



Noise Emission Assessment
Millers Point Community Centre
15A – 17 Argyle Street, Millers Point, NSW

Client:
City of Sydney Council



22 April 2024



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GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined in Section 2 below.

NOISE DESCRIPTORS

dB – Decibels. The fundamental unit of sound, a Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

L_{Aeq} – The A-weighted sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period. Measured in dB.

L_{Amax} – The maximum or peak A-weighted noise level that occurs over the measurement period. Measured in dB.

Indoor Design Level – The recommended maximum level in dB(A) inside a building from external noise sources.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

NOISE CHARACTER, NOISE LEVEL AND ANNOYANCE

The perception of a given sound to be deemed annoying or acceptable is greatly influenced by the character of the sound and how it contrasts with the character of the background noise. A noise source may be measured to have only a marginal difference to the background noise level, but may be perceived as annoying due to the character of the noise.

Acoustic Dynamics' analysis of noise considers both the noise level and sound character in the assessment of annoyance and impact on amenity.

1 INTRODUCTION

1.1 SUMMARY

Acoustic Dynamics is engaged by **City of Sydney Council** to assess noise emission resulting from use and operation of the Millers Point Community Centre located at 15A-17 Argyle Street, Millers Point, NSW, as the community centre has been operating without a development consent since its opening in 1957.

This document provides an assessment of noise emission levels at nearby receivers resulting from various noise sources associated with the community centre. This assessment is prepared in accordance with the various acoustic assessment requirements of City of Sydney Council, the NSW Environmental Protection Authority (EPA) and relevant Australian Standards.

1.2 LOCATION & DESCRIPTION OF SUBJECT SITE

The proposal is for the operation of the community centre from 7am to 12am (midnight). The site consists of three (3) buildings, Harry Jensen Activity Centre, Abraham Mott Hall and Abraham Mott Community Space. The layout of these buildings is shown in Appendix A. Spaces in the three buildings are available for hire from 7am to midnight, Monday to Sunday, subject to hiring and leasing agreements.

The spaces are mostly used for community activities. Regular bookings include community organisation gatherings, workshops, health and wellbeing classes. The City North Men's Shed uses the Abraham Mott Community Space from 8:30am to 5:00pm on Tuesdays, Wednesdays and Thursdays and stores their equipment within the building 24 hours a day, 7 days a week. The various noise sources associated with the site include noise from patrons, playback of music within the various rooms and the hall, and use of any power tools or machines as part of the City North Men's Shed. Acoustic Dynamics understands that the venue will be used for many uses that will not be as impactful as a workshop and consist of low-impact activities and gatherings. However, as part of this assessment, Acoustic Dynamics has assessed the operation of the space as a workshop as a worst-case scenario during the daytime hours.

Acoustic Dynamics understands that Council requires an acoustic assessment to be undertaken of the use and operation of the buildings that incorporate the Millers Point Community Centre to confirm that nearby sensitive receivers will not be adversely affected.

The proposed hours of operation for the Millers Point Community Centre are as follows:

- 7am to 12am – Monday to Sunday.

Acoustic Dynamics understands that the buildings have the following capacities:

- Abraham Mott Community Space – 100 people;
- Harry Jensen Community Centre – 50 people; and
- Abraham Mott Hall – 180 people.

Acoustic Dynamics advise that the assessment of noise impacts on most affected surrounding residential receivers has been conducted for the daytime and night-time periods, as these are the most affected periods most stringent time periods for the scenarios assessed. Predicting compliance during the daytime and night-time at the identified receivers, listed below, will ensure compliance is achieved during the daytime and at all other sensitive receivers further away.

Timed parking is available on the surrounding local roads, however, due to the nature of the community centre operations, it is expected that most patrons would arrive on-foot or by public transport. Access to the community centre is from Argyle Street.

With regard to acoustical assessment, the nearest sensitive receivers are as follows:

- **[R1]** Residential receivers at 10 to 40 Kent Street [West]; and
- **[R2]** Residential at 20 to 44 Argyle Place [North].

The subject building and surrounding area are shown in the location map, aerial image and drawings presented within **Appendix A**.

1.3 SCOPE

Acoustic Dynamics has been engaged to provide an acoustic assessment suitable for submission to the City of Sydney Council.

The scope of the assessment is to include the following:

- Review of legislation, Council criteria and Australian Standards relevant to the internal noise emission at the subject site;
- Travel to site to conduct inspections and testing;
- Conduct operator-attended noise measurements to establish background noise levels near the subject site;
- Conduct operator-attended noise measurements of the installed mechanical plant and any equipment regularly used within the community centre;
- Examination of architectural drawings; and
- Prediction of likely noise emission associated with the subject site.

2 ASSESSMENT CRITERIA AND STANDARDS

Acoustic Dynamics has conducted a review of the local council, state government and federal legislation that is applicable to noise assessment for the subject site. The relevant sections of the legislation are presented below. The most stringent criteria which have been used in the assessment of the subject site are summarised below.

2.1 CITY OF SYDNEY COUNCIL CRITERIA

Acoustic Dynamics notes that the City of Sydney Council's Standard Conditions of Development" have been removed from public view. However, Acoustic Dynamics understands that the following conditions must be met in the assessment of the proposed development.

