

SYDNEY METRO MARTIN PLACE – INTEGRATED STATION DEVELOPMENT NOISE AND VIBRATION MONITORING REPORT JUL-DEC 2021



REVISION STATUS

Rev	Date	Details / Description
0	15/03/2022	Initial issue
1	09/05/2022	Revised issue addressing comments

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1.0 INTRODUCTION

1.1 Sydney Metro project background

The New South Wales (NSW) Government through Transport for NSW (TfNSW) is implementing Sydney's Rail Future, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of commuters and customers in the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (previously known as the North West Rail Link), Sydney Metro City & Southwest and Sydney Metro West.

This monitoring report has been developed for the Martin Place Integrated Station Development (MPISD) construction.

1.2 Martin Place Integrated Station Development

The Martin Place Integrated Station Development comprises of the new Martin Place Metro Station. The Martin Place Metro Station works are being constructed as part of the Critical State Significant Infrastructure (CSSI) project (reference SSI 7400), and as approved by SSI 7400 MOD 3.

The south tower and north tower Over Station Development (OSD) works will be completed under separate State Significant Development (SSD) approvals.

1.3 Project location and monitoring locations

The Project is located at Martin Place, with the following components:

- North site, bounded by Hunter Street to the north, 50 Martin Place to the south, Elizabeth Street to the east and Castlereagh Street to the west.
- South site, bounded by Martin Place to the north, 65 Elizabeth Street to the south, Elizabeth Street to the east and Castlereagh Street to the west.
- Bligh Street compound, a temporary works location at 33 Bligh Street.

The location of these sites is shown in Figure 1 below.

MPISD works were undertaken at the Martin Place North site, South site, tunnels, station caverns and Bligh Street compound for the duration of the reporting period.

Realtime noise and vibration monitors have been placed at 50 Martin Place, as this is the most potentially impacted building and group of receivers.

Attended noise monitoring has taken place at various locations and receivers around the MPISD work sites.

