7	1005.3	18.2	31	0	#	4	1001.5
Highest		19.2	28.8	6.8	7.2	10.9	W	67		23.1	99	8	W	31	1029.1	28.6	77	8	WSW	31	1026.9
Total				15.4	135.3	268.4															

Temperature, humidity and rainfall observations are from Sydney (Observatory Hill) {station 066214}. Pressure, cloud, evaporation and sunshine observations are from Sydney Airport AMO {station 066037}. Wind observations are from Fort Denison {station 066022}

Sydney Airport is about 10 km to the south of Observatory Hill.

IDCJDW2124.202104 Prepared at 13:00 UTC on 3 Jul 2021

Sydney, New South Wales
May 2021 Daily Weather Observations

Most observations from Observatory Hill, but some from Fort Denison and Sydney Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Sa	14.3	23.0	0	3.2	7.1	ENE	30	18:44	16.8	97	2	WNW	17	1030.4	22.1	76	2	E	17	1027.6
2	Su	14.8	24.6	0	0.4	8.2	NNE	31	11:19	16.6	98	7	W	11	1028.5	22.4	72	7	ENE	20	1024.7
3	Mo	13.8	24.7	0	4.0	7.6	NNE	26	17:04	15.1	100	6	WNW	13	1022.4	23.5	64	1	ENE	13	1017.8
4	Tu	15.1	17.1	0	4.0	0.0	WSW	33	00:56	16.9	85	8	WNW	15	1016.7	15.3	94	8	WSW	9	1015.4
5	We	14.2	19.5	18.0	73.0	0.7	S	35	11:36	15.3	100	7	SW	19	1014.9	18.6	86	7	SSW	19	1012.2
6	Th	15.3	22.0	25.4	3.6	0.3	SSE	69	09:11	18.9	98	7	SSE	39	1011.8	21.2	91	7	SE	17	1011.3
7	Fr	17.8	22.8	16.4	1.8	6.8	SSE	39	12:30	19.2	96	7	SSE	19	1011.4	21.7	77	6	SSW	22	1009.3
8	Sa	15.0	26.2	0.4	3.8	6.7	WNW	24	09:15	17.3	96	5	WNW	19	1013.1	23.4	61	7	WNW	6	1012.1
9	Su	16.2	19.4	0	4.4	0.0	WNW	26	07:13	17.7	71	7	WNW	15	1019.4	19.2	72	7	NW	4	1016.6
10	Mo	13.7	24.7	0	2.2	9.6	NW	37	14:18	16.6	87	0	W	20	1015.8	24.5	41	2	WNW	20	1011.7
11	Tu	15.1	23.6	0	3.2	6.0	SW	33	15:06	16.7	84	3	WNW	6	1015.3	19.2	61	7	SW	22	1014.7
12	We	12.8	22.5	0.4	3.0	9.5	S	37	10:38	15.4	86	4	W	15	1020.1	21.9	69	2	S	15	1017.6
13	Th	13.3	24.4	0.8	3.4	9.5	W	31	23:07	15.3	91	1	WNW	15	1014.2	24.0	50	2	WNW	6	1009.2
14	Fr	13.2	20.3	0	4.0	9.9	WSW	50	10:11	16.0	50	1	W	26	1012.4	19.9	36	1	W	28	1011.4
15	Sa	10.5	18.6	0	5.2	7.3	W	65	13:38	13.3	65	5	W	9	1013.2	16.9	38	1	WNW	28	1011.6
16	Su	7.8	19.2	0	5.2	9.7	W	50	23:25	10.3	58	1	W	24	1021.5	18.7	27	0	WNW	13	1017.9
17	Mo	9.0	20.2	0	2.8	9.8	W	43	00:10	12.5	64	1	W	24	1022.1	18.4	47	2	SSE	20	1022.5
18	Tu	8.7	20.6	0	4.0	9.5	W	30	04:51	11.3	74	1	W	20	1029.2	20.2	46	1	ENE	13	1026.3
19	We	8.5	21.3	0	3.4	9.8	W	26	08:41	11.0	81	0	W	19	1029.3	18.9	61	0	E	13	1025.4
20	Th	8.6	21.6	0	2.8	7.8	WNW	28	07:55	11.3	78	4	W	20	1027.1	20.5	40	3	SSE	15	1025.0
21	Fr	10.0	16.4	0	2.8	0.5	S	28	09:48	11.7	84	7	W	19	1030.4	16.0	81	7	S	7	1028.3
22	Sa	9.0	21.8	1.4	0.4	9.4	W	30	08:10	11.4	87	2	W	24	1028.0	19.6	58	2	SSE	11	1024.7
23	Su	10.5	20.3	0.2	3.0	4.6	SSW	30	14:35	12.6	89	7	W	20	1027.2	19.8	69	2	SSW	22	1025.9
24	Mo	12.5	18.7	1.0	1.2	1.2	ENE	31	15:52	15.2	100	4	WNW	17	1030.8	18.1	86	7	E	4	1028.2
25	Tu	12.9	22.6	2.6	5.0	9.2	NNE	35	17:25	14.6	99	5	W	15	1026.5	21.1	59	6	NE	17	1021.1
26	We	14.4	22.3	0	0.4	9.1	WSW	50	19:35	16.2	60	1	W	20	1017.6	21.4	34	1	W	19	1015.8
27	Th	9.9	19.6	0	6.2	9.5	W	41	05:28	12.5	58	0	W	28	1024.1	19.0	41	1	W	24	1020.8
28	Fr	10.1	17.4	0	4.0	9.5	SW	59	11:49	12.8	63	1	W	22	1023.7	16.3	33	1	SSW	26	1024.4
29	Sa	8.6	16.0	0	6.0	4.1	SW	56	12:15	9.9	61	5	W	28	1028.8	14.3	55	8	SW	24	1027.1
30	Su	9.9	16.2	0	2.8	1.6	W	43	07:08	12.1	70	7	W	20	1028.5	14.3	76	7	SSW	13	1026.7
31	Mo	9.6	20.4	0	2.4	9.3	W	33	08:53	11.8	71	1	W	24	1025.9	18.8	52	1	E	11	1023.2
Statistics for May 2021																					
	Mean	12.1	20.9		5.5	6.6				14.3	80	3		19	1021.9	19.7	59	3		16	1019.6
	Lowest	7.8	16.0		0.4	0.0				9.9	50	0	WNW	6	1011.4	14.3	27	0	#	4	1009.2
	Highest	17.8	26.2	25.4	73.0	9.9	SSE	69		19.2	100	8	SSE	39	1030.8	24.5	94	8	#	28	1028.3
	Total			66.6	171.6	203.8															

Temperature, humidity and rainfall observations are from Sydney (Observatory Hill) {station 066214}. Pressure, cloud, evaporation and sunshine observations are from Sydney Airport AMO {station 066037}. Wind observations are from Fort Denison {station 066022}

Sydney Airport is about 10 km to the south of Observatory Hill.