2.1.1 STANDARD CONDITIONS OF CONSENT

"NOISE – GENERAL

- (a) *The emission of noise associated with the use of the premises including the cumulative operation of any mechanical plant and equipment, and air conditioning shall comply with the following:*
- (i) *The $L_{Aeq, 15 \text{ minute}}$ noise level emitted from the use must not exceed the project specific noise level for that receiver as determined in accordance with the NSW EPA Industrial Noise Policy. Noise must be measured in accordance with the Industrial Noise Policy and relevant requirements of Australian Standard AS 1055-1997 Acoustics — Description and measurement of environmental noise.*
 - (ii) *Project specific noise levels shall be determined by establishing the existing environmental noise levels, in complete accordance with the assessment $L_{A90, 15 \text{ minute}}$ / rating $L_{A90, 15 \text{ minute}}$ process to be in accordance with the requirements for noise monitoring listed in the NSW EPA Industrial Noise Policy and relevant requirements of Australian Standard AS1055- 1997 Standard AS 1055-1997 Acoustics — Description and measurement of environmental noise.*
 - (iii) *Modifying factors in Table 4.1 of the NSW EPA Industrial Noise Policy are applicable.*
- (b) *An $L_{Aeq, 15 \text{ minute}}$ noise level emitted from the use must not exceed the $L_{A90, 15 \text{ minute}}$ noise level by more than 3dB in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) when assessed inside any habitable room of any affected residence or noise sensitive commercial premises provided that;*
- (i) *Where the $L_{A90, 15 \text{ minute}}$ noise level is below the threshold of hearing, T_f at any Octave Band Centre Frequency as defined in Table 1 of International Standard ISO 226: 2003-Normal Equal-Loudness-Level Contours then the value of T_f corresponding to that Octave Band Centre Frequency shall be used instead.*
 - (ii) *The $L_{Aeq, 15 \text{ minute}}$ noise level and the $L_{A90, 15 \text{ minute}}$ noise level shall both be measured with all external doors and windows of the affected residence closed;*
 - (iii) *The relevant background noise level ($L_{A90, 15 \text{ minute}}$) is taken to mean the day, evening or night rating background noise level determined in complete accordance with the methodology outlined in the NSW EPA Industrial Noise Policy and Australian Standard AS1055.1997 Acoustics — Description and measurement of environmental noise.*

- (iv) *Background noise shall be established in the absence of all noise emitted from the use but with the ventilation equipment normally servicing the affected residence operating. Background noise measurements are to be representative of the environmental noise levels at the affected location.*
 - (v) *Modifying factors in Table 4.1 of the NSW EPA Industrial Noise Policy are applicable. Internal Noise measurements are not to be corrected for duration.*
- (c) *Structure Borne Noise including noise/vibration associated with the impact of 'free weights' on the floor must not exceed $L_{A1 \text{ slow, 15minute}} \leq \text{Background} + 3\text{dB(A)}$ at the boundary or within any adjacent premises or tenancy.*
- (d) *Prior to any modifications of the floor and prior to installation or introduction of any equipment including 'free weights' to the premises an acoustics assessment is to be undertaken by a suitably qualified Acoustic Consultant. The assessment shall consider all relevant requirements of this condition, so that equipment and the floor construction methodology is determined so that the operation of the premises will be conducted in a manner compliant with conditions.*
- (e) *Prior to the issue of an Occupation Certificate, a suitably qualified acoustic consultant is to provide a written Acoustic Verification Report to the satisfaction of the Principal Certifying Authority that the development and its operation will comply with conditions. The Acoustic Verification Report is to address parameters of this condition.*

Note: Suitably qualified Acoustic Consultant means a consultant who possess the qualifications to render them eligible for membership of the Australian Acoustics Society, Institution of Engineers Australia or the Association of Australian Acoustic Consultants at the grade of member.

NOISE – ENTERTAINMENT

- (a) *$L_{A10, 15 \text{ minute}}$ noise level emitted from the use must not exceed the background noise level ($L_{A90, 15 \text{ minute}}$) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) by more than 5dB between the hours of 7.00am and 12.00 midnight when assessed at the boundary of any affected residence.*
- (b) *The $L_{A10, 15 \text{ minute}}$ noise level emitted from the use must not exceed the background noise level ($L_{A90, 15 \text{ minute}}$) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) between the hours of 12.00 midnight and 7.00am when assessed at the boundary of any affected residence.*
- (c) *Notwithstanding compliance with (a) and (b) above, noise from the use when assessed as an $L_{A10, 15 \text{ minute}}$ enters any residential use through an internal-to-internal transmission path is not to exceed the existing internal $L_{A90, 15 \text{ minute}}$ (from external sources excluding the use) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) when assessed within a habitable room at any affected residential use between the hours of 7am and 12*

midnight. Where the $L_{A10, 15 \text{ minute}}$ noise level is below the threshold of hearing, T_f at any Octave Band Centre Frequency as defined in Table 1 of International Standard ISO 226 : 2003- Normal Equal-Loudness-Level Contours then the value of T_f corresponding to that Octave Band Centre Frequency shall be used instead.

- (d) Notwithstanding compliance with (a), (b) and (c) above, the noise from the use must not be audible within any habitable room in any residential use between the hours of 12.00 midnight and 7.00am.
- (e) The $L_{A10, 15 \text{ minute}}$ noise level emitted from the use must not exceed the background noise level ($L_{A90, 15 \text{ minute}}$) in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) by more than 3dB when assessed indoors at any affected commercial premises.