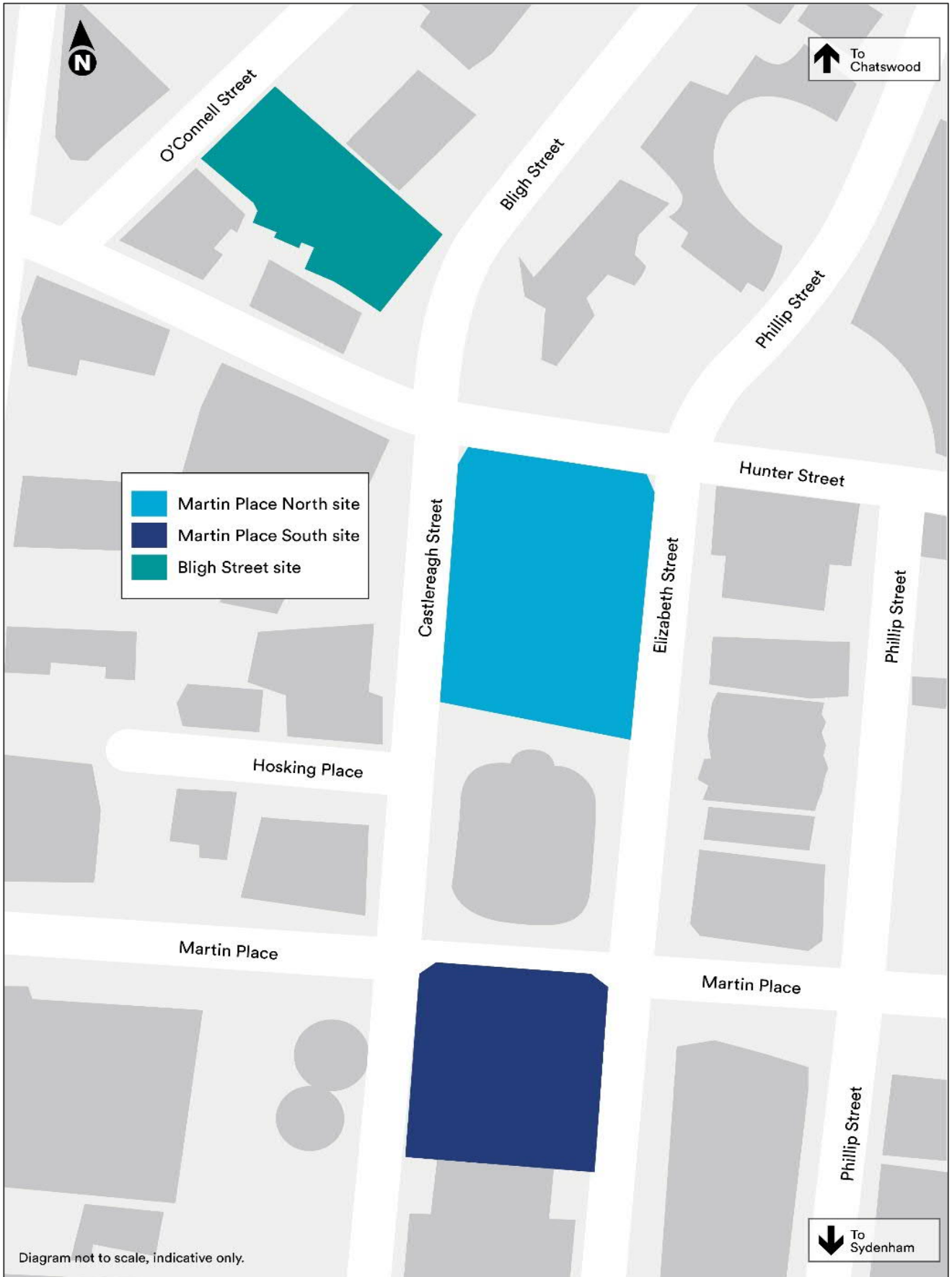


Figure 1 - Project Site Location

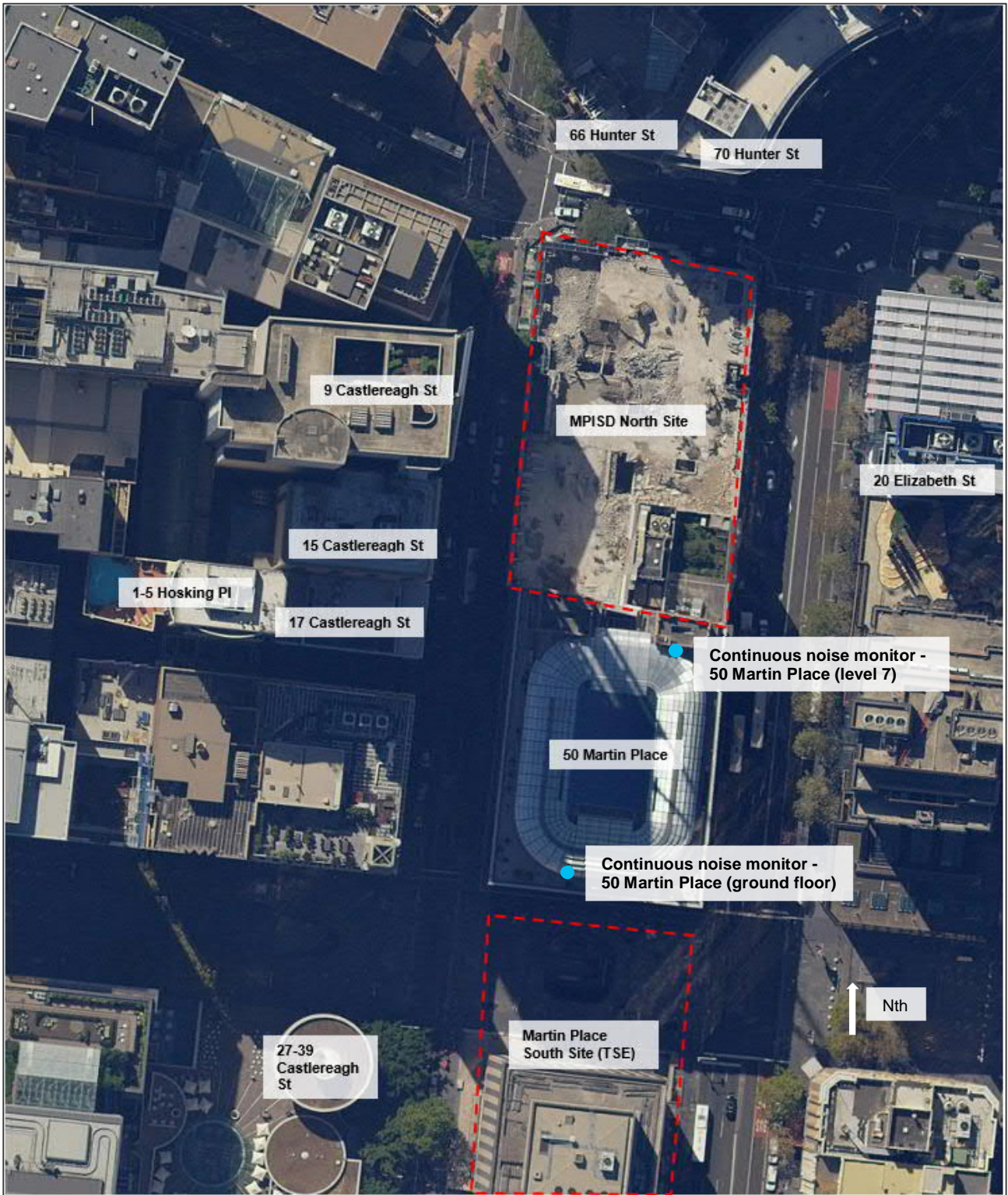


Figure 2 - Attended & continuous noise monitoring locations
(Source: maps.six.nsw.gov.au)

