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BAPS HINDU MAHĀ-MANDIR, MELBOURNE
ENVIRONMENTAL NOISE ASSESSMENT

Rp 003 R04 20240727 | 22 April 2026

Project: **BAPS HINDU MAHĀ-MANDIR, MELBOURNE**

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Report No.: **Rp 003 R04 20240727**

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SUMMARY

This report presents the environmental noise assessment for the planning submission of the BAPS Hindu Mahā-Mandir place of worship facility at 1390-1450 Western Port Highway, Cranbourne South (the subject site).

The project will introduce a variety of noise sources to the area including music, patrons, carparking and mechanical services.

Noise modelling has been undertaken to predict noise from the various sources. The assessment of predicted noise levels has been undertaken with reference to limits and targets that take into account the existing noise environment at the site, which is dominated by road traffic noise on the Western Port Highway.

Limits have been adopted to assess noise sources where direct legislation is applicable. These sources include non-religious music, noise from waste and deliveries, and mechanical services equipment.

Targets and benchmarks have been adopted for noise sources that are not specifically covered by legislation. These sources include music associated with religious observance and patrons.

For most noise sources, predicted noise is lower than relevant limits and targets, provided that the controls described in the report and summarised below are incorporated. Some predicted noise levels are higher than guideline targets, however additional contextual information is provided in this report.

Noise calculations have given consideration to the hourly estimated patron numbers as opposed to the total number of patrons per day on the assumption that they would not all be on site simultaneously.

Summary of noise mitigation measures

Noise source	Requirement	Recommendation
All	-	A noise management plan should be prepared and maintained regarding all potential noise sources. Permit condition suggested in Section 7.1.
All	-	Post-construction noise measurements should be carried out to verify the noise levels from the various sources across the site.
Outdoor background music	Amplification system to be designed to achieve the noise benchmark provided in Section 6.2.2.	The design may include numerous distributed loudspeakers operating at low volume, noise limiters and highly-directional speakers.
Outdoor amplified music (Arti ritual)	Amplification system to be designed to achieve the noise benchmark provided in Section 6.2.2. Loudspeakers must be directed south (away from Homewood Road).	The design may include numerous distributed loudspeakers operating at low volume and noise limiters. Permit condition suggested in Section 7.1.
Indoor music	Appropriately designed building envelope during detailed design stage.	Locate music rooms centrally within building. Design to enable closed windows and doors during use (i.e. provision of mechanical ventilation systems which allow provision of fresh air if doors and windows are closed).

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Noise source	Requirement	Recommendation
Carparking	-	Noise barriers to subject site perimeter as shown in Section 7.3.2 and setbacks to closest dwellings.
Patrons in external gathering areas and carparks	Noise barriers to subject site perimeter as shown in Section 7.3.2.	Behaviour monitoring and management, signage.
Mechanical services	Must be appropriately reviewed and designed in accordance with the general environmental duty and the noise limits provided in Section 6.1 during detailed design stage.	Specific recommendations would be prepared during detailed design.
Waste collection	Only to occur during the day period.	-
Deliveries	Only to occur during the day period.	-

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1.0 INTRODUCTION

BAPS Swaminarayan Sanstha, Australia Ltd (BAPS) is proposing to construct a new place of worship facility known as BAPS Hindu Mahā-Mandir, Melbourne, at 1390-1450 Western Port Highway, Cranbourne South (the subject site).

The proposal includes a religious complex, featuring a central traditional stone temple known as a Maha-Mandiram (Grand Temple) and a variety of worship and ancillary service facilities.

BAPS has engaged Marshall Day Acoustics Pty Ltd (MDA) to prepare this acoustic report to accompany the town planning submission.

This report describes the anticipated noise sources at the site, the relevant policies and guidelines used to assess these noise sources, and the noise mitigation measures that are recommended to be adopted.

This report addresses the proposed normal operating conditions of the facility and does not address any potential special events.

The architectural drawings dated 15 April 2026, prepared by Peddle Thorpe has been reviewed for this assessment.

A summary of acoustic terminology used in this report is provided as Appendix A.

2.0 SITE DESCRIPTION

2.1 Location

The subject site is located at 1390-1450 Western Port Highway, Cranbourne South. At the time of writing, a vacant equestrian facility and several residential dwellings are located on the subject site land.

The subject site is surrounding by low density and rural residential uses on all sides.

Western Port Highway runs along the west boundary of the subject site and Homewood Road runs along the north boundary.

The border of the Melbourne Urban Growth Boundary (UGB) runs along the western perimeter of the site (i.e. the site is located outside the Melbourne UGB).

Aerial imagery of the subject site is provided as Figure 1.

2.2 Zoning

The site, and land to the north, east and south is zoned GWZ2 (Green Wedge Zone Schedule 2).

Beyond Western Port Highway (TRZ2 Transport Road Zone 2), the zoning is characterised as LDRZ (Low Density Residential Zone) and RCZ1 (Rural Conservation Zone).

A planning map is provided in Figure 2.

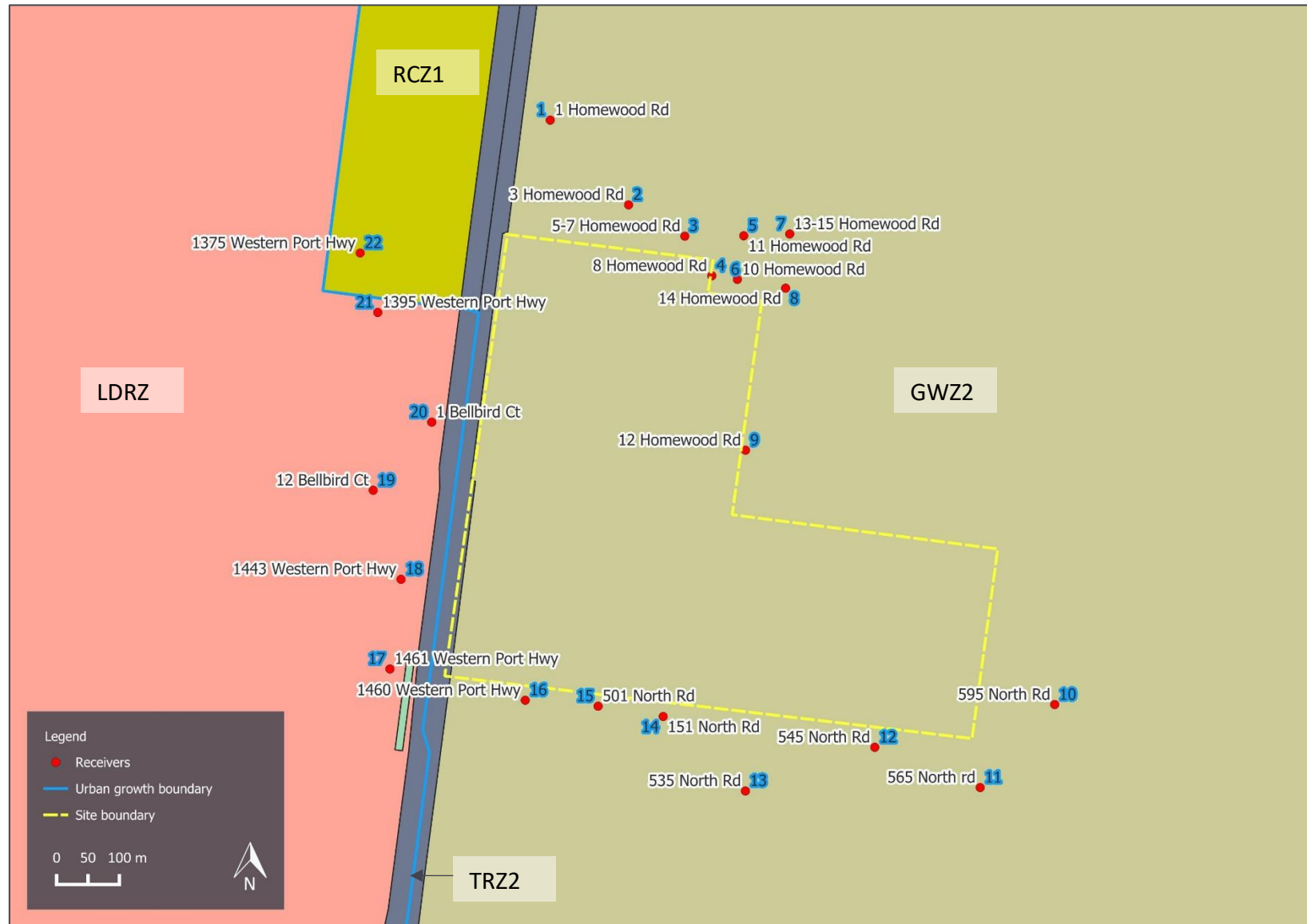
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Figure 1: Aerial image of subject site and surrounds (background image: Metromap)



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Figure 2: Subject site zoning and nearby receivers



2.3 Assessment receivers

The nearest residential properties surrounding the site have been identified as the most affected receivers of noise from the subject site.

Further information regarding the formal classification of receivers and 'noise sensitive areas' is provided in Appendix B.

The assessment receivers are listed in Table 1 and shown in Figure 3.

