

Borg Manufacturing Facility

Quarter 4 - Construction Noise Monitoring

Prepared for Borg Manufacturing Pty Ltd

November 2022

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Quarter 4 - Construction Noise Monitoring

Borg Manufacturing Pty Ltd

E220481 RP#1

November 2022

Version	Date	Prepared by	Approved by	Comments
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15 November 2022

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TABLE OF CONTENTS

1	Introduction	1
1.1	Background	1
1.2	Attended noise monitoring locations	1
1.3	Terminology and abbreviations	3
2	Regulator requirements and noise criteria	4
2.1	Development consents	4
2.2	Environment protection licence	4
2.3	Construction Noise Management Plan	4
2.4	Noise criteria	4
2.5	Meteorological conditions	5
2.6	Modifying factors	5
3	Methodology	6
3.1	Overview	6
3.2	Attended noise monitoring	6
3.3	Modifying factors	7
3.4	Attended noise monitoring equipment	7
4	Results	8
4.1	Total measured noise levels	8
4.2	Modifying factors	8
4.3	Attended noise monitoring results	8
4.4	Atmospheric conditions	9
5	Summary	10

Appendices

Appendix A	Regulator documents	A.1
Appendix B	Calibration certificates	B.1

Tables

Table 1.1	Attended monitoring locations	1
Table 1.2	Terminology and abbreviations	3
Table 2.1	Impact assessment criteria	4
Table 2.2	General construction noise limits	4

Table 2.3	Rock/Concrete breaking noise limits	4
Table 3.1	Attended noise monitoring equipment	7
Table 4.1	Measured noise levels – Quarter 4 2022	8
Table 4.2	$L_{Aeq,15minute}$ generated by Borg against criteria – Quarter 4 2022	8
Table 4.3	Observed atmospheric conditions – Quarter 4 2022	9

Figures

Figure 1.1	Borg noise monitoring locations	2
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1 Introduction

1.1 Background

Global Acoustics (now part of EMM) was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was done during the day period of 10 November 2022 at four monitoring locations around Borg.

1.2 Attended noise monitoring locations

Monitoring locations are detailed in Table 1.1 and shown in Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not the location of residences.

Table 1.1 Attended monitoring locations

Location Descriptor	Monitoring Locations
NM1	Oberon Caravan Park
NM2	Intersection of Pine Street and Herborn Street
NM3	127 Hazelgrove Road
NM4	Intersection of Tasman Street and Earl Street

Figure 1.1 Borg noise monitoring locations

Operational Noise Management Plan – Borg Panels, Oberon



1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The “A” weighting scale is used to describe human response to noise.
L _{Amax}	The maximum A-weighted noise level over a time period.
L _{A1}	The noise level which is exceeded for 1 per cent of the time.
L _{A1,1minute}	The noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L _{A10}	The noise level which is exceeded for 10 percent of the time.
L _{Aeq}	The average noise A-weighted energy during a measurement period.
L _{A50}	The noise level which is exceeded for 50 per cent of the time and the median noise level during a measurement period.
L _{A90}	The level exceeded for 90 percent of the time. The L _{A90} level is often referred to as the “background” noise level and is commonly used to determine noise criteria for assessment purposes.
L _{Amin}	The minimum A-weighted noise level over a time period.
L _{Ceq}	The average C-weighted noise energy during a measurement period. The “C” weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
SC	Stability class (or category) is determined from measured wind speed and either sigma-theta or VTG.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	This is the period 7:00am to 6:00pm.
Evening	This is the period 6:00pm to 10:00pm.
Night	This is the period 10:00pm to 7:00am.

2 Regulator requirements and noise criteria

2.1 Development consents

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 20 May 2022. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment protection licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 8 September 2022. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Construction Noise Management Plan

Noise monitoring requirements are detailed in the Borg Construction Noise Management Plan (CNMP). The most recent version of the CNMP was approved in August 2022. Relevant sections of the CNMP are reproduced in Appendix A.

2.4 Noise criteria

Noise limits are consistent between the consent and EPL and have been reproduced in Table 2.1 below.

Table 2.1 Impact assessment criteria

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
All sensitive receivers	55	50	45

Construction noise criteria for each monitoring location are detailed in Table 2.2 and Table 2.3.