2.0 WORK ACTIVITIES

Works during the reporting period have comprised of the following activities:

- Deliveries.
- Excavation of station footings and foundations using hydraulic hammers and saws.
- Construction of station footings and foundations including steel and concrete placement.
- Waterproofing.
- Structural station elements including steel and concrete placement.
- Operation of the Bligh Street compound.

Working hours are based on the requirements of the CSSI planning approval. Standard approved working hours are:

- 7:00am to 6:00pm Mondays to Fridays; and
- 8:00am to 1:00pm Saturdays.

CSSI conditions E38 and E44 allow for works to be undertaken outside the standard approved hours where a negotiated agreement has been reached with a substantial majority of potentially affected sensitive receivers.

As such, a community negotiated agreement has been reached and approved, which includes provision for:

- 5am to 6am Monday to Saturday - site, plant and equipment set up, material deliveries, spoil haulage and hoist operations (north site only)
- 6am to 7am Monday to Saturday - material deliveries, spoil haulage, tower crane operations, hoist operations, concrete pours and general construction works
- 6pm to 10pm Monday to Saturday - material deliveries, spoil haulage, concrete pours, concrete finishing, tower crane operations, hoist operations and general construction works
- 5am to 8am, 12pm to 1pm and 7pm to 10pm Monday to Saturday - no high impact noise/vibration activities to occur (jack hammering, rock breaking, vibratory rolling, any other works occurring on the surface that generates noise with impulsive, intermittent, tonal or low frequency characteristics).

3.0 NOISE AND VIBRATION CRITERIA

Relevant noise and vibration criteria have been nominated in the MPISD Construction Noise and Vibration Management Plan and are reproduced below.

3.1 Noise

Between the hours 7am and 8pm, the following internal noise control limits apply:

- LAeq(15minute) > 60 dBA for no longer than 6.5 hours
- LAeq(15minute) < 55 dBA for at least 3.25 hours
- The above are inclusive of a 5 dB penalty if rock breaking or any other annoying activity likely to result in ground-borne noise or a perceptible level of vibration

3.2 Vibration

The following vibration screening criteria has generally been applied to 50 Martin Place:

- Screening criteria - 7.5 mm/s

As per CSSI condition E28.1, a vibration impact assessment was prepared by DPIE-approved specialists for pedestrian tunnel works underneath 50 Martin Place. The assessment:

- included structural engineering inspection of the parts of the building predicted to be affected by vibration levels above 7.5mm/s;
- concluded that vibration up to 20mm/s (or more) is appropriate for newer (non-heritage) structures;
- retained the 7.5mm/s vibration screening criterion for heritage parts of the building; and
- was endorsed by the Acoustic Advisor on 25 November 2020.

Specific revised screening criteria for 50 Martin Place are outlined in Table 1 below:

Table 1 – Vibration screening criteria for 50 Martin Place

Location	PPV Vibration Criterion, mm/s
50 Martin Place building (unless noted otherwise)	7.5mm/s
Concrete sub-basement structure if frequency dependent vibration monitoring is not used	20mm/s
Concrete sub-basement structure if frequency dependent vibration monitoring is used	<ul style="list-style-type: none"> • 20mm/s for vibration frequency < 20Hz • 25mm/s for vibration frequency > 20Hz • or the frequency dependant vibration criterion in line 1 of Table 1 in DIN4150 (refer to Figures 11 & 12)

Note: vibration levels are measured in Peak Particle Velocity (PPV).

4.0 MONITORING EQUIPMENT

The monitors used for the various monitoring completed during the reporting period are outlined in Table 2 below. Attended monitors were field calibrated before each field measurement.

Table 2 – Monitoring equipment details

Equipment Details	Monitoring Type	Location(s)	Serial No.	NATA Calibration Date	Envirosuite Ref.
Bruel & Kjaer Type 2245 Type 1 sound level meter	Attended noise	Various, as per Table 3	2245-100100	04/07/20	N/A
Bruel & Kjaer Type 4231 Type 1 sound level meter calibrator	Attended noise	Various, as per Table 3	3023895	04/07/20	N/A
Brüel & Kjær 2250 sound level meter	Real-time noise	50 Martin Place Ground Floor C1 & Level 7 NE	3023931	09/10/19	GF C1, Level 7 NE
Brüel & Kjær 4450 vibration monitor	Real-time vibration	50 Martin Place sub-basement & Level 7 NE	1000126	07/12/20	SB C10, Level 7 NE

Calibration of the Brüel & Kjær 2250 sound level meter within 50 Martin Place expired during the reporting period. A non-conformance was raised in relation to this, and the meter replaced with a newly calibrated meter. This issue is unlikely to affect the outcomes noted in this report, as the noise levels within 50 Martin Place were routinely significantly below the required criteria.