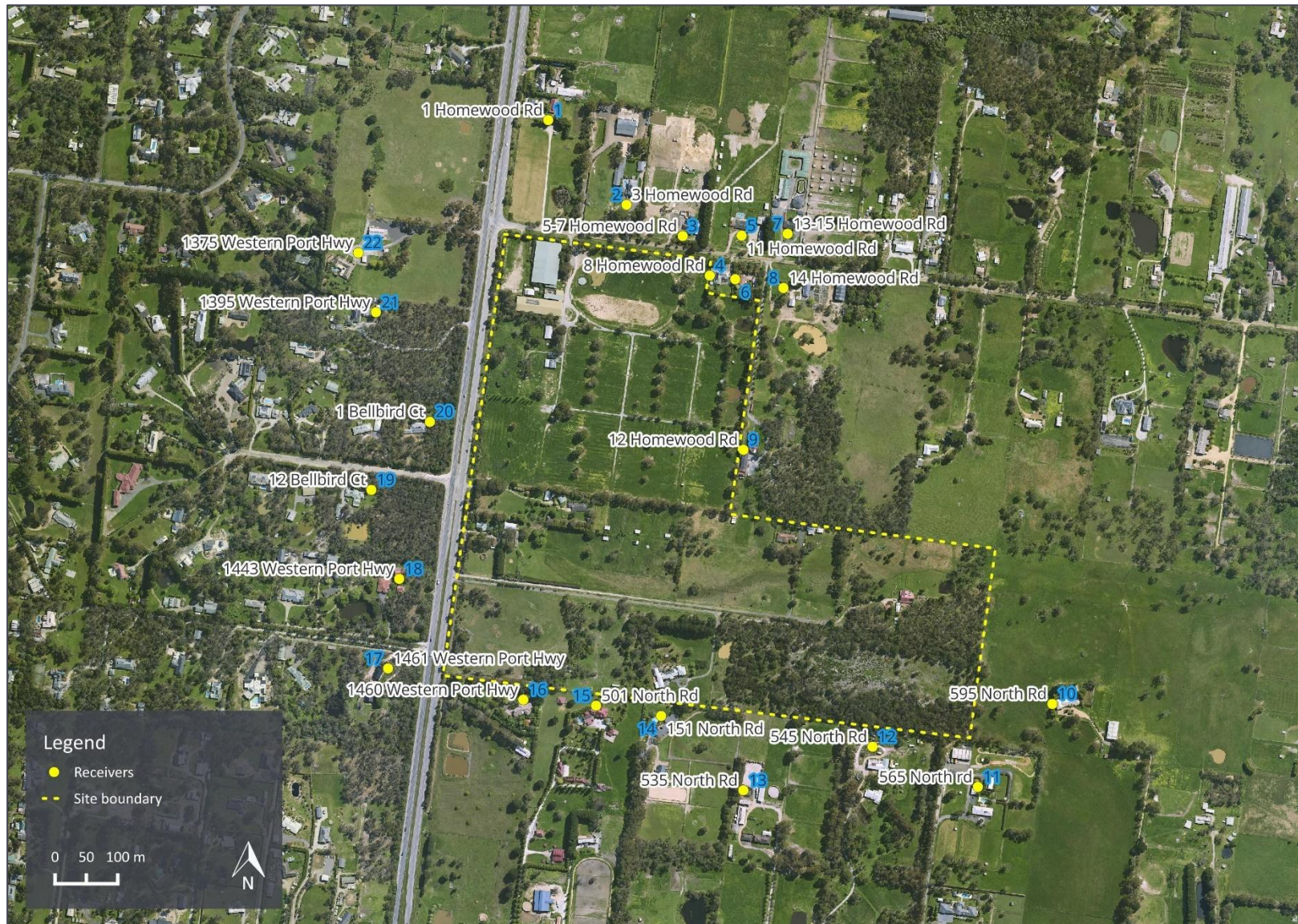
Table 1: Assessment receivers

Receiver Number	Address	Orientation from site
1	1 Homewood Rd	North
2	3 Homewood Rd	North
3	5-7 Homewood Rd	North
4	8 Homewood Rd	Northeast
5	11 Homewood Rd	Northeast
6	10 Homewood Rd	Northeast
7	13-15 Homewood Rd	Northeast
8	14 Homewood Rd	Northeast
9	12 Homewood Rd	East
10	595 North Rd	East
11	565 North Rd	South
12	545 North Rd	South
13	535 North Rd	South
14	151 North Rd	South
15	501 North Rd	South
16	1460 Western Port Hwy	South
17	1461 Western Port Hwy	West
18	1443 Western Port Hwy	West
19	12 Bellbird Ct	West
20	1 Bellbird Ct	West
21	1395 Western Port Hwy	West
22	1375 Western Port Hwy	West

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Figure 3: Receivers (background image: Metromap)



3.0 PROPOSAL DESCRIPTION

3.1 Facilities

The proposed site layout features a traditional stone Hindu Maha-Mandiram (Grand Temple) approximately in the centre of the site.

The proposed supporting worship and ancillary facilities are summarised in Table 2.

Table 2: Worship and ancillary service facilities

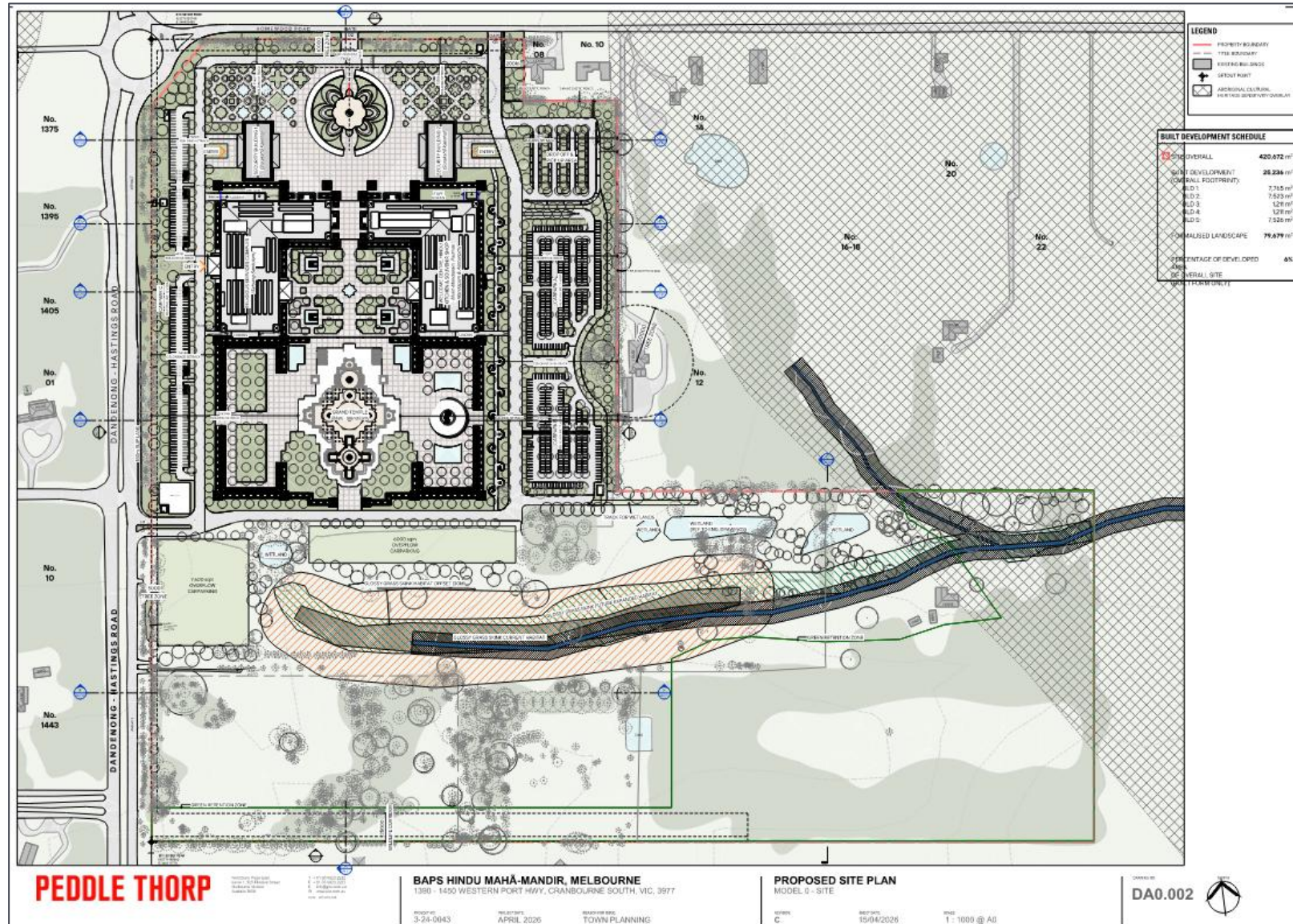
Indoor	Outdoor
Religious services complex	Car and bus parking
Welcome centre, hindu kitchen, souvenir shop	Gardens and landscaping, water features
Security buildings	Outdoor dining
Accommodation (for Religious Attendants and Hindu monks)	Mechanical services (heating, cooling, ventilation)
Cultural and learning facilities	-

The proposed site layout is shown in Figure 4.

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Figure 4: Proposed site layout



3.2 Patron numbers

3.2.1 Normal operations

Estimated patron numbers are shown in Table 3 below. Noise calculations have given consideration to the hourly estimated patron numbers as opposed to the total number of patrons per day on the assumption that they would not all be on site simultaneously.

Table 3: Estimated patron numbers on site

Description	Maximum patrons on site	Number of days per calendar year
Top tier	3,600	9
Middle tier	2,400	8
Typical weekend	1,650	
Typical weekday	1,200	

It is estimated that visitors would spend on average 2.5-3 hours on site.

The visitors would be distributed throughout the site, including internal areas, as well as through the gardens and outdoor areas.

3.3 Operating hours

The proposed operating hours are 0700 – 2000 hrs daily.

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4.0 LEGISLATION AND GUIDELINES

A variety of legislation and guidelines apply to different noise sources in Victoria.

4.1 Victorian legislation

Operational noise from commercial, industrial and trade (CIT) premises in Victoria is assessed with regard to the *Environment Protection Act 2017* (EP Act).

While the proposal is primarily a religious facility, much of the operation of the subject site is relevant to the requirements for CIT premises. These requirements are defined by several Victorian government documents, comprising:

- the Environment Protection Act 2017 (EP Act)
- the Environment Protection Regulations 2021 (EP Regulations)
- the Environment Reference Standard published 25 May 2021, and as amended by Environment Reference Standard No. S158 Gazette 29 March 2022 (ERS)
- EPA Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues, published May 2021* (Noise Protocol)

The EP Act provides the overarching legislated protection of the environment in Victoria and establishes mandatory requirements for the control of environmental noise.

Under the EP Act, operators of commercial, industrial or trade premises (industry premises) must:

- fulfil a general environmental duty (GED) to implement all reasonably practicable measures to minimise the risk of harm from noise, and
- not emit unreasonable noise.

Section 4 of the EP Act provides the following definition of harm.

In this Act, harm, in relation to human health or the environment, means an adverse effect on human health or the environment (of whatever degree or duration) and includes—

an adverse effect on the amenity of a place or premises that unreasonably interferes with or is likely to unreasonably interfere with enjoyment of the place or premises;

a change to the condition of the environment so as to make it offensive to the senses of human beings; or

anything prescribed to be harm for the purposes of this Act or the regulations.

The risk of harm that must be minimised under the EP Act therefore includes both health and amenity related impacts.

According to the EP Act, environmental noise is unreasonable if it is:

- prescribed to be unreasonable from an assessment against mandatory noise limits, or
- assessed to be unreasonable noise according to factors defined in the EP Act considering its:
 - noise volume, intensity or duration
 - noise character
 - the time, place and other circumstances in which the noise is emitted;
 - how often the noise is emitted
 - any prescribed factors relating to the noise (frequency spectrum being a prescribed factor).

An assessment of compliance with the EP Act must therefore demonstrate that:

- all reasonably practicable measures would be implemented to reduce the risk of harm from noise
- the project could achieve noise levels below the thresholds prescribed to be unreasonable
- the project would not result in unreasonable noise according to the listed factors of the EP Act.

A summary of the other key documents is presented in Table 4.

Table 4: Summary of policy documents

Policy document	Summary
<i>Environment Protection Regulations 2021</i> (EP Regulations)	The objectives of the EP Regulations are to further the purposes of, and give effect to, the EP 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 EP Regulations sets out requirements that are specific to environmental noise. Noise from industry is prescribed by the EP Regulations to be unreasonable for the purposes of the EP Act if it exceeds the noise limit determined in accordance with the Noise Protocol.
EPA Publication 1826.4 <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.
<i>Environment Reference Standard (ERS)</i>	The ERS was introduced under the EP Act and sets out environmental and human health outcomes that are sought to be achieved and maintained in Victoria. The outcomes are described by the ERS in terms of a collection of environmental values, indicators and objectives. The ERS is not a compliance standard. The primary function of the ERS is to provide an environmental assessment reporting benchmark which can be used as a reference point for decision makers to consider whether a proposal or activity is consistent with the environmental values identified in the ERS.
EPA Publication 1834.1 <i>Civil construction, building and demolition guide</i> published September 2023 (EPA Publication 1834.1)	EPA Publication 1834.1 describes measures for managing noise and vibration from construction and decommissioning of a project.

To support the application and use of the above legislation and guidance, a range of Victorian EPA publications provide additional advice on matters of interpretation and technical assessment requirements. These publications include:

- EPA Publication 1992 Guide to the Environment Reference Standard, dated June 2021
- EPA Publication 1997 Technical guide: Measuring and analysing industry noise and music noise, dated June 2021.

The EPA also provides online guidelines relating to noise, including:

- commerce, industry and trade noise guidelines¹
- noise advice for businesses²
- unreasonable noise guidelines³

Broader relevant industry guidance is also provided in:

- EPA Publication 1695.1 Assessing and controlling risk for business, dated 1 March 2019 (EPA Publication 1695.1)
- EPA Publication 1856 *Reasonably practicable*, dated September 2020 (EPA Publication 1856).

4.2 City of Casey planning scheme

4.2.1 Clause 13.05

The *Casey planning scheme clause 13.05 'Noise'* includes general requirements to 'minimise the impact on human health from noise exposure'. It lists 'building siting and design (including orientation and internal layout), urban design and land use separation techniques' as noise mitigation measures but does not prescribe objective requirements.