Note: The $L_{A10, 15 \text{ minute}}$ noise level emitted from the use is as per the definition in the Australian Standard AS1055-1997 Acoustics – Description and measurement of environmental noise. The background noise level $L_{A90, 15 \text{ minute}}$ is to be determined in the absence of noise emitted by the use and be representative of the noise sensitive receiver. It is to be determined from the assessment L_{A90} / rating L_{A90} methodology in complete accordance with the process listed in the NSW EPA Industrial Noise Policy and relevant requirements of AS1055.1997.”

2.1.2 LOCAL ENVIRONMENT PLAN

A review of City of Sydney Council Local Environment Plan (LEP) 2013 was conducted. No relevant acoustic requirements and relevant noise criteria were presented within the LEP.

2.1.3 DEVELOPMENT CONTROL PLANS

A review of City of Sydney Council Development Control Plan (DCP) 2017 was conducted. No relevant acoustic requirements and relevant noise criteria were presented within the DCP.

2.1.4 PROTECTION OF THE ENVIRONMENT OPERATIONS (POEO) ACT

In accordance with the noise emission requirements of City of Sydney Council, we advise that noise emission from the development must also comply with the requirements of the relevant legislation, being the *Protection of the Environment Operations (POEO) Act 1997*. The POEO Act 1997 requires that the subject plant and equipment must not generate “offensive noise”. Offensive noise is defined as follows:

““**offensive noise**” means noise:

- (a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
 - (i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
 - (ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) *that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.”*

Council can enforce the above planning controls under the Environmental Planning and Assessment Act of 1979.

2.2 NSW EPA’S NOISE POLICY FOR INDUSTRY

The EPA, in its Noise Policy for Industry (NPfI) document published in October 2017, outlines and establishes noise criteria for industrial or other noise sources in various zoning areas.

Acoustic Dynamics has operator-attended noise measurements on Wednesday 10 April 2024 to establish the acoustic environment at the nearest residential receivers during the daytime and night-time assessment periods. Acoustic Dynamics advises the measurement location, near the boundary shared with the rear of residences along Kent Street, was representative of the existing noise environment of the nearest sensitive receivers.

Following the general procedures outlined in the EPA’s NPfI, a summary of the established noise environment, and relevant environmental noise criteria is presented in **Table 2.1**.

Table 2.1 Summary of External Measured Noise Levels & NPfI Project Noise Trigger Levels

| Location | Time of Day | L _{A90} Rating Background Noise Level (RBL) [dB] | Measured L _{Aeq} [dB] | Project Intrusive Noise Level [dB] | Project Amenity Noise Level ¹ L _{Aeq} [dB] | Project Noise Trigger Level L _{Aeq} [dB] |
|---------------------------------|------------------------------------|---|--------------------------------|------------------------------------|--|---|
| Nearest residential receiver(s) | Daytime (7am to 6pm) | 53 | 63 | 58 | 58 | 56 |
| | Evening ² (6pm to 10pm) | - | - | - | 48 | 48 |
| | Night-time (10pm to 12am) | 40 | 49 | 45 | 43 | 43 |

Note: 1) Amenity adjustment based on “Urban” receiver type (Table 2.3 of the NPfI). The noise emission objective has been modified in accordance with the recommendations detailed within the NPfI Section 2.2, for time period standardising of the intrusiveness and amenity noise levels (L_{Aeq,15min} will be taken to be equal to the **L_{Aeq, period} + 3 decibels (dB)**).

2) Not assessed as the night-period is the most stringent assessment period for the proposed operations.

The EPA’s NPfI specifies additional noise emission level corrections that should be applied when a noise source is determined to include “modifying factors” that can vary the perceived intrusiveness of a noise source. Such modifying factors include tonal, low frequency, impulsive, or intermittent noise.

2.2.1 THE EPA'S SLEEP DISTURBANCE CRITERION

Acoustic Dynamics advises that sleep disturbance is a complex issue and the potential for sleep disturbance to occur depends on both the level of noise at a residential receiver and the number of events that occur.

The EPA has in the past investigated overseas and Australian research on sleep disturbance. The method of assessing noise for sleep disturbance relies on the application of a screening that indicates the potential for this to occur. The EPA's Noise Guide for Local Government, provides the following guidance for such a screening test:

“Currently, there is no definitive guideline to indicate a noise level that causes sleep disturbance and more research is needed to better define this relationship. Where likely disturbance to sleep is being assessed, a screening test can be applied that indicates the potential for this to occur. For example, this could be where the subject noise exceeds the background noise level by more than 15 dB(A). The most appropriate descriptors for a source relating to sleep disturbance would be $L_{A1(1\text{ minute})}$ (the level exceeded for 1% of the specified time period of 1 minute) or L_{Amax} (the maximum level during the specified time period) with measurement outside the bedroom window.”

Additionally, the guidelines of the NSW EPA's NPfl provide the following additional information:

“Where the subject development/premises night-time noise levels at a residential location exceed:

- *$L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
- *L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater*

Further to the above information, the following summarizes the sleep disturbance criterion:

$$L_{Amax} \text{ or } L_{A1(1\text{ minute})} < L_{A90} + 15 \text{ dB or } 52 \text{ dB(A), whichever is greater}$$

In addition to the above, the EPA has published the following additional information relating to findings of significant research carried out for sleep disturbance:

“Maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions... One or more noise events per night, with maximum internal noise levels of 65-70 dBA, are not likely to affect health and wellbeing significantly.”

