

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright.

ADVERTISED PLAN

Project: **MENTONE GRAMMAR - YEAR 7 & 8 BUILDING**

Prepared for: **Mentone Grammar
Level 2, 325 Flinders Lane
Melbourne VIC 3000**

Attention: **c/o McIldowie Partners**

Report No.: **Rp 001 R02 20210344**

**ADVERTISED
PLAN**

**This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright**

Disclaimer

Reports produced by Marshall Day Acoustics Proprietary Limited are based on a specific scope, conditions and limitations, as agreed between Marshall Day Acoustics and the Client. Information and/or report(s) prepared by Marshall Day Acoustics may not be suitable for uses other than the specific project. No parties other than the Client should use any information and/or report(s) without first conferring with Marshall Day Acoustics.

The advice given herein is for acoustic purposes only. Relevant authorities and experts should be consulted with regard to compliance with regulations or requirements governing areas other than acoustics.

Copyright

The concepts and information contained in this document are the property of Marshall Day Acoustics Proprietary Limited. Use or copying of this document in whole or in part without the written permission of Marshall Day Acoustics constitutes an infringement of copyright. Information shall not be assigned to a third party without prior consent.

Document Control

Status:	Rev:	Comments	Date:	Author:	Reviewer:
Final	-	Issued to client	17 Jun 2021	B. Kalt	T. Nicholls
Final	R01	Updated to include roof terrace	24 Aug 2021	B. Kalt	T. Nicholls
Final	R02	Updated to reflect revised scheme	1 Nov 2021	B. Kalt	T. Nicholls

TABLE OF CONTENTS

1.0	INTRODUCTION.....	5
1.1	Changes to Victorian legislation	5
2.0	SITE AND PROJECT DESCRIPTION	6
2.1	Development site.....	6
2.2	Noise-sensitive receivers	7
2.3	Project description	7
3.0	IDENTIFIED NOISE SOURCES	7
4.0	REGULATORY FRAMEWORK.....	8
4.1	Victorian Legislation.....	8
4.2	General Standards & Guidelines.....	9
5.0	EXISTING NOISE ENVIRONMENT	9
6.0	NOISE LEVEL DATA	10
6.1	Mechanical services equipment.....	10
6.2	Activities on Level 1 and rooftop terrace	10
6.3	Vehicle noise	11
7.0	MECHANICAL SERVICES NOISE	12
7.1	Noise limits.....	12
7.2	Summary of mitigation measures	12
8.0	NOISE FROM THE OUTDOOR AREAS	13
8.1	Design Target Noise Levels	13
8.2	Predicted outdoor noise levels – Level 1 and rooftop terrace	13
9.0	NOISE FROM WASTE COLLECTIONS AND DELIVERIES	14
10.0	MAXIMUM NOISE LEVELS AND SLEEP DISTURBANCE	14
10.1	Sleep disturbance criteria	14
10.2	Summary of mitigation measures	15
10.3	Predicted maximum noise levels.....	15
11.0	CONCLUSION.....	15

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

APPENDIX A GLOSSARY OF TERMINOLOGY

APPENDIX B PLANNING MAP

APPENDIX C ARCHITECTURAL DRAWINGS

APPENDIX D ASSESSMENT CRITERIA – DETAILED INFORMATION

APPENDIX E UNATTENDED NOISE MEASUREMENTS

APPENDIX F PATRON NOISE DATA

**This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright**

**ADVERTISED
PLAN**

1.0 INTRODUCTION

It is proposed to redevelop part of the Mentone Grammar site in Mentone. The development proposal includes the construction of a new Year 7 & 8 building, sports oval, car park and multi-purpose space.

Mentone Grammar has engaged Marshall Day Acoustics Pty Ltd (MDA) to conduct an environmental noise assessment for the proposed development to accompany the town planning application.

This report has been prepared to assess the potential acoustic impacts from the proposed development and details our findings and recommendations.

The Department of Environment, Land, Water and Planning has issued an RFI on 7 July 2021 (Application Ref.:PA2101261) with the following item relating to acoustics:

14. Acoustic report amended to address possible noise impacts of the rooftop terrace including amphitheatre, gardens, 'the Lookout', 'the Observation Deck', and seating areas.

This report has been updated to address the above RFI.

The latest revision also reflects the revised scheme. The main changes of the amended scheme include the following:

- Relocation of the multipurpose hall to the car park level
- Removal of undercroft area
- New terrace on Level 1
- Area reduction of rooftop terrace.

A glossary of acoustic terms used throughout this report is provided in Appendix A.

1.1 Changes to Victorian legislation

Note that the Victorian legislation referenced in the first iteration of this report have since been superseded by new legislation and guidelines. In particular, SEPP N-1 has been replaced by EPA Publication 1826 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the Noise Protocol) as of 1 July 2021. The relevant criteria and assessment procedures of SEPP N-1 are largely consistent with the Noise Protocol. Demonstrating compliance with SEPP N-1 therefore also demonstrates compliance with the criteria of the Noise Protocol. Hence, the recommendations set out in the earlier version of this report remain unchanged.

This report has been updated to reference the latest legislation.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

2.0 SITE AND PROJECT DESCRIPTION

2.1 Development site

The proposed development site is located at 75-77 Naples Road, 33-35 Warrigal Road and 37 Warrigal Road, Mentone and is bounded by the following:

- Existing school buildings immediately adjacent to the north, east and south
- Naples Road to the south-west with St. Bede's College and residential dwellings beyond.

An aerial photo of the site and surrounding area is shown in Figure 1. The nearest existing residential receivers are highlighted in yellow.

Figure 1: Subject site (Source: Nearmap)



The subject site and adjacent land is zoned General Residential Zone 3 (GRZ3). The relevant planning map is provided in Appendix B.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

2.2 Noise-sensitive receivers

The closest noise-sensitive receivers to the subject site have been identified in Table 1.

Table 1: Closest identified noise-sensitive receivers to subject site

Receiver	Address	Description
R1	23 Palermo Street	Double storey house to the west
R2	Unit 1 & 2, 85 Naples Road	Single storey houses to the south-east
R3	Unit 1 & 2, 29 Warrigal Road	Double storey houses to the south-east
R4	44-48 Warrigal Road	Residential receivers across Warrigal Road
R5	78-86 Naples Road	St. Bede's College

2.3 Project description

The proposed development consists of:

- New under cover car park
- A new multipurpose hall adjacent the car park
- A new sports oval above the car park / multipurpose hall to replace the existing sports field
- A new double storey year 7 & 8 building including external terraces on Level 1 and the roof.

The terraces will mainly be used during the day during school hours.

The mechanical services are proposed to be located on the roof of the new building. The nearest residential receivers are located approximately 40m away from the plant deck to the east and south.

The latest Town Planning drawings prepared by McIldowie Partners, dated 21 October 2021 have been reviewed as part of this assessment.

Copies of the drawings are included in Appendix C for reference.

3.0 IDENTIFIED NOISE SOURCES

The following noise sources from the proposed development may affect nearby properties:

- Mechanical services equipment noise
- Noise from the external terraces on Level 1 and the roof
- Noise from delivery and rubbish collection vehicles
- Noise from vehicles entering and exiting the site.

The new sports oval will replace an existing sports field. Hence, noise levels from the sports field will be consistent with the existing conditions.

The external play areas to the north, south and west of the new building are existing and will be retained.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

4.0 REGULATORY FRAMEWORK

The following sections outline a review of:

- Key noise legislation in Victoria
- Related guidelines and standards commonly referenced in Victoria.

4.1 Victorian Legislation

The Environment Protection Act (the Act) provides the legislative framework for the protection of the environment in Victoria. The Act includes requirements relating to noise and defines prescribed standards for a range of situations where noise must be assessed.

