

REPORT



WILKINSON  MURRAY

38 – 40 STRONACH AVENUE EAST MAITLAND

EAST MAITLAND

ACOUSTICS
RWDI # 2190056
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SUBMITTED TO

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WILKINSON MURRAY

In October 2020, Wilkinson Murray Pty Ltd merged with RWDI Group, a leading international consulting firm. Wilkinson Murrays core practice areas of noise, acoustics, vibration and air quality consulting built since 1962 servicing Australia and Asia-Pacific region will complement RWDI practice areas. Combined, RWDI+Wilkinson Murray is one of the largest teams globally specialising in the area of noise, acoustics, vibration and air quality.

RWDI

RWDI is a team of highly specialised consulting engineers and scientists working to improve the built environment through three core areas of practice: building performance, climate engineering and environmental engineering. More information is available at www.rwdi.com.

QUALITY ASSURANCE

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ACOUSTIC TERMINOLOGY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

dB(A) – A-weighted decibels. The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the “A” filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.

Frequency – Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.

Impulsive Noise – Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.

Intermittent Noise – The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.



Sound Absorption – The ability of a material to absorb sound energy through its conversion into thermal energy.

Sound Level Meter – An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure level.

Sound Pressure Level – The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.

Tonal Noise – Containing a prominent frequency and characterised by a definite pitch.

Weighted Sound Reduction Index (R_w) - This is a single number value in decibels given to an individual element or path through a construction, providing guidance on its sound insulation performance across the spectrum of audible frequencies. Different building elements may have different R_w values, and a single R_w value may be used to represent the overall 'composite' value. Consider for example a brick wall (R_w 45 dB) with a lightweight door inset (R_w 20 dB) and a gap underneath (R_w ~0 dB). The R_w value representing the overall wall, door and gap will depend on the relative size of each component and real examples typically range from 10 dB to 30 dB.



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1 INTRODUCTION

RWDI (formerly Wilkinson Murray) has been engaged by Icon Project Management Pty Ltd, on behalf of the Fresh Hope Care to assess the potential noise impacts associated with landscaping works for a recreation area and ancillary storage shed and kiosk at 38-40 Stronach Avenue, East Maitland.

This report presents the survey results of ambient noise levels previously carried out as part of the Fresh Hope Residential Aged Care Facility development application submission, predictions of operational noise levels received at nearby potentially sensitive residences (including mechanical plant and patron/visitor noise) and an assessment of the impact of these emissions in relation to recognised criteria for environmental noise.

Where required, recommendations are made for control measures to effectively ameliorate excessive noise emissions and enable the premises to operate without adverse impact upon the existing acoustical environment of the area.

This report forms part of the Development Application submission to Maitland City Council and has been carried out in accordance with NSW regulatory requirements.

2 PROJECT OVERVIEW

2.1 Site Location

The Three Peaks Recreation Reserve will be located at 38 – 40 Stronach Avenue, East Maitland. Stronach Avenue runs (generally) north-south and the subject site is located on the north-western corner of the Martin Close intersection. Surrounding properties include residential dwellings to the south, east and a single residence to the north. The existing Greenhills Nursing Home, which will be demolished to make way for the new Fresh Hope Residential Aged Care Facility is located to the west and the Greenhills Retirement Village is located to the north(west). Further to the north(east) along Stronach Avenue, is the Stocklands Green Hills shopping centre. The nearest residential receivers to the proposed recreation reserve are located to the south (36 Stronach Avenue) and to the north (44 Stronach Avenue). The project area and surrounding environment are shown in Figure 2-1.