Broadly, the intent of the clause aligns with the legislated general environmental duty described in Section 4.1.

The policy documents summarised in Section 4.1 are stated to be considered 'as relevant' to the clause.

Additional documents listed in the clause relate to noise from rail infrastructure and are not relevant to this assessment.

Overall, the clause does not impose any mandatory or specific requirements additional to those outlined by state legislation.

4.3 General standards and guidelines

The legislation set out in Section 4.1 addresses a wide range of noise sources and considerations.

In situations where objective noise assessments are required for sources that are not directly addressed by the legislation, an effect and risk-based assessment is often carried out by referring to supplementary guidelines sourced from a range of sources such as interstate publications and established assessment precedents.

For example, there is an absence of any Victorian guidance regarding noise-induced sleep disturbance.

Supplementary guidance relevant to the assessment of the proposal are provided in Table 5.

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¹ <https://www.epa.vic.gov.au/for-business/find-a-topic/noise-guidance-for-businesses/commerce-industry-and-trade-noise-guidelines>

² <https://www.epa.vic.gov.au/for-business/find-a-topic/noise/advice-for-businesses>

³ <https://www.epa.vic.gov.au/for-business/find-a-topic/noise-guidance-for-businesses/unreasonable-noise-guidelines>

Table 5: General standards and guidelines

Noise consideration	Reference	Overview
Patron noise	MDA Patron noise guideline	Contains sound level data to be used in predictive assessments and establishes design targets for noise from patrons in licensed premises.
Environmental noise	EPA Publication 1254.2 Noise Control Guidelines	Contains relevant guidelines for a range of noise sources not covered by other policy or legislation documents. Relevant sections for this assessment include guidance on deliveries and industrial waste collection.

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5.0 EXISTING NOISE ENVIRONMENT

5.1 Noise survey description

The assessment criteria applicable to the subject site includes noise limits and design targets that are defined based on background noise levels in the absence of noise associated with the operation of the venue.

Existing noise levels at the site were measured with 2 noise loggers that were deployed at the site for a period approximately 11 days from 8 to 18 October 2024.

One Rion NL-32 (S/N 00630453) type 1 sound level meter and one Rion NL-31 (S/N 00503818) type 1 sound level meter were used. They were deployed in the locations shown in Figure 5 in order to measure the variation in background noise levels.

Noise logger microphones were mounted on poles at approximately 1.5 m above local ground level, fitted with a windshield and calibration checked before and after logging with no significant drift observed.

During deployment, road traffic noise dominated the noise environment at both locations, however noise from birds and wind in trees was also intermittently audible.

Figure 5: Noise logger locations



The measured noise levels at each logger location are summarised in Appendix C.

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5.2 Subjective impression of existing noise environment

Subjective observations of the existing noise environment at the subject site were taken when deploying noise loggers at the site.

Typically, the noise environment in the area is dominated by noise from road traffic on Western Port Highway. This is most pronounced along the western boundary of the subject site and reduces with increased distance to the east.

Other than intermittent traffic noise on the surrounding smaller roads, there are limited sources of consistent noise other than natural sources such as insects, birds and wind in trees.

A summary of the measured noise levels is provided in Appendix C.

6.0 PROJECT NOISE LIMITS AND DESIGN TARGETS

This section summarises the noise limits and targets for the project.

The limits and targets are used as objective tools to conduct an assessment of potential amenity impacts. They do not represent definite levels under which no amenity impact will occur.

6.1 Commercial, industrial and trade premises (operational noise)

Operational noise other than music will be subject to the mandatory noise limits that apply to noise from commercial, industrial and trade (CIT) premises that are outlined by Part 1 of the Noise Protocol.

The Noise Protocol also outlines the steps that must be followed to undertake an assessment (measurement or prediction) of the effective noise level (ENL) at given receiver or at an alternative assessment location. A comparison between the ENL and the relevant noise limit or the relevant alternative assessment criterion will determine whether the noise that is emitted from the premises is unreasonable under the EP Regulations.

The noise limits for CIT premises are determined on the basis of land zoning and background noise levels, and are separately designated for day, evening, and night periods.

The Noise Protocol provides different methodologies for setting noise limits depending on whether the receivers are within a 'rural' or 'urban' area. The definition of rural/urban for receivers at the outskirts of Melbourne is based on the Melbourne Urban Growth Boundary as defined by the Victorian State Government.

6.1.1 Rural receivers (outside the urban growth boundary)

Receivers east of Western Port Highway (R1-R16) and 1375 Western Port Highway (R22) are outside the urban growth boundary and therefore the Noise Protocol rural method applies.

The limits are calculated based on the methodology outlined in the Noise Protocol, with reference to land-use zoning.

Based on the prescribed method outlined in the Noise Protocol, 4 separate noise limit calculations are required:

- One set of limits applies to 1375 Western Port Hwy (R22) as it is the only receiver not located in the same contiguous zone as the Site.
- One set of limits applies to 1 Homewood Road (R1) as it is significantly closer to Western Port Hwy than the other receivers and therefore is subject to the highest ambient background noise.
- One set of limits applies to receivers R2-R9 and R13-R16. The ambient background noise recorded at Logger 2 has conservatively been adopted for all of these receivers, notwithstanding the fact that receivers closer to the Highway are exposed to higher noise levels in practice.

- One set of limits applies to receivers R10-R12. These receivers are significantly further from Western Port Freeway than the background noise measurements, and the measured background noise level is not likely to be representative. As such, background noise was not considered for these receivers. It is noted that consideration of background noise can only increase noise limits (less stringent limits) and cannot result in lower limits (more stringent limits) for rural area receivers.

The limits for the rural receivers are summarised in Table 6. More detailed information regarding limit derivation is provided in Appendix B3. Information regarding the existing noise environment is provided in Section 5.0 and Appendix C.

Table 6: Summary of rural noise limits, dB ENL

Period	Day	Start time	End time	R1	R22	R2-R9, R13-R16	R10-R12
Day	Monday-Saturday	0700 hrs	1800 hrs	61	47	47	46
Evening	Monday-Saturday	1800 hrs	2030 hrs	52	42	42	41
	Sunday, Public holidays	0700 hrs	2030 hrs				
Night	Monday-Sunday	0600 hrs	0700 hrs	41	36	36	36

6.1.2 Urban receivers

Receivers R17-R21 are located within the Urban Growth Boundary and noise limits are therefore calculated using the Noise Protocol urban method.

The limits are calculated based on the method outlined in the Noise Protocol, with reference to the background noise at the receiver during the operating periods and the zone types of the land uses nearby to the receivers.

The limits for the urban receivers are summarised in Table 7. More detailed information regarding limit derivation is provided in Appendix B3. Information regarding the existing noise environment is provided in Section 5.0 and Appendix C.

Two sets of noise limit calculations have been carried out to account for varying distances of receivers from Western Port Hwy.

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Table 7: Summary of urban noise limits, dB ENL

Period	Day	Start time	End time	1 Bellbird Ct/1443 Western Port Hwy (R17/R18/R20))	1395 Western Port Hwy/12 Bellbird (R19/R21)
Day	Monday-Saturday	0700 hrs	1800 hrs	59	51
Evening	Monday-Saturday	1800 hrs	2030 hrs	50	45
	Sunday, Public holidays	0700 hrs	2030 hrs		
Night	Monday-Sunday	0600 hrs	0700 hrs	43	40

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6.2 Music

6.2.1 Types of music noise proposed

A summary of the music proposed to occur at the subject site is provided in Table 8.

Table 8: Types of music associated with subject site

Description	Religious observance?	Location	Duration	Times/occurrence
Amplified pre-recorded ceremonial music - "Arti ritual"	Yes	Outdoors	5 minutes	1900 hrs each day
Unamplified ad-hoc hymns and/or chanting	Yes	Indoors	Unrestricted	Any time during operating hours
Music associated with religious music tuition	No	Indoors	Unrestricted	Any time during operating hours
Background music in landscaped areas	No	Outdoors	Unrestricted	Any time during operating hours

The following types of external noise are not proposed:

- Collective outdoor singing or chanting
- Temple bells
- Live amplified music entertainment
- Any music or amplified sound during the night

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6.2.2 Project music noise benchmark

Depending on the nature of the music and the site at which it is occurring, Victorian policy provides different procedures for setting noise limits.

In particular, Regulation 124 of the EP Regulations states that, "in the case of a place of worship, the performance or playing of music that is *not* related to recognised religious observance" must be taken into account when assessing whether the music noise is prescribed to be unreasonable in accordance with the regulations.

Music noise is deemed to be unreasonable in accordance with Regulation 125 if the noise exceeds the relevant music noise limit for indoor entertainment venues determined in accordance with the Noise Protocol.

Much of the music at the subject site will occur indoors within the religious services complex during services. Outdoor music will be very limited to specific times only (e.g. during the Arti Ritual once a day) or otherwise restricted to background levels.

The EP Regulations provide provisions for "outdoor entertainment venues" (EP Regulations 128-131) which require a separate, specific permit to be sought whenever more than 6 'concerts' in a financial year are proposed. As concerts are not part of this proposal, the site is not considered to be an outdoor entertainment venue. Further, the noise criteria applicable to outdoor entertainment venues is less stringent than that which applies to external areas of indoor entertainment venues.

In recognition of this, the more stringent indoor noise limits have been adopted as the music noise criteria in this assessment. This provides a conservative basis for assessing all music from the venue, regardless of whether it occurs indoors or outdoors, and provides the most protective criteria across all areas of the site.

While the noise limits are not strictly mandatory for sources associated with religious observation, they may still be used as a benchmark to enable an objective assessment.

The methodology for determining the music noise limit is based on the existing background noise at receivers at the time of the music.

Music noise limits for sources that may occur at any time are derived according to the lowest measured background noise level during the proposed operating hours. Music sources that occur at specific times are derived according to the measured background noise level at that time.

Further information regarding the derivation of noise limits is provided in Appendix B and a summary of the measured background noise levels is provided in Appendix C.

The limits have conservatively been based on the measured background noise levels from the logger location 2 which is furthest away from Western Port Highway.

Table 9: Music noise benchmark, dB L_{Aeq} 15 minutes

Noise source	Time	Lowest measured background level ^[1] , L _{A90}	Limit basis	Music noise benchmark
All music	Any time during operating hours	36	L _{A90} + 5 dB	41

1 Lowest hourly background noise level during the proposed operating hours. Refer Appendix C.

Music noise at the benchmark level may be audible at times at receivers. However, the noise level is not anticipated to be intrusive.

6.3 Patron and carpark noise

Noise from patron and carparking activity is not specifically covered by any Victorian policy document.

To inform an assessment of potential noise from patrons, MDA has developed an in-house patron noise guideline to inform reference noise levels for the assessment of external patron areas of licensed venues.

The recommended patron noise design targets are described and presented in Table 10.

With consideration to the scale of the project, and the fact that the site is located within a rural area, The semi-steady noise level design target has been derived based on the lower of the background noise level + 10 dB and the fixed value of 50 dB L_{Aeq}. Typically, the higher of the two values is used. The approach for this project is therefore conservative.

Further information is provided in Appendix B4.

The project design target for patron noise are presented in Table 10.

Table 10: Recommended design targets for patron noise

Description	Design target	Derivation	Purpose
Semi-steady noise levels	46 dB L _{Aeq}	Lowest of either 50 dB L _{Aeq} or the lowest measured hourly background noise level ^[1] + 10 dB	Amenity protection

1 Lowest measured hourly background noise level during the proposed operating hours. Refer Appendix C.

Carparking noise, and short instances of high noise levels due to patrons raising voices are typically assessed against sleep disturbance criteria during the night period only. Since night period operation is not proposed as part of normal operations, these items have not been objectively assessed using

benchmarks and noise modelling. Nonetheless, the measures outlined in Section 7.0 would be implemented to mitigate potential impacts from these noise sources.