5.0 MONITORING RESULTS

5.1 Attended vibration monitoring summary

Attended vibration monitoring was not required during the monitoring period.

Vibration within 50 Martin Place was monitored real-time, as discussed in Section 5.3 below.

5.2 Attended noise monitoring summary

Attended noise monitoring was undertaken at various representative locations around the MPISD work sites as outlined in Figure 2. A summary of monitoring results is presented in Table 3.

As detailed excavation and tunnelling were completed prior to the reporting period, potential impacts of construction noise were reduced to the equipment associated with structural and fitout works.

It is noted that the surrounding buildings are predominantly used for commercial purposes with assumed façade transmission loss of airborne noise of 20-35 dB, as per the MPISD Construction Noise and Vibration Impact Statement.

Monitoring during the reporting period was reduced due to the NSW Government covid-19 construction shutdown, and later lockdowns. Attended monitoring during July and August was unable to be completed, but resumed in September. Noise levels were comparable to the previous reporting period, and increased slightly as the CBD became busier later in the reporting period.

There were no exceedances of noise criteria recorded during the reporting period, as per Table 3.

5.3 Real-time vibration monitoring summary

Vibration data collected for the MPISD works have been based on real-time monitoring results as these are considered to best represent the most impacted structure, being 50 Martin Place, and group of receivers, being the personnel working within 50 Martin Place. Vibration data for 50 Martin Place is included in Appendix 2.

A real-time vibration monitor was located within the sub-basement at the north end of 50 Martin Place for the majority of the reporting period. It was then moved on 30 November 2021 to higher within the north end of the building to pick up potential impacts from bridging works from the MPISD north site to 50 Martin Place.

Screening criteria are outlined in Section 3.2.

There were no exceedances of vibration criteria recorded during the reporting period, as per Appendix 2. Slightly increased vibration levels during December 2021 compared to earlier results were attributable to the change to the new monitoring location higher in the 50 Martin Place building.

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Table 3 – Attended noise monitoring results

Location/ Receiver	Date ²	Main Activities	Noise period	External L _{Aeq(15minute)} dB(A)	Assumed façade loss dB(A)	Penalty applied dB(A)	Internal L _{Aeq(15minute)} dB(A)	Goal L _{Aeq(15minute)} dB(A)	Compliant	Notes
9 Castlereagh	16/09/21	Haulage, steel, concrete	Daytime	66	25	0	41	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
70 Hunter	16/09/21	Haulage, steel, concrete	Daytime	63	25	0	38	60	Yes	Dominant noise source observed from local traffic on Hunter Street.
20 Elizabeth	16/09/21	Haulage, steel, concrete	Daytime	65	20	0	45	60	Yes	Local traffic and buses on Elizabeth Street during works.
1-5 Hosking ¹	16/09/21	Haulage, steel, concrete	Daytime	66	30 ¹	0	36	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
9 Castlereagh	20/10/21	Haulage, steel, concrete	Daytime	67	25	0	42	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
70 Hunter	20/10/21	Haulage, steel, concrete	Daytime	64	25	0	39	60	Yes	Dominant noise source observed from local traffic on Hunter Street.
20 Elizabeth	20/10/21	Haulage, steel, concrete	Daytime	67	20	0	47	60	Yes	Local traffic and buses on Elizabeth Street during works.
1-5 Hosking ¹	20/10/21	Haulage, steel, concrete	Daytime	68	30 ¹	0	38	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
9 Castlereagh	12/11/21	Haulage, steel, concrete	Daytime	69	25	0	44	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
70 Hunter	12/11/21	Haulage, steel, concrete	Daytime	66	25	0	41	60	Yes	Dominant noise source observed from local traffic on Hunter Street.
20 Elizabeth	12/11/21	Haulage, steel, concrete	Daytime	67	20	0	47	60	Yes	Local traffic and buses on Elizabeth Street during works.
1-5 Hosking ¹	12/11/21	Haulage, steel, concrete	Daytime	69	30 ¹	0	39	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
9 Castlereagh	14/12/21	Haulage, steel, concrete	Daytime	68	25	0	43	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.
70 Hunter	14/12/21	Haulage, steel, concrete	Daytime	65	25	0	40	60	Yes	Dominant noise source observed from local traffic on Hunter Street.
20 Elizabeth	14/12/21	Haulage, steel, concrete	Daytime	65	20	0	45	60	Yes	Local traffic and buses on Elizabeth Street during works.
1-5 Hosking ¹	14/12/21	Haulage, steel, concrete	Daytime	70	30 ¹	0	40	60	Yes	Local traffic and buses on Castlereagh Street dominant noise.