Conservatively based on an assumed minimum ambient background noise level, the following sleep disturbance screening criterion was determined for the residential receivers with windows open:

$$\text{Sleep Disturbance Criterion} = \underline{55 \text{ dB(A)}}$$

2.2.2 THE EPA'S ROAD NOISE POLICY

The NSW Environmental Protection Authority (EPA) presents guidelines for assessment of road traffic noise in its Road Noise Policy (RNP). The document provides road traffic noise criteria for proposed road as well as other developments with the potential to have an impact in relation to traffic noise generation. **Table 2.3** presents the relevant RNP noise criteria for the subject site.

Table 2.3 Road Traffic Noise Assessment Criteria for Residential Land Uses

| Road category | Type of project / land use | Assessment Criteria [dB] | |
|---------------|--|---|---|
| | | Day (7am – 10pm) | Night (10pm – 7am) |
| Local roads | 6. Existing residences affected by additional traffic on existing local roads generated by land use developments | L _{Aeq} , (1 hour) 55 (external) | L _{Aeq} , (1 hour) 50 (external) |

2.3 SUMMARY OF APPLICABLE NOISE CRITERIA

2.3.1 SUMMARY OF MEASURED NOISE LEVELS & CRITERIA

The results of operator-attended noise measurements conducted near the boundary shared with the residences of Kent Street on Wednesday 10 April 2024 have been used to determine the appropriate intrusive noise emission criteria in accordance with the assessment guidelines of the City of Sydney Council.

Acoustic Dynamics advises that the assessment of the Millers Point Community Centre has been based on the **lowest** background noise levels at the nearest residential receivers during typical **maximum** operations of the centre. Acoustic Dynamics advises that such an assessment is conservative and will ensure no loss of amenity to the nearby residential and commercial receivers.

The noise monitoring at the subject location was undertaken in octave bands to satisfy the requirements of the City of Sydney Council. **Table 2.3.1** and **Table 2.3.2** below summarises the existing external and internal (octave band) noise criteria levels at the nearest residential receivers. We note that by achieving compliance with a criterion of Background + 3 dB externally at the windows of the affected receiver will ensure compliance is achieved of the room internally.

Table 2.3.1 Summary of External Measured Noise Levels & Most Stringent Criteria

| Location | Time of Day | L _{A90} Rating Background Noise Level (RBL) [dB] | Measured L _{Aeq} [dB] | Project Intrusive Noise Level [dB] | Project Amenity Noise Level L _{Aeq} [dB] ² | Project Noise Trigger Level L _{Aeq} [dB] |
|-------------------------------|---|---|--------------------------------|------------------------------------|--|---|
| Nearest residential receivers | Day-Time (7am ¹ to 6pm) | 53 | 63 | 58 | 58 | 56 |
| | Evening (6pm to 10pm) | - | - | - | 48 | 48 |
| | Night-time (10pm to 12am ¹) | 40 | 49 | 45 | 43 | 43 |

Table 2.3.2 Calculated External Octave Band Noise Emission Criteria for Adjacent Residential Receivers

| Location | Assessment Period | Method for Calculation of Criteria | Relevant L _{A10, 15minute} External Noise Emission Criteria [dB] | | | | | | | | | |
|----------------------------------|-------------------|---|---|----|-----|-----|-----|----|----|----|----|-----------|
| | | | Octave Band Centre Frequency [Hz] | | | | | | | | | |
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | O/A |
| Residential Receivers (External) | 7:00am to 6:00pm | Spectrum of External Background (L _{A90}) | 21 | 33 | 36 | 42 | 45 | 48 | 45 | 39 | 28 | 53 |
| | | Council Criteria (BG + 5dB) | 26 | 38 | 41 | 47 | 50 | 53 | 50 | 40 | 33 | 58 |

Table 2.3.3 Calculated External Octave Band Noise Emission Criteria for Adjacent Residential Receivers

| Location | Assessment Period | Method for Calculation of Criteria | Relevant L _{A10, 15minute} External Noise Emission Criteria [dB] | | | | | | | | | |
|----------------------------------|--------------------|---|---|----|-----|-----|-----|----|----|----|----|-----------|
| | | | Octave Band Centre Frequency [Hz] | | | | | | | | | |
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | O/A |
| Residential Receivers (External) | 10:00pm to 12:00am | Spectrum of External Background (L _{A90}) | 13 | 23 | 29 | 30 | 34 | 36 | 30 | 22 | 15 | 40 |
| | | Council Criteria (BG + 5dB) | 20 ¹ | 28 | 34 | 35 | 39 | 41 | 35 | 27 | 20 | 45 |

Table 2.3.4 Summary of Internal Measured Noise Levels & Most Stringent Criteria

| Location | Assessment Period | Method for Calculation of Criteria | Measured L _{A90} Noise Emission Octave Band Spectrum at Receiver & L _{A10} Internal Noise Emission Criteria [dB] | | | | | | | | | |
|-------------|-------------------|------------------------------------|--|----|-----|-----|-----|----|----|----|-----|----|
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | OA |
| Residential | Day (7am-10pm) | Internal Criteria (BG + 3) | 19 | 24 | 19 | 21 | 18 | 17 | 19 | 9 | -11 | 29 |
| | Night (10pm-12am) | | 20 ¹ | 14 | 12 | 9 | 7 | 5 | 4 | -8 | -24 | 19 |

Note: 1) Based on ISO threshold of hearing (Tf) levels.
 2) Includes transmission loss from 5mm standard glazing.