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6.4 Environment reference standard

Section 60(1A) of the Planning and Environment Act 1987 states:

Before deciding on an application, the responsible authority, if the circumstances appear to so require, may consider—

...

(f) any relevant environment reference standard within the meaning of the Environment Protection Act 2017;

The responsible authority must determine whether the circumstances of the application would require the ERS to be considered. Where they do, relevant environmental values, indicators and objectives should be considered.

The ERS indicators and objectives for noise that are relevant to the subject site based on the zoning are presented in Table 11.

Table 11: ERS project indicator and objective

Land use category (Receivers)	Environmental indicator	Environmental objective
Category IV (GWZ, LDRZ, RCZ)	Outdoor L_{Aeq} from 6 am to 10 pm	40 dBA

The ERS objectives are not limits. Also, the ERS does not apply to noise sources that are directly regulated (i.e. those that are assessed under the Noise Protocol). It may therefore apply to the following sources:

- Patron noise
- Noise from carparking
- Music associated with religious observance

Table 3.1 of EPA Publication 1992⁴ provides the following key points regarding the principles of application of the ERS in regulatory decisions:

Indicators and objectives within the ERS are generally not relevant considerations where they relate to an aspect of the environment that is the subject of prescriptive regulation. For example, the ambient sound indicators and objectives will not be relevant when considering noise in relation to CIT premises, nor entertainment venues when impacting on noise sensitive areas, as defined in the EP Regulations. This is because noise in these circumstances is regulated by specific provisions and noise limits in the EP Regulations and the associated Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venue (publication 1826).

Assessments should be proportionate to the scale of the proposal and the magnitude of potential harms.

EPA Publication 1992 also notes that when a decision-maker considers the ERS for a development proposal, the decision-maker would examine whether:

- the proposal would change the sound of the ambient environment
- sounds emitted from a proposal would adversely affect or pose a risk to the environmental values.

⁴ EPA Publication 1992 *Guide to the Environment Reference Standard*

We do not foresee a need for the responsible authority to further review the proposed development in the context of the environmental values, indicators and objectives for sound set by the ERS on the basis of the following points:

- The ERS objective is specified in terms of a 16-hour equivalent noise level, which is unlikely to represent impacts associated with patron noise, carparking or religious music, which feature shorter-term noise events. These noise events are more readily assessed by the respective methods described in Section 6.2, Section 6.3.
- As evidenced by the data presented in Appendix C, the existing noise level environment is typically characterised by hourly noise levels during the day and evening period ranging from 38-56 dB L_{Aeq} at Logger 2, typically exceeding the ERS objective of 40 dB L_{Aeq} (as an average across the day and evening). This is due to the proximity of the site to Western Port Highway.

For these reasons, the ERS objective has not been adopted as an appropriate tool to assess amenity impacts for noise sources from the subject site in this report.

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7.0 REASONABLY PRACTICABLE NOISE CONTROLS

In accordance with the general environmental duty made under the EP Act, this section summarises noise mitigation measures that should be considered and implemented where reasonably practicable.

7.1 Recommended planning permit conditions

The following planning permit conditions are provided for consideration:

- Before operations commence, a noise management plan should be prepared. It should outline all of the major noise sources within the development and list reasonably practicable ways to mitigate the risk of harm from noise. It should also outline complaints handling procedures regarding noise.
- Background music and music played during the Arti ritual must comply with the music noise limits set out in EPA Publication 1826.5 *Noise limit and assessment protocol for the control of noise from commercial, industry and trade premises and entertainment venues*, notwithstanding the fact that music associated with recognised religious observance is excluded from formal assessment against noise limits in Victoria.
- Within 3 months of normal operations commencing, a noise survey must be conducted to confirm that background music and music played during the Arti ritual complies with the relevant music noise limits. If the music noise is found to exceed the noise limits, then mitigation measures should be proposed and implemented within 3 months of normal operations commencing. A report summarising the outcomes of the survey should be provided to the Responsible Authority and made public.
- Outdoor sound amplification between 19:00 and 07:00 is prohibited.

7.2 Site layout

The layout of the site balances multiple competing requirements for access and circulation, buildings and natural areas.

Wherever practicable, noise generating areas or activities and items should be located as far from noise sensitive receivers as possible.

7.3 Managerial controls

Patron noise

- Ensuring compliance with the maximum patron capacity conditions.
- Ensuring that any nearby resident or temporary accommodation provider is given the operator's phone number on request to report disturbance from patron noise.
- Providing adequate training to volunteers to ensure they are aware of the best practice operations for music and patrons.
- Installing signage requesting patrons respect the amenity of the neighbourhood and nearby residents.
- Ensuring there are sufficient volunteers present throughout the site to supervise patron behaviour.

Deliveries and waste collection

- Limiting waste collections and deliveries to the day period.
- Location of bins and bin emptying location as far as practicable on site from nearby residents and close to road to avoid unnecessary truck movements on site.

Car parking

- Signage to remind patrons that there are nearby residential areas and to minimise noise upon leaving the venue.
- Monitoring patron dispersal to ensure patrons do not loiter in the carpark.
- Busses to only park in the north-eastern designated bus parking area.

Noise management plan

A noise management plan should be prepared and maintained, including:

- Summary and protocols to review, update and enforce the above managerial controls.
- Community communication and consultation protocols.
- Staff training.
- Complaint handling procedures and record keeping.

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7.4 Physical controls

All recommended physical controls are shown on current plans and are designed to reduce noise from the site as far as reasonably practicable, and to address compliance with relevant criteria.

7.4.1 Carpark setbacks

To mitigate noise from use of the carpark, a minimum setback of 20 m has been incorporated between 8 Homewood Road and the site entry driveway, and a minimum setback of 50 m has been incorporated between 12 Homewood Road and the carpark.

7.4.2 Noise barriers

Noise barriers may be required to mitigate noise from the site to the receivers to the north and east as shown in Figure 6. The barriers will mitigate noise from amplified music and patrons at the northern part of the site, and use of the carpark. The extent and height of the noise barriers can be confirmed at detailed design phase.

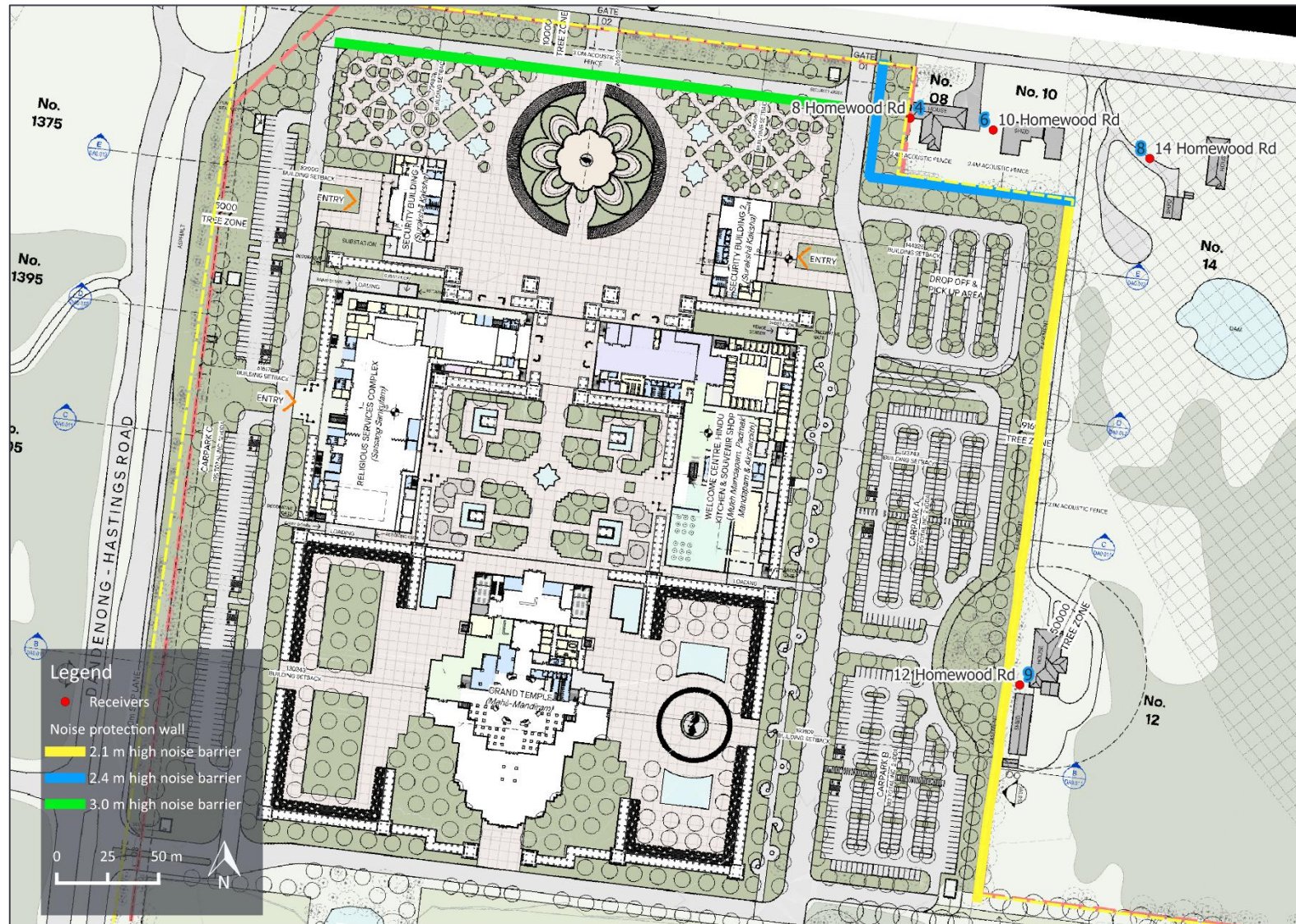
Materials for the noise barrier have not yet been confirmed. The barrier is required to be solid, achieving a minimum surface mass of 12 kg/m² and be free of holes or gaps. Suitable materials include:

- 6 mm thick glass
- 12 mm thick Perspex
- 25 mm thick timber
- Earthen bunding
- Masonry (e.g. brick or concrete)

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Figure 6: Noise barriers (subject to confirmation at detailed design phase)



7.4.3 Building envelope

On-site buildings shall be designed to mitigate noise breakout. It is anticipated that standard building construction techniques will be sufficient to control noise breakout from internal noise sources. The following should be considered throughout the detailed design process:

- Designing buildings such that windows and doors can be closed during noisy activities (including provision of mechanical means of ventilation to enable fresh air to be provided when doors and windows are closed).
- Locating the noisiest rooms in the centre of buildings if practicable.

The preliminary design demonstrates good placement of potentially noisy spaces in the centre of buildings with the music room and gymnasium located in the centre of the main building.

7.4.4 Loudspeaker installation and system design

Careful design of any sound amplification system will be required, including:

- Inclusion of noise limiter systems.
- Inclusion of appropriate controls to enable system fine-tuning.
- Consideration and design of reverberation treatment for internal spaces.
- Selection of loudspeakers with appropriate size, directivity and power specifications.

Amplification systems will require further detailed design and input from AV specialist consultants as the design of the project develops.

7.4.5 Mechanical plant design

At this early stage of project development, limited information is available regarding the mechanical services design.

Provided that the mechanical services design is reviewed and developed appropriately, it is anticipated that the design will be able to achieve the relevant noise limits. The following general acoustic controls will need to be considered and included if necessary and wherever practicable:

- Appropriate siting of plant (as far from receivers as practicable).
- Screening or enclosure of plant.
- Lining of external ductwork, or attenuators provided to external fans.
- Selection of low-noise equipment wherever possible, that is free from tonal or low-frequency character.

8.0 NOISE MODELLING METHOD

To predict noise levels to nearby receivers, the following factors have been considered:

- Noise emissions from sources within the subject site.
- The distance between the sources and noise sensitive receivers.
- The presence of items such as buildings, barriers etc that screen the noise path.