¹External noise level at 1-5 Hosking Place assumes a façade loss of 20 dB(A), and 10 dB(A) additional loss due to distance attenuation and shielding. Measurements taken at footpath outside 17 Castlereagh Street as internal access to 1-5 Hosking Place unavailable.

²All measurements for airborne noise.



5.4 Real-time noise monitoring summary

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

- Criteria 1 - LAeq(15minute) > 60 dBA no longer than 6.5 hours
- Criteria 2 - LAeq(15minute) < 55 dBA for at least 3.25 hours

To monitor compliance with criteria 1 and 2, the number of 15 minute periods between 7am and 8pm that internal noise levels were observed to be above 60dBA (LEq15) and below 55dBA, respectively, have been counted. Within these hours, works are 'permitted' up to 6.5 hours (26x15 minute periods) of noise greater than 60dBA and 'require' minimum 3.25 hours (13x15 minute periods) less than 55dBA.

Real-time monitoring results for July to December 2021 within 50 Martin Place are outlined in Appendix 1.

Criteria 1 was not observed to be exceeded during the reporting period.

It is noted that although noisy construction activities including hydraulic hammering was intermittently used early in the reporting period, the stated 5dB penalty and resulting criteria of 55dB(A) does not provide an accurate representation of construction impact, as the internal background noise of 50 Martin Place is consistently at or above 55dB(A) without construction works being undertaken.

This is illustrated by LAeq levels observed in Figures 4 and 5. With noisy works (hydraulic hammering) not being completed between 7-8am and 12-1pm each day and completed by 6:00pm, it can be seen that the LAeq level stays constant, at or above 55dB(A). The screening criteria has therefore been left at 60dB(A).