IDCJDW2124.202105 Prepared at 16:00 UTC on 2 Jul 2021

Sydney, New South Wales
June 2021 Daily Weather Observations

Most observations from Observatory Hill, but some from Fort Denison and Sydney Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Tu	8.6	20.5	0	2.8	6.0	WNW	24	05:02	10.0	95	6	WNW	19	1023.7	19.6	48	7	W	6	1020.5
2	We	9.4	22.0	0	1.8	9.3	W	22	02:22	11.0	88	3	WNW	15	1021.8	19.7	61	1	E	11	1017.7
3	Th	10.9	13.4	0	2.4	0.0	W	31	09:53	12.4	92	7	WNW	11	1015.2	13.1	98	8	WNW	11	1010.8
4	Fr	10.5	20.5	7.8	1.4	6.4	W	43	13:53	12.0	95	2	W	17	1010.8	17.6	56	7	W	28	1010.7
5	Sa	8.5	18.0	0.2	3.2	9.3	SSW	31	01:29	11.1	76	1	WNW	20	1022.9	17.7	39	1	W	9	1020.4
6	Su	8.1	21.3	0	2.2	9.3	W	41	06:52	10.8	66	0	W	24	1024.0	21.1	39	1	ENE	2	1023.0
7	Mo	7.9	20.2	0	3.2	8.6	W	22	02:12	10.5	84	6	W	15	1024.0	19.3	62	6	ENE	13	1018.7
8	Tu	10.4	19.1	0	2.6	1.3	W	46	21:36	14.7	55	6	N	19	1013.5	18.4	54	7	NNE	26	1008.5
9	We	10.2	15.7	7.4	2.4	7.6	NNW	44	15:36	10.5	86	3	WNW	30	1005.0	12.8	56	4	NW	19	1001.7
10	Th	6.7	10.3	0	4.0	0.0	NNW	31	00:04	9.3	81	7	NNE	15	1006.0	9.8	86	8	NNW	11	1005.5
11	Fr	5.8	15.4	6.0	1.6	4.9	WNW	31	12:31	7.1	100	3	WNW	17	1011.0	14.6	64	7	NW	11	1009.6
12	Sa	7.1	18.8	0	2.5	9.3	W	39	13:15	12.9	66	1	N	19	1016.1	17.7	41	1	WNW	17	1013.8
13	Su	8.1	19.6	0	4.2	9.4	W	37	12:04	11.6	71	1	W	11	1017.4	18.6	45	1	WSW	19	1014.3
14	Mo	9.9	17.8	0	4.6	0.4	W	30	09:25	11.0	70	7	W	22	1016.6	17.4	66	7	SSW	9	1014.9
15	Tu	10.6	18.2	0	0.0	0.9	W	26	03:18	12.6	85	6	WNW	19	1018.0	16.7	76	7	S	7	1015.7
16	We	8.8	20.2	0	1.6	7.4	W	54	22:37	10.3	98	1	WNW	11	1017.9	20.0	61	5	ENE	11	1013.5
17	Th	9.5	17.9	6.2	2.0	8.3	W	50	01:24	11.9	70	1	NW	7	1009.9	17.3	41	3	W	28	1007.6
18	Fr	9.0	18.9	0	4.0	8.0	W	65	13:50	12.1	75	1	W	9	1007.4	18.1	46	6	W	35	1004.7
19	Sa	11.0	14.6	1.8	4.0	0.0	SSW	67	16:22	13.3	61	7	W	30	1012.0	12.9	89	8	SW	35	1014.2
20	Su	11.5	15.3	10.8	1.3	1.5	SW	46	07:43	12.6	85	6	SW	20	1023.1	13.7	87	7	SW	20	1022.7
21	Mo	9.9	15.8	9.4	1.2	3.3	W	33	03:14	11.5	97	7	W	17	1027.4	14.8	82	3	SSW	17	1026.1
22	Tu	9.4	18.9	1.4	2.2	2.8	W	30	07:42	10.7	94	7	WNW	19	1031.8	17.1	68	4	E	4	1029.7
23	We	10.0	19.2	0	0.0	2.9	NNW	33	12:41	12.0	99	7	W	6	1027.6	17.3	62	6	N	19	1022.8
24	Th	12.0	21.7	0	3.6	3.1	N	48	13:26	15.4	74	7	NNE	9	1015.8	20.1	57	4	N	24	1010.6
25	Fr	11.6	19.8	0	3.0	9.1	W	44	14:37	15.1	63	1	WNW	17	1015.5	19.5	42	1	W	20	1013.7
26	Sa	9.2	19.1	0	4.8	9.2	W	43	12:38	13.3	67	1	WNW	19	1018.9	17.8	43	3	W	24	1018.3
27	Su	8.1	19.6	0	4.6	9.1	W	28	11:00	10.7	76	1	WNW	15	1025.7	19.3	38	0	WNW	7	1024.7
28	Mo	8.0	17.0	0.6	0.6	2.8	SSW	33	15:21	8.9	91	6	W	22	1032.2	16.6	76	4	SSW	17	1030.5
29	Tu	8.9	17.2	3.2	2.2	1.8	WNW	26	00:47	11.3	98	7	W	20	1034.1	14.4	93	5	NW	4	1031.6
30	We	11.1	18.3	25.6	2.0	1.9	W	20	09:27	11.7	100	7	WNW	11	1031.5	16.4	88	7	E	7	1027.7
Statistics for June 2021																					
Mean		9.4	18.1		2.5	5.1				11.6	81	4		16	1019.2	17.0	62	4		15	1016.8
Lowest		5.8	10.3		0.0	0.0				7.1	55	0	W	6	1005.0	9.8	38	0	ENE	2	1001.7
Highest		12.0	22.0	25.6	4.8	9.4	SSW	67		15.4	100	7	#	30	1034.1	21.1	98	8	#	35	1031.6
Total				80.4	76.0	153.9															

Temperature, humidity and rainfall observations are from Sydney (Observatory Hill) {station 066214}. Pressure, cloud, evaporation and sunshine observations are from Sydney Airport AMO {station 066037}. Wind observations are from Fort Denison {station 066022}

Sydney Airport is about 10 km to the south of Observatory Hill.