A summary of the key requirements and provisions of the Act and associated prescribed standards is provided in Table 2. Further information is contained in Appendix D.

Table 2: Key noise legislation

Document	Overview
<i>Environment Protection Act 2017</i> (the Act)	The Act provides the overarching legislative framework for the protection of the environment in Victoria. It establishes a general environmental duty to minimise the risks of harm to human health or the environment from pollution or waste, including noise, so far as reasonably practicable. The Act does not specify noise limit values, but prohibits the emission of unreasonable or aggravated noise from non-residential premises.
<i>Environmental Noise Regulations</i> (Regulations)	The objectives of the Regulations are to further the purposes of, and give effect to, the Act. Part 5.3, Division 1 states that prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the Act or these Regulations, must do so in accordance with the Noise Protocol (see below). Division 3 stipulates requirements that are specific to commercial, industrial and trade premises. The Division defines assessment time periods, minimum noise limit values, management of cumulative noise from multiple premises, noise sensitive areas where assessment requirements apply, definition of frequency spectrum as a prescribed factor, and a definition for unreasonable and aggravated noise. Refer to Appendix D2 for further detail.
EPA Victoria Publication 1826 <i>Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues</i> (Noise Protocol)	The Noise Protocol defines the method for setting the noise limits for new and existing commercial, industrial and trade premises and entertainment venues in Victoria. It also outlines the steps that must be followed to undertake an assessment (measurement or prediction) of the effective noise level within a noise sensitive area or at an alternative assessment location. Refer to Appendix D3 for further detail.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Note that schools are considered noise sensitive receivers under the new Noise Protocol. As such, the criteria will also apply to St. Bede’s College. This has been included in our assessment.

**ADVERTISED
PLAN**

4.2 General Standards & Guidelines

Other standards and guidelines reviewed as part of this noise assessment are provided in Table 3.

Table 3: General standards and guidelines

Document	Overview
EPA Publication 1254 <i>Noise Control Guidelines</i> (EPA Guidelines)	Provides an overview of noise policies and legislation in Victoria for a range of different noise sources and provides supplementary guidance for situations where there is no policy or legislation. Refer to Appendix D4 for further detail.
Patron noise guidelines	Noise predominantly related to voices of patrons in outdoor areas is not covered under any State Environment Protection Policy or general Victorian guideline. In lieu of an established state policy or criterion, MDA has developed a set of design targets which have been referenced as part of numerous planning applications and VCAT hearings for proposed external patron noise areas. The design targets are defined separately for day, evening and night periods and are determined on the basis of background noise levels. Refer to Appendix D5 for further detail.
Sleep disturbance criteria sourced from NSW Road Noise Policy 2011 (Sleep disturbance criteria)	The provisions of this document are often referred to in Victoria for general guidance on potential sleep disturbance. Based on a review of research into sleep disturbance, the NSW policy nominates maximum external night-time noise levels at noise sensitive locations which are unlikely to disturb sleep. Refer to Appendix D6 for further detail.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

5.0 EXISTING NOISE ENVIRONMENT

The determination of applicable noise limits is based on land zoning and existing background noise levels at a location representative of the nearest affected residential receivers.

Background noise measurements were undertaken between Friday 7 May and Tuesday 11 May 2021 at a location representative of the background noise level at the nearest noise sensitive receiver locations.

The lowest of the average measured noise levels per period are summarised in Table 4. Further information on the measurement position and methodology is provided in Appendix E.

Table 4: Existing ambient noise levels

Time period	Lowest average background noise level, dB LA90
Day	43
Evening	41
Night	33

These noise levels have been used to determine the noise limits and the full derivation is provided in Appendix D.

**ADVERTISED
PLAN**

6.0 NOISE LEVEL DATA

6.1 Mechanical services equipment

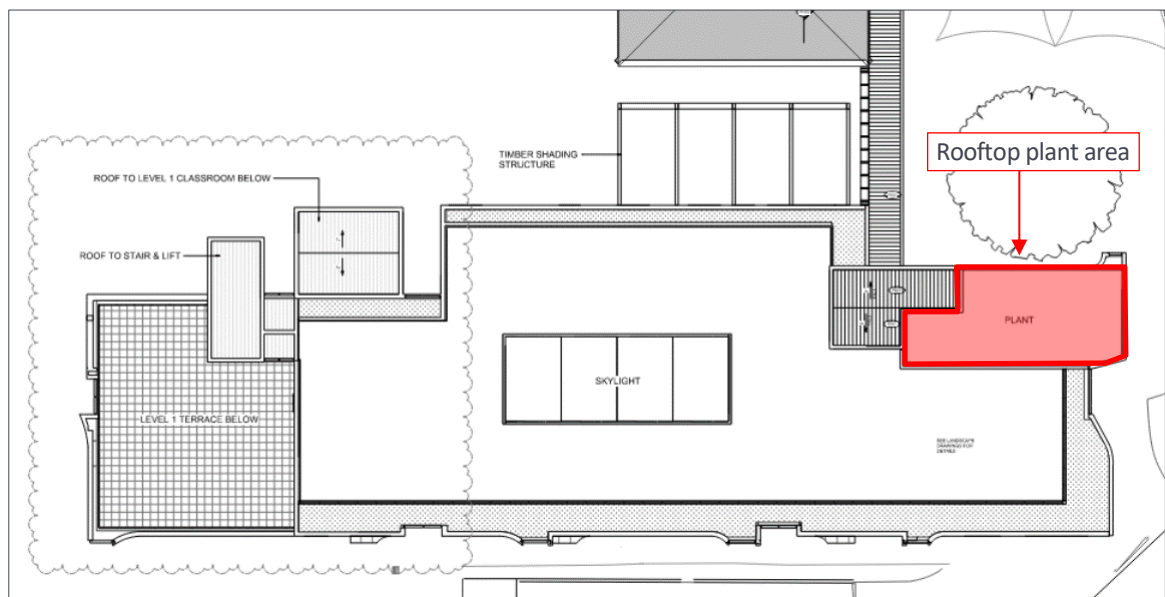
The mechanical services equipment serving the development has not yet been fully confirmed but is expected to include the following:

- Car park supply and exhaust fans
- Exhaust fans for toilets
- VRV/VRF condensing A/C units
- Hot water plant (gas heater).

The majority of plant equipment is expected to be located in a rooftop plant area on the new building, as highlighted in Figure 2.

The car park exhaust fans will be located within the car park.

Figure 2: Rooftop plant area



Noise level data for the equipment has not been supplied at the time of writing.

6.2 Activities on Level 1 and rooftop terrace

The new building will include external terraces on Level 1 and the roof. The Level 1 terrace will be used as an outdoor learning space for approximately 25-50 students. The rooftop terrace will mainly be used as an outdoor learning area or for passive recreation at recess and lunch. On some occasions, the rooftop terrace will be used for events involving parents, visitors, or staff. These events would include a maximum of 50-350 people and are proposed to occur between 0900–2100 hrs.

For the purposes of assessment, MDA has derived representative noise levels for the type of expected activities in the external spaces.

MDA commonly assesses noise from children playing at childcare centres, and also from patrons at external areas associated with licenced premises such as bars, pubs, restaurants etc. Furthermore, MDA has developed a prediction methodology to determine typical patron noise levels associated with particular types of external area associated with licensed premises. Whilst not directly applicable, a similar assessment approach has been adopted for the subject site. The derived external activity noise levels have been provided in Table 5.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

Table 5: Outdoor activity noise levels sound power level data, dB L_{Aeq}

Area	Source	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	A
Level 1 terrace	50 people 'restaurant dining'*	78	80	81	88	86	82	75	90
Rooftop terrace	350 people 'restaurant dining'*#	87	89	90	97	95	91	84	99

* See Appendix F for further information on the derivation of the noise levels

This is a worst-case scenario. The maximum number of people is expected to be lower outside of school hours

6.3 Vehicle noise

Vehicles entering and exiting the car park as well as within the car park may generate noise. The following noise data in Table 6 has been used for assessment purposes.