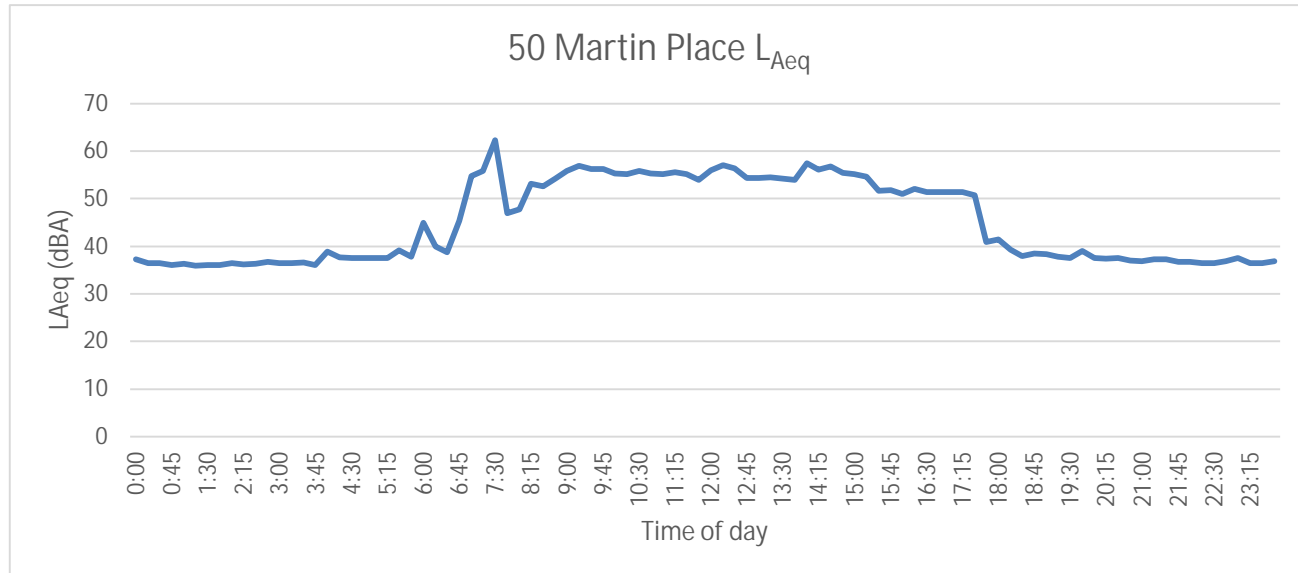


Figure 3 - LAeq levels 20 October 2021

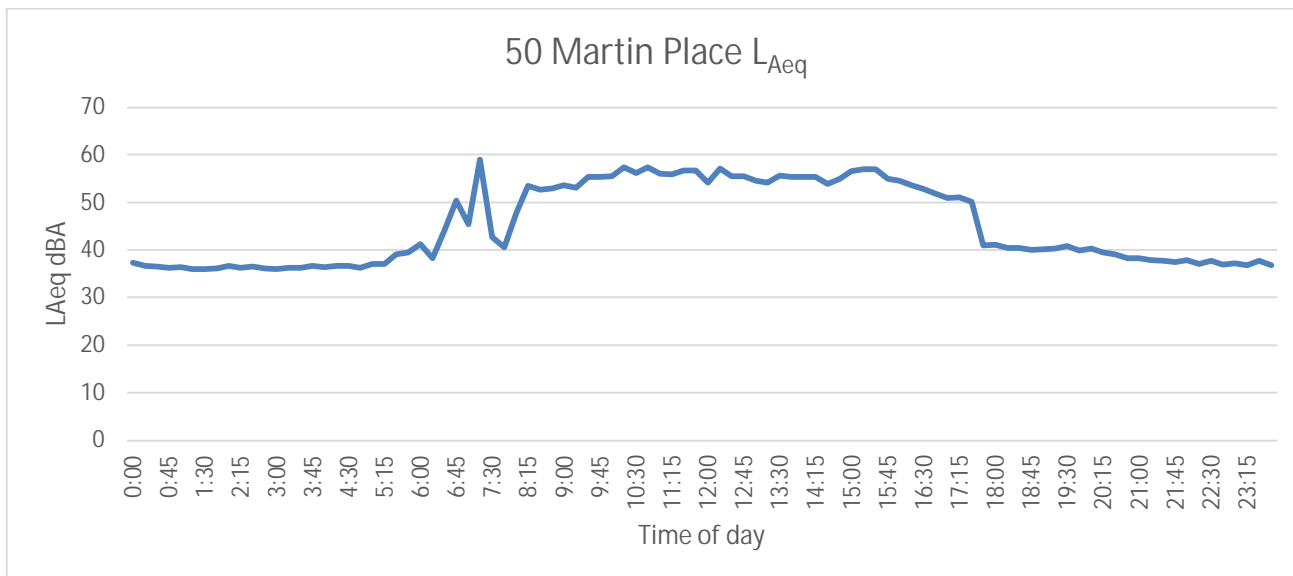


Figure 4 - LAeq levels 12 November 2021

Noise levels were not observed to exceed Criteria 2.

For the reporting period, respites from high noise works have been in place 7am to 8am and 12pm to 1pm each day. In addition, main construction works were not completed between 6pm and 8pm. As such, there have been at least eight hours per day where noise resulting from construction activities was below 55dBA.

It is noted that it is assumed that occasional hammering of concrete is the loudest activity undertaken as part of the works, and that no other activity has generated noise levels as high as hammering.

Note that all monitoring data will be provided to DPIE at the completion of monitoring.

6.0 CONCLUSION

Observed noise and vibration levels are generally in accordance with, or below, the forecasts presented in the Construction Noise and Vibration Impact Statements.

Based on the monitoring results and site investigations, noise and vibration associated with construction works was compliant with project approvals and requirements during the monitoring period.

APPENDIX 1: REAL-TIME NOISE MONITORING RESULTS SUMMARY

July 2021 real-time noise summary

Location	Start Time	End Time	Criteria 1 Hours >60dB	Criteria 2 Hours <55dB
Noise - GF C1	1/07/2021 7:00:00 AM	1/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	2/07/2021 7:00:00 AM	2/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	3/07/2021 7:00:00 AM	3/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	4/07/2021 7:00:00 AM	4/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	5/07/2021 7:00:00 AM	5/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	6/07/2021 7:00:00 AM	6/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	7/07/2021 7:00:00 AM	7/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	8/07/2021 7:00:00 AM	8/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	9/07/2021 7:00:00 AM	9/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	10/07/2021 7:00:00 AM	10/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	11/07/2021 7:00:00 AM	11/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	12/07/2021 7:00:00 AM	12/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	13/07/2021 7:00:00 AM	13/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	14/07/2021 7:00:00 AM	14/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	15/07/2021 7:00:00 AM	15/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	16/07/2021 7:00:00 AM	16/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	17/07/2021 7:00:00 AM	17/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	18/07/2021 7:00:00 AM	18/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	19/07/2021 7:00:00 AM	19/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	20/07/2021 7:00:00 AM	20/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	21/07/2021 7:00:00 AM	21/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	22/07/2021 7:00:00 AM	22/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	23/07/2021 7:00:00 AM	23/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	24/07/2021 7:00:00 AM	24/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	25/07/2021 7:00:00 AM	25/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	26/07/2021 7:00:00 AM	26/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	27/07/2021 7:00:00 AM	27/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	28/07/2021 7:00:00 AM	28/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	29/07/2021 7:00:00 AM	29/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	30/07/2021 7:00:00 AM	30/07/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	31/07/2021 7:00:00 AM	31/07/2021 8:00:00 PM	0.00	13.00