A 3-dimensional digital model of the site and surrounding built environment has been created using proprietary noise modelling software SoundPLANnoise version 9.1. The software enables the calculation of noise levels over a wide area, and accounts for key considerations including reflected noise, terrain conditions, and the height and location of sources.

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The model calculates noise levels at surrounding receivers in accordance with the standard ISO 9613-2:2024 *Acoustics - Attenuation of sound during propagation outdoors – Part 2: engineering method for the prediction of sound pressure levels outdoors* (ISO 9613-2). The ISO 9613-2 propagation model is a general-purpose noise propagation method that has become established as the primary international standard for calculation of industrial noise into the environment.

ISO 9613-2 is designed to account for favourable propagation conditions, which are described as a slight wind from source to receiver, or a moderate ground-based temperature inversion, such as commonly occurs on clear, calm nights.

A ground factor of 0.0 has been adopted to represent hard flat ground for the entire site, including carparks, and roads. This is likely to be somewhat conservative (over-estimating the enhanced sound propagation due to the ground).

A ground factor of 1.0 has been adopted for all receivers, representing soft ground in accordance with ISO 9613-2.

9.0 MUSIC NOISE ASSESSMENT

9.1 Description of types of music proposed

9.1.1 Outdoor background music

Outdoor background music is proposed for the main garden and landscaped areas.

To assess potential off-site impacts, MDA prepared a preliminary feasibility noise model to predict noise from 76 distributed loudspeakers within the landscaped garden area. The noise model is not intended to present a finalised design which will require input from an AV consultant.

The noise model was calibrated to achieve a background music noise level within much of the garden and landscaped areas of 55-60 dB L_{Aeq} . This music would be subjectively low level and not prominent in the sound environment but instead would add to the overall ambience within the gardens and landscaped areas.

Loudspeakers were modelled as simple omni-directional point sources at 1.5 m above local ground level.

The sound power level used for each loudspeaker in the noise model is presented in Table 12.

Table 12: Outdoor background music loudspeaker sound power level, dB $L_{W eq}$ re 10^{-12} W

Source	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1000	2000	4000	
Outdoor background music loudspeaker	75	75	75	70	70	70	70	77

Predicted noise levels at receivers from outdoor background music is provided in Section 9.2.

9.1.2 Outdoor music – “Arti ritual”

According to cultural tradition, a 5-minute musical “Arti ritual” is proposed to occur once daily at 1900 hrs.

This will feature a pre-recorded musical track and not live musical instruments so that the level of noise can be more accurately controlled.

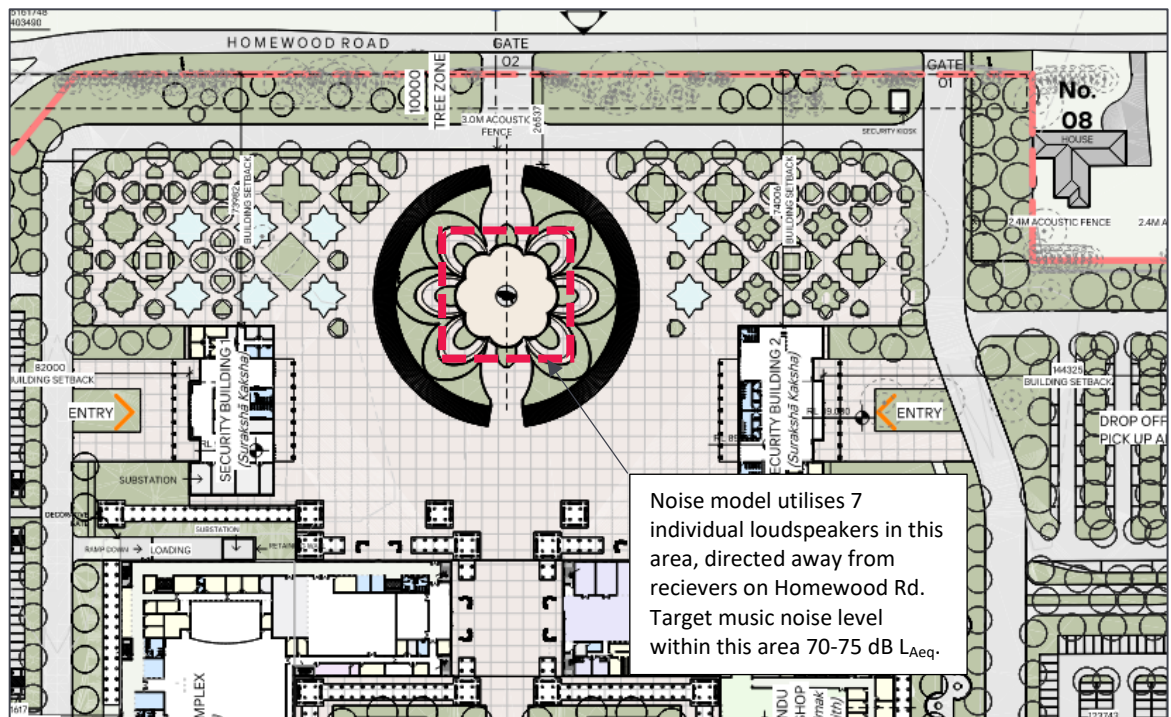
To assess potential off-site impacts, MDA prepared a noise model to predict noise from 7 loudspeakers located within the circular amphitheatre as shown in Figure 7. The loudspeakers were modelled with point source featuring a directivity pattern approximating a line array of speakers⁵ and oriented south and west (away from the nearest receivers to the north and east on Homewood Road).

The loudspeakers are nominally situated 1 m below the top of the raised amphitheatre walls to take advantage of additional acoustic shielding.

The noise model is not intended to present a finalised design which will require input from an AV consultant.

The noise model was calibrated to achieve a music noise level of approximately 70-75 dB L_{Aeq} within the area shown in Figure 7. Subjectively, this would be lower than typical amplified noise levels that would occur for a typical outdoor concert, but higher than typical background levels.

Figure 7: Location of Arti ritual amplified music



The sound power level used for each loudspeaker in the noise model is presented in Table 13.

Table 13: Outdoor background music loudspeaker sound power level, dB L_{w eq} re 10⁻¹² W

Source	Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1000	2000	4000	
Arti ritual loudspeaker	104	104	104	99	99	99	99	106

Predicted noise levels at receivers from outdoor background music is provided in Section 9.2.

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⁵ Selected directivity attenuation values at 180 degrees azimuth are -1 dB at 63 Hz, -10 dB at 500 Hz, -28 dB at 2kHz.

9.1.3 Indoor music – religious observation and music classes

Music within music rooms is anticipated to be higher level (louder). The placement of these rooms centrally within the main ancillary building (refer Section 7.4.3) and not at the perimeter of the building is anticipated to mitigate music noise such that no significant amount of breakout occurs.

Low-level traditional religious music consisting predominantly of traditional musical instruments will be played inside the congregation hall during the weekly congregation in the Religious Services Complex. This noise is expected to be sufficiently attenuated by the structure of the Religious Services Complex building and the distances to the surrounding receivers.

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9.2 Predicted music noise levels

The predicted levels for external music have been compared to the project benchmark in Table 14.

Music noise assessment includes all physical controls mentioned in Section 7.4.

Table 14: Predicted music noise levels, dB L_{Aeq} 15 minutes

Receiver number	Receiver	Predicted music noise levels			Benchmark	Below benchmark?
		Arti ritual ^[1]	Background music ^[2]	Combined		
1	1 Homewood Rd	36	27	37	41	Yes
2	3 Homewood Rd	37	31	38	41	Yes
3	5-7 Homewood Rd	38	33	39	41	Yes
4	8 Homewood Rd	38	32	39	41	Yes
5	11 Homewood Rd	35	29	36	41	Yes
6	10 Homewood Rd	34	29	35	41	Yes
7	13-15 Homewood Rd	33	26	34	41	Yes
8	14 Homewood Rd	34	28	35	41	Yes
9	12 Homewood Rd	38	32	39	41	Yes
10	595 North Rd	27	17	27	41	Yes
11	565 North Rd	27	19	28	41	Yes
12	545 North Rd	28	20	28	41	Yes
13	535 North Rd	28	21	29	41	Yes
14	151 North Rd	31	25	32	41	Yes
15	501 North Rd	32	29	34	41	Yes
16	1460 Western Port Hwy	32	28	33	41	Yes
17	1461 Western Port Hwy	31	27	32	41	Yes
18	1443 Western Port Hwy	32	29	34	41	Yes
19	12 Bellbird Ct	35	31	37	41	Yes
20	1 Bellbird Ct	39	36	40	41	Yes
21	1395 Western Port Hwy	39	31	39	41	Yes
22	1375 Western Port Hwy	38	28	38	41	Yes

- 1 Arti ritual predicted music noise level has been adjusted to reflect maximum 5 minutes music during the standard minimum 15-minute assessment period as defined by the Noise Protocol.
- 2 Background music is assumed to be constant throughout a minimum 15-minute assessment period as defined by the Noise Protocol.

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10.0 PATRON NOISE OBJECTIVE ASSESSMENT

10.1 Description of types of patron noise

Noise from patrons in external areas of the site has been assessed by estimating the maximum number of patrons within external areas during normal operations.

During typical weekends, the anticipated rush hour (11:00-15:00) visitor flow is 550 patrons/hour. Based on the anticipated stay of 2.5-3 hours, this results in a total of approximately 1650 patrons on site during rush hours.

The patrons will be distributed throughout the external and internal areas of the site.

To assess the level of patron noise at off-site noise sensitive areas, we have prepared a noise model with groups of patrons distributed across the external areas.

Reference has been made to the MDA in-house library of patron noise data, which includes distinct noise levels depending on the type of premises. For example, a premises with significant alcohol offerings typically has a higher noise level than a standard restaurant. Further information is provided in Appendix B4

Two input levels have been adopted for the project:

- Patrons dining in dedicated outdoor dining areas: Library data representative of 'restaurant dining' conditions has been adopted.
- Patrons moving through garden areas: The lowest library data for patrons has been adopted, which is referred to as 'smoking areas'. It is intended to align with smaller groups talking amongst themselves (less than 40 per group) that are expected when patrons are moving through the outdoor areas. A total number of 200 patrons, made up of smaller groups, has been assumed for each of the zones shown in Figure 8.

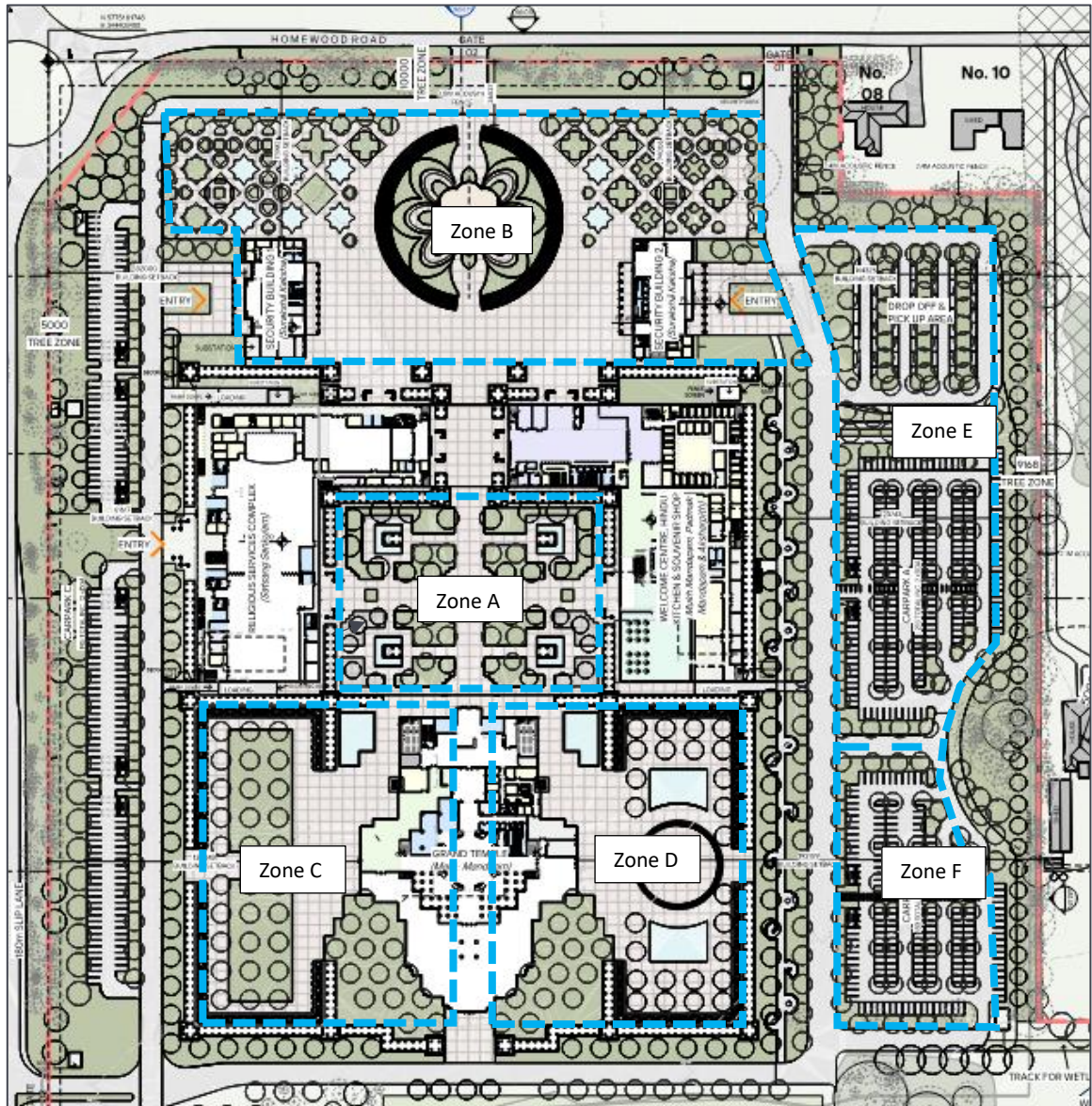
The sound power levels used for noise modelling are presented in Table 15. The levels consider the number of patrons.

Table 15: Patron sound power level range, dB L_w re 10⁻¹² W

Source	Zone	Octave Band Centre Frequency (Hz)							A
		63	125	250	500	1000	2000	4000	
200 patrons dining – outdoor, L _{eq}	A	82	84	85	92	90	86	79	94
200 patrons in garden/ carpark, L _{eq}	B - E	79	81	82	89	87	83	76	91

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Figure 8: Zones for patron noise calculations



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10.2 Predicted patron noise levels

The predicted semi-steady noise levels from patrons in all areas, based on numbers corresponding to a typical weekday, are presented in Table 16.

Patron noise assessment includes all physical controls mentioned in Section 7.4.

Table 16: Predicted semi-steady patron noise levels, dB L_{Aeq}

Receiver number	Receiver	Predicted noise level	Target	Below benchmark?
1	1 Homewood Rd	33	46	Yes
2	3 Homewood Rd	35	46	Yes
3	5-7 Homewood Rd	37	46	Yes
4	8 Homewood Rd	39	46	Yes
5	11 Homewood Rd	37	46	Yes
6	10 Homewood Rd	40	46	Yes
7	13-15 Homewood Rd	36	46	Yes
8	14 Homewood Rd	33	46	Yes
9	12 Homewood Rd	40	46	Yes
10	595 North Rd	27	46	Yes
11	565 North Rd	29	46	Yes
12	545 North Rd	30	46	Yes
13	535 North Rd	30	46	Yes
14	151 North Rd	33	46	Yes
15	501 North Rd	33	46	Yes
16	1460 Western Port Hwy	32	46	Yes
17	1461 Western Port Hwy	32	46	Yes
18	1443 Western Port Hwy	35	46	Yes
19	12 Bellbird Ct	34	46	Yes
20	1 Bellbird Ct	38	46	Yes
21	1395 Western Port Hwy	34	46	Yes
22	1375 Western Port Hwy	32	46	Yes

The benchmark is not a strict or mandatory limit. Nonetheless the predicted noise levels are lower than the patron noise benchmark with a margin of at least 6 dB.

For context, an increase in noise level of 6 dB would approximately represent a quadrupling of the number of patrons considered in the noise model.

Accordingly, the predicted margin to the noise limit for different number of patrons on site, assuming they are all located outdoors, is contained in Table 17.

Table 17: Estimated patron numbers on site

Description	Maximum patrons on site	Number of days per calendar year	Margin to noise limit
Top tier	3,600	9	1 dB
Middle tier	2,400	8	2 dB
Typical weekend	1,650		4 dB
Typical weekday	1,200		6 dB

Patron controls listed at Section 7.3 will be particularly important to maintain when top-tier patron numbers are present on site.

Further information regarding patron noise assessment is provided in Appendix B4.

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11.0 WASTE COLLECTION AND DELIVERY NOISE OBJECTIVE ASSESSMENT

11.1 Description of waste collection and delivery noise

In order to predict noise from waste collection and deliveries, the following assumptions have been used:

- Vehicles would use the perimeter service road.
- Waste collection and deliveries would occur within the dedicated loading bays within Building 2 and Building 5 via a private contractor as required. The loading bay at Building 5 has been used as the basis of the noise model as it is closest to a noise-sensitive dwelling.
- Driving speed is assumed to be 15 km/h.
- The delivery van is assumed to be a medium rigid vehicle (MRV) or smaller.
- One vehicle movement will occur in any 30-minute period. It is assumed that a waste collection could occur in the same 30-minute period as a delivery.
- Garbage collection is assumed to take place over 30 seconds for bin emptying.
- Unloading delivery vans would be via pallet jacks and by hand.
- Deliveries and waste collection would occur only during the day period as defined by the EP Regulations (0700-1800 hrs, Monday-Saturday) and not on Sundays.

Sound power data for waste collection and deliveries has been sourced from MDA's in-house database and is presented in Table 18.

Table 18: Waste collection and deliveries sound power levels, dB re 10⁻¹² W

Source	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1000	2000	4000	
Garbage collection	99	99	93	91	90	91	87	96
Garbage truck movement (per metre)	64	60	58	57	57	56	52	62
Delivery vehicle movement MRV (per metre)	61	59	57	57	57	54	50	61

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11.2 Predicted waste collection and delivery noise

Waste collection and delivery noise assessment includes all physical controls mentioned in Section 7.4.

Table 19: Predicted waste collection and delivery noise levels, dB ENL

Receiver number	Receiver	Predicted music noise levels			Limit	Complies
		Waste collection	Deliveries	Combined		
1	1 Homewood Rd	32	30	34	61	Yes
2	3 Homewood Rd	37	36	39	47	Yes
3	5-7 Homewood Rd	41	39	43	47	Yes
4	8 Homewood Rd	41	36	42	47	Yes
5	11 Homewood Rd	35	32	37	47	Yes
6	10 Homewood Rd	39	31	40	47	Yes
7	13-15 Homewood Rd	36	29	37	47	Yes
8	14 Homewood Rd	29	26	31	47	Yes
9	12 Homewood Rd	41	31	41	47	Yes
10	595 North Rd	26	19	27	46	Yes
11	565 North Rd	28	21	29	46	Yes
12	545 North Rd	28	21	29	46	Yes
13	535 North Rd	29	22	30	47	Yes
14	151 North Rd	31	25	32	47	Yes
15	501 North Rd	32	26	33	47	Yes
16	1460 Western Port Hwy	31	25	32	47	Yes
17	1461 Western Port Hwy	30	25	31	59	Yes
18	1443 Western Port Hwy	31	28	33	59	Yes
19	12 Bellbird Ct	30	28	32	51	Yes
20	1 Bellbird Ct	36	33	38	59	Yes
21	1395 Western Port Hwy	30	29	33	51	Yes
22	1375 Western Port Hwy	29	27	31	47	Yes

Predicted noise levels from waste collection and deliveries comply with the relevant noise limits at all receivers.

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APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	A set of frequency-dependent sound level adjustments that are used to better represent how humans hear sounds. Humans are less sensitive to low and very high frequency sounds. Sound levels using an “A” frequency weighting are expressed as dB L_A. Alternative ways of expressing A-weighted decibels are dBA or dB(A).
Background sound	The sound that is continuously present in a room or outdoor location. Often expressed as the A-weighted sound level exceeded for 90 % of a given time period i.e. L_{A90}.
dB	Decibel. The unit of sound level.
Frequency	Sound occurs over a range of frequencies, extending from the very low (e.g. thunder) to the very high (e.g. mosquito buzz). Measured in units of Hertz (Hz). Humans typically hear sounds between 20 Hz and 20 kHz. High frequency acuity naturally reduces with age most adults can hear up to 15 kHz.
Hertz (Hz)	The unit of frequency, named after Gustav Hertz (1887-1975). One hertz is one pressure cycle of sound per second. One thousand hertz – 1000 cycles per second – is a kilohertz (kHz).
L_{Aeq}	The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.
L_{eff}	The effective noise level from commercial, industrial or trade premises determined in accordance EPA Publication 1826.4 <i>Noise limit and assessment protocol for the control of noise from commercial, industry and trade premises and entertainment venues</i>. This is the L_{Aeq} noise level over a 30-minute period, adjusted for the character of the noise. Adjustments are made for tonality, intermittency and impulsiveness.
L_w	Sound Power Level. The calculated level of total sound power radiated by a sound source. Usually A-weighted i.e. L_{WA}.
Octave band	The interval between one frequency and its double. Sound is divided into octave bands for analysis. The typical octave band centre frequencies are 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz and 4 kHz.
R_w	Weighted Sound Reduction Index. A single number system for quantifying the transmission loss through a building element. The measured transmission loss, in third octave bands from 100 Hz to 3.15 kHz, is compared to a standard reference contour to determine the single number value. Can only be measured in laboratory conditions
Transmission loss (TL)	The reduction in sound level resulting from sound passing through a material or construction.

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APPENDIX B RELEVANT POLICY

B1 Environment Protection Act 2017

The *Environment Protection Act 2017* (EP Act) came into effect on 1 July 2021 and incorporates several subordinate documents relating to assessment of noise.

The EP Act also introduces a general environmental duty (GED), which requires anyone engaging in an activity posing a risk of harm to human health and/or the environment from pollution (including noise) and waste, to minimise those risks to prevent harm as far as reasonably practicable.

The legislative documents that prescribe noise limits are the *Environment Protection Regulations 2021* (EP Regulations) and EPA Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol).

The following key concepts and definitions are reproduced from the *Environment Protection Act 2017* (EP Act).

General environmental duty (Section 25(1)):

A person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.

Harm (EP Act Section 4(1)):

In this Act, harm, in relation to human health or the environment, means an adverse effect on human health or the environment (of whatever degree or duration) and includes—

- (a) an adverse effect on the amenity of a place or premises that unreasonably interferes with or is likely to unreasonably interfere with enjoyment of the place or premises; or*
- (b) a change to the condition of the environment so as to make it offensive to the senses of human beings; or*
- (c) anything prescribed to be harm for the purposes of this Act or the regulations*

Minimising harm (EP Act Section 6(1)):

A duty imposed on a person under this Act to minimise, so far as reasonably practicable, risks of harm to human health and the environment requires the person—

- (a) to eliminate risks of harm to human health and the environment so far as reasonably practicable; and*
- (b) if it is not reasonably practicable to eliminate risks of harm to human health and the environment, to reduce those risks so far as reasonably practicable.*

Prohibition of unreasonable noise (EP Act Section 166):

A person must not, from a place or premises that are not residential premises—

- (a) emit an unreasonable noise; or*
- (b) permit an unreasonable noise to be emitted*

Unreasonable noise definition (EP Act Section 3):

unreasonable noise means—

noise that is unreasonable having regard to the following—

- (i) its volume, intensity or duration;*
- (ii) its character;*
- (iii) the time, place and other circumstances in which it is emitted;*
- (iv) how often it is emitted;*
- (v) any prescribed factors; and*

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- (a) *noise that is prescribed to be unreasonable noise; and*
- (b) *does not include noise prescribed not to be unreasonable noise*

B2 Environment Protection Regulations 2021 (EP Regulations)

The *Environmental Protection Regulations 2021* (EP Regulations) are made under Section 465 of the EP Act and impose obligations in relation to environmental protection, including noise. The EP Regulations state that a person who conducts a prediction, measurement, assessment, or analysis of noise within a noise sensitive area must do so in accordance with the Noise Protocol. In particular, noise from CIT premises or entertainment venues or events is prescribed as unreasonable if it exceeds a noise limit or alternative criterion determined in accordance with the Noise Protocol.

Key matters addressed in the EP Regulations include:

- definition of commercial, industrial and trade premises, which is essentially any premises that is not a residential premises, a road, or a railway. It is noted that noise from common building services equipment (such as shared condensing units and kitchen exhaust fans) is assessable
- definition of an outdoor music entertainment venue
- definition of noise sensitive areas where the noise limits are assessed, which broadly include:
 - a residential building
 - temporary accommodation
 - hospital corrective institution
 - retirement or residential village
 - A room for learning in a childcare centre, kindergarten, or school
 - A tourist establishment, campground, or caravan park
- assessment time periods
- noise sources that must not be taken into account
- minimum noise limit values

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B3 EPA Publication 1826 - Noise Protocol

EPA Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*, dated May 2021 (Noise Protocol) sets noise limits that apply to CIT premises and entertainment venues within Victoria. Compliance with the noise limits is mandatory under the EP Act.

Noise limits are defined separately for music noise from entertainment venues and other operational noise from commercial industrial or trade (CIT) premises.

Noise from the development that exceeds the noise limits is prescribed to be unreasonable. Part 7.6 of the *Environment Protection Act 2017* essentially places the onus of compliance on the operator of the development by prohibiting the emission of unreasonable or aggravated noise.

For the purposes of this report and assessments of predicted noise levels, the noise limits apply up to 10 m from a dwelling, but within the property boundary.

Once a noise limit is established, an equivalent noise level (L_{Aeq}) due to the operation of the commercial premises is measured or predicted for a 30-minute operating period during the day, evening and night period as appropriate. If necessary, the L_{Aeq} noise level is adjusted for duration and noise character (tonality, impulsiveness and intermittency) to give the effective noise level (ENL). If the ENL exceeds the noise limit, then remedial action will be required.

A summary of the background noise measurements that have been used to derive noise limits is provided in Appendix C.

EPA Publication 1826 – rural area noise limits

Table 20 summarises the ‘zone levels’ and noise limits for the rural Receivers in accordance with the method provided in the Noise Protocol.

Table 20: Rural receivers – noise limits, dB

Receiver	Zone levels	Distance-adjusted levels	Background noise level, L_{A90}	Background-adjusted level	Noise limit, ENL ^[1]
1 Homewood Rd (R1)	Day: 46 Evening: 41 Night: 36	Day: 46 Evening: 41 Night: 36	Day: 53 Evening: 47 Night: 36	Day: 61 Evening: 52 Night: 41	Day: 61 Evening: 52 Night: 41
1375 Western Port Hwy (R22)	Day: 48 Evening: 38 Night: 33	Day: 43 Evening: 36 Night: 31	Day: 39 Evening: 37 Night: 31	Day: 47 Evening: 42 Night: 36	Day: 47 Evening: 42 Night: 36
R2-R09, R13-R16	Day: 46 Evening: 41 Night: 36	Day: 46 Evening: 41 Night: 36	Day: 39 Evening: 37 Night: 31	Day: 47 Evening: 42 Night: 36	Day: 47 Evening: 42 Night: 36
R10-R12 ^[2]	Day: 46 Evening: 41 Night: 36	Day: 46 Evening: 41 Night: 36	N/A	N/A	Day: 46 Evening: 41 Night: 36

1 The higher of the distance-adjusted level and the background-adjusted level.

2 These receivers are significantly further away from Western Port Freeway compared to the background noise monitor location, and therefore the background noise measured is likely to not be representative and has not been used.

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EPA Publication 1826 – urban area noise limits

The noise limits for the urban Receivers are summarised in Table 21 and Table 22 in accordance with the Noise Protocol.

Table 21: Urban receivers – noise limits (R17, R18, R20)

Period	Day of week	Start time	End time	Measured background, dB LA90	Zoning level, dB	Background relative to zoning level	Noise limit, dB Leff
Day	Monday-Saturday	0700 hrs	1800 hrs	53	54	High	59
Evening	Monday-Saturday	1800 hrs	2200 hrs	47	48	High	50
	Sunday, Public holidays	0700 hrs	2200 hrs				
Night	Monday-Sunday	2200 hrs	0700 hrs	36	43	Neutral	43

Table 22: Urban receivers – Noise limits (R19, R21)

Period	Day of week	Start time	End time	Measured background, dB LA90	Zoning level, dB	Background relative to zoning level	Noise limit, dB Leff
Day	Monday-Saturday	0700 hrs	1800 hrs	39	51	Neutral	51
Evening	Monday-Saturday	1800 hrs	2200 hrs	37	45	Neutral	45
	Sunday, Public holidays	0700 hrs	2200 hrs				
Night	Monday-Sunday	2200 hrs	0700 hrs	31	40	Neutral	40

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Part II Section A – Noise limits for music noise from entertainment venues and events

Part II of the Noise Protocol provides noise limits for music noise entertainment venues and events.

The EP Regulations define an indoor entertainment venue as follows:

... any premises (other than residential premises or an outdoor entertainment venue), where music is played and includes a live music entertainment venue, hotel, tavern, cabaret, night club, discotheque, reception centre, skating rink, restaurant, cafe, health and fitness centre, recording and rehearsal studio, theatre, amusement park, amusement parlour, retail store, shop, public hall and club.

The noise limits for music noise from indoor entertainment venues that apply within the noise sensitive areas are as follows.

Table 23: Music noise limits

Time period	Noise limit
Day/Evening	Music noise (L_{Aeq}) not permitted to exceed background noise (L_{A90}) plus 5 dB
Night	Music noise (L_{OCT10}) is not permitted to exceed the background noise level (L_{OCT90}) by more than 8 dB in any octave band (63Hz-4kHz) at a noise-sensitive area

While noise from recognised religious observance is not strictly assessable according to the music noise limits, the limit has been adopted as a benchmark to assess music from the project.

Night period limits are not relevant to the project.

Part II Section B – Assessing music noise from entertainment venues and events

Noise from the development that exceeds the noise limits is prescribed to be unreasonable. Part 7.6 of the *Environment Protection Act 2017* essentially places the onus of compliance on the operator of the development by prohibiting the emission of unreasonable or aggravated noise.

For the purposes of this report and assessments of predicted noise levels, the noise limits apply up to 10 m from a dwelling, but within the property boundary.

Once a noise limit is established, the effective noise level (ENL) for music noise from indoor entertainment venues is measured or predicted for 15 cumulative minutes of music. The effective noise level is:

- For the day and evening period: the L_{Aeq} measured in dB(A)

If the ENL exceeds the noise limit, then remedial action will be required.

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B4 Patron noise

Noise from voices of patrons is not covered under any Victorian policy or general guideline.

There has been extensive discussion between members of the Association of Australian Acoustical Consultants (AAAC) in regard to suitable criteria but consensus between members has not yet been reached.

For a theoretical assessment of a venue, the purpose of the proposed patron noise design targets 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.

In performing a patron noise analysis the results are interpreted as follows:

Table 24: Interpretation of patron noise assessment results

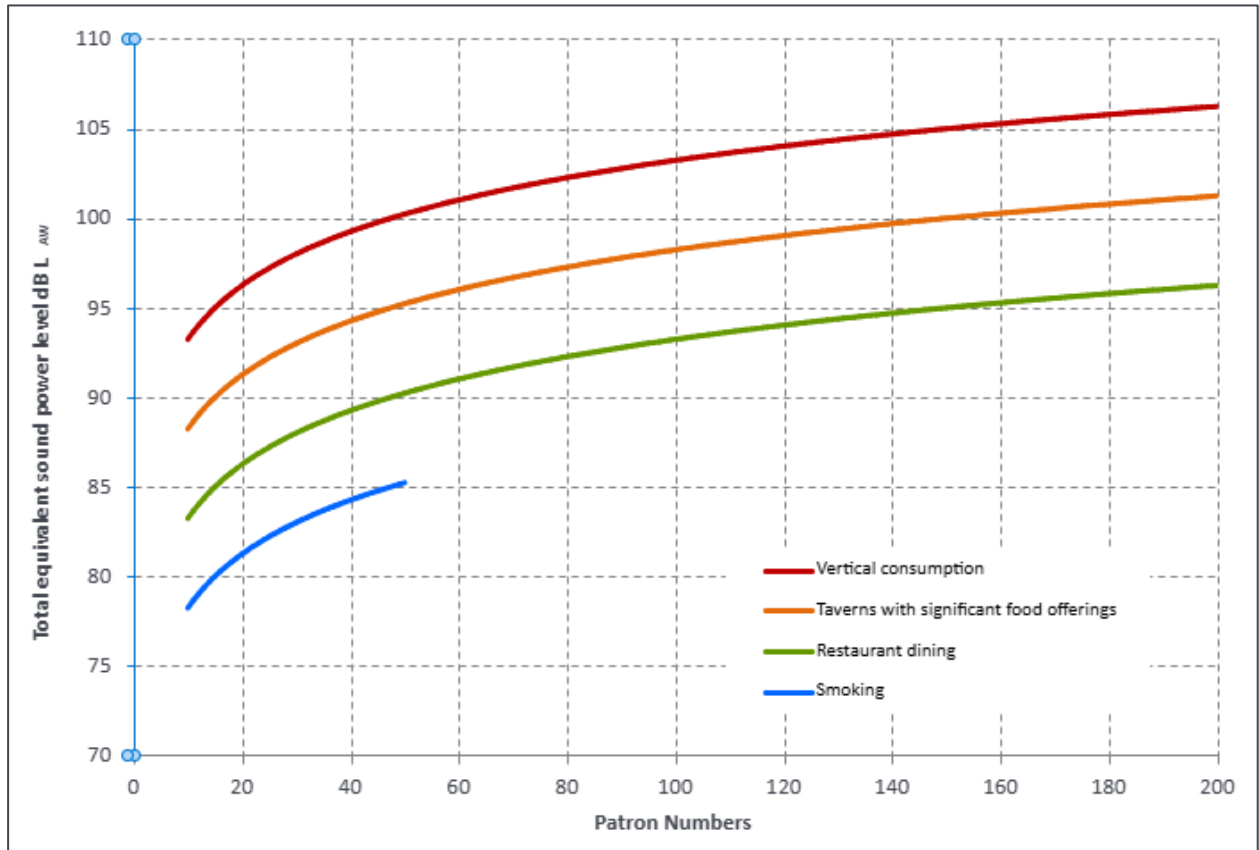
Predicted noise level	Likely impact
Meets the proposed criteria	No impact likely
Exceeds the proposed criteria by up to 2 dB	No impact likely
Exceeds the criteria by 3-5 dB	There is a possibility of impact and the proposal should be assessed with measurements once it is operational to determine typical 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 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 venue will be required

Sound power levels used for predictive assessment of patron noise have been derived based on a range of measurements of patrons. The overall noise level selected is based on the number of patrons and the type of venue, for example, whether food or alcohol are present.