Table 2.2 General construction noise limits

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
All sensitive receivers	55	50	45

Table 2.3 Rock/Concrete breaking noise limits

Location	Day $L_{Aeq,15minute}$
All sensitive receivers	75

2.5 Meteorological conditions

As described in the consent, noise generated by Borg is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy (INP), as follows:

- During rain and wind speeds greater than 3 metres/second at 10 metres above ground level; or
- Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- Stability category G temperature inversion conditions.

2.6 Modifying factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP, 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors has been done in accordance with Fact Sheet C of the NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was conducted in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements, and the Borg CNMP. Meteorological data was obtained from the Borg automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended noise monitoring

During this survey, attended monitoring was done during the day period at each location. The duration of each measurement was 15 minutes. Atmospheric condition observations were also made at each monitoring location.

This report presents noise levels gathered during attended monitoring that can be the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of Borg's contribution, if any, to measured levels. At each receptor location, Borg's $L_{Aeq,15\text{minute}}$ (in the absence of any other noise) was measured directly, where possible, or, determined by frequency analysis.

If the exact contribution of the source of interest (in this case Borg) cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise descriptors in accordance with Section 7.1 of the NPfl. This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking, but estimated to be significant in relation to a relevant criterion, we would employ methods (eg measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- site noise levels were masked by another relatively loud noise source that is characteristic of the environment (eg breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- it was not feasible, nor reasonable, to employ methods such as move closer and back calculate. Cases may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

Often extraneous noise events (for example, road traffic pass-bys and dogs) interfere with the measurement of site noise levels in the frequency range of interest. Where required, the sound level meter is paused during these occurrences to aid in quantification of site only noise.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable, such that the site only L_{Aeq} was not “NM” or less than a maximum cut off value (eg “<20 dB” or “<30dB”).

If applicable, modifying factors have been reported and added to measured site only L_{Aeq} when meteorological conditions satisfied requirements for site noise criteria to be applicable. Low-frequency modifying factors have only been applied to site-only L_{Aeq} if Borg was the only contributing low-frequency noise source.

3.4 Attended noise monitoring equipment

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix B.

Table 3.1 Attended noise monitoring equipment

Model	Serial number	Calibration due date
Rion NA-28 sound level meter	00370304	31/10/2024
Pulsar 105 acoustic calibrator	81334	29/11/2023

4 Results

4.1 Total measured noise levels

Overall noise levels measured at each location during attended monitoring are provided in Table 4.1.

Table 4.1 Measured noise levels – Quarter 4 2022

Location	Start Date and Time	L _{Amax} dB	L _{A1} dB	L _{A10} dB	L _{Aeq} dB	L _{A50} dB	L _{A90} dB	L _{Amin} dB
NM1	10/11/2022 13:10	61	54	51	48	48	45	43
NM2	10/11/2022 13:33	63	57	49	47	45	42	40
NM3	10/11/2022 12:41	80	75	57	60	37	34	31
NM4	10/11/2022 13:56	74	60	52	50	45	38	33

Notes: 1. Levels in this table are not necessarily the result of activity at Borg.

4.2 Modifying factors

Measured site-only levels were assessed for the applicability of modifying factors in accordance with the NPfl and methodology described in Section 3.3.

There were no modifying factors, as defined in the NPfl, applicable during the survey.

4.3 Attended noise monitoring results

Table 4.2 compares measured L_{Aeq,15minute} from Borg with project specific noise criteria.

Table 4.2 L_{Aeq,15minute} generated by Borg against criteria – Quarter 4 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies? ¹	Borg L _{Aeq,15minute} dB ²	Exceedance ^{3,4}
NM1	10/11/2022 13:10	2.6	A	55	Yes	46	Nil
NM2	10/11/2022 13:33	2.7	A	55	Yes	IA	Nil
NM3	10/11/2022 12:41	1.6	A	55	Yes	<25	Nil
NM4	10/11/2022 13:56	1.3	A	55	Yes	<25	Nil

Notes: 1. Noise criteria apply under all meteorological conditions except those detailed in Section 2.5.