August 2021 real-time noise summary

Location	Start Time	End Time	Criteria 1 Hours >60dB	Criteria 2 Hours <55dB
Noise - GF C1	1/08/2021 7:00:00 AM	1/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	2/08/2021 7:00:00 AM	2/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	3/08/2021 7:00:00 AM	3/08/2021 8:00:00 PM	3.50	13.00
Noise - GF C1	4/08/2021 7:00:00 AM	4/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	5/08/2021 7:00:00 AM	5/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	6/08/2021 7:00:00 AM	6/08/2021 8:00:00 PM	3.25	13.00
Noise - GF C1	7/08/2021 7:00:00 AM	7/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	8/08/2021 7:00:00 AM	8/08/2021 8:00:00 PM	1.00	13.00
Noise - GF C1	9/08/2021 7:00:00 AM	9/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	10/08/2021 7:00:00 AM	10/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	11/08/2021 7:00:00 AM	11/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	12/08/2021 7:00:00 AM	12/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	13/08/2021 7:00:00 AM	13/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	14/08/2021 7:00:00 AM	14/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	15/08/2021 7:00:00 AM	15/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	16/08/2021 7:00:00 AM	16/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	17/08/2021 7:00:00 AM	17/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	18/08/2021 7:00:00 AM	18/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	19/08/2021 7:00:00 AM	19/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	20/08/2021 7:00:00 AM	20/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	21/08/2021 7:00:00 AM	21/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	22/08/2021 7:00:00 AM	22/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	23/08/2021 7:00:00 AM	23/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	24/08/2021 7:00:00 AM	24/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	25/08/2021 7:00:00 AM	25/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	26/08/2021 7:00:00 AM	26/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	27/08/2021 7:00:00 AM	27/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	28/08/2021 7:00:00 AM	28/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	29/08/2021 7:00:00 AM	29/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	30/08/2021 7:00:00 AM	30/08/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	31/08/2021 7:00:00 AM	31/08/2021 8:00:00 PM	0.00	13.00



September 2021 real-time noise summary

Location	Start Time	End Time	Criteria 1 Hours >60dB	Criteria 2 Hours <55dB
Noise - GF C1	1/09/2021 7:00:00 AM	1/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	2/09/2021 7:00:00 AM	2/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	3/09/2021 7:00:00 AM	3/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	4/09/2021 7:00:00 AM	4/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	5/09/2021 7:00:00 AM	5/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	6/09/2021 7:00:00 AM	6/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	7/09/2021 7:00:00 AM	7/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	8/09/2021 7:00:00 AM	8/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	9/09/2021 7:00:00 AM	9/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	10/09/2021 7:00:00 AM	10/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	11/09/2021 7:00:00 AM	11/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	12/09/2021 7:00:00 AM	12/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	13/09/2021 7:00:00 AM	13/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	14/09/2021 7:00:00 AM	14/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	15/09/2021 7:00:00 AM	15/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	16/09/2021 7:00:00 AM	16/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	17/09/2021 7:00:00 AM	17/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	18/09/2021 7:00:00 AM	18/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	19/09/2021 7:00:00 AM	19/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	20/09/2021 7:00:00 AM	20/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	21/09/2021 7:00:00 AM	21/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	22/09/2021 7:00:00 AM	22/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	23/09/2021 7:00:00 AM	23/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	24/09/2021 7:00:00 AM	24/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	25/09/2021 7:00:00 AM	25/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	26/09/2021 7:00:00 AM	26/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	27/09/2021 7:00:00 AM	27/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	28/09/2021 7:00:00 AM	28/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	29/09/2021 7:00:00 AM	29/09/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	30/09/2021 7:00:00 AM	30/09/2021 8:00:00 PM	0.00	13.00