Table 6: Vehicle noise levels – car park, dB L_{Amax}

Source	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	A
Vehicle pass-by, L _w	100	98	94	88	86	82	82	92

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

7.0 MECHANICAL SERVICES NOISE

7.1 Noise limits

External noise from mechanical services such as from air-conditioning, ventilation, exhaust and refrigeration equipment is required to comply with the requirements of the Noise Protocol.

A description of the legislation, including the method used to derive the noise limits based on the land use and background noise levels is presented in Appendix D3.

The limits are summarised below in Table 7.

Table 7: Noise Protocol limits, dB

Period	Noise limits, L_{eff}
Day	50
Evening	44
Night	39

**ADVERTISED
PLAN**

7.2 Summary of mitigation measures

Noise level data for the equipment has not been supplied at the time of writing.

In order to achieve compliance with the Noise Protocol limits, it is expected that the following mitigation measures will be required:

- A solid screen on the east and south sides of the roof plant deck
- The solid screen must extend a minimum of 1 m above the top of the condensing units
- Car park exhaust fans will be fitted with acoustic attenuators and enclosed with acoustic enclosures as required to achieve compliance
- The car park will include acoustic louvres where required.

During the detailed design stage, an acoustic analysis must be performed to determine the exact nature of the treatments required. To perform this analysis, the following information would be required for review:

- Equipment schedules and operating duties
- Manufacturer's noise level data
- Updated mechanical services drawings showing specific equipment locations and configurations.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

8.0 NOISE FROM THE OUTDOOR AREAS

8.1 Design Target Noise Levels

There is no Victorian legislation that prescribes noise limits for noise from voices in outdoor learning areas/terraces. The derivation of the applicable semi-steady state design targets for outdoor noise is summarised in Table 8, adopted from the method defined in Appendix D5 and the background noise data presented in Section 5.0. The design targets are based on protecting residential amenity and give an indication of the likely impact of predicted noise levels at a noise-sensitive location such as a residential dwelling.

The outdoor spaces are not proposed to be used during the night-time. Hence, noise targets are provided for the day and evening periods only.

Table 8: Patron noise design targets, dB

Period	Measured background noise level, L_{90}	Adjustment	Patron noise target, $L_{Aeq, 15 \text{ min}}$
Day	43	+10 dB	53
Evening	41	+10 dB	51

8.2 Predicted outdoor noise levels – Level 1 and rooftop terrace

Both terraces will include a solid balustrade up to 970 mm and then a glass balustrade up to 2000 mm above FFL around the whole perimeter. The balustrades have been included in the acoustic assessment. In order to provide sufficient attenuation, the construction material of the balustrades must have a minimum surface density of 15 kg/m². Some suitable materials for this purpose include:

- 25 mm thick plywood timber panelling
- 9 mm thick fibre cement sheet
- 6 mm toughened laminated safety glass.

It is critical that the balustrades are well sealed and free from any holes or gaps. In particular, there must be no gap at the base of the balustrades.

The predicted noise levels at the neighbouring dwellings due to activities on the Level 1 and rooftop terrace are presented in Table 9. For the assessment it was assumed that the people are spread evenly across the whole of each terrace.

Table 9: Predicted external activity noise levels, dB

Description	Noise levels, $L_{eq, 15 \text{ min}}$
Predicted noise level at nearest receiver	46
Day/Evening patron noise targets	53/51
Compliance achieved	Yes

The predicted noise levels from the terraces are well below the patron noise design targets. This indicates that no impact is likely at the nearest residents.

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

9.0 NOISE FROM WASTE COLLECTIONS AND DELIVERIES

It is recommended that the schedules and practices detailed in EPA Publication 1254 *Noise Control Guidelines* be adopted for waste collections on the site as follows:

- Refuse bins should be located at sites that provide minimal annoyance to residential premises
- Compaction should be carried out while the vehicle is moving
- Bottles should not be broken up at the collection site
- Routes which service predominantly residential areas should be altered regularly to reduce early morning disturbances
- Noisy verbal communication between operators should be avoided if possible.

The following schedule of acceptable times for waste collection is also provided in the *EPA Noise Control Guidelines*:

One collection per week

6:30am-8pm Monday to Saturday

9am-8pm Sunday and public holidays

Two or more collections per week

7am-8pm Monday to Saturday

9am-8pm Sunday and public holidays

10.0 MAXIMUM NOISE LEVELS AND SLEEP DISTURBANCE

10.1 Sleep disturbance criteria

When vehicle movements into the car park occur during the night-time period of 2200-0700 hours, it is considered appropriate that criteria based on sleep disturbance are used to assess the noise impact. When such movements occur during the day, they are usually not considered to have an adverse impact on the existing amenity. The sleep disturbance criteria is listed in Table 10.

Table 10: Sleep disturbance criteria

Description	External design target, dB L _{Amax}
Short-term maximum noise levels	60-65

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any conviction.

10.2 Summary of mitigation measures

High noise levels can be generated in carparks as vehicles travel over obstructions or irregularities in the carpark surface, such as speed humps, ramp profiling or expansion joints, particularly with inadequately restrained metal devices.

To control carpark noise generation, it is recommended that irregularities in the carpark surface should be avoided; i.e. no speed humps, ramp profiling or expansion joints in areas where cars are driving. Drainage grates must be securely restrained to avoid any “crashing” or “banging” of grates as cars drive over them

The use of a protective floor surface that reduces tyre squeal associated with vehicle movement should be considered, such as those available from Flowcrete or similar.

10.3 Predicted maximum noise levels

Table 11 presents the maximum noise levels due to vehicle movements used in the calculation of maximum noise levels for assessing risk of sleep disturbance.

Table 11: Predicted maximum noise levels due to vehicle movements

Description	Noise levels, dB L _{max}
Predicted noise level at nearest receiver	41
Sleep disturbance criteria	60-65
Compliance achieved	Yes

ADVERTISED PLAN

The predicted maximum noise levels are below the sleep disturbance criteria.

11.0 CONCLUSION

It is proposed to redevelop part of the Mentone Grammar site in Mentone. The development proposal includes the construction of a new Year 7 & 8 building sports oval, car park and multi-purpose space.

This report has been prepared to assess the potential acoustic impacts from the proposed development and details our findings and recommendations.

MDA has carried out an environmental noise assessment of the proposed development in accordance with the relevant Victorian EPA legislation, guidelines and accepted industry practice.

This assessment has been based on:

- Existing noise conditions determined from a measurement survey at the site;
- Limits determined in accordance with the relevant Victorian EPA legislation, guidelines and accepted industry practice.; and
- Noise modelling of the site and surrounding environment, accounting for typical worst-case atmospheric conditions which favour the propagation of noise.

The preliminary assessment indicates that noise impacts associated with the proposed development can be adequately mitigated.

Noise from the multipurpose room and rooftop terrace are also predicted to not adversely impact the amenity of nearby noise-sensitive receivers.

Mechanical services details are not yet available and will require careful review as the design progresses. However, it is expected that with appropriate selection of equipment, location and acoustic treatment, the Noise Protocol limits will be easily achievable.

APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
Ambient	The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source.
dB	<u>Decibel</u> The unit of sound level. Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
Frequency	The number of pressure fluctuation cycles per second of a sound wave. Measured in units of Hertz (Hz).
Hertz (Hz)	Vibration can occur over a range of frequencies extending from the very low, such as the rumble of thunder, up to the very high such as the crash of cymbals. The frequency of vibration and sound is measured in hertz (Hz). Once hertz is one cycle per second. Structural Vibration is generally measured over the frequency range from 1 Hz to 500 Hz (0.5 kHz).
L_w (or SWL)	Sound Power Level. The level of total sound power radiated by a sound source.
L_{A90}	The A-weighted noise level equalled or exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.
L_{Aeq}	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.
L_{Amax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
L_{eff}	The effective noise level of commercial or industrial noise determined in accordance with the Noise Protocol. This is the L_{Aeq} noise level over a half-hour period, adjusted for the character of the noise. Adjustments are made for tonality, intermittency and impulsiveness.
Octave Band	A range of frequencies where the highest frequency included is twice the lowest frequency. Octave bands are referred to by their logarithmic centre frequencies, these being 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz for the audible range of sound.
R_w	<u>Weighted Sound Reduction Index</u> A single number rating of the sound insulation performance of a specific building element. R_w is measured in a laboratory. R_w is commonly used by manufacturers to describe the sound insulation performance of building elements such as plasterboard and concrete.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

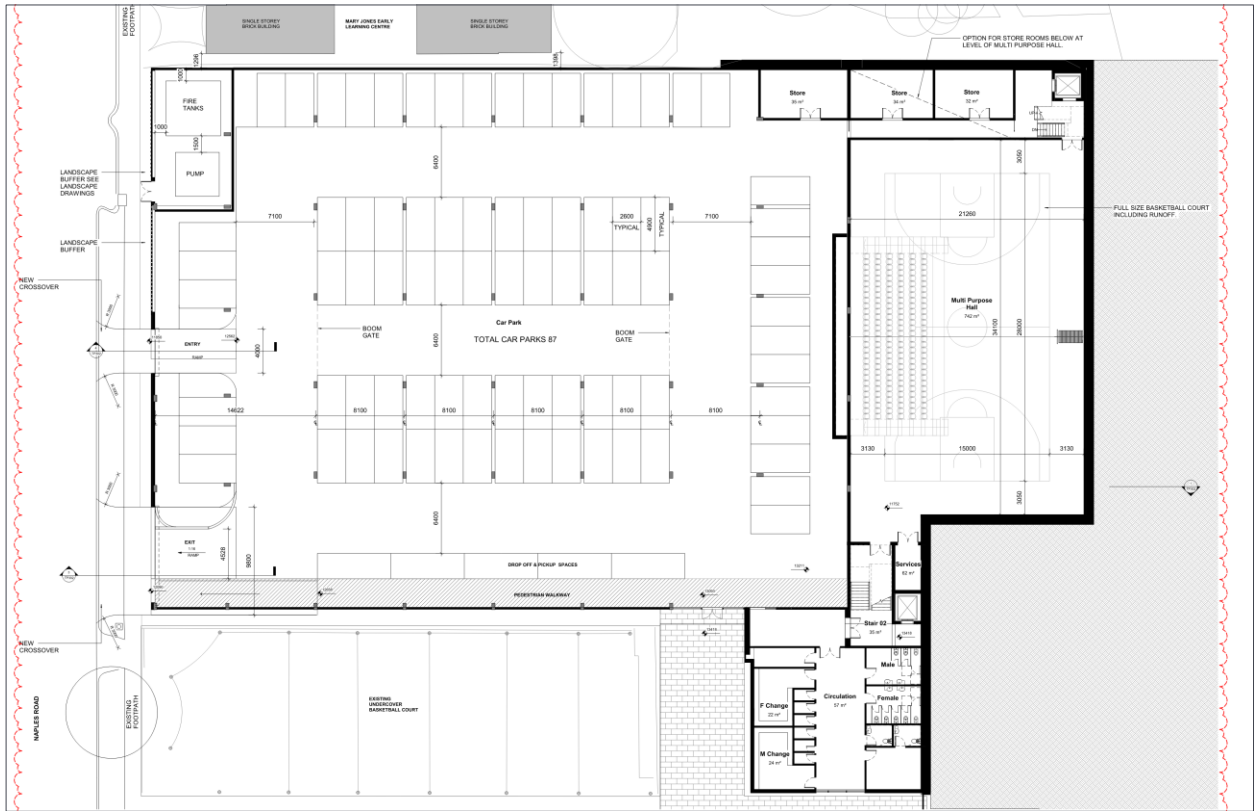
APPENDIX B PLANNING MAP



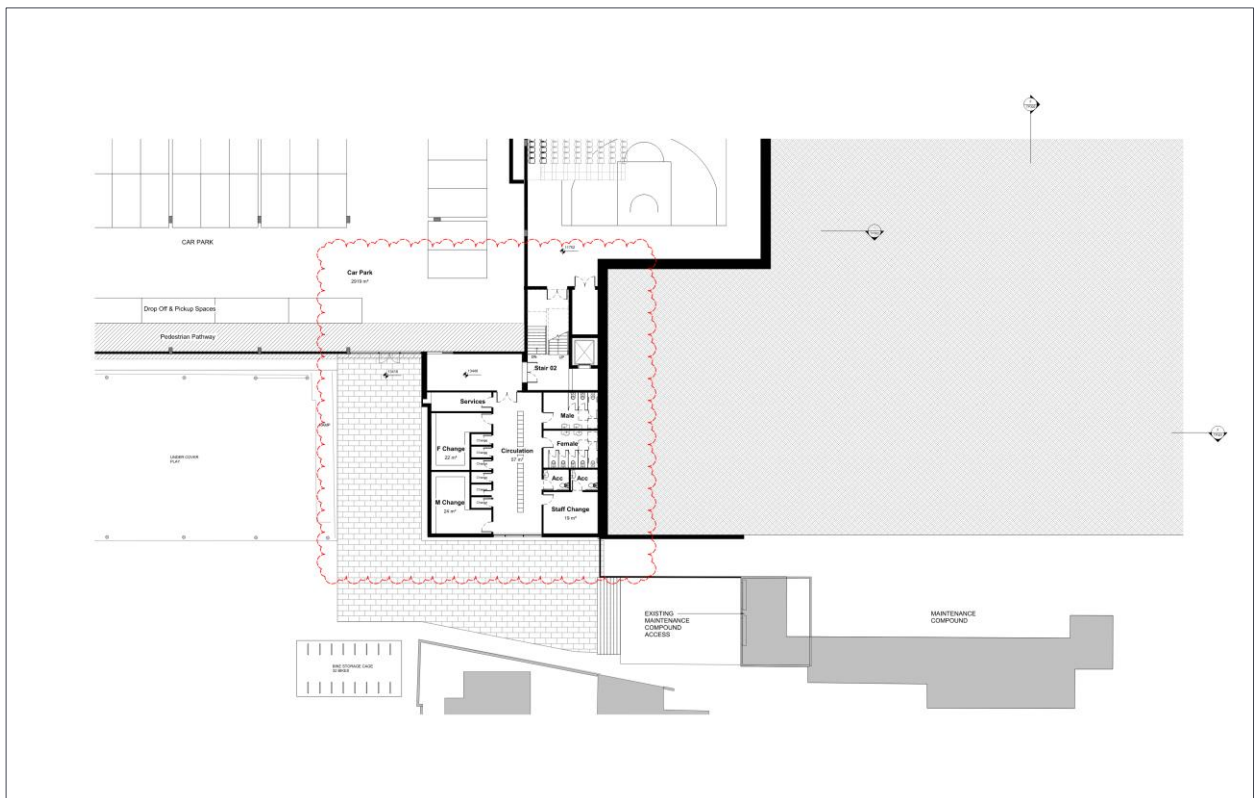
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any