2. Site only L_{Aeq,15minute} attributed to Borg including modifying factors if applicable.

3. Bold results in red indicate exceedance of criterion (if applicable).

4. NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.

4.4 Atmospheric conditions

Atmospheric condition observations made by the operator during each measurement are shown in Table 4.3. Wind speed, direction and cloud cover were observed by the operator and temperature was taken from Borg AWS. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Observed atmospheric conditions – Quarter 4 2022

Location	Start Date and Time	Temperature °C	Wind Speed m/s	Wind Direction ° Magnetic North ¹	Cloud Cover 1/8s
NM1	10/11/2022 13:10	19	1.1	220	2
NM2	10/11/2022 13:33	27	0.7	230	2
NM3	10/11/2022 12:41	30	1.3	220	2
NM4	10/11/2022 13:56	22	2.2	240	2

Notes: 1. “-” indicates calm conditions at monitoring location

Meteorological data for compliance assessment is sourced from Borg AWS.

5 Summary

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey is to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was done during the day period of 10 November 2022 at four monitoring locations around Borg.

Borg operations complied with relevant criteria during the Quarter 4 2022 survey at all monitoring locations.

Appendix A

Regulator documents

A.1 Development consent SSD 7016

NOISE

Hours of Work

B13 The Applicant must comply with the hours detailed in **Table 1**, unless otherwise agreed in writing by the Secretary.

Table 1: Hours of Work

Activity	Day	Time
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm
Operation	Monday – Sunday	24 hours

B14 Works outside of the hours identified in Condition B13 may be undertaken in the following circumstances:

- works that are inaudible at the nearest sensitive receivers;
- works agreed to in writing by the Secretary;
- for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B15 The Applicant must prepare a Construction Noise Management Plan (CNMP) for the Project to manage construction noise. The plan must form part of the CEMP required by Condition C1 and must:

- be prepared by a suitably qualified and experienced noise expert;
- be approved by the Secretary prior to the commencement of construction of the Project;
- describe procedures for achieving the noise limits in **Table 2**;
- describe the measures to be implemented to manage noisy works such as rock/concrete breaking activities, in close proximity to sensitive receivers;
- include strategies that have been developed with the community for managing noisy works;
- describe the community consultation undertaken to develop the strategies in e) above; and
- include a complaints management system that would be implemented for the duration of the Project.

Operational Noise Limits

B16 The Applicant must ensure that noise generated by the Development does not exceed the noise limits in **Table 2**.

Table 2: Noise Limits dB(A)

Location	Day	Evening	Night
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)
All sensitive receivers	55	50	45

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

Noise Mitigation

B17 The Applicant must ensure all noise attenuation measures already installed for the Existing Development are maintained in good working order for the life of the Development.

Operational Noise Management Plan

- B18 Within 6 months of the date of this consent, the Applicant must prepare an Operational Noise Management Plan (ONMP) for the Existing Development, to manage operational noise to the satisfaction of the Secretary. The ONMP must form part of the OEMP required by Condition C4 and be prepared in accordance with Condition C9. The ONMP must:
- (a) be prepared by a suitably qualified and experienced noise expert;
 - (b) describe the measures that will be implemented to minimise noise from the Existing Development including:
 - (i) all reasonable and feasible measures being employed on site;
 - (ii) maintain equipment to ensure it is in good order;
 - (iii) traffic noise is effectively managed;
 - (iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply;
 - (v) compliance with the relevant conditions of this consent;
 - (c) include a noise monitoring program that:
 - (i) must be carried out until otherwise agreed to in writing by the Secretary;
 - (ii) is capable of evaluating the performance of the Existing Development; and
 - (iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and
 - (d) include a procedure for implementing noise mitigation measures, should the Applicant be directed by the EPA or the Secretary, or should non-compliances be detected.
- B19 Prior to the commencement of operation of the Project, the Applicant must update the ONMP required under Condition B18, to incorporate the Project and its management, to the satisfaction of the Secretary. The updated plan must be prepared in accordance with the requirements of Condition B18, and must incorporate the following:
- (a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL; ~~and~~
 - (b) description of any additional measures that would be implemented for the Development to ensure compliance with the noise limits in Condition B16 and the EPL; ~~and~~
 - (c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area; ~~and~~
 - (d) details of the noise attenuations measures for the materials handling equipment approved for installation and operation under SSD 7016 MOD 3.

Noise Verification

- B20 Within 3 months of commencement of operation of the Project, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert;
 - (b) include an analysis of compliance with noise limits specified in Condition B16;
 - (c) demonstrate achievement of the sound power levels in Table 12 of the *Borg Panels Timber Panel Processing Facility Noise and Vibration Impact Assessment*, dated May 2016 and prepared by Global Acoustics;
 - (d) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
 - (e) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

- B20A Within three months of the commissioning of the gas turbines and ancillary equipment, the Applicant must undertake a noise verification study for the Department to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert; and

- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSE 7016 MOD 3, the Applicant must undertake a Noise Verification Study for the Department to the satisfaction of the Secretary. The Study must:

- (a) be undertaken by a suitably qualified expert;
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B21 Should the noise verification study indicate the Development has not complied with the noise limits in Condition B16 and applicable EPL requirements, or where the verification indicates that greater impacts than predicted in the EIS may arise, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

B26 Within 3 months of commissioning the two cogeneration units, the Applicant, in consultation with the EPA, must undertake post-commissioning noise monitoring of the cogeneration units to demonstrate the operation of the cogeneration units do not exceed the noise criteria at sensitive receivers as described in Section 7.0 of *Gas Fire Co-generators Noise Impact Assessment* prepared by Vipac Engineers and Scientists, dated 2 July 2015.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B27 Should the post-commissioning emissions verification study indicate the two cogeneration units have not demonstrated compliance with the NIA, a detailed investigation and an outline of any

management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

A.2 Environmental Protection Licence

L4 Noise limits

L4.1 Noise from the premises must not exceed:

- a) 55 dB(A) $L_{Aeq(15\text{ minute})}$ during the day (7am to 6pm); and
- b) 50 dB(A) $L_{Aeq(15\text{ minute})}$ during the evening (6pm to 10pm); and
- c) at all other times 45 dB(A) $L_{Aeq(15\text{ minute})}$, except as expressly provided by this licence.

Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L4.2 To determine compliance with condition L4.1, noise must be measured at or computed for Oberon High School or any other noise sensitive locations (such as a residence/school). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "NSW Industrial Noise Policy (EPA, January 2000)".

L4.3 The noise limits set out in condition L4.1 apply under all meteorological conditions except for the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- c) Stability category G temperature inversion conditions.

L4.4 For the purpose of condition L4.3:

- a) Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
- b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

M7 Other monitoring and recording conditions

M7.1 Noise monitoring to determine compliance with condition L4 must be carried out at least once annually during the day, evening, and night time hours specified by L4.1 at the location(s) specified under condition L4.2 or at the nearest residence, and be undertaken in accordance with Australian Standard AS 2659.1 (1998) Guide to use of sound measuring equipment - portable sound level meters, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

5 Construction Noise Management Levels

Construction activities will be undertaken simultaneously with regular operation of the existing site. Borg propose to generally restrict site noise emission from both construction and operational tasks combined to comply with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035.

Following consideration of the ICNG (Section 2.6), Development Consent (SSD 7016) conditions (Section 2.2), EPL 3035 (Section 2.4) and the measured background noise levels (refer Global Acoustics, May 2016), Table 6 summarises the Noise Management Levels (NMLs) for all residential receivers.

Table 6 – Operation and Construction Noise Management Levels

Location	Activity	Day	Evening	Night
		(7am-6pm) LAeq (15 min)	(6pm-10pm) LAeq (15 min)	(10pm-7am) LAeq (15 min)
All residential receivers	General Construction	55	50	45
	Rock/ Concrete Breaking	75		

Work outside approved construction hours are not expected, however unforeseen constraints relating to delivery of materials or equipment, or other technical requirements, may see some activities undertaken outside approved hours. Where required, out of hours works will be undertaken to meet the noise management levels in Table 6.

Development Consent SSD 7016 Condition B14 requires non-standard construction hour work to be inaudible at the nearest sensitive receivers. The Development Consent takes precedence over the ICNG and will be adopted in this plan.

In this instance, "inaudible" means the activity is not discernible from general operation activities.

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

The following compliance monitoring, to be undertaken during construction by a suitably qualified noise expert, is recommended for the project:

- Periodic attended noise monitoring at the potentially most affected residences during the day period, with a frequency of once per quarter, during the construction phase of the Project; and
- If exceedance of limits is demonstrated, additional mitigation controls are to be implemented, and follow-up monitoring undertaken within one week of the exceedance.

Construction noise performance is reported as detailed in Section 10.

7.2.2 Management Monitoring

In addition to quarterly compliance monitoring, off-site management noise monitoring by suitably trained site personnel should be undertaken regularly, particularly during periods of meteorological enhancement and on commencement of new construction activities or areas, to ensure relevant noise criteria are adhered to.

Operations should be modified accordingly as required when exceedance or potential exceedances are measured. Modifications may include, but are not limited to, erection of temporary barriers or screens, temporary shutdown of equipment until adverse weather conditions change, or relocating equipment to less sensitive areas when feasible to do so.

7.3 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in **Table 8**. Refer to **Figure 2** for these locations.

Table 8 – Noise Monitoring Locations

Location ID	Monitoring Location
NM1	Oberon Caravan Park
NM2	Intersection Pine Street and Herborn Street
NM3	127 Hazelgrove Road
NM4	Intersection Tasman Street and Earl Street

Noise management levels for each monitoring location are provided in **Table 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

- Before commencing monitoring, ensure the Sound Level Meter's (SLM) laboratory calibration is current (refer to the sticker on the unit).
- If unsure about the functions of the SLM, refer to the instruction sheet in the case. All site environment officers should be trained in the use of the SLM and training documents kept on file.
- Ensure the windscreen is attached and that the SLM settings include a windscreen factor, the SLM is set to A-weighted and fast response.
- Prior to and completing the measurement, the SLM should be field calibrated using the supplied calibrator. Ensure that the pre- and post- measurements do not differ by more than 0.5 dB(A).

7.3.2 Weather Conditions

Monitoring should be undertaken on days of light winds (<5 m/s) and no rain. Wind speed is to be monitored using a hand held wind speed monitor. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions on the field sheet.

NMLs listed in **Table 6** apply under all meteorological conditions except for the following:

- Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- Stability category G temperature inversion conditions.

Weather conditions measured at the site weather station should be used to determine applicability of meteorological exclusion rules.

Appendix B

Calibration certificates

B.1 Calibration certificates



Octave Band Filter
IEC 61260-3:2016
Calibration Certificate

Calibration Number C22699A

Client Details: EMM Consulting
Level 3/175 Scott Street
Newcastle NSW 2300

Filter Model Number : Rion NA-28
Filter Serial Number : N/A
Instrument Serial Number : 00370304
Microphone Serial Number : 10421
Pre-amplifier Serial Number : 60313
Firmware Version : 2.0

Atmospheric Conditions

Ambient Temperature : 23.8°C
Relative Humidity : 47.8%
Barometric Pressure : 98.77kPa

Calibration Technician : Lucky Jaiswal Secondary Check: Dhamsh Bonu
Calibration Date : 31 Oct 2022 Report Issue Date : 31 Oct 2022

Approved Signatory :  Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
Midband Relative Attenuation (Clause 10)	Pass	Operating Range Lower Limit (Clause 12)	Pass
Linearity, Range and Overload (Clause 11)	Pass	Relative Attenuation (Clause 13)	Pass

The filter submitted for testing successfully completed the periodic tests of IEC 61260-3, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the filter to the full specifications of 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 filter fully conformed to the class 1 specifications in IEC 61260-1:2014 and (b) because the periodic tests of IEC 61260-3 cover only a limited subset of the specifications in IEC 61260-1:2014.

Uncertainties of Measurement -			
Electrical Tests	Environmental Conditions		
-5dB < ΔA(f) ≤ 40dB	±0.12dB	Temperature	±0.1°C
40dB < ΔA(f) ≤ 120dB	±0.2dB	Relative Humidity	±1.9%
		Barometric Pressure	±0.014kPa

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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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C21832

Client Details Global Acoustics Pty Ltd
12/16 Huntingdale Drive
Thomton NSW 2322

Equipment Tested/ Model Number : Pulsar Model 105
Instrument Serial Number : 81334

Atmospheric Conditions

Ambient Temperature : 25°C
Relative Humidity : 49.6%
Barometric Pressure : 100.8kPa

Calibration Technician : Lucky Jaiswal **Secondary Check:** Harrison Kim
Calibration Date : 29 Nov 2021 **Report Issue Date :** 2 Dec 2021

Approved Signatory : *[Signature]*

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	94.19	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.

Uncertainties of Measurement -			
Specific Tests		Environmental Conditions	
Generated SPL	±0.11dB	Temperature	±0.1°C
Frequency	±0.07%	Relative Humidity	±1.9%
Distortion	±0.50%	Barometric Pressure	±0.014kPa

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