October 2021 real-time noise summary

Location	Start Time	End Time	Criteria 1 Hours >60dB	Criteria 2 Hours <55dB
Noise - GF C1	1/10/2021 7:00:00 AM	1/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	2/10/2021 7:00:00 AM	2/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	3/10/2021 7:00:00 AM	3/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	4/10/2021 7:00:00 AM	4/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	5/10/2021 7:00:00 AM	5/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	6/10/2021 7:00:00 AM	6/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	7/10/2021 7:00:00 AM	7/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	8/10/2021 7:00:00 AM	8/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	9/10/2021 7:00:00 AM	9/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	10/10/2021 7:00:00 AM	10/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	11/10/2021 7:00:00 AM	11/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	12/10/2021 7:00:00 AM	12/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	13/10/2021 7:00:00 AM	13/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	14/10/2021 7:00:00 AM	14/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	15/10/2021 7:00:00 AM	15/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	16/10/2021 7:00:00 AM	16/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	17/10/2021 7:00:00 AM	17/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	18/10/2021 7:00:00 AM	18/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	19/10/2021 7:00:00 AM	19/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	20/10/2021 7:00:00 AM	20/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	21/10/2021 7:00:00 AM	21/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	22/10/2021 7:00:00 AM	22/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	23/10/2021 7:00:00 AM	23/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	24/10/2021 7:00:00 AM	24/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	25/10/2021 7:00:00 AM	25/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	26/10/2021 7:00:00 AM	26/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	27/10/2021 7:00:00 AM	27/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	28/10/2021 7:00:00 AM	28/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	29/10/2021 7:00:00 AM	29/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	30/10/2021 7:00:00 AM	30/10/2021 8:00:00 PM	0.00	13.00
Noise - GF C1	31/10/2021 7:00:00 AM	31/10/2021 8:00:00 PM	0.00	13.00



November 2021 real-time noise summary

Location	Start Time	End Time	Criteria 1 Hours >60dB	Criteria 2 Hours <55dB
Noise L7 - NE	1/11/2021 7:00:00 AM	1/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	2/11/2021 7:00:00 AM	2/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	3/11/2021 7:00:00 AM	3/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	4/11/2021 7:00:00 AM	4/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	5/11/2021 7:00:00 AM	5/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	6/11/2021 7:00:00 AM	6/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	7/11/2021 7:00:00 AM	7/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	8/11/2021 7:00:00 AM	8/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	9/11/2021 7:00:00 AM	9/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	10/11/2021 7:00:00 AM	10/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	11/11/2021 7:00:00 AM	11/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	12/11/2021 7:00:00 AM	12/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	13/11/2021 7:00:00 AM	13/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	14/11/2021 7:00:00 AM	14/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	15/11/2021 7:00:00 AM	15/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	16/11/2021 7:00:00 AM	16/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	17/11/2021 7:00:00 AM	17/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	18/11/2021 7:00:00 AM	18/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	19/11/2021 7:00:00 AM	19/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	20/11/2021 7:00:00 AM	20/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	21/11/2021 7:00:00 AM	21/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	22/11/2021 7:00:00 AM	22/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	23/11/2021 7:00:00 AM	23/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	24/11/2021 7:00:00 AM	24/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	25/11/2021 7:00:00 AM	25/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	26/11/2021 7:00:00 AM	26/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	27/11/2021 7:00:00 AM	27/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	28/11/2021 7:00:00 AM	28/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	29/11/2021 7:00:00 AM	29/11/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	30/11/2021 7:00:00 AM	30/11/2021 8:00:00 PM	0.00	13.00



December 2021 real-time noise summary

Location	Start Time	End Time	Criteria 1 Hours >60dB	Criteria 2 Hours <55dB
Noise L7 - NE	1/12/2021 7:00:00 AM	1/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	2/12/2021 7:00:00 AM	2/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	3/12/2021 7:00:00 AM	3/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	4/12/2021 7:00:00 AM	4/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	5/12/2021 7:00:00 AM	5/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	6/12/2021 7:00:00 AM	6/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	7/12/2021 7:00:00 AM	7/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	8/12/2021 7:00:00 AM	8/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	9/12/2021 7:00:00 AM	9/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	10/12/2021 7:00:00 AM	10/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	11/12/2021 7:00:00 AM	11/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	12/12/2021 7:00:00 AM	12/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	13/12/2021 7:00:00 AM	13/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	14/12/2021 7:00:00 AM	14/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	15/12/2021 7:00:00 AM	15/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	16/12/2021 7:00:00 AM	16/12/2021 8:00:00 PM	0.00	12.75
Noise L7 - NE	17/12/2021 7:00:00 AM	17/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	18/12/2021 7:00:00 AM	18/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	19/12/2021 7:00:00 AM	19/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	20/12/2021 7:00:00 AM	20/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	21/12/2021 7:00:00 AM	21/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	22/12/2021 7:00:00 AM	22/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	23/12/2021 7:00:00 AM	23/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	24/12/2021 7:00:00 AM	24/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	25/12/2021 7:00:00 AM	25/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	26/12/2021 7:00:00 AM	26/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	27/12/2021 7:00:00 AM	27/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	28/12/2021 7:00:00 AM	28/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	29/12/2021 7:00:00 AM	29/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	30/12/2021 7:00:00 AM	30/12/2021 8:00:00 PM	0.00	13.00
Noise L7 - NE	31/12/2021 7:00:00 AM	31/12/2021 8:00:00 PM	0.00	13.00

APPENDIX 2: REAL-TIME VIBRATION MONITORING RESULTS SUMMARY

July – December 2021 Vibration