IDCJDW2124.202106 Prepared at 13:00 UTC on 14 Jul 2021

B – Photos of Real-Time Equipment

Figure B-1 N1 Pitt Street North

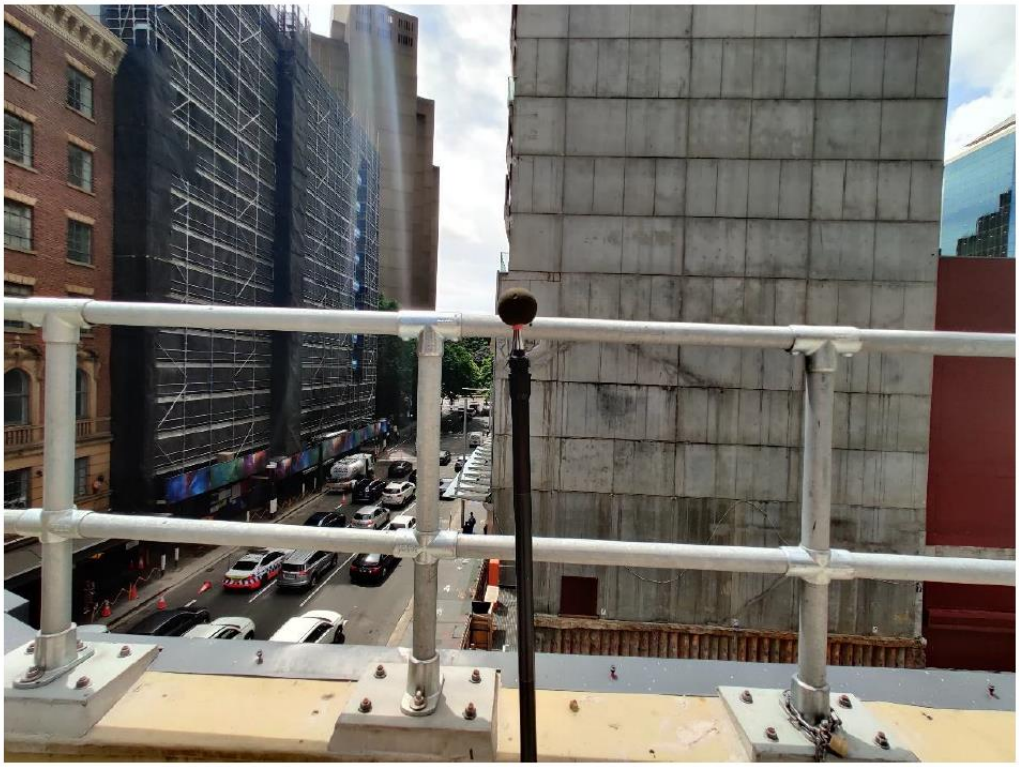

Figure B-2 N2 Pitt Street South (facing Pitt Bathurst)

Figure B-3 N3 Pitt Street South (facing Pitt Street)

Figure B-4 V1 Castlereagh Boutique Hotel

Figure B-5 V2 Sydney Fire Station

Figure B-6 V3 Edinburgh Castle Hotel

Figure B-7 V4 250 Pitt Street

C – Attended Monitoring Photos

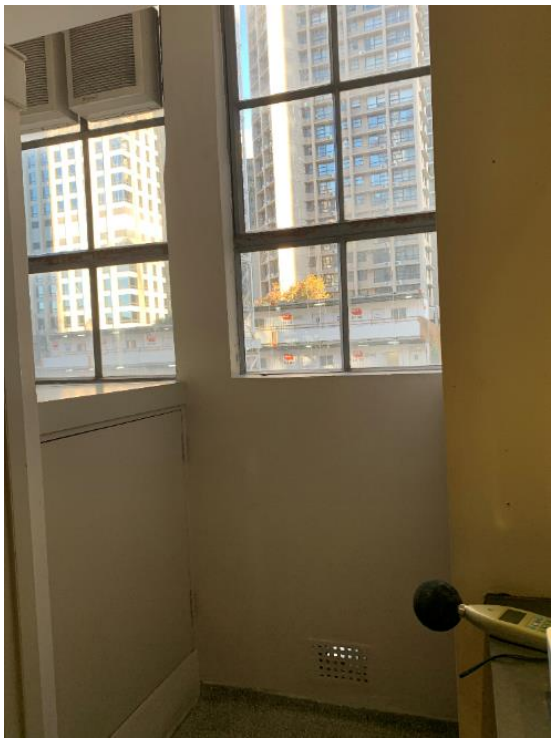

Figure C-1 C5 Attended Monitoring 04/05/2021

Figure C-2 R4 Attended Monitoring 30/04/2021

D – Calibration Certificates

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	17/01/2020	**Job No**	RB762	**Operator**	JA
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-13500-E0 #RTA07-020
Microphone Make	NTI	**Model**	MC230	**Serial No**	#9533
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#6540
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.2

SLM Type	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	23.2	23.5
Rel. Humidity (%)	58.9	57.4
Air Pressure (kPa)	100.6	99.9

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:
Accredited for compliance with ISO/IEC 17025 - Calibration.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. 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.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Authorized Signatory:

Print Name: Renzo Tonin Date: 22 January 2020

Template Document Name: RQT-05 (rev 65) SLM ISO Verification

NATacoustic
Sound Level Meter Verification - Summary of Tests

Calibration Date	17/01/2020	**Job No**	RB762	**Operator**	JA
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1. Instrument Information & Reference Conditions

Instrument Make	NTI	**Model**	XL2	**Serial No**	#A2A-13500-E0 #RTA07-020
Microphone Make	NTI	**Model**	MC230	**Serial No**	#9533
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#6540
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.2

Freq Weightings	**FLAT**	No	**A**	Yes	**C**	Yes	**Z**	Yes
Time Weightings	**Fast**	Yes	**Slow**	Yes	**Impulse**	Yes		

SLM Type	1
Filter Class	1

Instruction Manual is Available	Yes

2. Preliminary Inspection and Power Supply

Logger Inspected	Yes
Calibration Equipment Okay	Yes
Power Supply Ok (Start)	Yes
Power Supply Ok (End)	Yes

3. Environmental Conditions

	Measured	
Environmental Conditions	**Start**	**End**
Air Temp. (°C)	23.2	23.5
Rel. Humidity (%)	58.9	57.4
Air Pressure (kPa)	100.6	99.9
Conforming	Yes	Yes