ADVERTISED PLAN

APPENDIX C ARCHITECTURAL DRAWINGS
C1 Car Park

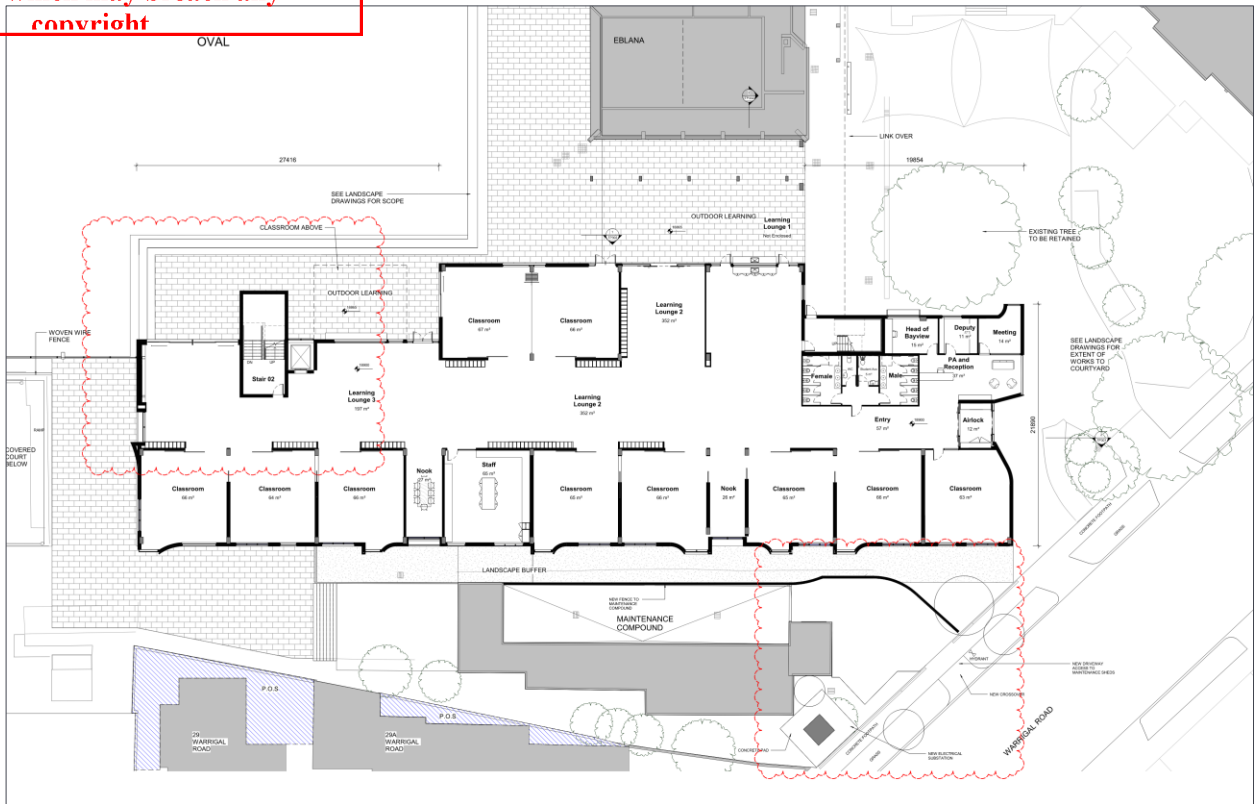


C2 Lower Ground

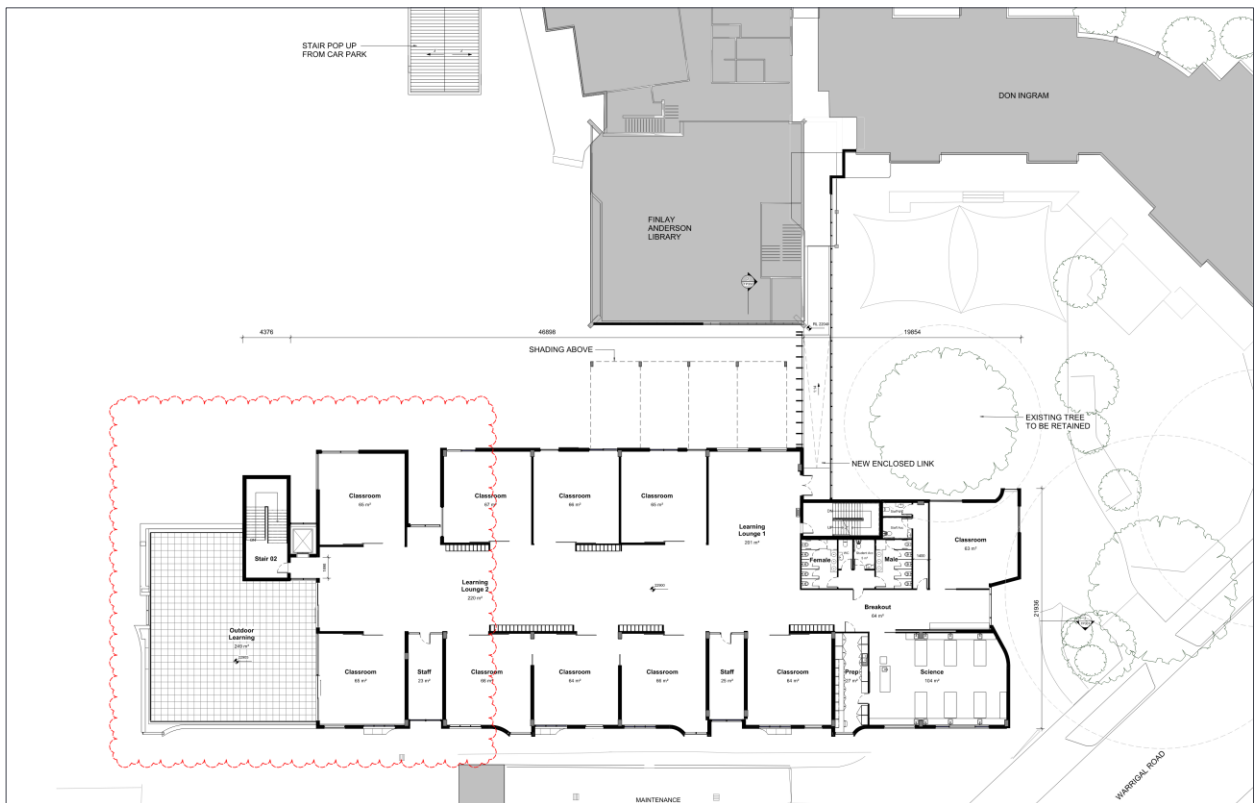


This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

C3 Ground Floor



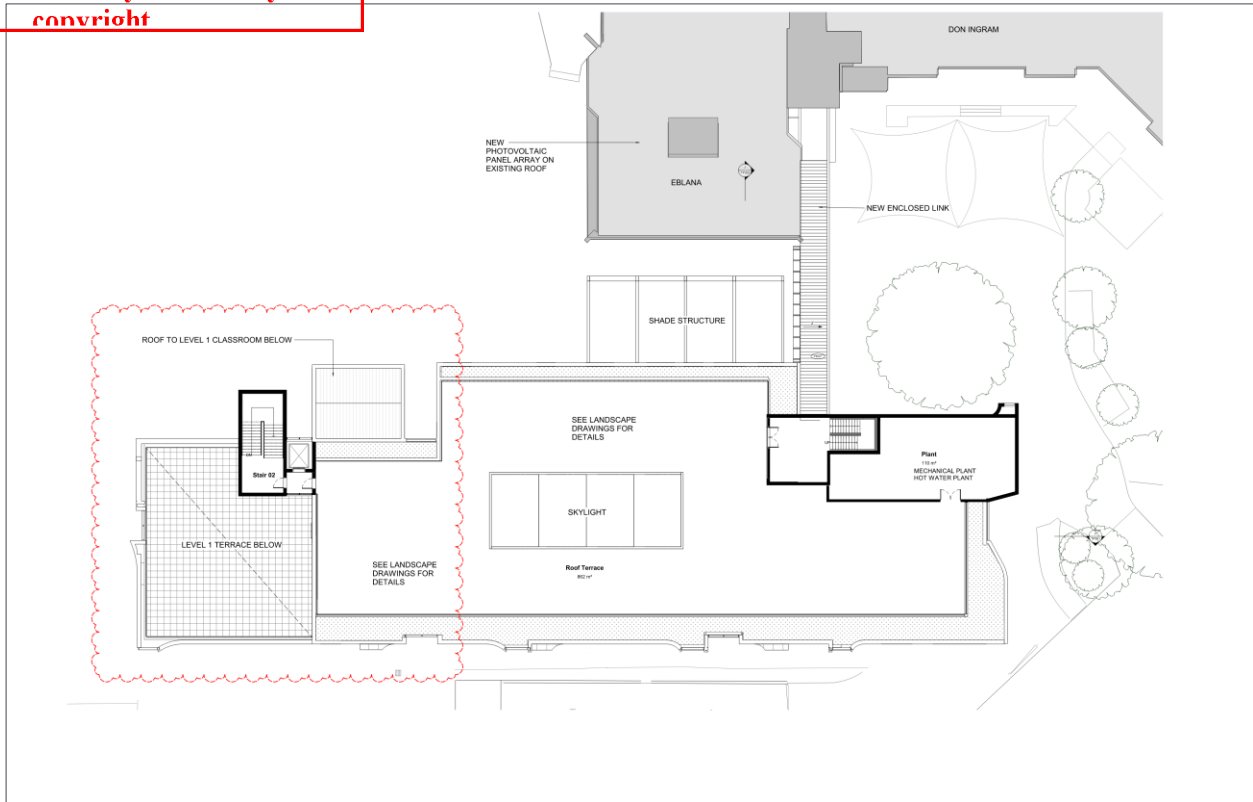
C4 Level 01



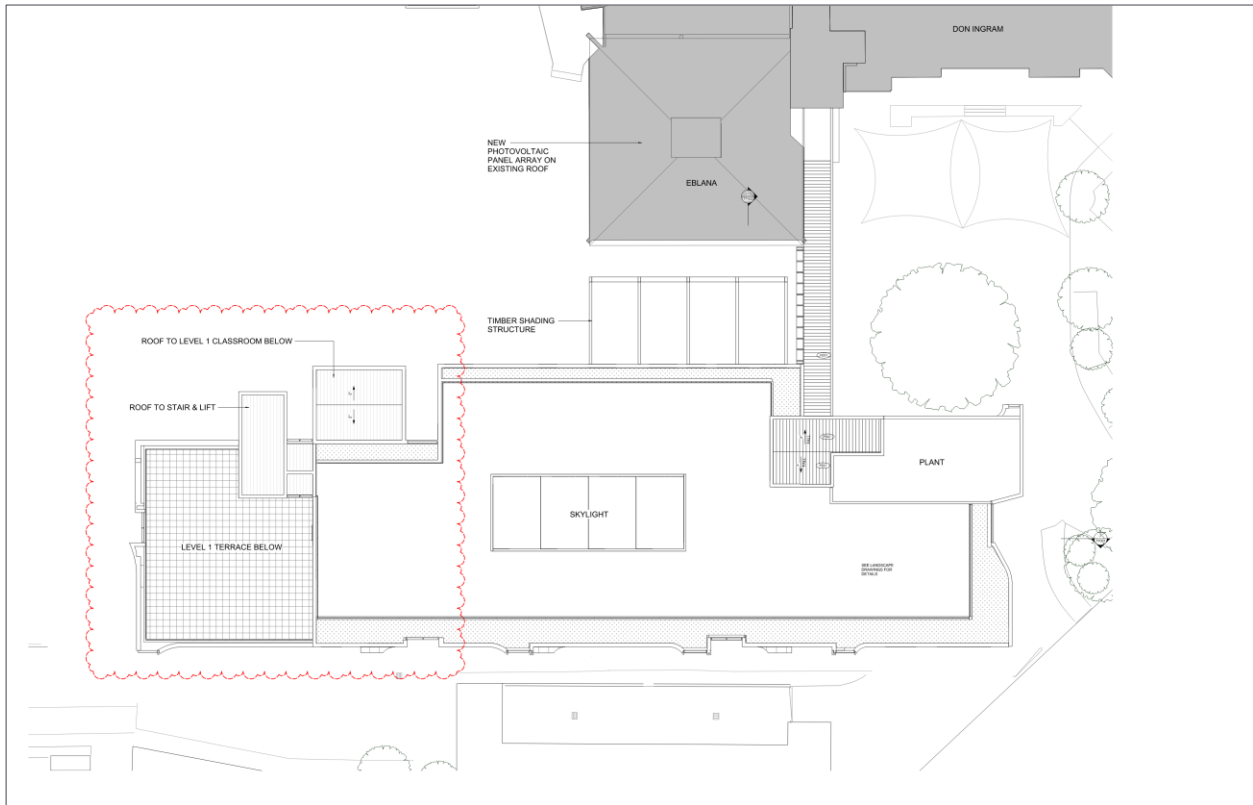
ADVERTISED PLAN

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

C5 Level 02



C6 Roof Plan



ADVERTISED PLAN

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document is not to be used for any purpose which may breach any copyright.

APPENDIX C – ASSESSMENT CRITERIA – DETAILED INFORMATION
D1 ~~Copyright~~ General Environmental Duty

The Regulations and the Noise Protocol set noise limits that must not be exceeded. The noise limits are not intended to be levels one can ‘pollute up to’ and must not to be interpreted as noise levels below which no action is required. This is because the duty holder is required under the GED to minimise risks so far as reasonably practicable.

D2 Environmental Protection Regulations

The objectives of the Regulations are to further the purposes of, and give effect to, the Act. The Regulations also define outdoor sensitive areas, commercial, industrial and trade premises, as well as indoor, outdoor and live entertainment venues and events.

Part 5.3 of the Regulations sets out requirements that are specific to environmental noise. Division 1 states that the prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the Act or the Regulations must be conducted in accordance with the Noise Protocol (see below). Division 3 stipulates requirements that are specific to commercial, industrial and trade premises. Division 4 applies to music noise from entertainment venues and events.

In particular, noise from these types of premises and venues is prescribed as unreasonable if it exceeds a noise limit or alternative criterion determined in accordance with the Noise Protocol (see below). Additional matters addressed in Divisions 3 and 4 include assessment time periods, minimum noise limit values, management of cumulative noise from multiple premises, noise sensitive areas where assessment requirements apply, definition of frequency spectrum as a prescribed factor, and a definition for aggravated noise.

D3 EPA Publication 1826 (The Noise Protocol)

The EPA Victoria Publication 1826 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the Noise Protocol) outlines the EPA’s required approach to the determination of noise limits and to the measurement, prediction and analysis of noise.