Figure 2-1: Project Location



Source: © Nearmaps 2021

2.2 Project Description

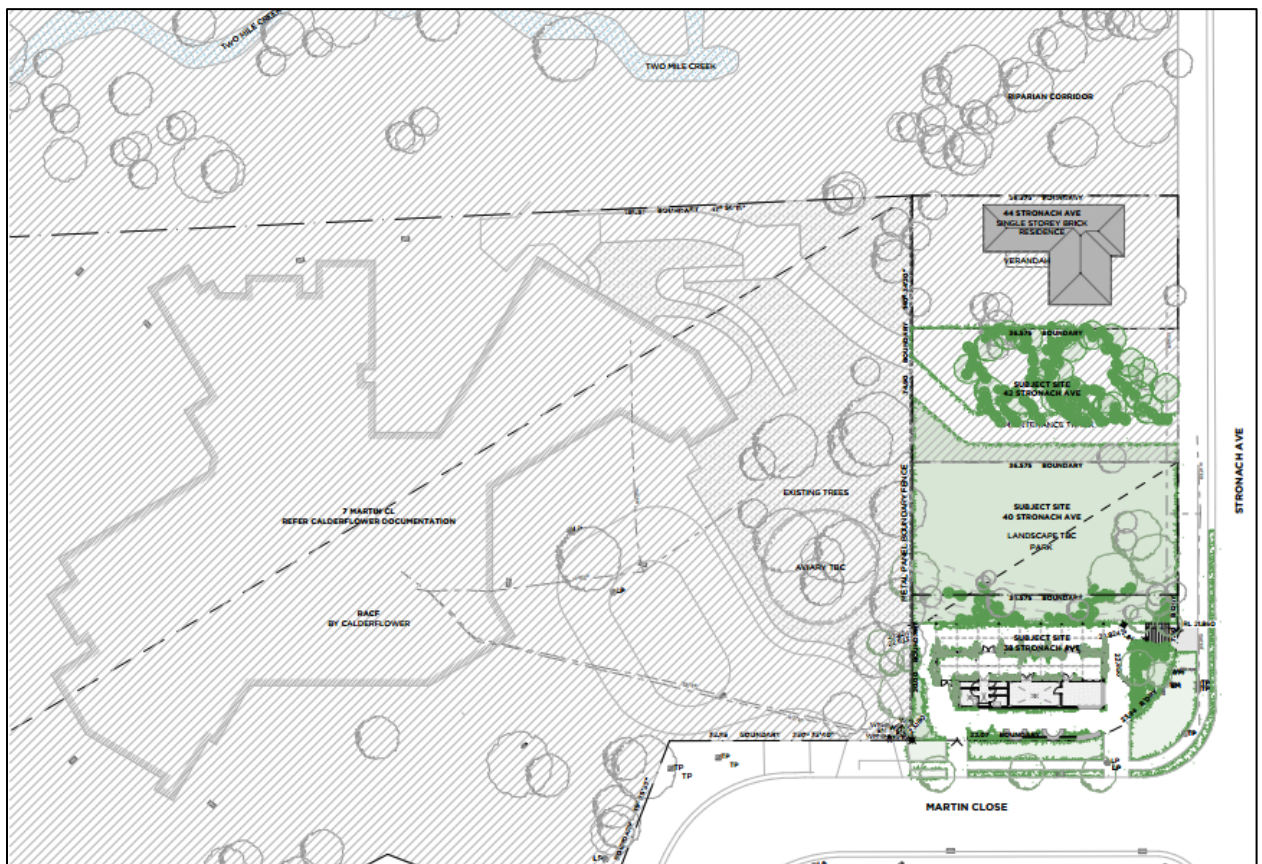
The proposed recreation reserve forms part of the Fresh Hope Care Concept Masterplan. The development aims to provide landscaped grounds for the passive enjoyment of Fresh Hope Care residents, family and friends and the local community. The design is intended to provide a statement frontage/entry for the new RACF development that engages with the wider community.

The proposal features a kiosk and arboretum refreshment area located on the corner allotment (38 Stronach Avenue). A landscaped parkland including a play precinct will be developed on the former 40 Stronach Avenue.

The kiosk and refreshment area would only operate during daytime hours (ie between 7.00am and 6.00pm).

The proposed site layout is shown in Figure 2-2 and detailed architectural and landscape documentation accompany this submission.

Figure 2-2: Proposed Site Layout



Source: Breathe Architecture



Sources of potential noise generation associated with the proposed development are limited, of an unremarkable nature and include:

- Patrons and visitors at the kiosk counter and nearby seating;
- Patrons and visitors within the pergola area;
- The childrens' play precinct.

3 ASSESSMENT CRITERIA

The project trigger limits applicable to the Fresh Hope Care RACF project are presented in Table 3-1. These limits were determined in accordance with NSW Noise Policy for Industry 2017 (NPfI) requirements based ambient noise monitoring conducted in April 2020 for the Development Application *Acoustic Assessment* prepared by TTM Consulting (Report Reference 20SYA0021 R01_0) dated 16.06.2020.

Table 3-1: NSW NPfI Project Noise Trigger Limits – Continuous Noise

Assessment Period ¹	Project Noise Trigger Limit $L_{Aeq,15min}$ dBA
Day – 7.00am to 6.00pm	47
Evening – 6.00pm to 10.00pm	42
Night-time – 10.00pm to 7.00am	37

Note 1: Daytime is between 8.00am and 6.00pm Sundays and Public holidays; night time is between 10.00pm and 8.00am Sundays and Public holidays.