2.4 INSTRUMENTATION & MEASUREMENT STANDARDS

All measurements were conducted in general accordance with Australian Standard 1055.1-1997, “Acoustics – Description and Measurement of Environmental Noise Part 1: General Procedures”. Acoustic Dynamics’ sound measurements were carried out using precision sound level meters conforming to the requirements of IEC 61672-2002 “Electroacoustics: Sound Level Meters – Part 1: Specifications”. The survey instrumentation used during the survey is set out in **Table 2.6**.

Table 2.6 Noise Survey Instrumentation

| Type | Serial Number | Instrument Description |
|------|---------------|---|
| 2270 | 2664115 | Brüel & Kjaer Modular Precision Sound Level Meter |
| 4189 | 2650956 | Brüel & Kjaer 12.5 mm Prepolarised Condenser Microphone |
| 4231 | 1730737 | Brüel & Kjaer Acoustic Calibrator |
| 2250 | 2679541 | Brüel & Kjaer Modular Precision Sound Level Meter |
| 4189 | 2670479 | Brüel & Kjaer 12.5 mm Prepolarised Condenser Microphone |
| 4230 | 1234136 | Brüel & Kjaer Acoustic Calibrator |

The reference sound pressure level was checked prior to and after the measurements using the acoustic calibrator and remained within acceptable limits.

3 ASSESSMENT

The following subsections provide an assessment of the community centre against the various noise emission criteria and objectives outlined in **Section 2** above.

3.1 MODEL CONFIGURATION & ASSUMPTIONS

Acoustic modelling was undertaken using computer modelling software (CadnaA™ 2022) to predict operational noise levels generated by the use and operation of the shed. CadnaA calculates environmental noise propagation according to the applicable international and ISO standards, including the ISO 9613 algorithm.

Ground absorption, reflection and relevant shielding objects are taken into account in the calculations, while topographical information was obtained and imported directly into the model.

The following assumptions were made with regard to the configuration of the noise model:

- A general ground absorption coefficient of 0.5 was used throughout the model to account for paved and unpaved surfaces throughout the community centre and surrounding environment; and
- All development site buildings and facade have been modelled as a 'smooth facade/reflective barrier', and the calculations have been configured to include 3-orders of reflections.

3.2 MODELLING SCENARIOS

Acoustic Dynamics has conducted computer modelling based on a number of worst-case scenarios, to determine the predicted levels at nearby sensitive receivers for the different types of activities expected to be held within the site. Given the nature of the development, and the limited availability of street parking in the surrounding area, patrons are assumed to arrive on foot or by public transport, and arrival by private vehicle is assumed to be limited.

Additionally, a night-time scenario has been provided to demonstrate that the site is able to operate during the most stringent night-time period.

The following scenarios have been modelled, including implementation of the management plan recommended in **Section 4.1** below:

Scenario 1 – “Men’s Shed” Operations & Use of the Hall and Centre - Daytime

- The ingress & egress of people (calculations based on the conservative assumption of a maximum of 82 people (25% of total capacity) within any 15-minute period. These noise sources have been modelled as moving point sources and have been located in and around the site;
- All windows and doors of the Abraham Mott Community Space remain closed when in use;
- A maximum number of 330 people concurrently using internal areas of the community centre buildings within any given 15-minute assessment period;

- Internal reverberant noise environment of a workshop with the thickness cutter and table saw being used, with associated dust extractor fans. Measured internal reverberant **SPL = 85 dB(A)**;
- All mechanical plant operating, including:
 - Air conditioning condensers located between buildings and cliff-face to Observatory Hill (*Building servicing – Make – Model (SWL)*):
 - Community Centre – Mitsubishi SRC50ZSA-W (**61 dB(A)**);
 - Community Centre – Hitachi RAC – 50YHA4 (**63 dB(A)**);
 - Community Space – LG – ARUN080LSSO (**69 dB(A)**);
 - Community Space – LG – ARUN120LSSO (**71 dB(A)**);
 - Abraham Mott Hall – LG – ARUM200LTE5 (**96 dB(A)**);
 - Bathroom Exhaust fans (**73 dB(A)**); and
 - Hall Kitchen Exhaust Fan (**77 dB(A)**).
- Music being played within Abraham Mott Hall (Internal SPL = **80 dB(A)**).

Scenario 2 – Use of the Hall and Centre – Night-time (10pm to 12am)

The Evening scenario includes using the site to hold classes for crafts where tools are all hand tools, or low impact machines like a sewing machine. The following scenario has been modelled:

- The ingress & egress of people (calculations based on the conservative assumption of a maximum of 82 people (25% of total capacity) within any 15-minute period. These noise sources have been modelled as moving point sources and have been located in and around the site;
- All windows and doors of the Abraham Mott Community Space remain closed when in use;
- A maximum number of 330 people concurrently using internal areas of the community centre buildings within any given 15-minute assessment period;
- No workshop activities being conducted in the Abraham Mott Community Space;
- All mechanical plant operating, including:
 - Air conditioning condensers located between buildings and cliff-face to Observatory Hill (*Building servicing – Make – Model (SWL)*):
 - Community Centre – Mitsubishi SRC50ZSA-W (**61 dB(A)**);
 - Community Centre – Hitachi RAC – 50YHA4 (**63 dB(A)**);
 - Community Space – LG – ARUN080LSSO (**69 dB(A)**);
 - Community Space – LG – ARUN120LSSO (**71 dB(A)**);
 - Abraham Mott Hall – LG – ARUM200LTE5 (**96 dB(A)**);

- o Bathroom Exhaust fans (**73 dB(A)**); and
- o Hall Kitchen Exhaust Fan (**77 dB(A)**).