D3.1 Noise limits for commercial, industrial and trade premises

The Noise Protocol provides two methods for deriving the relevant noise limits, the Urban area method and the Rural area method. The Urban area method is applicable to the proposed development.

The noise limits are calculated taking into account planning scheme land ‘zoning types’ within a 70 m and 200 m radius of a noise sensitive receiver. The Noise Protocol categorises land zones as type 1, 2 or 3. Zone type designations consider the nature of the permitted land uses and are generally as follows:

- areas such as residential, rural and open space are type 1;
- areas such as commercial, business and light industry are type 2; and
- areas such as general industry and major roads are type 3.

A prescribed formula is used to calculate a corresponding Zoning Level. Greater areas of type 2 and 3 land within a 200 m radius of a noise sensitive site result in higher Zoning Levels than a site with respectively larger areas of type 1 land.

The noise limit is equal to the ‘zoning level’ unless the background level at the noise sensitive site is categorised as low or high according to clause 4 of the Policy. If the background level is low or high,

the Noise Limit is calculated from a formula taking into account both the Zoning Level and the Background Level.

The current land use zones around the subject site are shown in the planning map in Appendix B.

The limits are separately defined for the day, evening and night periods. The relevant noise limits applicable to this development are shown in Table 12.

Table 12: Environmental noise limits

Period	Day	Time	Zoning level, dB	Measured background noise level, dB L _{A90}	Background relative to zoning level	Noise limit, dB L _{eff}
Day	Monday – Saturday	0700 to 1800 hrs	50	43	Neutral	50
Evening	Monday – Saturday	1800 to 2200 hrs	44	41	Neutral	44
	Sunday and Public Holidays	0700 to 2200 hrs				
Night	Monday – Sunday	2200 to 0700 hrs the next day	39	33	Neutral	39

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

D4 EPA Publication 1254 Noise Control Guidelines

The guidelines state the following in the introduction:

These guidelines are primarily intended to be used by municipal officers to assist in the resolution of complaints or to avert a possible noise nuisance. Some guidelines have been prepared so that they could be incorporated into a permit condition of a development or embodied as a local law. The guidelines are designed, however, to be the basis of assessment and not the last word.

Many of the guidelines do not require an actual measurement of the noise. In these cases, the inherent nature of the activity outside the hours suggested is sufficient to consider the activity unreasonable.

D3.1 Industrial waste collection

EPA Publication 1254.2 *Noise Control Guidelines* (Guidelines) provides the following recommendations for industrial waste collections:

- Refuse bins should be located at sites that provide minimal annoyance to residential premises
- Compaction should be carried out while the vehicle is moving
- Bottles should not be broken up at the collection site
- Routes which service predominantly residential areas should be altered regularly to reduce early morning disturbances
- Noisy verbal communication between operators should be avoided where possible.

The Guidelines recommend that collections should be restricted to the following times:

One collection per week

6:30 am - 8 pm Monday to Saturday

9 am – 8 pm Sunday and Public Holidays

Two or more collections per week

7 am – 8 pm Monday to Saturday

9 am – 8 pm Sunday and Public Holidays.

It is recommended that waste disposal activities adhere to the above guidelines and procedures.

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright.

D5 Patron noise / Noise from children

Noise from voices of patrons outdoors is not covered under any State Environment Protection Policy or general Victorian guideline.

In lieu of an established state policy or criterion, MDA has developed a set of design targets which have been referenced as part of numerous planning applications and VCAT hearings for proposed external patron noise areas.

The structure of the patron noise design targets is summarised in Table 13.

Table 13: Recommended design targets for night-time patron noise

Description	Design Target	Purpose
Semi-steady noise levels - L_{Aeq}	Day Period - 50 dB or background noise (L_{A90}) + 10 dB, whichever is higher Evening Period - 45 dB or background noise (L_{A90}) + 10 dB, whichever is higher Night Period - 40 dB or background noise (L_{A90}) + 5 dB, whichever is higher	Amenity protection
Short-term maximum noise levels L_{Amax}	60-65 dB (refer to Appendix D6)	Sleep disturbance protection

Note that the design targets noted above are identical to the targets recommended by the Association of Australian Acoustical Consultants (AAAC) for the control of noise from children playing in outdoor areas in child care centres (*Guideline for Child Care Centre Acoustic Assessment*).

For a theoretical assessment of a venue, the purpose of the proposed patron noise criteria is not to provide an absolute limit but to provide an indication of whether a venue has the potential to cause an unreasonable impact. It is difficult to propose an absolute limit because unlike other noise sources (e.g. mechanical equipment), there is a large variation in patron noise and this variation is not always linked to the number of patrons.

The results of the analysis are interpreted as follows:

Table 14: Interpretation of patron noise assessment results

Predicted noise level	Likely impact
Meets the proposed criteria	No impact likely
Exceeds the proposed criteria by up to 2 dB	No impact likely
Exceeds the criteria by 3-5 dB	There is a possibility of impact and the proposal should be assessed with measurements once it is operational to determine typical crowd noise levels from the venue. Provision should be made to adopt managerial controls and retrofit engineering controls if deemed necessary
Exceeds the criteria by 5-8 dB	There is a strong possibility of impact and engineering controls should be incorporated. Managerial controls should also be considered at the planning stage. Further measurements will be required once the development is operational to determine appropriate managerial controls
Exceeds the criteria by more than 8 dB	There will be noise impact and major changes to the design and/or operation of the proposed outdoor area will be required

**ADVERTISED
PLAN**

D6 Sleep disturbance

The NSW *Road Noise Policy* 2011 produced by the NSW Environmental Protection Agency strictly only applies in NSW. However, the provisions of the document are often referred to in Victoria for general guidance on potential sleep disturbance.

The NSW policy notes that from the research on sleep disturbance to date it can be concluded that:

- *maximum internal noise levels below 50–55 dB L_{Amax} are unlikely to awaken people from sleep*
- *one or two noise events per night, with maximum internal noise levels of 65–70 dB L_{Amax} , are not likely to affect health and wellbeing significantly.*

It is generally accepted that a partially open window provides approximately 10 dB noise reduction from outside to inside. Therefore, in accordance with the *NSW Road Noise Policy* sleep disturbance findings, we recommend that maximum noise levels from on-site activities at night should not exceed 65 dB L_{Amax} outside an openable window of existing or future residential dwellings.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document is not to be used for any purpose which may breach any Part 101.

APPENDIX B UNATTENDED NOISE MEASUREMENTS

Unattended background noise measurements have been undertaken at the subject site between Friday 7 May and Tuesday 11 May 2021 at a location representative of the background noise level at the nearest noise sensitive receiver locations.

The prevailing noise environment when consultants attended the site to install and collect the equipment was dominated by road traffic.

Unattended noise measurements were obtained using a Rion Type 1 NL-31 noise logger (serial no: 00503821). The microphone was fitted with a weatherproof windshield and were mounted at a height of approximately 1.5m above local ground level under free-field conditions. Measurements were obtained using the 'F' response time and A-weighting frequency network. The equipment was checked before and after the survey and no significant drift in calibration was observed.

Figure 3 provides an aerial view of the monitoring location.

Figure 3: Unattended monitoring location (Source: Nearmap)



The average measured background noise levels per period are summarised in Table 15.

Table 15: Average measured background level, dB LA90

Date	Day	Period	
		Evening	Night
Friday, 7 May 2021	-	42	36
Saturday, 8 May 2021	43	41	33
Sunday, 9 May 2021	-	42	38
Monday, 10 May 2021	55	42	45
Minimum	43	41	33

ADVERTISED PLAN

APPENDIX F PATRON NOISE DATA

The following sections discuss noise from patrons in mainly licensed venues. It is noted that noise from students may be different to that of patrons in a pub. However, the principles discussed below are still valid for the noise that is expected from people on the rooftop terrace. It is therefore considered acceptable to use the information below for this assessment.