The noise levels for each of the types of venues depending on the number of patrons are presented in Figure 9.

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Figure 9: Patron noise data



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APPENDIX C MEASURED NOISE LEVELS

Charts showing the hourly measured noise levels are provided as Figure 10 and Figure 11.

Figure 10: Logger 1 measured noise levels

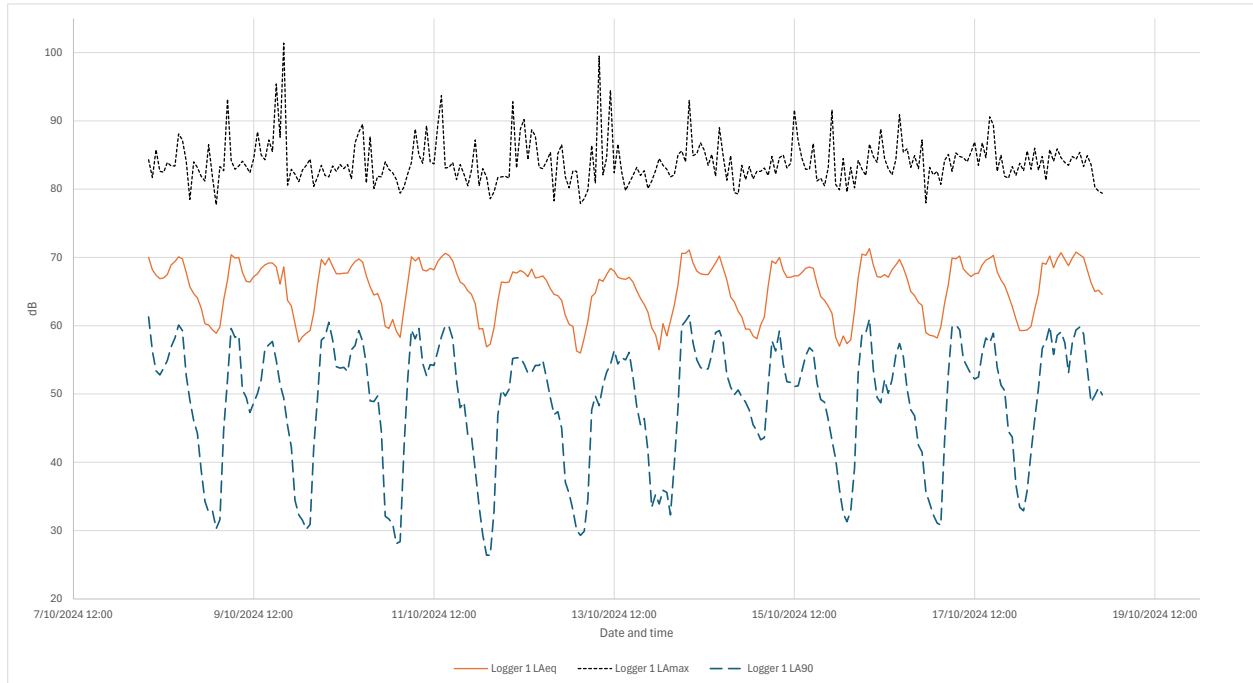
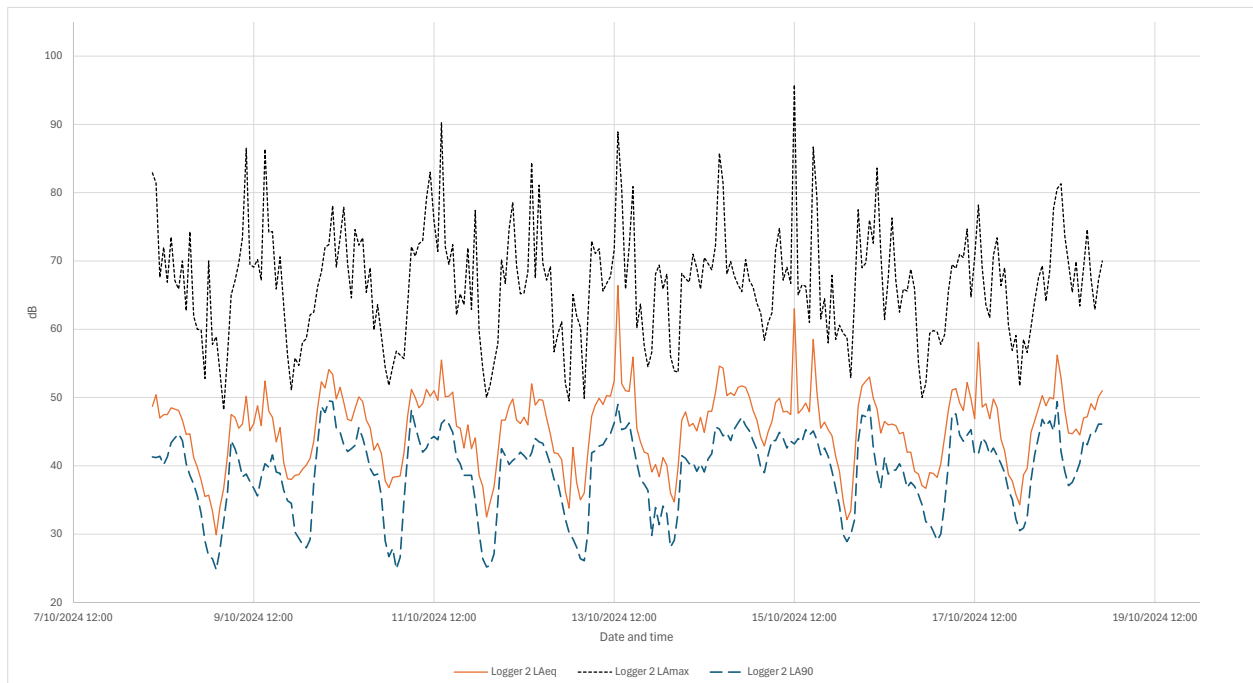


Figure 11: Logger 2 measured noise levels



The above data is tabulated to show key parameters used for deriving criteria and targets, and for contextualising the predicted noise levels.

Shaded values indicate that the data may be adversely affected by inclement weather, based on a review of historical weather data published by the Bureau of Meteorology as measured at Frankston Ballan Park weather station.

The average background noise levels for each of the day, evening and night periods are summarised in Table 25 and Table 26.

Table 25: Logger 1 – summary of measured noise levels, dB L_{A90} 1 hour

Date	Day	Day average	Evening average	Night average
8 October 2024	Tuesday	57	48	40
9 October 2024	Wednesday	53	50	39
10 October 2024	Thursday	57	54	39
11 October 2024	Friday	57	48	37
12 October 2024	Saturday	54	49	36
13 October 2024	Sunday	-	51	39
14 October 2024	Monday	57	51	48
15 October 2024	Tuesday	54	49	41
16 October 2024	Wednesday	54	47	40
17 October 2024	Thursday	56	50	42
18 October 2024	Friday	58	51	50
MINIMUM		53	47	36

Table 26: Logger 2 – summary of measured noise levels, dB L_{A90} 1 hour

Date	Day	Day average	Evening average	Night average
8 October 2024	Tuesday	42	38	31
9 October 2024	Wednesday	39	37	34
10 October 2024	Thursday	45	44	33
11 October 2024	Friday	45	40	32
12 October 2024	Saturday	42	39	31
13 October 2024	Sunday	-	43	33
14 October 2024	Monday	42	45	43
15 October 2024	Tuesday	44	42	36
16 October 2024	Wednesday	41	37	34
17 October 2024	Thursday	44	39	37
18 October 2024	Friday	42	45	40
Minimum		39	37	31

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The equivalent noise levels for each of the day, evening and night periods are summarised in Table 25 and Table 26.

Table 27: Logger 1 – summary of measured equivalent noise levels, dB L_{Aeq}

Date	Day	Day average	Evening average	Night average
8 October 2024	Tuesday	69	66	64
9 October 2024	Wednesday	68	67	64
10 October 2024	Thursday	69	68	64
11 October 2024	Friday	69	66	62
12 October 2024	Saturday	67	65	61
13 October 2024	Sunday	-	66	64
14 October 2024	Monday	69	64	63
15 October 2024	Tuesday	68	64	64
16 October 2024	Wednesday	69	65	64
17 October 2024	Thursday	69	66	63
18 October 2024	Friday	70	66	65
Minimum		67	64	61
Maximum		70	68	65

Table 28: Logger 2 – summary of measured equivalent noise levels, dB L_{Aeq}

Date	Day	Day average	Evening average	Night average
8 October 2024	Tuesday	48	43	40
9 October 2024	Wednesday	48	43	45
10 October 2024	Thursday	51	50	44
11 October 2024	Friday	51	45	41
12 October 2024	Saturday	49	44	41
13 October 2024	Sunday	-	56	41
14 October 2024	Monday	50	51	48
15 October 2024	Tuesday	55	48	45
16 October 2024	Wednesday	49	41	45
17 October 2024	Thursday	51	45	45
18 October 2024	Friday	50	49	46
Minimum		48	41	40
Maximum		55	56	48

The range of hourly equivalent noise levels for each of the day, evening and night periods are summarised in Table 25 and Table 26.

Table 29: Logger 1 – summary of measured equivalent noise levels, dB L_{Aeq} 1hour

Date	Day	Day	Evening	Night
8 October 2024	Tuesday	67-70	64-66	59-70
9 October 2024	Wednesday	66-68	64-67	58-70
10 October 2024	Thursday	68-69	68-68	58-70
11 October 2024	Friday	68-69	65-66	57-66
12 October 2024	Saturday	66-67	64-65	56-64
13 October 2024	Sunday	-	62-66	57-71
14 October 2024	Monday	68-69	62-64	58-70
15 October 2024	Tuesday	67-68	63-64	57-71
16 October 2024	Wednesday	67-69	63-65	58-70
17 October 2024	Thursday	67-69	64-66	59-69
18 October 2024	Friday	69-70	65-66	65-65
Minimum		66	62	56
Maximum		70	68	71

Table 30: Logger 2 – summary of measured equivalent noise levels, dB L_{Aeq} 1hour

Date	Day	Day	Evening	Night
8 October 2024	Tuesday	47-50	40-43	30-48
9 October 2024	Wednesday	45-48	38-43	38-52
10 October 2024	Thursday	47-51	47-50	37-51
11 October 2024	Friday	49-51	43-45	33-47
12 October 2024	Saturday	46-49	42-44	34-47
13 October 2024	Sunday	-	42-56	35-47
14 October 2024	Monday	45-50	50-51	43-52
15 October 2024	Tuesday	48-55	45-48	32-52
16 October 2024	Wednesday	45-49	39-41	37-51
17 October 2024	Thursday	47-51	39-45	34-50
18 October 2024	Friday	45-50	47-49	39-51
Minimum		45	38	30
Maximum		55	56	52

The lowest hourly background noise levels between 0900-2000 hrs throughout the logging period are summarised in Table 31.

Table 31: Lowest measured background noise level, dB L_{A90} 1 hour

Date	Day	Time	Logger 1	Logger 2
8 October 2024	Tuesday	0900 – 2000 hrs	49	39
9 October 2024	Wednesday	0900 – 2000 hrs	47	36
10 October 2024	Thursday	0900 – 2000 hrs	49	40
11 October 2024	Friday	0900 – 2000 hrs	48	40
12 October 2024	Saturday	0900 – 2000 hrs	49	40
13 October 2024	Sunday	0900 – 2000 hrs	46	38
14 October 2024	Monday	0900 – 2000 hrs	51	39
15 October 2024	Tuesday	0900 – 2000 hrs	49	42
16 October 2024	Wednesday	0900 – 2000 hrs	48	37
17 October 2024	Thursday	0900 – 2000 hrs	51	40
18 October 2024	Friday	0900 – 2000 hrs	49	37
Minimum			46	36

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