- Music being played within Abraham Mott Hall (Internal SPL = **70 dB(A)**).

Acoustic Dynamics recommends that once any leases or hires are finalised, noise emission for the proposed use should be reviewed, and the management plan for the site updated to ensure noise emission is adequately controlled, while also allowing for the site to be used to its fullest.

3.3 OPERATIONAL NOISE PREDICTIONS

3.3.1 SCENARIO 1 – “MEN’S SHED” OPERATIONS & USE OF THE HALL AND CENTRE - DAYTIME

The calculated maximum noise emission levels at the nearest external and internal receiver locations and the relevant noise emission criteria are presented in **Table 3.3.1** and **Table 3.3.2** below. It is advised that by achieving compliance with the nearest residential receiver locations, compliance will also be achieved at all other residential and receiver locations further away.

Table 3.3.1 Maximum External Noise Emission Levels & Relevant Criteria – Nearest External Receivers

| Receiver Location | Assessment Description & Period | Noise Source | Maximum $L_{Aeq(15min)}$ Noise Emission Level [dB] | Overall $L_{Aeq(15min)}$ Noise Emission Level [dB] | Project Noise Trigger Level L_{Aeq} [dB] | Complies ? |
|--|---|--|--|--|--|------------|
| [R1] Residential receivers on Kent St (West) | Daytime (7:00am to 6:00pm) ¹ | Use and operation of the centre | 48 | 48 | 56 | Yes |
| | | Ingress/Egress of patrons ³ | 23 | | | |
| | | Cars parking along surrounding streets | 34 | | | |
| [R2] Residential receivers on Argyle Ln (North) | Daytime (7:00am to 6:00pm) ¹ | Use and operation of the centre | 37 | 38 | 56 | Yes |
| | | Ingress/Egress of patrons ³ | 18 | | | |
| | | Cars parking along surrounding streets | 34 | | | |

Note: 1) Acoustic Dynamics advises that by achieving compliance with the more stringent night-time criteria, compliance will also be achieved with the less stringent daytime and evening criteria.

2) Calculated on the basis of 10 vehicle movements (10 cars arriving or 10 cars starting, leaving and driving off in a 15-minute period), which is deemed to be a highly conservative estimate.

Table 3.3.2 Maximum External Noise Emission Levels & Relevant Criteria – Nearest Receivers

| Location | Assessment Period | Method for Calculation of Criteria | Relevant LA10 External Noise Emission Criteria [dB] | | | | | | | | | | Complies? |
|--|-------------------|--------------------------------------|---|----|-----|-----|-----|----|----|----|----|----|-----------|
| | | | Octave Band Centre Frequency [Hz] | | | | | | | | | | |
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | OA | |
| [R1] Residential receivers on Kent St (West) | Daytime (7am-6pm) | Octave Band RBL + 5 | 26 | 38 | 41 | 47 | 50 | 53 | 50 | 40 | 33 | 58 | - |
| | | Operation LA10 Levels ^{1,2} | 12 | 26 | 42 | 47 | 43 | 47 | 50 | 38 | 19 | 54 | Yes |
| [R2] Residential receivers on Argyle Ln (North) | Daytime (7am-6pm) | Octave Band RBL + 5 | 26 | 38 | 41 | 47 | 50 | 53 | 50 | 40 | 33 | 58 | - |
| | | Operation LA10 Levels ^{1,2} | 2 | 13 | 20 | 27 | 28 | 28 | 26 | 20 | 7 | 34 | Yes |

Note. 1) Use and operational scenarios are based on assumptions & inputs provided in **Section 3.1 & Section 3.2**.
 2) Calculation is based on the assumption that windows are closed, and includes the transmission loss of standard 6mm glass.

Table 3.3.3 Maximum Internal Noise Emission Levels & Relevant Criteria – Nearest Receivers

| Location | Assessment Period | Method for Calculation of Criteria | Relevant LA10 External Noise Emission Criteria [dB] | | | | | | | | | | Complies? |
|--|-------------------|--------------------------------------|---|----|-----|-----|-----|----|----|-----|-----|----|------------------|
| | | | Octave Band Centre Frequency [Hz] | | | | | | | | | | |
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | OA | |
| [R1] Residential receivers on Kent St (West) | Daytime (7am-6pm) | Octave Band RBL + 3 | 20 | 24 | 19 | 21 | 18 | 17 | 19 | 9 | -11 | 29 | - |
| | | Operation LA10 Levels ^{1,2} | 7 | 14 | 22 | 23 | 13 | 13 | 21 | 5 | -23 | 28 | Yes ³ |
| [R2] Residential receivers on Argyle Ln (North) | Daytime (7am-6pm) | Octave Band RBL + 3 | 20 | 24 | 19 | 21 | 18 | 17 | 19 | 9 | -11 | 29 | - |
| | | Operation LA10 Levels ^{1,2} | -3 | 1 | 0 | 3 | -2 | -6 | -3 | -13 | -35 | 8 | Yes |

Note. 1) Use and operational scenarios are based on assumptions & inputs provided in **Section 3.1 & Section 3.2**.
 2) Calculation is based on the assumption that windows are closed, and includes the transmission loss of standard 6mm glass.
 3) Acoustic Dynamics advises marginal compliance is achieved as an exceedance of 1-3 dB in an octave band is unlikely to arouse complaint from the nearest sensitive receivers, and compliance is still achieved with the broadband criterion.

Table 3.3.4 Maximum L_{Aeq} Road Traffic Noise Emission Levels & Criteria for Residential Receivers

| All Residential Receivers | Noise Source | Quietest Period Source Operates | Calculated Maximum $L_{Aeq(1\text{ hour})}$ Noise Level [dB] | Relevant Criterion $L_{Aeq(1\text{ hour})}$ [dB] | Complies With Criteria? |
|---------------------------------------|-------------------------------------|---------------------------------|--|--|-------------------------|
| Residential receivers on nearby roads | Off-site car movements ¹ | Daytime | 34 | 55 | Yes |

Further to the above, we advise that the operations as assumed under Scenario 1 **achieves compliance** with the relevant noise emission criteria for the operation of the Millers point Community Centre during the daytime assessment period.

3.3.2 SCENARIO 2 – USE OF THE HALL AND CENTRE – NIGHT-TIME

The calculated maximum noise emission levels of Scenario 2 as described in **Section 3.2** at the nearest external and internal receiver locations and the relevant noise emission criteria are presented in **Table 3.1.3** and **Table 3.1.4** below. It is advised that by achieving compliance with the nearest residential receiver locations, compliance will also be achieved at all other residential and receiver locations further away.

Table 3.3.5 Maximum External Noise Emission Levels & Relevant Criteria – Nearest External Receivers

| Receiver Location | Assessment Description & Period | Noise Source | Maximum $L_{Aeq(15\text{min})}$ Noise Emission Level [dB] | Overall $L_{Aeq(15\text{min})}$ Noise Emission Level [dB] | Project Noise Trigger Level L_{Aeq} [dB] | Complies ? |
|--|---|--|---|---|--|------------|
| [R1] Residential receivers on Kent St (West) | Night-time (10:00pm to midnight) ¹ | Use and operation of the centre | 43 | 43 | 43 | Yes |
| | | Ingress/Egress of patrons ³ | 23 | | | |
| | | Cars parking along surrounding streets | 34 | | | |
| [R2] Residential receivers on Argyle Ln (North) | Night-time (10:00pm to midnight) ¹ | Use and operation of the centre | 34 | 38 | 43 | Yes |
| | | Ingress/Egress of patrons ³ | 18 | | | |
| | | Cars parking along surrounding streets | 34 | | | |

Note: 1) Acoustic Dynamics advises that by achieving compliance with the more stringent night-time criteria, compliance will also be achieved with the less stringent daytime and evening criteria.

2) Calculated on the basis of 5 vehicle movements (5 cars arriving or 5 cars starting, leaving and driving off in a 15-minute period), which is deemed to be a highly conservative estimate.

Table 3.3.6 Maximum External Noise Emission Levels & Relevant Criteria – Night-Time

| Location | Assessment Period | Method for Calculation of Criteria | Relevant LA10 External Noise Emission Criteria [dB] | | | | | | | | | | Complies? |
|--|-------------------|--------------------------------------|---|----|-----|-----|-----|----|----|----|----|----|------------------|
| | | | Octave Band Centre Frequency [Hz] | | | | | | | | | | |
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | OA | |
| [R1] Residential receivers on Kent St (West) | Night (10pm-12am) | Octave Band RBL + 5 | 20 | 28 | 34 | 35 | 39 | 41 | 35 | 27 | 20 | 45 | - |
| | | Operation LA10 Levels ^{1,2} | 12 | 22 | 32 | 35 | 37 | 37 | 38 | 27 | 14 | 43 | Yes ³ |
| [R2] Residential receivers on Argyle Ln (North) | Night (10pm-12am) | Octave Band RBL + 5 | 20 | 28 | 34 | 35 | 39 | 41 | 35 | 27 | 20 | 45 | - |
| | | Operation LA10 Levels ^{1,2} | 3 | 13 | 20 | 27 | 29 | 32 | 32 | 26 | 16 | 37 | Yes |

- Note. 1) Use and operational scenarios are based on assumptions & inputs provided in **Section 3.1** & **Section 3.2**.
 2) Calculation is based on the assumption that windows are closed, and includes the transmission loss of standard 6mm glass.
 3) Acoustic Dynamics advises marginal compliance is achieved as an exceedance of 1-3 dB in an octave band is unlikely to arouse complaint from the nearest sensitive receivers, and compliance is still achieved with the broadband criterion.

Table 3.3.7 Maximum Internal Noise Emission Levels & Relevant Criteria – Nearest Internal Receivers

| Location | Assessment Period | Method for Calculation of Criteria | Relevant LA10 External Noise Emission Criteria [dB] | | | | | | | | | | Complies? |
|--|-------------------|--------------------------------------|---|----|-----|-----|-----|----|----|----|-----|----|------------------|
| | | | Octave Band Centre Frequency [Hz] | | | | | | | | | | |
| | | | 32 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K | OA | |
| [R1] Residential receivers on Kent St (West) | Night (10pm-12am) | Octave Band RBL + 3 | 20 | 14 | 12 | 9 | 7 | 5 | 4 | -8 | -24 | 19 | - |
| | | Operation LA10 Levels ^{1,2} | 7 | 10 | 12 | 11 | 7 | 3 | 6 | -6 | -28 | 18 | Yes ³ |
| [R2] Residential receivers on Argyle Ln (North) | Night (10pm-12am) | Octave Band RBL + 3 | 20 | 14 | 12 | 9 | 7 | 5 | 4 | -8 | -24 | 19 | - |
| | | Operation LA10 Levels ^{1,2} | -2 | 1 | 0 | 3 | -1 | -2 | 0 | -7 | -26 | 9 | Yes |