Test Description			**Value / Conforming**	**Uncert (+/-)**
4(a). Initial Calibration		**Calibration Frequency Hz**	1000.0	N/A
		Indicated Level Before Adjustment (dB)	113.9	0.11
		Indicated Level After Adjustment (dB)	114.0	0.11
		Stability During Continuous Operation (dB)	Yes	N/A
5(a). Self-Generated Noise, Microphone Installed		**A**	16.7	0.09
5(b). Self-Generated Noise, Electrical		**A**	8.8	0.09
		C	12.0	0.09
		Z	18.2	0.09
6. Acoustical Signal Test		**125 Hz**	Yes	0.42
		1 kHz	Yes	0.42
		8 kHz	Yes	0.60
7. Electrical Frequency Weighting		**A**	Yes	0.09
		C	Yes	0.09
		Z	Yes	0.09
8. Frequency & Time Weightings 1kHz	**8(a). Frequency Weighting**	**C**	Yes	0.09
		Z	Yes	0.09
		FLAT	N/A	0.09
	8(b). Time Weighting	**Slow**	Yes	0.09
		Leq	Yes	0.09
9(a). Level Linearity 8kHz (Increasing)		**Conforming**	Yes	0.13
9(b). Level Linearity 8kHz (Decreasing)		**Conforming**	Yes	0.13
10(a). Level Linearity Including the Level Range (Reference Signal)		**Conforming**	Yes	0.13
10(b). Level Linearity Including the Level range (5dB Above Under-range)		**Conforming**	Yes	0.13
11. Toneburst Response		**Fast**	Yes	0.13
		Slow	Yes	0.13
		SEL/Leq	Yes	0.13
12. Peak C sound level		**8 kHz**	Yes	0.09
		500 Hz	Yes	0.09
13. Overload indication		**Conforming**	Yes	0.09
		Latches	N/A	N/A
14. High-level Stability		**Conforming**	Yes	0.09
15(a). Octave Band Filter Relative Attenuation (≤2kHz)		**Conforming**	Yes	0.09
15(b). Octave Band Filter Relative Attenuation (>2kHz)		**Conforming**	Yes	0.09
16. Octave Band Filter Relative Attenuation at Midband Frequency		**Conforming**	Yes	0.09
17(a). Octave Band Filter Level Linearity 31.5Hz (Increasing)		**31.5Hz**	Yes	0.13
17(b). Octave Band Filter Level Linearity 1kHz (Increasing)		**1kHz**	Yes	0.13
17(c). Octave Band Filter Level Linearity 16kHz (Increasing)		**16kHz**	Yes	0.13
18(a). Octave Band Filter Level Linearity 31.5Hz (Decreasing)		**31.5Hz**	Yes	0.13
18(b). Octrave Band Filter Level Linearity 1kHz (Decreasing)		**1kHz**	Yes	0.13
18(c). Octave Band Filter Level Linearity 16kHz (Decreasing)		**16kHz**	Yes	0.13
19(a). Octave Level Linearity Including the Level range (31.5Hz)		**31.5Hz**	Yes	0.13
19(b). Octave Level Linearity Including the Level range (1kHz)		**1kHz**	Yes	0.13
19(c). Octave Level Linearity Including the Level range (16kHz)		**16kHz**	Yes	0.13
20(a). Octave Band Filter Lower Limit (Reference Range)		**Conforming**	Yes	0.09
20(b). Octave Band Filter Lower Limit (Lowest Range)		**Conforming**	Yes	0.09
21(a). Third Octave Band Filter Relative Attenuation (≤31.5Hz)		**Conforming**	Yes	0.09
21(b). Third Octave Band Filter Relative Attenuation (40Hz-315Hz)		**Conforming**	Yes	0.09
21(c). Third Octave Band Filter Relative Attenuation (400Hz-3.15kHz)		**Conforming**	Yes	0.09
21(d). Third Octave Band Filter Relative Attenuation (≥4kHz)		**Conforming**	Yes	0.09

22. Third Octave Band Filter Relative Attenuation at Midband Frequency	**Conforming**	Yes	0.09
23(a). Third Octave Band Filter Level Linearity 31.5Hz (Increasing)	**31.5Hz**	Yes	0.13
23(b). Third Octave Band Filter Level Linearity 1kHz (Increasing)	**1kHz**	Yes	0.13
23(c). Third Octave Band Filter Level Linearity 16kHz (Increasing)	**16kHz**	Yes	0.13
24(a). Third Octave Band Filter Level Linearity 31.5Hz (Decreasing)	**31.5Hz**	Yes	0.13
24(b). Third Octave Band Filter Level Linearity 1kHz (Decreasing)	**1kHz**	Yes	0.13
24(c). Third Octave Band Filter Level Linearity 16kHz (Decreasing)	**16kHz**	Yes	0.13
25(a). Third Octave Level Linearity Including the Level range (31.5Hz)	**31.5Hz**	Yes	0.13
25(b). Third Octave Level Linearity Including the Level range (1kHz)	**1kHz**	Yes	0.13
25(c). Third Octave Level Linearity Including the Level range (16kHz)	**16kHz**	Yes	0.13
26(a). Octave Band Filter Lower Limit (Reference Range)	**Conforming**	Yes	0.09
26(b). Octave Band Filter Lower Limit (Lowest Range)	**Conforming**	Yes	0.09
SLM Overall Conforming		**Yes**	

Accredited for compliance with ISO/IEC 17025 - Calibration.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

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

☑ Checked

Template Document Name: RQT-05 (rev 65) SLM ISO 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	19/12/2019	**Job No**	RB759	**Operator**	JA
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-TA	**Serial No**	#A2A-13529-E0 #RTA07-021
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A1498
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#7064
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.2

SLM Type	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	23.7	25.1
Rel. Humidity (%)	57.4	55.1
Air Pressure (kPa)	101.0	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:
Accredited for compliance with ISO/IEC 17025 - Calibration.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. 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. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2017 and IEC 61260-2:2017, 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, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013 and IEC 61260-1:2014.

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Authorized Signatory:

Print Name: Renzo Tonin Date: 20 December 2019

Template Document Name: RQT-05 (rev 65) SLM ISO Verification

NATacoustic
Sound Level Meter Verification - Summary of Tests

Calibration Date	19/12/2019	**Job No**	RB759	**Operator**	JA
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1. Instrument Information & Reference Conditions

Instrument Make	NTI	**Model**	XL2-TA	**Serial No**	#A2A-13529-E0 #RTA07-021
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A1498
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#7064
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.2

Freq Weightings	**FLAT**	No	**A**	Yes	**C**	Yes	**Z**	Yes
Time Weightings	**Fast**	Yes	**Slow**	Yes	**Impulse**	Yes		

SLM Type	1
Filter Class	1

Instruction Manual is Available	Yes

2. Preliminary Inspection and Power Supply

Logger Inspected	Yes
Calibration Equipment Okay	Yes
Power Supply Ok (Start)	Yes
Power Supply Ok (End)	Yes

3. Environmental Conditions

	Measured	
Environmental Conditions	**Start**	**End**
Air Temp. (°C)	23.7	25.1
Rel. Humidity (%)	57.4	55.1
Air Pressure (kPa)	101.0	101.3
Conforming	Yes	Yes

Test Description			**Value / Conforming**	**Uncert (+/-)**
4(a). Initial Calibration		**Calibration Frequency Hz**	1000.0	N/A
		Indicated Level Before Adjustment (dB)	114.2	0.11
		Indicated Level After Adjustment (dB)	114.0	0.11
		Stability During Continuous Operation (dB)	Yes	N/A
5(a). Self-Generated Noise, Microphone Installed		**A**	16.6	0.09
5(b). Self-Generated Noise, Electrical		**A**	9.6	0.09
		C	12.7	0.09
		Z	18.8	0.09
6. Acoustical Signal Test		**125 Hz**	Yes	0.42
		1 kHz	Yes	0.42
		8 kHz	Yes	0.60
7. Electrical Frequency Weighting		**A**	Yes	0.09
		C	Yes	0.09
		Z	Yes	0.09
8. Frequency & Time Weightings 1kHz	**8(a). Frequency Weighting**	**C**	Yes	0.09
		Z	Yes	0.09
		FLAT	N/A	0.09
	8(b). Time Weighting	**Slow**	Yes	0.09
		Leq	Yes	0.09
9(a). Level Linearity 8kHz (Increasing)		**Conforming**	Yes	0.13
9(b). Level Linearity 8kHz (Decreasing)		**Conforming**	Yes	0.13
10(a). Level Linearity Including the Level Range (Reference Signal)		**Conforming**	Yes	0.13
10(b). Level Linearity Including the Level range (5dB Above Under-range)		**Conforming**	Yes	0.13
11. Toneburst Response		**Fast**	Yes	0.13
		Slow	Yes	0.13
		SEL/Leq	Yes	0.13
12. Peak C sound level		**8 kHz**	Yes	0.09
		500 Hz	Yes	0.09
13. Overload indication		**Conforming**	Yes	0.09
		Latches	N/A	N/A
14. High-level Stability		**Conforming**	Yes	0.09
15(a). Octave Band Filter Relative Attenuation (≤2kHz)		**Conforming**	Yes	0.09
15(b). Octave Band Filter Relative Attenuation (>2kHz)		**Conforming**	Yes	0.09
16. Octave Band Filter Relative Attenuation at Midband Frequency		**Conforming**	Yes	0.09
17(a). Octave Band Filter Level Linearity 31.5Hz (Increasing)		**31.5Hz**	Yes	0.13
17(b). Octave Band Filter Level Linearity 1kHz (Increasing)		**1kHz**	Yes	0.13
17(c). Octave Band Filter Level Linearity 16kHz (Increasing)		**16kHz**	Yes	0.13
18(a). Octave Band Filter Level Linearity 31.5Hz (Decreasing)		**31.5Hz**	Yes	0.13
18(b). Octrave Band Filter Level Linearity 1kHz (Decreasing)		**1kHz**	Yes	0.13
18(c). Octave Band Filter Level Linearity 16kHz (Decreasing)		**16kHz**	Yes	0.13
19(a). Octave Level Linearity Including the Level range (31.5Hz)		**31.5Hz**	Yes	0.13
19(b). Octave Level Linearity Including the Level range (1kHz)		**1kHz**	Yes	0.13
19(c). Octave Level Linearity Including the Level range (16kHz)		**16kHz**	Yes	0.13
20(a). Octave Band Filter Lower Limit (Reference Range)		**Conforming**	Yes	0.09
20(b). Octave Band Filter Lower Limit (Lowest Range)		**Conforming**	Yes	0.09
21(a). Third Octave Band Filter Relative Attenuation (≤31.5Hz)		**Conforming**	Yes	0.09
21(b). Third Octave Band Filter Relative Attenuation (40Hz-315Hz)		**Conforming**	Yes	0.09
21(c). Third Octave Band Filter Relative Attenuation (400Hz-3.15kHz)		**Conforming**	Yes	0.09
21(d). Third Octave Band Filter Relative Attenuation (≥4kHz)		**Conforming**	Yes	0.09

22. Third Octave Band Filter Relative Attenuation at Midband Frequency	**Conforming**	Yes	0.09
23(a). Third Octave Band Filter Level Linearity 31.5Hz (Increasing)	**31.5Hz**	Yes	0.13
23(b). Third Octave Band Filter Level Linearity 1kHz (Increasing)	**1kHz**	Yes	0.13
23(c). Third Octave Band Filter Level Linearity 16kHz (Increasing)	**16kHz**	Yes	0.13
24(a). Third Octave Band Filter Level Linearity 31.5Hz (Decreasing)	**31.5Hz**	Yes	0.13
24(b). Third Octave Band Filter Level Linearity 1kHz (Decreasing)	**1kHz**	Yes	0.13
24(c). Third Octave Band Filter Level Linearity 16kHz (Decreasing)	**16kHz**	Yes	0.13
25(a). Third Octave Level Linearity Including the Level range (31.5Hz)	**31.5Hz**	Yes	0.13
25(b). Third Octave Level Linearity Including the Level range (1kHz)	**1kHz**	Yes	0.13
25(c). Third Octave Level Linearity Including the Level range (16kHz)	**16kHz**	Yes	0.13
26(a). Octave Band Filter Lower Limit (Reference Range)	**Conforming**	Yes	0.09
26(b). Octave Band Filter Lower Limit (Lowest Range)	**Conforming**	Yes	0.09
SLM Overall Conforming		**Yes**	

Accredited for compliance with ISO/IEC 17025 - Calibration.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

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

☑ Checked

Template Document Name: RQT-05 (rev 65) SLM ISO 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	20/12/2019	**Job No**	RB759	**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-TA	**Serial No**	#A2A-13528-E0 #RTA07-022
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A14673
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#7164
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.2

SLM Type	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	25.1	25.4
Rel. Humidity (%)	55.7	55.1
Air Pressure (kPa)	101.4	101.5

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:
Accredited for compliance with ISO/IEC 17025 - Calibration.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. 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. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2017 and IEC 61260-2:2017, 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, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013 and IEC 61260-1:2014.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Authorized Signatory:

Print Name: Renzo Tonin Date: 20 December 2019

Template Document Name: RQT-05 (rev 65) SLM ISO Verification

NATacoustic
Sound Level Meter Verification - Summary of Tests

Calibration Date	20/12/2019	**Job No**	RB759	**Operator**	AM
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1. Instrument Information & Reference Conditions

Instrument Make	NTI	**Model**	XL2-TA	**Serial No**	#A2A-13528-E0 #RTA07-022
Microphone Make	NTI	**Model**	MC230A	**Serial No**	#A14673
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	#7164
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil			**Firmware**	4.2

Freq Weightings	**FLAT**	No	**A**	Yes	**C**	Yes	**Z**	Yes
Time Weightings	**Fast**	Yes	**Slow**	Yes	**Impulse**	Yes		

SLM Type	1
Filter Class	1

Instruction Manual is Available	Yes

2. Preliminary Inspection and Power Supply

Logger Inspected	Yes
Calibration Equipment Okay	Yes
Power Supply Ok (Start)	Yes
Power Supply Ok (End)	Yes

3. Environmental Conditions

	Measured	
Environmental Conditions	**Start**	**End**
Air Temp. (°C)	25.1	25.4
Rel. Humidity (%)	55.7	55.1
Air Pressure (kPa)	101.4	101.5
Conforming	Yes	Yes

Test Description			**Value / Conforming**	**Uncert (+/-)**
4(a). Initial Calibration		**Calibration Frequency Hz**	1000.0	N/A
		Indicated Level Before Adjustment (dB)	114.2	0.11
		Indicated Level After Adjustment (dB)	114.0	0.11
		Stability During Continuous Operation (dB)	Yes	N/A
5(a). Self-Generated Noise, Microphone Installed		**A**	16.5	0.09
5(b). Self-Generated Noise, Electrical		**A**	9.1	0.09
		C	12.4	0.09
		Z	18.6	0.09
6. Acoustical Signal Test		**125 Hz**	Yes	0.42
		1 kHz	Yes	0.42
		8 kHz	Yes	0.60
7. Electrical Frequency Weighting		**A**	Yes	0.09
		C	Yes	0.09
		Z	Yes	0.09
8. Frequency & Time Weightings 1kHz	**8(a). Frequency Weighting**	**C**	Yes	0.09
		Z	Yes	0.09
		FLAT	N/A	0.09
	8(b). Time Weighting	**Slow**	Yes	0.09
		Leq	Yes	0.09
9(a). Level Linearity 8kHz (Increasing)		**Conforming**	Yes	0.13
9(b). Level Linearity 8kHz (Decreasing)		**Conforming**	Yes	0.13
10(a). Level Linearity Including the Level Range (Reference Signal)		**Conforming**	Yes	0.13
10(b). Level Linearity Including the Level range (5dB Above Under-range)		**Conforming**	Yes	0.13
11. Toneburst Response		**Fast**	Yes	0.13
		Slow	Yes	0.13
		SEL/Leq	Yes	0.13
12. Peak C sound level		**8 kHz**	Yes	0.09
		500 Hz	Yes	0.09
13. Overload indication		**Conforming**	Yes	0.09
		Latches	N/A	N/A
14. High-level Stability		**Conforming**	Yes	0.09
15(a). Octave Band Filter Relative Attenuation (≤2kHz)		**Conforming**	Yes	0.09
15(b). Octave Band Filter Relative Attenuation (>2kHz)		**Conforming**	Yes	0.09
16. Octave Band Filter Relative Attenuation at Midband Frequency		**Conforming**	Yes	0.09
17(a). Octave Band Filter Level Linearity 31.5Hz (Increasing)		**31.5Hz**	Yes	0.13
17(b). Octave Band Filter Level Linearity 1kHz (Increasing)		**1kHz**	Yes	0.13
17(c). Octave Band Filter Level Linearity 16kHz (Increasing)		**16kHz**	Yes	0.13
18(a). Octave Band Filter Level Linearity 31.5Hz (Decreasing)		**31.5Hz**	Yes	0.13
18(b). Octrave Band Filter Level Linearity 1kHz (Decreasing)		**1kHz**	Yes	0.13
18(c). Octave Band Filter Level Linearity 16kHz (Decreasing)		**16kHz**	Yes	0.13
19(a). Octave Level Linearity Including the Level range (31.5Hz)		**31.5Hz**	Yes	0.13
19(b). Octave Level Linearity Including the Level range (1kHz)		**1kHz**	Yes	0.13
19(c). Octave Level Linearity Including the Level range (16kHz)		**16kHz**	Yes	0.13
20(a). Octave Band Filter Lower Limit (Reference Range)		**Conforming**	Yes	0.09
20(b). Octave Band Filter Lower Limit (Lowest Range)		**Conforming**	Yes	0.09
21(a). Third Octave Band Filter Relative Attenuation (≤31.5Hz)		**Conforming**	Yes	0.09
21(b). Third Octave Band Filter Relative Attenuation (40Hz-315Hz)		**Conforming**	Yes	0.09
21(c). Third Octave Band Filter Relative Attenuation (400Hz-3.15kHz)		**Conforming**	Yes	0.09
21(d). Third Octave Band Filter Relative Attenuation (≥4kHz)		**Conforming**	Yes	0.09

22. Third Octave Band Filter Relative Attenuation at Midband Frequency	**Conforming**	Yes	0.09
23(a). Third Octave Band Filter Level Linearity 31.5Hz (Increasing)	**31.5Hz**	Yes	0.13
23(b). Third Octave Band Filter Level Linearity 1kHz (Increasing)	**1kHz**	Yes	0.13
23(c). Third Octave Band Filter Level Linearity 16kHz (Increasing)	**16kHz**	Yes	0.13
24(a). Third Octave Band Filter Level Linearity 31.5Hz (Decreasing)	**31.5Hz**	Yes	0.13
24(b). Third Octave Band Filter Level Linearity 1kHz (Decreasing)	**1kHz**	Yes	0.13
24(c). Third Octave Band Filter Level Linearity 16kHz (Decreasing)	**16kHz**	Yes	0.13
25(a). Third Octave Level Linearity Including the Level range (31.5Hz)	**31.5Hz**	Yes	0.13
25(b). Third Octave Level Linearity Including the Level range (1kHz)	**1kHz**	Yes	0.13
25(c). Third Octave Level Linearity Including the Level range (16kHz)	**16kHz**	Yes	0.13
26(a). Octave Band Filter Lower Limit (Reference Range)	**Conforming**	Yes	0.09
26(b). Octave Band Filter Lower Limit (Lowest Range)	**Conforming**	Yes	0.09
SLM Overall Conforming		**Yes**	

☑ Checked

Template Document Name: RQT-05 (rev 65) SLM ISO Verification

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Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C21038

Client Details	CPB Contractors Level 4, 201 Elizabeth Street Sydney NSW 2000
Equipment Tested/ Model Number :	Rion NL-20
Instrument Serial Number :	00143337
Microphone Serial Number :	94478
Pre-amplifier Serial Number :	10094

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	23°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	52.5%	**Relative Humidity :**	50.2%
Barometric Pressure :	100.78kPa	**Barometric Pressure :**	100.77kPa

Calibration Technician :	Jeff Yu	**Secondary Check:**	Max Moore
Calibration Date :	29 Jan 2021	**Report Issue Date :**	29 Jan 2021

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*N/A*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2013, 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 requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.12dB*	*Temperature*	*±0.2°C*
1kHz	*±0.11dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.13dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Accelerometer / Vibration Monitor

Calibration Date 25/02/2021 **Operator** AH
Client Name RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010

Test Item

Manufacturer Sigicom **Serial No** #70190
Instrument Model C12

Applicable Work Instruction:
WiTC-101 Minimate 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:

Print Name: Ariel Michael Date: 8/03/2021

1. Calibration Information

Calibration Date	25/02/2021	**Job No**	RB859	**Operator**	AH
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1(a). Reference Instrument Information

Accelerometer Info	61C13 #21124

Sensitivity (mV/EU)	105.4
Engineering units (EU)	
Date of Last Calibration	25/02/2019

1(b). Test Instrument Information

Manufacturer	Sigicom
Model	C12
Serial Number	#70190

Colour Legend	
Enter Value	110
Operator Action	**110**
Difference	1.0
Tolerance	+/-1
Select Toggle	**Val**
Error/Outside Tolerance	2.0
Informative	**110**

Test Settings	
test no	**Test Accelerometer Axis**
1	V-Axis
2	T-Axis
3	L-Axis

1(c). Preliminary Inspection

Laboratory Calibration Equipment Ok	**Yes**
Test Instrument Inspected	**Yes**

1(d). Calibration Notes

Notes for Certificate

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.

Other Notes

The reference accelerometer was mounted on the BK4294 field calibrator and the output was connected to the DAQ. The 0-Peak vibration level was 1.429g = 14.02 m/s/s. The rms acceleration level was 9.91 m/s/s. This differs from the reference rms vibration level of 10.0m/s/s by 0.08 dB.

2. Comparison Tests

Comparison Test 1 - V-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Minimate Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.226	0.080	-0.1%	Pass	22.05	22.55	-0.50	0.19	Pass
8.0	4	0.400	0.141	0.3%	Pass	39.03	40.20	-1.17	0.26	Pass
31.5	3	0.358	0.127	-0.3%	Pass	8.87	8.20	0.67	0.68	Pass
				N/A	N/A	N/A		N/A	N/A	N/A

Comparison Test 1 - T-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Minimate Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.180	0.064	-0.6%	Pass	17.56	20.50	-2.94	1.34	Pass
8.0	4	0.320	0.113	0.1%	Pass	31.23	36.70	-5.47	1.40	Pass
31.5	2	0.242	0.086	-0.5%	Pass	6.00	5.95	0.05	0.07	Pass
31.5	3	0.399	0.141	0.0%	Pass	9.89	9.65	0.24	0.21	Pass

Comparison Test 1 - L-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Minimate Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.245	0.087	-0.4%	Pass	23.91	24.70	-0.79	0.28	Pass
8.0	4	0.422	0.149	0.1%	Pass	41.18	39.20	1.98	0.43	Pass
				N/A	N/A	N/A		N/A	N/A	N/A
				N/A	N/A	N/A		N/A	N/A	N/A

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Certificate of Calibration
Accelerometer / Vibration Monitor

Calibration Date 25/02/2021 **Operator** AH
Client Name RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010

Test Item

Manufacturer Sigicom **Serial No** #70250
Instrument Model C12

Applicable Work Instruction:
WiTC-101 Minimate 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:

Print Name: Ariel Michael Date: 8/03/2021

1. Calibration Information

Calibration Date	25/02/2021	**Job No**	RB859	**Operator**	AH
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1(a). Reference Instrument Information

Accelerometer Info	61C13 #21124

Sensitivity (mV/EU)	105.4
Engineering units (EU)	
Date of Last Calibration	25/02/2019

1(b). Test Instrument Information

Manufacturer	Sigicom
Model	C12
Serial Number	#70250

Colour Legend	
Enter Value	110
Operator Action	**110**
Difference	1.0
Tolerance	+/-1
Select Toggle	**Val**
Error/Outside Tolerance	2.0
Informative	**110**

Test Settings	
test no	**Test Accelerometer Axis**
1	V-Axis
2	T-Axis
3	L-Axis

1(c). Preliminary Inspection

Laboratory Calibration Equipment Ok	**Yes**
Test Instrument Inspected	**Yes**

1(d). Calibration Notes

Notes for Certificate

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.

Other Notes

The reference accelerometer was mounted on the BK4294 field calibrator and the output was connected to the DAQ. The 0-Peak vibration level was 1.429g = 14.02 m/s/s. The rms acceleration level was 9.91 m/s/s. This differs from the reference rms vibration level of 10.0m/s/s by 0.08 dB.

2. Comparison Tests

Comparison Test 1 - V-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Minimate Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.236	0.083	0.5%	Pass	23.03	22.30	0.73	0.28	Pass
8.0	4	0.412	0.146	-0.2%	Pass	40.20	39.60	0.60	0.13	Pass
				N/A	N/A	N/A		N/A	N/A	N/A
				N/A	N/A	N/A		N/A	N/A	N/A

Comparison Test 1 - T-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Minimate Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.180	0.064	-0.6%	Pass	17.56	17.40	0.16	0.08	Pass
8.0	4	0.332	0.117	0.3%	Pass	32.40	30.00	2.40	0.67	Pass
31.5	2	0.235	0.083	0.1%	Pass	5.82	5.65	0.17	0.26	Pass
31.5	3	0.392	0.139	-0.3%	Pass	9.71	9.40	0.31	0.29	Pass

Comparison Test 1 - L-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Minimate Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.237	0.084	-0.2%	Pass	23.13	22.70	0.43	0.16	Pass
8.0	4	0.426	0.151	-0.3%	Pass	41.57	42.20	-0.63	0.13	Pass
				N/A	N/A	N/A		N/A	N/A	N/A
				N/A	N/A	N/A		N/A	N/A	N/A

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Certificate of Calibration
Accelerometer / Vibration Monitor

Calibration Date	1/12/2020	**Operator**	Mohammed (Intern)
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD		
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010		

Test Item

Manufacturer	Sigicom	**Serial No**	#61860
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.
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.

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:

Print Name: Conrad Weber Date: 16/12/2020

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Certificate of Calibration
Accelerometer / Vibration Monitor

Calibration Date 25/02/2021 **Operator** AH
Client Name RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010

Test Item

Manufacturer Sigicom **Serial No** #70130
Instrument Model C12

Applicable Work Instruction:
WiTC-101 Minimate 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:

Print Name: Ariel Michael Date: 5/08/2021

1. Calibration Information

Calibration Date	25/02/2021	**Job No**	RB894	**Operator**	AH
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1(a). Reference Instrument Information

Accelerometer Info	61C13 #21124

Sensitivity (mV/EU)	105.4
Engineering units (EU)	
Date of Last Calibration	31/03/2021

1(b). Test Instrument Information

Manufacturer	Sigicom
Model	C12
Serial Number	#70130

Colour Legend	
Enter Value	110
Operator Action	**110**
Difference	1.0
Tolerance	+/-1
Select Toggle	**Val**
Error/Outside Tolerance	2.0
Informative	**110**

Test Settings	
test no	**Test Accelerometer Axis**
1	V-Axis
2	T-Axis
3	L-Axis

1(c). Preliminary Inspection

Laboratory Calibration Equipment Ok	**Yes**
Test Instrument Inspected	**Yes**

1(d). Calibration Notes

Notes for Certificate

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.

Other Notes

The reference accelerometer was mounted on the BK4294 field calibrator and the output was connected to the DAQ. The 0-Peak vibration level was 1.429g = 14.02 m/s/s. The rms acceleration level was 9.91 m/s/s. This differs from the reference rms vibration level of 10.0m/s/s by 0.08 dB.

2. Comparison Tests

Comparison Test 1 - V-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Sigicom Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.236	0.083	0.5%	Pass	23.03	22.30	0.73	0.28	Pass
8.0	4	0.412	0.146	-0.2%	Pass	40.20	39.60	0.60	0.13	Pass
31.5	3			#N/A	#N/A	0.00		0.00	0.00	#N/A
31.5	4			#N/A	#N/A	0.00		0.00	0.00	#N/A

Comparison Test 2 - T-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Sigicom Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.180	0.064	-0.6%	Pass	17.56	17.40	0.16	0.08	Pass
8.0	4	0.332	0.117	0.3%	Pass	32.40	30.00	2.40	0.67	Pass
31.5	2	0.235	0.083	0.1%	Pass	5.82	5.65	0.17	0.26	Pass
31.5	3	0.392	0.139	-0.3%	Pass	9.71	9.40	0.31	0.29	Pass

Comparison Test 3 - L-Axis

Test Frequency	Amplifier Volume	Reference Accelerometer Results					Sigicom Results	Difference	Difference	
(Hz)	setting	PK to PK (G) (3SF)	RMS (G) (3SF)	Sine Wave Quality	Sine Wave Quality	0-Pk (mm/s)	Zero to PK (mm/s) 3SF	(mm/s)	(dB)	Pass/Fail
8.0	3	0.237	0.084	-0.2%	Pass	23.13	22.70	0.43	0.16	Pass
8.0	4	0.426	0.151	-0.3%	Pass	41.57	42.20	-0.63	0.13	Pass
31.5	2			#N/A	#N/A	0.00		0.00	0.00	#N/A
31.5	3			#N/A	#N/A	0.00		0.00	0.00	#N/A

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Sound Calibrator

IEC 60942-2017

Calibration Certificate

Calibration Number C21042

Client Details CPB Contractors
Level 4, 201 Elizabeth Street
Sydney NSW 2000

Equipment Tested/ Model Number : Pulsar Model 106
Instrument Serial Number : 93277

Atmospheric Conditions
Ambient Temperature : 22.9°C
Relative Humidity : 50.7%
Barometric Pressure : 100.74kPa

Calibration Technician : Jeff Yu
Secondary Check: Max Moore
Calibration Date : 29 Jan 2021
Report Issue Date : 29 Jan 2021

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.01	1000.30

The sound calibrator has been shown to conform to the class 2 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..

Least Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.14dB*	*Temperature*	*±0.2°C*
Frequency	*±0.09%*	*Relative Humidity*	*±2.4%*
Distortion	*±0.09%*	*Barometric Pressure*	*±0.015kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

* The tests <1000 kHz are not covered by Acoustic Research Labs Pty Ltd NATA accreditation.

NATA
WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

Yeo-Kal Electronics Pty Ltd 18/26 Wattle Road, Brookvale NSW Australia
Telephone +61 2 9939 2616 Fax +61 2 9905 1100

CERTIFICATE OF CALIBRATION

Model: 611

Make: Yeo-Kal Electronics Pty Ltd.

Serial Number 426
Date/s of Calibration 28/01/21

Standards:

Temperature: Mercury in glass thermometer. Certified thermometer R246

Salinity: 35.00ppt seawater standardised with a model 610MK1V Salinometer against IAPSO Standard Seawater P101 K15= 1.00002 (Chlorinity 19.377). The conversion between conductivity and salinity is performed using the Practical Salinity Scale. UNESCO Technical Papers in marine Science 1983.

Conductivity: 1413us/cm. The conversion of low conductivity raw data to conductivity referenced to 25Deg C is performed using constants derived from the HANDBOOK OF CHEMISTRY AND PHYSICS 1963, Chemical Rubber Publishing Company, Page 2691, Conductivity of Standard Solutions using KCL, 0.001M Solution.

Dissolved Oxygen: 100% saturated distilled water. The YK611 measures dissolved oxygen as % saturation and then it automatically converts the reading to milligrams per litre. This conversion is calculated from the dissolved oxygen solubility tables found in International Oceanographic Tables vol.2. National Institute of Oceanography 1972. Zero oxygen achieved by purging probe with nitrogen/ or zero dummy plug.

Turbidity: Formazin 200ntu prepared as per Standard Methods. 0ntu prepared using distilled water.

pH: 4 and 10 buffers prepared as per Standard Methods. Ref: Durst, R.A. 1975 Standard Reference Materials: Standardization of pH Measurements NBS Spec Publ.260-53, National Bur. Standards, Washington D.C.

ORP: Buffers 7 and 10 with quinhydrone prepared as per standard methods and American Society for Testing and Materials. The redox potential conforms to International Standard IEC 746-5 "Expressions of Performance of Electrochemical Analyzers, Part 5: Oxidation-Reduction potential". In accordance with this standard, the Redox potential is referred to the standard ("normal") hydrogen electrode (NHE) and is expressed in mV.

Depth: Calibrated using a Druck DPI 610 pressure calibrator / 2.0 meter water column.

Model 611- Serial 426

At the time of calibration the sensors were calibrated to the following accuracy.

Temperature: $^{+}/_{-}$ 0.05 $^{\circ}$ C

Salinity: +/-0.1ppt

Conductivity: +/- 5us/cm

pH: +/- 0.03

ORP: +/- 3mv

Dissolved Oxygen: Normally ($^{+}/_{-}$ 0.5%).

Turbidity: +/- 0.3ntu for range of 0-200ntu.

Yeo-Kal Reference: RFS 2680

Calibrated by: G. Yeomans

SERIAL NUMBER: 426

CAL DATE/TIME	SENSOR	OFFSET	SLOPE
28/01/21 10:18	TEMPERATURE	2397.738	115.303
28/01/21 10:29	SAL/COND MSCM	-1.000	20470.480
28/01/21 10:22	COND USCM	9.735	4.868
28/01/21 10:38	DISSOLVED OXYGEN	-16.000	5.794
28/01/21 10:32	PH	3534.632	-511.943
28/01/21 10:35	ORP	437.000	2.305
28/01/21 10:40	TURBIDITY	-288.000	3.885

ENDORSEMENT
CITY & SOUTHWEST ACOUSTICS ADVISOR

Project:	**SSI-7400**		
Review of	**Pitt Street Integrated Station Development Quarterly Environment Construction Monitoring Report Q2 2021**	**Document reference:**	Pitt Street Integrated Station Development Quarterly Environment Construction Monitoring Report Q2 – April to June 2021 Teambinder Ref: SMCSWSPU-CPB-SPS-EM-REP-008819.B.RVW.B.03
Prepared by:	Larry Clark, Alternate Acoustics Advisor		
Date of issue:	30 October 2021		

As approved Alternate Acoustics Advisor for the Sydney Metro City & Southwest project, I have reviewed and provided comment on the noise and vibration components of the Quarterly Environment Construction Monitoring Report Q2 2021 for the Pitt Street Integrated Station Development (PSISD), as required under A27 (d) of the project approval conditions.

The PSISD Quarterly Environment Construction Monitoring Report is to be submitted to the Department of Planning, Industry and Environment in accordance with Condition of Approval C16 and the PSISD Construction Monitoring Program.

The report has been updated to address my comments. I am satisfied that the report meets the requirements for construction noise and vibration monitoring for PSISD, as outlined in the PSISD CNVMP and CNVIS and I endorse Teambinder Revision B.03.

Larry Clark, City & Southwest Alternate Acoustics Advisor