4 ASSESSMENT OF NOISE EMISSIONS

4.1 Mechanical Plant & Equipment

The Kiosk will not require a commercial kitchen exhaust system. Given the apparent limited nature of the facility, a domestic ducted exhaust hood would be adequate to meet ventilation requirements. Likewise, refrigeration plant would involve domestic standard items or commercial grade with in-built compressor.

The Kiosk will rely on passive design with natural ventilation and cooling techniques. As such, there will be no HVAC associated with the project.

There will be no environmental noise emissions from mechanical plant and equipment associated with the proposed development.

4.2 Patrons & Visitors

Noise emissions would consist primarily of people-related noise including conversation, laughter, etc that occurs during normal social interaction. No amplified music system is proposed as part of the Kiosk/refreshment area development. The project design intent is focused on promoting the enjoyment of, and interaction with, the natural environment.

4.2.1 Kiosk & Refreshment Area

We have considered the levels of noise generated by the social interaction expected to occur as a result of the Kiosk and refreshment area. Patrons and visitors can be expected to enter the kiosk from the south (facing Martin Close), the east (facing Stronach Ave) and the north (via the pergola and Arboretum) to order food and beverages. The pergola has been assumed to provide a space for Kiosk patrons to gather together over their refreshments. Based upon CM Harris "*Handbook of Acoustical Measurements and Noise Control*" (Harris, 1979) the sound power level (L_w) generally adopted as representing a "normal" male voice is typically 69dBA. The US EPA also adopts the Harris referenced levels based upon the report prepared for the US EPA entitled *Speech Levels in Various Noise Environments* (May 1977).

Accordingly, the noise levels expected to be transmitted to the facades of the nearest neighbouring residential properties (36 and 44 Stronach Avenue) have been calculated based on the following source scenarios:

- "Normal" male voice spectrum (overall A-weighted L_w 69dBA) at the southern and eastern kiosk counters and associated bench seating. Two people have been assumed at each counter service area and a group of 4 people at the each of the eastern and southern bench seating areas. Half of each group are assumed to be speaking concurrently; and
- 24 people seated in the pergola area in groups of 4. Two people per group assumed speaking simultaneously at "normal" voice level (overall A-weighted L_w 72dBA per group).

These overall source noise levels are believed to be a reasonable approximation of the likely "worst case" that could be expected to be generated given the nature of the development.

The predicted $L_{Aeq,15min}$ noise levels at the nearest residential properties due to typical patron activity are shown in Table 4-1.



Table 4-1: Predicted Patron Noise Levels

Receiver	Predicted $L_{Aeq(15min)}$ dBA	Criterion Daytime 7.00am-6.00pm dBA	Criterion Evening 6.00pm-10.00pm dBA	Exceedance dBA
36 Stronach Avenue	41	47	42	0
44 Stronach Avenue	39	47	42	0

Noise levels generated as a result of the typically expected worst-case future operation of the Kiosk and refreshment area will comply with the daytime project trigger limits. The evening trigger limits are also achieved.

4.2.2 Parkland & Play Precinct

The landscaped parkland is intended as a passive recreation area and as such, would not be expected to generate any noise emissions of significance. Noise generated with children engaged in play activities within the play precinct would be consistent with that expected from any public parkland play area. Such noise is characteristic of any residential area, is non-continuous in nature, occurs for limited periods throughout daytime hours only and does not warrant further acoustic consideration.

5 CONCLUSIONS

An acoustic assessment has been prepared for the proposed development of the Three Peaks Recreation Reserve at 38-40 Stronach Avenue, East Maitland. The project aims to provide an environmentally sympathetic, landscaped frontage linking to the new Fresh Hope Care RACF for the benefit of the broader community.

The sources of potential noise generation associated with the project were considered to include:

- Patrons and visitors at the kiosk;
- Patrons and visitors within the pergola and external bench seating area enjoying their refreshments;
- The childrens' play precinct.

Prediction of potential noise emissions was carried out based on assumed patron noise levels and maximum capacity. Noise levels have been predicted to the nearest residential properties to the project.

Criteria for noise assessment was adopted based upon the project specific limits developed during the Development Application stage assessment for the approved RACF.

The predicted noise levels from typical operations have been shown to comply with these criteria. Use of the passive recreation area and play precinct is not considered to generate noise that could be considered offensive and does not warrant further assessment.