- Note. 1) Use and operational scenarios are based on assumptions & inputs provided in **Section 3.1** & **Section 3.2**.
 2) Calculation is based on the assumption that windows are closed, and includes the transmission loss of standard 6mm glass.
 3) Acoustic Dynamics advises marginal compliance is achieved as an exceedance of 1-3 dB in an octave band is unlikely to arouse complaint from the nearest sensitive receivers, and compliance is still achieved with the broadband criterion.

Table 3.3.8 Maximum L_{Aeq} Road Traffic Noise Emission Levels & Criteria for Residential Receivers

| All Residential Receivers | Noise Source | Quietest Period Source Operates | Calculated Maximum $L_{Aeq(1\text{ hour})}$ Noise Level [dB] | Relevant Criterion $L_{Aeq(1\text{ hour})}$ [dB] | Complies With Criteria? |
|---------------------------------------|-------------------------------------|---------------------------------|--|--|-------------------------|
| Residential receivers on nearby roads | Off-site car movements ¹ | Night-time | 34 | 50 | Yes |

Further to the above, we advise that the operations as assumed under Scenario 2 **achieves compliance** with the relevant noise emission criteria for the operation of the Millers Point Community Centre during the evening and night assessment period.

3.3.3 SLEEP DISTURBANCE

Acoustic Dynamics has also determined the potential maximum $L_{A1(60\text{ Sec})}$ noise emission from the shed to be **46 dB** from activities (assumed under Scenario 2) within the community centre and **55 dB** from the closing of car doors on nearby roads to receivers at the nearest potential residential receivers on the surrounding streets, during night-time hours. We advise that the calculated L_{A1} noise emission from all activities achieve compliance with the EPA’s sleep disturbance screening criterion during night-time hours of $L_{A1(60\text{sec})} \leq 55 \text{ dB}$. It is advised that by achieving compliance with the nearest residential receiver locations, compliance will also be achieved at all other residential receiver locations further away.

4 RECOMMENDATIONS

4.1 RECOMMENDED MANAGEMENT PLAN

Acoustic Dynamics’ calculations and analysis indicate that all noise emission associated with the use of the Millers Point Community Centre, is likely to achieve compliance with the various relevant noise emission criteria during the evening and night period when operating as classes utilising hand tools or low-impact machines such as a domestic sewing machine. Nevertheless, we provide the following recommendations that should be incorporated into the management of the Millers Point Community Centre to ensure noise emission is adequately managed and minimised during operation.

We recommend a management plan incorporating measures to protect the acoustic amenity of the surrounding area be implemented by the proprietor. Such a management plan should outline policies and procedures to ensure noise emission from community uses at the Millers Point Community Centre are kept to a minimum, including:

- 1) With the exception of when patrons enter and exit the premises, ensuring the glass windows/doors of the shed are kept closed when classes are operated during the evening and night period (i.e. after 6pm), or when internal noise levels are expected to be high, such as when loud music is being played back through an amplified speaker;

- 2) The erection of clear signage at all entries and exits advising community users that they must not generate excessive noise when entering and leaving the premises;
- 3) Tenants/hirers monitoring the behaviour of community use within the subject premises and as they enter/exit to ensure noise emission is kept to a minimum when entering and leaving the premises;
- 4) Activities during the evening and night periods (6:00pm to 12:00am) restricted to the use of hand tools (**Note:** no use of hammers), crafts and low impact machines such as domestic sewing machines;
- 5) If noise generating equipment is not used during the evening period, the windows and doors of the shed are able to be kept open, provided activities are kept to conversation, and no playback or performance of live music;
- 6) Restricting the use of low frequency speakers (sub-woofers) and ensuring any full range speakers are isolated from building services; and
- 7) Ensuring the internal noise level from music remains at $L_{Aeq, 15minute}$ **80 dB** or lower within the Abraham Mott Hall during the daytime, and $L_{Aeq, 15minute}$ **70 dB** or lower during the evening and night periods. It is recommended a consumer-grade sound level meter be kept on-premise for use in such scenarios.

5 CONCLUSION

Acoustic Dynamics has conducted an acoustic assessment of the noise emission resulting from the extended operating hours of the Millers Point Community Centre located at 15A-17 Argyle Street, Millers Point.

Acoustic Opinion

Further to the noise monitoring and measurements conducted, our review of the relevant acoustic criteria and requirements and our calculations, Acoustic Dynamics advises that the proposed development, with the incorporations of the recommendations detailed within Section 4 above, will comply with the relevant acoustic criteria of City of Sydney Council, the NSW POEO Act 1997 and the NSW EPA.

We trust that the above information meets with your requirements and expectations. Please do not hesitate to contact us on 02 9908 1270 should you require more information.

APPENDIX A — LOCATION MAP, AERIAL IMAGE AND DRAWINGS

A.1 LOCATION MAP (COURTESY OF SIX MAPS)



A.2 AERIAL IMAGE (COURTESY OF SIX MAPS)