The noise of patron areas associated with dining and licensed venues is highly variable according to a wide range of factors including:

- The type of venue
- The function of the space within the venue (i.e. seated areas for dining or standing areas with a focus on alcohol consumption)
- Total crowd numbers
- The composition of the total patron numbers in terms of demographics and group sizes
- Weather
- Background noise levels
- The acoustic properties of the space.

Based on the above considerations, total patron noise emissions will vary significantly between different venues. Further, for a given venue patron noise emissions will vary from day to day and hour to hour according to these types of factors.

The individual and cumulative effect of these factors cannot be precisely calculated. Accordingly, to provide a practical basis for assessing the noise from proposed external areas, a simplified method has been developed to characterise the noise emissions of four broad categories of venue type for different number of patrons. The method is based on a single representative vocal effort to characterise the range of emissions of all individuals within the crowd.

It is assumed that a portion of the crowd may be speaking at any given point in time.

In practice, the vocal effort of each individual will vary across the crowd and throughout the assessment period. The portion of the crowd will also vary. The selected values are therefore not considered exact representations of a crowd's patterns. The values have been chosen to enable a simple relationship to be formulated which provides close agreement with patron noise measurements conducted at a range of venues.

Marshall Day Acoustics and other acoustic consultants in Melbourne have measured patron noise from several different venues. These measurements indicate a large variation in the noise levels of crowds. Variations are due to a number of factors including the situational context of the crowd.

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

For the purpose of predicting noise levels from a venue, external patron areas are categorised according to the descriptions outlined in Table 16. Reference sound power data for one person is detailed in the 2011 Hayne paper¹.

Table 16: Patron area use categories

Area use category	Reference sound power data per one person		Area use definition
	Equivalent	Maximum	
Vertical drinking ('worst-case' crowd)	88 dB L _{AW}	104 dB L _{AW}	Standing patrons drinking and talking Focus of activity on drinking and socialising
Taverns with significant food offerings	83 dB L _{AW}	104 dB L _{AW}	Predominantly seated patrons, drinking, dining and talking Focus of activity on drinking, whilst dining and socialising
Restaurant dining	78 dB L _{AW}	98 dB L _{AW}	Seated patrons, drinking, dining and talking Focus of activity on dining and socialising
Small smoking areas (<40 patrons)	73 dB L _{AW}	98 dB L _{AW}	Patrons using area for smoking Focus of activity on smoking rather than socialising (data also includes outdoor areas with alcohol consumption)

Based on the above reference sound power data and measurements by MDA, a simplified empirical relationship to represent the total sound power level for which crowd numbers and character were varied has been derived for determining design equivalent and maximum sound power level as follows:

- Design equivalent sound power level - derived by assuming that one third of the total crowd speaks continuously over the duration of the assessment period, and each of these speakers emit a constant total sound power level over the duration of the assessment period. In practice, the actual number of individuals speaking, the sound power emitted by each individual, and the temporal characteristics of each speaker will vary considerably over the assessment period. The derived values therefore do not represent the actual percentage of patrons speaking, or the emission of each patron, but simply represent the total sound power level for the number of patrons
- Design maximum sound power level - derived by assuming that the maximum noise level occurs as a result of two (2) individuals simultaneously producing a maximum level. Smoking areas and restaurants are considered to have the same maximum sound power level characteristics, as are taverns with significant food offerings and vertical consumption crowds.

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

¹ Hayne et al 2011, 'Prediction of noise from small to medium sized crowds', in *Acoustics 2011: Breaking New Ground, Proceedings of the Annual Conference of the Australian Acoustical Society, AAS Queensland Division 2011, Gold Coast*, paper number 133.

Figure 4 provides the total equivalent sound power based on patron numbers.

Figure 4: Total equivalent sound power based on patron number

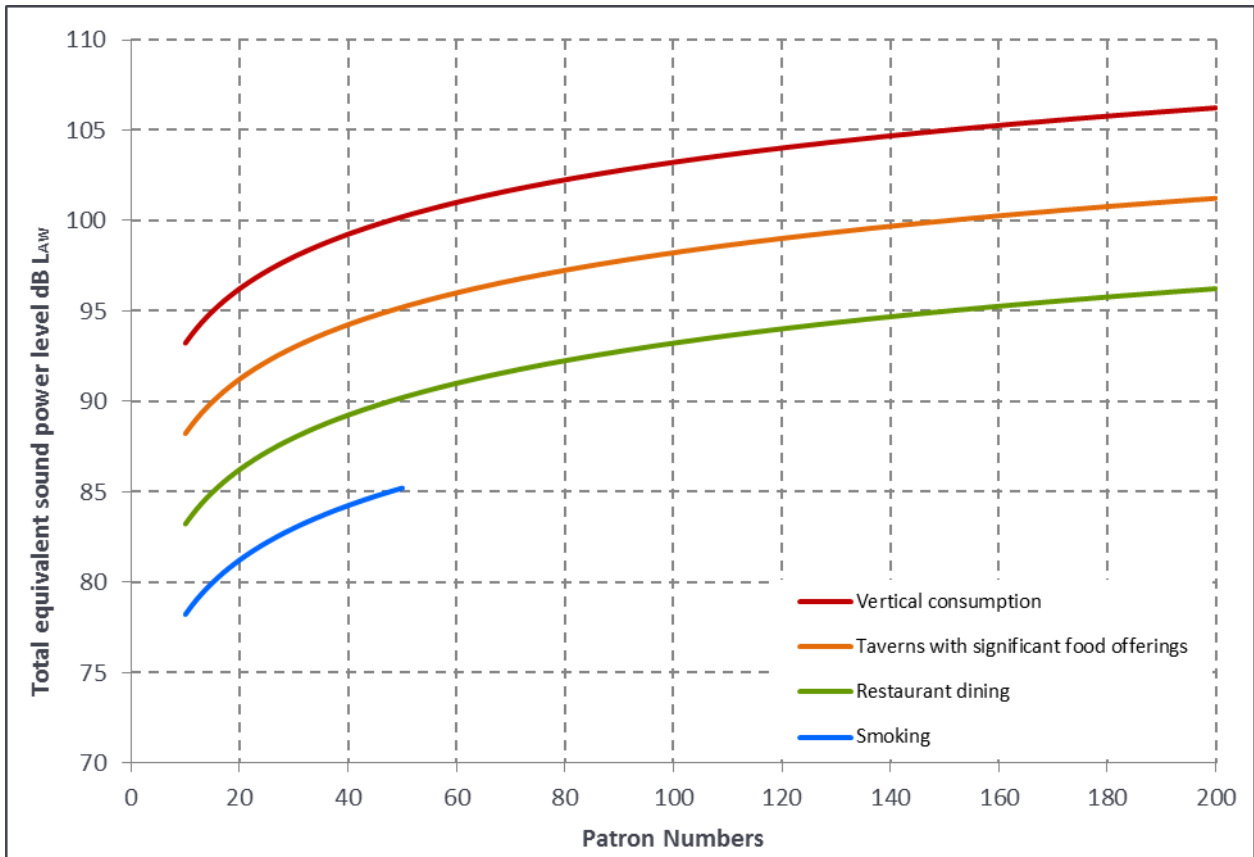


Table 17 provides the octave band spectral correction applied to the calculated patron sound power.

Table 17: Octave band spectral correction

Source	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Spectral Correction	-12	-10	-9	-2	-4	-8	-15

**ADVERTISED
PLAN**

This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright