MARSHALL DAY Acoustics

NORTH ST. KILDA CHILDREN'S CENTRE
TOWN PLANNING ACOUSTIC REPORT

Rp 002 R01 20211196 | 23 June 2025

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Project: **NORTH ST. KILDA CHILDREN'S CENTRE**

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EXECUTIVE SUMMARY

It is proposed to replace the existing single storey childcare building at 71 Argyle Street, St. Kilda with a new double storey centre. This report presents an environmental noise assessment of the development addressing mechanical services noise, deliveries, waste collection, staff car parking, and noise from children playing in the external areas.

Marshall Day Acoustics Pty Ltd has been engaged to assess noise expected from the proposed development. Noise limits and target noise levels have been developed for the subject site, based on relevant Melbourne planning policy ordinance, Victorian environmental noise policies and guidelines.

Background noise levels have been measured at the subject site to inform the nomination of noise criteria.

Predictions of services noise indicate that the mechanical services design allows for environmental noise limits to be achieved. Noise from deliveries, waste collection and staff car parking in the basement car park are expected to be of low risk. Reference has been made to EPA Publications on the management of noise from deliveries and waste collection.

Physical controls in the form of noise barriers have been recommended to reduce noise from children playing outdoors from the subject site at nearby noise-sensitive receivers. As noise modelling indicated a notable increase in noise from outdoor areas for 87 Argyle Street and 5 – 7 Marriot Street relative to predicted noise levels form the current facility, a noise barrier is recommended for the southeast Level 1 outdoor play area to reduce the risk of disturbance.

The assessment has highlighted the effective implementation of these measures will be critical to reduce the risk of disturbance of nearby noise sensitive receivers. With the recommended controls in place, it is likely that the noise levels at the nearest residential dwellings may still be above the AAAC Guideline design targets. It is recommended that a Noise Management Plan be developed for this site to assist in managing the noise impacts and to reduce unnecessary noise.

Based on the conservative modelling assumptions, current noise from the existing child care centre operations, and the recommended physical and managerial controls described in Section 5.4.3 and Section 5.4.4 respectively, we consider the risk of disturbance to the surrounding noise sensitive areas can be minimised.

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1.0 INTRODUCTION

It is proposed to replace the existing single storey childcare building at 71 Argyle Street, St. Kilda with a new double storey centre. The City of Port Phillip have commissioned Marshall Day Acoustics Pty Ltd (MDA) to provide acoustic design services for the project.

This town planning stage acoustic report presents a review of the proposed centre and details our assessment and recommendations to minimise impacts to nearby noise sensitive receivers.

A glossary of acoustic terminology used throughout this report is included in Appendix A.

2.0 SITE AND PROJECT DESCRIPTION

2.1 Site location

The subject site is located at 71 Argyle Street, St Kilda.

The adjacent land uses are as follows:

- Two and three storey residences to the north of Argyle Street
- Two storey residences to the east on the corner of Argyle Street and Marriott Street
- Jim Duggan Reserve to the south
- Betty Day Community Centre to the west.

An aerial image of the site and surrounds is shown in Figure 1.

Figure 1: Site locations and surrounds (Source: Nearmap)

The subject site and immediate surrounds are zoned Public Use Zone-Local Government (PUZ6), General Residential Zone (GRZ1) and Neighbourhood Residential Zone (NRZ1). The relevant planning map is provided in Appendix B.

2.2 Existing environmental noise

MDA attended the site during the day on the following dates:

- 1100-1200 hrs, 15 March, 2022
- 1300-1330 hrs, 17 March, 2022
- 1000-1030 hrs, 29 March, 2022.

Background noise in the area was observed to primarily be distant traffic noise from St Kilda Road to the west. There was minimal local traffic on Argyle Street. The noise environment observed at the site was typical for a residential area.

Two unattended noise monitors were placed at the north and east boundary of the site to measure background and ambient noise levels between 15 March and 29 March 2022.

Typical average ambient noise levels were measured to range between 50 and 60 dB L_{Aeq} during the day, which was likely driven by noise from children in the outdoor play areas, distant traffic and wind in trees. Background (typical minimum) noise levels typically ranged between 30 and 40 dB L_{A90}. This was likely driven by distant traffic and wind in trees.

The measured hourly background noise levels were averaged for each day during the survey period and the lowest average background noise levels for each day, evening and night-time period are summarised in Table 1. This data is used to inform mechanical services, deliveries and waste collection, as well as childcare centre noise guideline levels.

Table 1: Lowest daily average free field background noise levels, dB L_{A90}

Description	Day	Evening	Night
Eastern location	37	34	26
Northern location	42	39	33

Note: Day: 0700 to 1800 hrs Monday to Saturday;
Evening: 1800 to 2200 hrs Monday to Saturday, 0700 to 2200 hrs Sunday and Public Holidays;
Night: 2200 to 0700 hrs 7 days

Further details on the noise monitoring methodology and results are provided in Appendix C.

2.3 Proposed development

Our assessment is based on Design Development architectural drawing set 02 rev. C dated 13 June 2025. The development is to accommodate 121 children between 0 – 5 years old and 36 staff members.

The proposed development includes the following key features:

- Basement parking and bin room
- Ground level spaces:
  - Western outdoor learning and play area
  - Four children rooms with interconnecting toilets and cot room
  - Reception office and circulation
  - Staff room, interview room and planning room
  - Kitchen, toilets and store rooms
- First floor spaces:
  - Western and southern outdoor learning and play terrace
  - Two children rooms with interconnecting toilets
  - Store room and circulation.

The proposed hours of operation are expected to be as per the existing centre, which are 0730 – 1815 hrs, Monday to Friday.

2.4 Acoustic considerations

Table 2 presents the key environmental acoustic considerations to be addressed by the design and the source of recommended criteria detailed in subsequent sections of this report.

Table 2: Acoustic considerations

Potential noise impact	Source of criteria	Status
Mechanical services noise to outdoor play areas and neighbouring noise sensitive areas	*Environment Protection Act 2017* *Environment Protection Regulations 2021* EPA Victoria Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*	Legislation
Noise from the car park, including waste collection and deliveries	EPA Victoria Publication 1254.2 *Noise Control Guidelines*	Guideline
Noise from children in outdoor areas to neighbouring noise sensitive areas	Australian Association of Acoustical Consultants (AAAC) *Guideline for Child Care Centre Acoustic Assessment v3.0*	Guideline
Internal noise levels due to external noise ingress and mechanical services	AS/NZS 2107:2016 *Acoustics - Recommended design sound levels and reverberation times for building interiors* Australian Association of Acoustical Consultants (AAAC) *Guideline for Child Care Centre Acoustic Assessment v3.0*	Guidelines

3.0 LEGISLATION AND GUIDELINES

3.1 Port Phillip Planning Scheme

The following Port Phillip planning scheme ordinance is considered applicable to noise from the proposed development:

13.05 NOISE

13.05-1S Noise management

Objective

To assist the management of noise effects on sensitive land uses.

Strategy

Ensure that development is not prejudiced and community amenity and human health is not adversely impacted by noise emissions.

Minimise the impact on human health from noise exposure to occupants of sensitive land uses (residential use, child care centre, school, education centre, residential aged care centre or hospital) near the transport system and other noise emission sources through suitable building siting and design (including orientation and internal layout), urban design and land use separation techniques as appropriate to the land use functions and character of the area.

Policy guidelines

Consider as relevant:

- *The noise requirements in accordance with the Environment Protection Regulations under the* Environment Protection Act 2017*.*

Policy documents

Consider as relevant:

- Environment Protection Regulations *under the* Environment Protection Act 2017
- Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues *(Publication 1826, Environment Protection Authority, May 2021)*
- Environment Reference Standard *(Gazette No. S 245, 26 May 2021)*
- Passenger Rail Infrastructure Noise Policy *(Victorian Government, 2013)*
- VicTrack Rail Development Interface Guidelines *(VicTrack, 2019)*

The key assessment item from the above is the assessment of noise from the proposed development against the *Environment Protection Regulations 2021* and the Noise Protocol (EPA Publication 1826), and consideration of any detrimental effects of noise from the proposed development at surrounding noise sensitive receivers.

3.2 Victorian legislation

A summary of the relevant Victorian legislation is provided in Table 3. Further details are provided in Appendix D.

Table 3: Victorian legislation

Document	Overview
Environment Protection Act 2017 (EP Act)	The EP Act provides the overarching legislative framework for the protection of the environment in Victoria. The EP Act does not specify noise limit values but prohibits the emission of unreasonable or aggravated noise from non-residential premises. The EP Act provides general definitions of unreasonable and aggravated noise; definitions that are specific to commercial, industrial and trade premises are provided in supporting publications (see below). Part 3.2 of the EP Act outlines the 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 to minimise those risks to prevent harm as far as reasonably practicable. Section 93 of the EP Act provides for the creation of an environmental reference standard to be used to assess and report on environmental conditions in the whole or any part of Victoria (see below).
Environment Protection Regulations 2021 (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. Division 1 states that the prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the EP Act or the EP 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.
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)	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. A comparison between the effective noise level 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 Regulations. The noise limits for commercial, industrial and trade premises are determined on the basis of land zoning and background noise levels, and are separately designated for day, evening and night periods.

Document	Overview
Environment Reference Standard, dated 25 May 2021 (ERS)	The ERS is made under Section 93 of the EP Act. The ERS sets out environmental values for ambient sound that are sought to be achieved and maintained in Victoria and standards to support those values. The indicators and objectives within the standard provide a benchmark for comparing desired outcomes to the actual state of the environment and a basis for assessing actual and potential risks to the environmental values. The ERS is not a compliance standard, and the values listed within the ERS for different land uses are explicitly not noise limits nor design criteria. The primary function of the ERS is to provide assessment and reporting benchmarks for environmental values. EPA Publication 1992 *Guide to the Environment Reference Standard* includes the following guidance: • *When considering an application for a planning permit, the responsible authority under the Planning and Environment Act 1987 (in most cases a local government) may consider the ERS, where relevant, 'if the circumstances appear to so require it.'* • *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.* • *Assessments should be proportionate to the scale of the proposal and the magnitude of potential harms.* Given the above guidance, and noting that the potential noise impacts in Section 2.4 have been assessed against applicable legislation or guidelines, this report has not considered the ERS further.

3.3 Supplementary guidelines

The legislation identified in Section 3.2 address 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. Supplementary guidance relevant to the assessment of the proposal are provided in Table 4.

Table 4: Supplementary guidelines

Noise consideration	Supplementary guidance
Previous VCAT Decisions – childcare centre	Several previous VCAT decisions have been reviewed to determine an approach to noise mitigation applicable to childcare centres that is consistent with planning in Victoria. Most decisions affirm that the noise from children playing in childcare centres is consistent with residential amenity. A summary of key outcomes from decisions is provided in Appendix D5.

Noise consideration	Supplementary guidance
Association of Australasian Acoustical Consultants (AAAC) *Guideline for Child Care Centre Acoustic Assessment* Version 3.0 (AAAC Guideline)	This document nominates the following goals for assessing noise from children in outdoor play areas: • Up to 4 hours play per day - $L_{Aeq,15min}$ noise level from outdoor play not to exceed the existing background noise level (L_{A90}) plus 10 dB • More than 4 hours play per day - $L_{Aeq,15min}$ noise level from outdoor play not to exceed the existing background noise level (L_{A90}) plus 5 dB. However, issues with these noise goals have been identified and therefore, the noise goals presented in the AAAC Guideline are primarily referenced as a means of providing contextual information about predicted noise impacts relative to existing conditions and to inform the design of noise control treatment. A detailed description of the noise goals set by the guideline, the issues identified with its application and the revised approach adopted by MDA (and other acoustic consultants), is provided in Appendix D6.
EPA Publication 1254.2 *Noise Control Guidelines* dated May 2021 (EPA Publication 1254.2)	Provides advice for the management of noise from a range of activities and noise sources. The 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 elements of the guidelines have been prepared so that they could be incorporated into a permit condition of a development or embodied as a local law.

To support the application and use of the legislation and guidance, a range of Victorian EPA publications provide additional advice on matters of interpretation and technical assessment requirements. Publication relevant to the proposed development are as follows:

- EPA Publication 1997 *Technical guide: Measuring and analysing industry noise and music noise*
- EPA Publication 1992 *Guide to the Environment Reference Standard*
- EPA Publication 1890 *Managing noise from reversing alarms*
- EPA Publication 1891 *Managing truck noise*
- EPA Publication 1856 *Reasonably Practicable*
- EPA Publication 1695.1 *Assessing and controlling risk for business.*

4.0 SUMMARY OF NOISE LIMITS AND DESIGN TARGETS

4.1 General Environmental Duty

The general environmental duty (GED) is outlined in Part 3.2 of the EP Act.

The GED 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. Commercial premises are therefore required to continue to review and eliminate or reduce the risk of harm from any emission of noise as far as reasonably practicable, even if they are compliant with the Noise Protocol.

The GED applies wherever there is a risk of harm, regardless of whether the noise emitted has caused complaints or caused harm to people or the environment.

The GED is applied first to eliminate or reduce the risk of harm to human health and the environment from noise so far as reasonably practicable. Any residual noise remaining after actions are taken to meet the GED is then managed as per the unreasonable noise definitions in Section 166 of the EP Act (i.e. complying with the Noise Protocol). Noise limits are not to be considered as levels that one can pollute up to.

The operators of the proposed development would therefore be required to continually review and consider how to minimise their environmental noise and the risk of annoyance wherever practicable.

4.2 EP Regulations noise limits

The EP Regulations noise limits applicable to noise from mechanical services, deliveries and waste collection for the proposed development are shown in Table 5.

Table 5: EP Regulations noise limits, effective noise level (ENL) dB

Description	Day	Evening	Night
Minton Street	49	43	36
Argyle Street	51	45	40

Note: Day: 0700 to 1800 hrs Monday to Saturday;
Evening: 1800 to 2200 hrs Monday to Saturday, 0700 to 2200 hrs Sunday and Public Holidays;
Night: 2200 to 0700 hrs 7 days

See Appendix D3 for further information on limit derivation for commercial, trade and industrial noise limits.

As the hours of operation are expected to be 0730 – 1815 hrs Monday to Friday, we do not expect mechanical services to operate during the night period. It is likely that only the day and evening limits need to be considered for the proposed development.

4.3 Children noise targets

The AAAC Guideline nominates the following goals for assessing noise from children in outdoor play areas:

- Up to 4 hours play per day - $L_{Aeq,\ 15min}$ noise level from outdoor play not to exceed the existing background noise level (L_{A90}) plus 10 dB.
- More than 4 hours play per day - $L_{Aeq,\ 15min}$ noise level from outdoor play not to exceed the existing background noise level (L_{A90}) plus 5 dB.

However, issues with these noise goals have been previously identified during assessments of other childcare centres, and therefore the noise goals presented in the AAAC Guideline are primarily

referenced as a means of providing contextual information about predicted noise impacts relative to existing conditions and to inform the design of noise control treatment.

This study assesses noise from children playing in terms of the average noise levels (L_{Aeq}) at nearby residences, and compares these levels to the existing background noise levels (L_{A90}).

In particular, the assessment has considered the predicted noise levels with respect to a 10 dB margin above background noise levels. The 5 dB margin is not referenced, as this is generally found to be too restrictive and does not consider the character of the noise.

Table 6 presents the derivation of the target noise level at adjacent noise sensitive areas due to children in external areas.

Table 6: Project noise targets for noise from children

Location	Period	Time	Background noise level, dB L_{A90}	Design target, dB L_{Aeq}
Argyle Street dwellings to the north	Day	0730 to 1800 hrs	39 *	49
Adjacent dwellings to the east	Day	0730 to 1800 hrs	37	47

* Given that background noise levels at this monitoring location may have been influenced by noise from children in outdoor areas, the lowest background noise level measured on a weekend has been nominated

The guideline nominates a design target of 65 dB $L_{Aeq,15min}$ at nearby commercial premises.

4.4 Internal noise levels

The AAAC Guideline recommends an internal noise level of 35 dB L_{Aeq} in sleeping areas and 40 dB L_{Aeq} within indoor activity areas.

Australian/New Zealand Standard AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS/NZS 2107) also provides recommended internal noise levels for a variety of spaces due to steady state sources such as traffic and mechanical services, but not from occupants in the space. The recommended noise levels for cot rooms is < 35 dB L_{Aeq} and 35 to 40 dB L_{Aeq} within play areas, with recommendations for other key noise sensitive spaces generally being 40 – 45 dB L_{Aeq}.

5.0 NOISE ASSESSMENT

5.1 Method

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

- The amount of noise being generated within the subject site
- The sound insulation provided by the building envelope, where applicable
- The distance between the sources and receivers and the presence of obstacles such as buildings or screens that obstruct the noise path
- The presence of hard reflective surfaces that may enable additional noise paths.

A 3-dimensional digital model of the site and surrounding built environment has been created using proprietary noise modelling software SoundPLANnoise (version 8.2), implementing ISO 9613[1]. ISO 9613 is a general environmental noise calculation standard that is used extensively throughout Australia, New Zealand, and Europe since its publication in 1996. The implementation of ISO 9613 within proprietary noise modelling software enables multiple sound transmission paths, including reflected and screened paths, to be accounted for in the calculated noise levels.

ISO 9613 is designed to assume favourable meteorological 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.

Geometry data for the model has been sourced from public aerial photography, visual inspections of the area, and building heights defined on the basis of assumed standard heights per floor level. The geometries in the model are simplified representations of the built environment that have been configured to a level of detail that is appropriate for noise calculation purposes.

Several assumptions were required to undertake the noise modelling, including:

- The ground effect attenuation has been based on completely hard ground on the subject site
- The noise levels produced are based on the noise data detailed in the relevant sections of this report
- The physical mitigation controls described in Section 5.4.3 are implemented.

5.2 Mechanical services noise

MDA have reviewed mechanical services drawings for Detailed Design Issue P1 dated 21 April 2024.

Key noise generating plant items include:

- Hot water heat pump rated at rated at 61 dB L_{Aeq} at 3 m, located on the roof
- Condensing unit CU-01 located on the southern boundary of the Level 1 outdoor area adjacent to the stairs, rated at 61 dB L_{Aeq} at 1 m
- Condensing unit CU-02 located on the northern Level 1 outdoor area, rated at 59 dB L_{Aeq} at 1 m
- Carpark exhaust fan located on the roof that once treated with 50 mm internal lining for the discharge radius bend, is expected to achieve 41 dB L_{Aeq} at 15 m.
- Kitchen exhaust fan discharge located on the roof expected to achieve 47 dB L_{Aeq} at 16 m
- Kitchen supply air fan intake at the eastern facade that, once the ductwork is sized to minimise airflow regenerated noise, is expected to achieve 42 dB L_{Aeq} at 6 m.

[1] ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*

It is assumed the kitchen exhaust fans will not be used during the evening period.

Table 7 presents a summary of the predicted noise levels and assessment against the day and evening period noise limit. The predictions include and screening of mechanical plant afforded by the noise barriers to the outdoor play areas as described in Section 5.4.3.

The prediction results indicate the day and evening period noise limits are expected to be satisfied.

Table 7: Assessment of calculated mechanical plant noise, dB ENL

Description	78 Argyle Street	83 Argyle Street	5 Marriot Street
Heat pump	32	35	32
Condensing units	34	34	39
Kitchen supply fan (day only)	14	43	23
Kitchen exhaust fan (day only)	34	31	27
Car park exhaust fan	35	33	28
All other plant	30	43	34
Day period total	**41**	**47**	**41**
Day period limit	51	51	49
Compliance?	✓	✓	✓
Evening period total	**39**	**44**	**41**
Evening period limit	45	45	43
Compliance?	✓	✓	✓

5.3 Car park, deliveries and waste collection

We understand the car park is to be primarily utilised by staff. Given the operating hours are expected to be 0730 – 1815 hrs and the relatively limited number of parking spaces, we envisage there would be limited use of the car park by staff during the early hours of the morning or the late evening. We therefore expect noise from vehicles utilising the car park to present a low risk of disturbance to the adjacent dwellings.

Deliveries and waste collections are understood to occur within the basement car park.

To minimise the risk of disturbance to nearby noise sensitive areas, it is recommended that the schedules and practices for waste collections and deliveries as detailed in EPA Publication 1254 be adopted, including limiting deliveries and waste collection to the day period only. Guidance in EPA Publications 1890 and 1891 regarding noise from trucks should also be reviewed and applied where reasonably practicable. Refer to Appendix D7 through to Appendix D10 for more details.

5.4 Children in outdoor areas

The assessment of noise from children in the outdoor areas is based on predictions of noise levels from children in the proposed outdoor areas at the nearest receivers. These predictions are compared to:

- AAAC Guideline noise targets presented in Section 4.3 in the context of the existing background noise conditions and to inform the design of noise control treatment
- Predictions of noise from children in the current outdoor areas of the existing facility. A comparison of noise from the current and proposed facilities undertaken using the same

methods and assumed noise source data allows for a better indication of the change in noise levels likely to be experienced at the nearest receivers.

5.4.1 Noise data

The AAAC Guideline provides typical sound power levels for a group of 10 children playing, shown in Table 8. Noise levels measured by MDA at a number of childcare centres are consistent with these values.

Table 8: AAAC Guideline typical sound power levels for groups of 10 children playing, dB $L_{Aeq, 15min}$

		Octave Band Centre Frequencies, Hz						
Number and age of children	**A**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**
10 children – 0-2 years	78	54	60	66	72	74	71	67
10 children – 2-3 years	85	61	67	73	79	81	78	74
10 children – 3-5 years	87	64	70	75	81	83	80	76

Note that the sound power levels would be approximately 6 dB lower for children involved in passive play.

For the proposed facility, we have assumed 42 children aged 3-5 years and 24 children aged 0-2 years may occupy the ground floor outdoor learning area, and up to 55 children aged 3-5 years may occupy the first floor outdoor learning area at the same time.

Based on information shown on the architectural drawings, noise data for the 2-3 years age group has not been used, and each area is assumed to contain children participating in active play, making for a conservative assessment.

The capacity of the current facility is 77 children. We have assumed 17 children aged 0-2 years in the existing western outdoor area and 60 children aged 3-5 years in the eastern outdoor area. These assumptions were based on a review of public imagery, the relative areas of outdoor play areas and the ratio of number of older and younger children at the proposed facility.

5.4.2 Predicted noise levels

Noise levels at the nearest residential dwellings have been predicted based on the following assumptions:

- Children using the external play areas are equally distributed throughout the areas
- The external play areas are occupied by the maximum number of children. i.e. all children are playing outside simultaneously.

Table 9 presents the predicted noise levels at nearest residential and commercial receivers. Also included in the table is the predicted increase in noise level of the proposed outdoor areas relative to the existing outdoor areas.

Table 9: Predicted noise levels, dB L_{Aeq}

Receivers	AAAC target	Existing facility	Proposed facility
78 Argyle Street to the north	49	58	60 2 dB increase
Level 1, 83 Argyle Street to the east	47	63	61 2 dB decrease
Level 2, 87 Argyle Street to the east	47	51	58 7 dB increase

Receivers	AAAC target	Existing facility	Proposed facility
5 – 7 Marriott Street to the south-east	47	44	54 10 dB increase
C Care to the south	65	35	66 31 dB increase
Betty Day Community Centre to the west	65	59	65 6 dB increase

The following observations are made from the above results:

- The predicted noise level for children in the proposed outdoor areas are well above the AAAC Guideline target at the nearest Argyle Street receivers, but are predicted to only experience a minor change (±2 dB) in noise relative to the existing facility (which is also well above the AAAC Guideline target).
- Noise at 87 Argyle Street and 5 – 7 Marriott Street is expected to increase significantly to be well above the AAAC Guideline target. This is due to the introduction of the adjacent elevated southeast outdoor area, whereas currently the receivers are well shielded from the existing outdoor areas by the existing buildings.
- Noise at the nearest commercial receivers is predicted to increase, but is expected to be comparable to the AAAC Guideline target.

5.4.3 Physical noise controls

It is proposed to enclose the outdoor play areas with acoustically transparent perforated metal screens which offer no meaningful acoustic attenuation.

Given the noise modelling indicates a notable increase in noise from outdoor areas for 87 Argyle Street and 5 – 7 Marriot Street receivers and that predicted noise levels from the proposed facility are well above the AAAC Guideline target, consideration should be given to the feasibility of attenuating noise from children with acoustic barriers or solid balustrades to outdoor areas.

Predicted noise levels to the northern Argyle Street residences are also well above the AAAC Guideline target, however the predictions indicate noise from outdoor areas would be unlikely to change significantly from those generated at the current facility. The need for acoustic screening of outdoor areas would therefore be better informed by any history of complaints from these residences regarding noise from children in existing outdoor areas. Refer to Section 5.4.5 for further discussion of the conservative nature of the assessment.

Subsequent noise modelling included a 1.8 m high barrier at the edges of the Level 1 south-east outdoor area, as depicted in Figure 2.

Figure 2: Indicative noise barriers shown in red

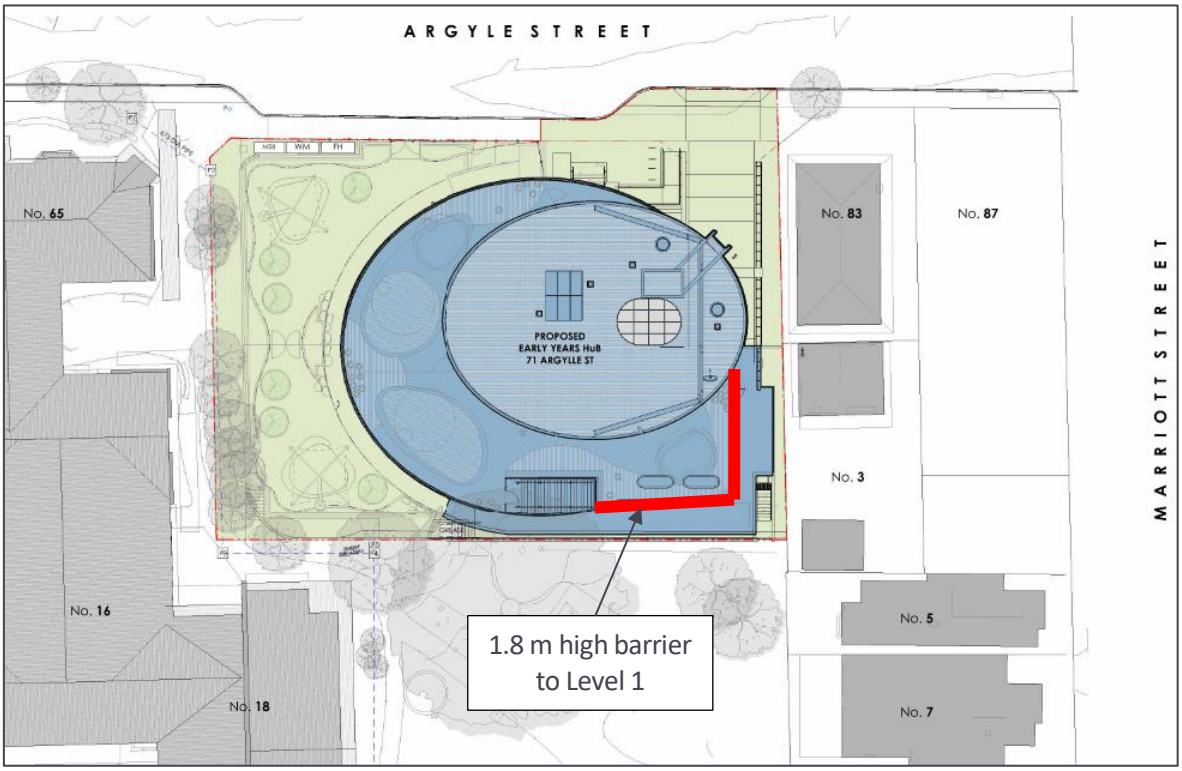


Table 10 presents the updated predictions with the Level 1 barrier described above included. Receivers with predictions that are not influenced by the barriers have been omitted.

Table 10: Review of predicted noise levels with and without Level 1 barriers, dB L_{Aeq}

Receivers	AAAC target	Existing facility	Proposed facility (no L1 barriers)	Proposed facility (with L1 barriers)
Level 1, 83 Argyle Street to the east	47	63	61	52 11 dB decrease below existing facility, 9 dB reduction by barrier
Level 2, 87 Argyle Street to the east	47	51	58	52 1 dB increase over existing facility, 6 dB reduction by barrier
5 – 7 Marriott Street to the south-east	47	44	54	47 3 dB increase over existing facility, 7 dB reduction by barrier

The above results demonstrate the beneficial 6 to 9 dB reduction in noise from the Level 1 outdoor area due to the barrier, with resultant noise levels predicted to be within 5 dB of the AAAC Guideline target at adjacent Argyle Street residences. Noise levels at Argyle Street residents are expected to be similar to or less than those from the existing facility with the Level 1 barrier included. The predicted

increase in noise levels at 5 – 7 Marriott Street would be limited to a relatively minor 3 dB with the 1.8 m barrier in place, with the predicted noise level matching the AAAC Guideline target.

The extents and heights of the barriers can be refined with the project team as the design progresses to improve acoustic outcomes, giving consideration to non-acoustic factors such as overshadowing, visual amenity and cost which may restrict the extent of acoustic screening that can be provided.

To provide the adequate noise attenuation, the construction material of barriers or solid balustrades must have a minimum surface density of 10 – 12 kg/m^2 and be free from holes and gaps. It is particularly important to ensure that any gaps at the bottom of the barrier is minimised as far as practicable.

Examples of suitable materials include:

- 25 mm thick timber
- 6 mm thick glass
- 12 mm thick Perspex or polycarbonate
- 9 mm fibre cement sheet or 6 mm compressed fibre cement sheet
- Brick or concrete.

The barrier material selections can be reviewed during subsequent design stages.

5.4.4 Managerial controls

It is recommended that a Noise Management Plan be developed for this site to assist in managing the noise impacts and to reduce unnecessary noise.

Examples of best practice management measures that could be incorporated into the plan include:

- The behaviour of children should be monitored and addressed as required by employees
- Regular emphasis with employees to be cognisant of the management of noise and to be mindful of the amenity of neighbours
- Crying children should be taken into the centre and comforted
- Parents and guardians should be informed of the importance of noise minimisation when entering the site, dropping off or picking up children
- A contact phone number for nearby residents to facilitate communication and resolve any neighbourhood issues that may arise.

5.4.5 Discussion

The predicted noise levels at the nearest residential dwellings are above the AAAC Guideline design targets despite the inclusion of noise barriers to external play areas.

However, we highlight that the assessment undertaken has adopted the following conservative assumptions:

- All children are outside simultaneously. For context, predicted noise levels would reduce by 3 dB if the number of children in outdoor areas were halved
- Centre attendance is at 100 % design capacity
- Higher noise level data has been assumed for the 2 – 3 year olds
- All children engaging in active play, noting that the AAAC Guideline notes that passive play is approximately 6 dB quieter

- The noise target for dwellings to the north were set based on a conservative background noise level measurement on a weekend, and not a weekday, to account for the potential that weekday measurements were influenced by children at the existing site.

The noise targets set by the AAAC Guidelines are primarily referenced as a means of providing contextual information about the predicted noise levels relative to existing conditions and to inform the design of noise control treatments. As such, the noise target cannot be regarded as legislative criteria. Legislated limits are generally restricted to the types of noise sources that an operator or owner of a premise can be reasonably expected to control or limit to a prescribed value. In situations where this is not the case, guidance and assessment practices tend to be primarily based on management measures (such as how a facility can be used, and when it can be used) rather than prescriptive noise limits.

It is also noted that noise from children in outdoor areas has been present for a number of years around the site as part of the existing childcare centre operations.

We therefore do not consider the conservative noise level predictions being above the target noise levels to be an indication of increased risk of disturbance to the surrounding noise sensitive areas. Rather, the assessment indicates that the implementation of both physical (i.e. noise barriers) and managerial noise mitigation measures (so far as reasonably practicable) are warranted to minimise the risk of disturbance of neighbours.

5.5 External noise ingress

From a review of the noise monitoring results and our observations of relatively low ambient noise levels at the site, we do not expect any specific external noise mitigation measures are required to the building envelope to address external environmental noise intrusion.

The AAAC Guideline recommends ambient noise in outdoor play and learning areas does not exceed 55 dB $L_{Aeq,1hr}$. A review of the noise monitoring results indicates that this noise level is seldomly exceeded at the site.

No specific mitigation is therefore considered necessary for the outdoor areas, however, noise barriers have been recommended to attenuate noise from children in outdoor areas to the nearest noise sensitive receivers. Noise barriers would in turn assist with partially reducing ambient noise levels in the outdoor areas.

Noise from mechanical services to external and internal areas should be reviewed as the design progresses and mitigation measures developed where appropriate.

6.0 CONCLUSIONS

It is proposed to replace the existing single storey childcare building at 71 Argyle Street, St. Kilda with a new double storey centre. This report presents an environmental noise assessment of the development addressing mechanical services noise, deliveries, waste collection, staff car parking and noise from children in the external areas.

Noise limits and target noise levels have been developed for the subject site, based on relevant Melbourne planning policy ordinance, Victorian environmental noise policies and guidelines.

Background noise levels have been measured at the subject site to inform the nomination of noise criteria.

Predictions of services noise indicate that the mechanical services design allows for environmental noise limits to be achieved. Noise from deliveries, waste collection and staff car parking in the basement car park are expected to be of low risk. Reference has been made to EPA Publications on the management of noise from deliveries and waste collection.

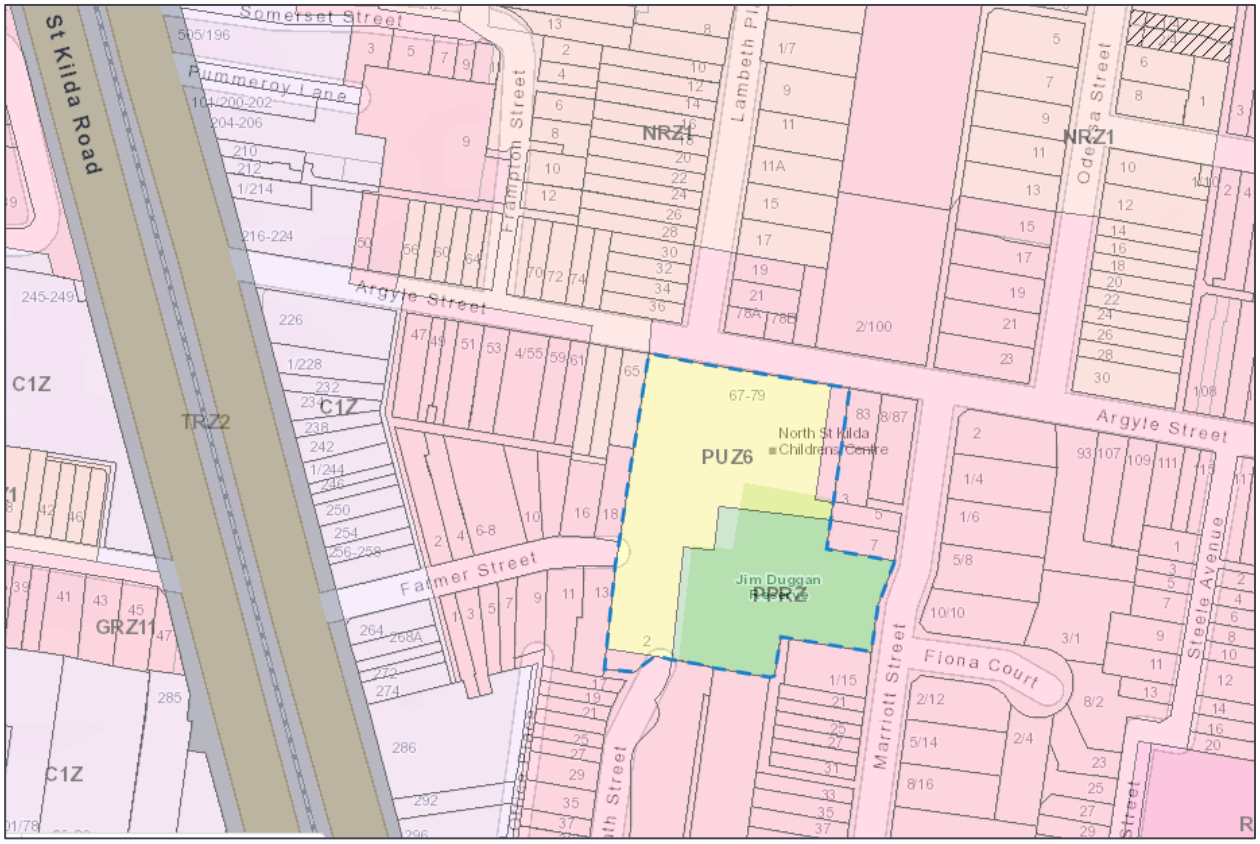
Physical controls have been recommended to reduce noise from children playing outdoors from the subject site at nearby noise-sensitive receivers. The assessment has highlighted the effective implementation of these measures will be critical to reduce the risk of disturbance of nearby noise sensitive receivers. With the recommended controls in place, it is likely that the noise levels at the nearest residential dwellings will be either comparable to the AAAC Guideline design targets, or would not differ significantly to noise from the existing outdoor areas. It is recommended that a Noise Management Plan be developed for this site to assist in managing the noise impacts and to reduce unnecessary noise.

Based on the conservative modelling assumptions, the existing child care centre operations, and the recommended managerial controls, we consider the noise level predictions being marginally above the target noise levels to be an indication of low risk of disturbance to the surrounding noise sensitive areas.

APPENDIX A GLOSSARY OF TERMINOLOGY

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.
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.
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.
L_{A10}	The A-weighted sound level exceeded for 10% of the measurement period, measured in dB. Commonly referred to as the average maximum noise level.
L_{A90}	The A-weighted sound level exceeded for 90 % of the measurement period, measured in dB. Commonly referred to as the background noise level.
L_{Aeq}	The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.
Effective noise level	The effective noise level from commercial, industrial or trade premises determined in accordance EPA Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industry and trade premises and entertainment venues*. 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.
Sound Insulation	When sound hits a surface, some of the sound energy travels through the material. 'Sound insulation' refers to ability of a material to stop sound travelling through it.
SPL or L_P	Sound Pressure Level A logarithmic ratio of a sound pressure measured at distance, relative to the threshold of hearing (20 µPa RMS) and expressed in decibels.

APPENDIX B PLANNING MAP



APPENDIX C NOISE MEASUREMENTS

C1 Equipment details

The equipment used for the unattended surveys is detailed in Table 11 and was placed at 1.5 m above local ground level at the locations presented in Section C2.

Table 11: Equipment type

Item	Description
Equipment type	Automated/unattended integrating sound levels
Make & model	Rion NL-31/Rion NL-32
Unit serial numbers	00503821/00630453
Instrumentation noise floor	Less than 25 dB
Wind shielding	Proprietary windshield supplied by the manufacturer
Calibration drift	No adverse drift

C2 Equipment location

Two unattended noise monitors were placed at the north and east boundary of the site to measure ambient and background noise levels, at the locations shown in Figure 3.

The majority of activity associated with the site is driven by children in the outdoor play areas, distant traffic and wind disturbed vegetation.

Figure 3: Noise monitor locations

C3 Background noise levels

A summary of the unattended noise monitoring data, based on the average 1-hour period required by Part I of the Noise Protocol, is presented in Table 12 and Table 13. No periods of inclement weather were noted during the noise monitoring.

Table 12: Unattended noise monitoring summary - east, dB L_{A90}

Date	Period average		
	Day	Evening	Night
Tuesday, 15 March 2022	41	37	30
Wednesday, 16 March 2022	42	36	34
Thursday, 17 March 2022	40	38	33
Friday 18, March 2022	42	40	34
Saturday, 19 March 2022	37	38	32
Sunday, 20 March 2022	-	37	29
Monday, 21 March 2022	39	39	28
Tuesday, 22 March 2022	42	39	36
Wednesday, 23 March 2022	42	38	29
Thursday, 24 March 2022	41	38	31
Friday, 25 March 2022	41	39	35
Minimum weekday	**39**	**36**	**28**

Note: A -2.5 dB correction will need to be applied to these measured levels to correct for facade reflections when being used to establish noise limits

Table 13: Unattended noise monitoring summary - north, dB L_{A90}

Date	Period average		
	Day	Evening	Night
Tuesday, 15 March 2022	46	41	35
Wednesday, 16 March 2022	47	41	39
Thursday, 17 March 2022	47	42	40
Friday 18, March 2022	47	43	38
Saturday, 19 March 2022	39	42	40
Sunday, 20 March 2022	-	43	40
Monday, 21 March 2022	44	43	40
Tuesday, 22 March 2022	47	44	40
Wednesday, 23 March 2022	47	43	37
Thursday, 24 March 2022	46	42	35
Friday, 25 March 2022	46	43	40
Minimum weekday	**44**	**41**	**35**

APPENDIX D LEGISLATION AND GUIDELINES

D1 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. This requires implementing proportionate controls to eliminate or minimise risks of harm including health and amenity related impacts.

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

D2 Environment Protection Regulations 2021

The EP Act does not specify noise limit values or technical aspects of environmental noise but sets out legal requirements to comply with the EP Regulations described below. Clause 166 of the EP Act essentially places the onus of achieving compliance with noise limits on the commercial premises.

The 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 industrial, commercial and trade 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 indoor 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 child care 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
- Management of cumulative noise from multiple premises.

Table 14 presents a summary of the relevant Divisions and Regulations from Part 5.3 *Noise*.

Table 14: Summary of Part 5.3 - Noise

Section	Description
Division 1 Regulation 113	States that *a person who conducts a prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the Act or these Regulations, must conduct the prediction, measurement, assessment or analysis in accordance with the Noise Protocol.*
Division 2	Applies to noise from residential premises
Division 3	Applies to noise from commercial, industrial and trade premises
Regulation 116	Defines the day, evening and night period as follows: Day: 0700 to 1800 hrs, Monday – Saturday Evening: 1800 to 2200 hrs, Monday – Saturday 0700 to 2200 hrs, Sunday and Public Holidays Night: 2200 to 0700 hrs the next day, Monday – Sunday
Regulation 117	In this Division, when the level of noise emitted from commercial, industrial and trade premises is assessed, the following sources of noise that could be expected at the proposed facility must not be taken into account: – Voices – Construction or demolition activity on building sites – Intruder, emergency or safety alarms or sirens – Equipment used in relation to an emergency – Non-commercial vehicles (except for maintenance activities).
Regulation 118	Defines noise as being unreasonable if it exceeds the Noise Protocol limits or the alternative assessment criteria that apply at an alternative assessment location. Defines the lowest base noise limits as follows: Major urban area: Day: 45 dB L_{eff}; Evening: 40 dB L_{eff}; Night: 35 dB L_{eff} Rural area: Day: 45 dB L_{eff}; Evening: 37 dB L_{eff}; Night: 32 dB L_{eff} The noise limit for commercial, industrial and trade premises for the night period must not exceed 55 dB $L_{eff.}$
Regulation 119	If multiple existing or proposed premises emit noise that contributes to the effective noise level at a noise sensitive receiver, all reasonable steps must be taken by the premises' management to ensure the combined noise level does not exceed the noise limit.
Regulation 120	This regulation essentially identifies that tonal aspects of noise must be considered when considering unreasonable noise for section 3(1)(a)(v) of the EP Act. The Noise Protocol provides a method of assessing tonal characteristics of noise from commercial, industrial and trade premises, with additional guidance on low frequency noise available in EPA Victoria Publication 1996 *Noise guideline – assessing low frequency noise.*

Section	Description
Regulation 121	Noise emitted from commercial, industrial and trade premises is prescribed to be aggravated noise if it exceeds the noise limits by more than 15 dB, or the following if lower: - 75 dB L_{eff} during the day, - 70 dB L_{eff} during the evening, or - 65 dB L_{eff} during the night.
Division 4	Applies to noise from entertainment venues and outdoor entertainment events, including music noise from entertainment venues or events.
Division 5	Applies to noise from wind turbines.

D3 EPA Publication 1826 – Noise Protocol

The regulatory framework includes a reference document 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). The Noise Protocol outlines the EPA's required approach to the determination of noise limits and to the measurement, prediction and analysis of noise.

Only *Part I: Commercial, industrial and trade premises* applies to the childcare centre, noting that it is defined as both a 'commercial, industrial and trade premises' as well as a 'noise sensitive area'.

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 current study.

Using the Urban area method, noise limits are calculated taking into account land 'zoning types' within a 70 m and 200 m radius of a noise sensitive building. Zoning types are categorised as type 1, 2 or 3 as defined in Annex A of the noise protocol. A prescribed formula is used to calculate a corresponding Zoning Level. In general, zone type designations are as follows:

- Type 1 for residential, rural, open space or similar zones;
- Type 2 for commercial, business, office and industrial 3 [light industry] zones; or
- Type 3 for industrial 1 and 2 [general industry] and similar zones.

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 the Noise Protocol. If the background level is low or high, the Noise Limit is calculated from a formula taking into account the Zoning Level and the Background Level.

The limits are separately defined for the day, evening and night periods. The time periods are defined in the EP Regulations and summarised in Table 15.

Table 15: EP Regulations time periods

Period	Day of week	Start time	End time
Day	Monday-Saturday	0700 hrs	1800 hrs
Evening	Monday-Saturday	1800 hrs	2200 hrs
	Sunday, Public holidays	0700 hrs	2200 hrs
Night	Monday-Sunday	2200 hrs	0700 hrs

The relevant noise limits applicable to this development are derived in Table 16.

Table 16: Noise limits

Period	Zoning level	Background noise level, dB L_{A90}	Background relative to zoning level	Noise Protocol limit, dB L_{eff}
Minton Street				
Day	51	37	Low	49
Evening	45	34	Low	43
Night	40	26	Low	36
Argyle Street				
Day	51	44	Neutral	51
Evening	45	41	Neutral	45
Night	40	35	Neutral	40

D4 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 Environment Reference Standard (ERS) is made under Section 93 of the EP Act. The ERS sets out environmental values for ambient sound that are sought to be achieved and maintained in Victoria and standards to support those values. The indicators and objectives (noise levels) within the ERS provide a benchmark for comparing desired outcomes to the actual state of the environment and a basis for assessing actual and potential risks to the environmental values.

Part 3 of the proposed ERS discusses ambient sound.

Table 3.1 of the ERS, reproduced in Table 17, describes the environmental values of the ambient sound environment.

Table 17: Environmental values of the ambient sound environment

Environmental value	Description of environmental value
Sleep during the night	An ambient sound environment that supports sleep at night. (Not directly applicable for this development, however there are spaces used by children for sleeping during the day)
Domestic and recreational activities	An ambient sound environment that supports recreational and domestic activities in a residential setting
Normal conversation	An ambient sound environment that allows for a normal conversation indoors without the need to raise voices

Environmental value	Description of environmental value
Child learning and development	An ambient sound environment that supports cognitive development and learning in children.
Human tranquillity and enjoyment outdoors in natural areas	An ambient sound environment that allows for the appreciation and enjoyment of the environment for its natural condition and the restorative benefits of tranquil soundscapes in natural areas (not applicable in this circumstance as there are no such areas in the immediate area)
Musical entertainment	An ambient sound environment that recognises the community's demand for a wide range of musical entertainment (not applicable in this circumstance as there are no live music entertainment venues in the immediate area)

Table 3.2 and 3.3 of the ERS then quantifies objective ambient day and night noise levels for different land uses.

The ERS is not a compliance standard, and the noise levels listed within the ERS for different land uses are explicitly not noise limits nor design criteria. The primary function of the ERS is to provide assessment and reporting benchmarks for environmental values.

EPA Publication 1992 *Guide to the Environment Reference Standard* provides information primarily for decision makers about how the ERS should be applied to support decision making, and how the environmental values, indicators and objectives for each element of the environment should be interpreted.

Table 3.1 of EPA Publication 1992 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 commercial, industrial and trade premises, nor entertainment venues when impacting on noise sensitive areas, as defined in the Environment Protection Regulations 2021 (the Regulations). This is because noise in these circumstances is regulated by specific provisions and noise limits in the 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.*

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 site is currently used for a childcare centre
- There are legislations and guidelines that inform on addressing noise generated at the site to surrounding noise sensitive areas, as identified in this report, which broadly address the relevant environmental values in Table 17
- There are guidelines that inform on addressing noise incident at the site, as identified in this report, which broadly address the relevant environmental values in Table 17

- It is intended that the acoustic design of the centre will consider and address noise generated by the centre and noise incident at the centre, referencing the relevant legislation and guidelines identified in this report.

D5 VCAT Decisions – Assessment of Child Care Centre noise

Several previous VCAT decisions have been reviewed to determine an approach to noise mitigation of childcare centres, consistent with planning in Victoria.

Most decisions affirm that the noise from children playing at childcare centres is consistent with residential amenity. The following decisions are of note:

- ***Petzierides v Hobsons Bay CC*** **(includes Summary) (Red Dot) [2012] VCAT 686 (28 May 2012)**

  This decision establishes that:

  > *Whilst generally speaking the noise of children playing is reasonable in a residential area, this does not mean that a childcare centre can obviate the need to act responsibly and appropriately by ensuring any noise impact is of an acceptable level.*

  This decision is consistent with MDA's experience that noise barriers are appropriate mitigation measures for childcare centres adjacent to residential land uses.

- ***Beis Efraim College Limited v Bayside CC*** **[2014] VCAT 856 (16 July 2014)**

  In this case, the matter under consideration was a change in use. The subject site had previously been used as a childcare centre, and the application was to use the site as a pre-school. The application was being heard retrospectively, as the use of the site as a pre-school had already commenced. With regard to the evidence given by objectors, it is notable that:

  – The objectors stated that when the site was used as a childcare centre they did not experience problems with noise

  – Objections were raised concerning the height of the 3-4 m high noise barriers that were proposed. These barriers were recommended in an attempt to use the AAAC Guideline values as mandatory noise limits; this is discussed further in the following section.

  This decision provides an excellent outline of the factors to be considered when assessing noise from childcare centres, referring to a New South Wales Land and Environment Court (LEC) decision (*Meriden School v Pedavoli*) which looks at the factors that should be considered when determining if noise is offensive.

- ***Basic Element Pty Ltd v Hobsons Bay CC*** **VCAT 522 (19 April 2017)**

  In this case, the matter under consideration was for a permit for a new childcare centre in Newport. The VCAT chairman stated the following in regard to the AAAC Guideline.

  > *There is no accepted standard for noise from people. Mr Tardio referred to a guideline for child care centres prepared by the Association of Australian Acoustical Consultants (the AAAC Guideline) that sets out recommendations for assessment methodology and acceptable noise levels. Other divisions of the Tribunal deemed that the AAAC Guideline should be given little weight in these matters as it (the L_{A90}+5dB noise target) is highly conservative and has no statutory basis in any planning schemes.*

  Given that this comment was made in reference to the lower of the two AAAC Guideline noise targets, MDA agrees and has consistently used a noise target for childcare centres of the background noise (L_{A90}) +10 dB.

Based on our review of VCAT decisions, the factors considered for this assessment are:

- The level of noise from the proposed use
- The nature of the noise
- Whether the noise is typical for the area
- The duration of exposure to the noise
- The time of day that the noise occurs
- Whether the noise occurs on weekends or is limited to weekdays only
- How many people are affected
- Whether all reasonable means of minimising the noise have been implemented.

D6 AAAC Guideline for Child Care Centre Acoustic Assessment

The Association of Australian Acoustical Consultants (AAAC) issued the *Guideline for Child Care Centre Acoustic Assessment*, version 3.0 in September 2020.

D6.1 Noise goals for outdoor areas

Table 18 shows the noise goals proposed by the current AAAC Guideline for assessing noise from outdoor play areas.

Table 18: Noise goals for outdoor play areas, dB

Use of outdoor area	Noise goal
Up to 4 hours (total) per day	If outdoor play is limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed $L_{Aeq,15min}$ noise level emitted from the outdoor play shall not exceed the background noise level by more than 10 dB at the assessment location
More than 4 hours (total) per day	If outdoor play is not limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed $L_{Aeq,15min}$ noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5 dB at the assessment location.

D6.2 Known issues with the AAAC Guideline

From MDA's experience and discussions with other AAAC members, the following issues have been identified with the guideline:

- Child care centres no longer limit outdoor play. As noted in the Petzierides v Hobsons Bay CC decision, *"the benefits of exercise, outdoor activity, sunshine and a play-based approach to education are at the forefront of the minds of today's educators, including child care centres."* The two-hour cut-off was not based on evidence regarding impacts, and was apparently included in the guideline without knowledge concerning contemporary practice.
- The noise goals do not acknowledge that the noise from children playing has a different character than other forms of environmental noise. For example, the L_{A90} + 5 dB target was based on NSW criteria for industrial noise. This target has been found to be unnecessarily restrictive.
- The L_{A90} + 5 dB target has been found to be unnecessarily restrictive.
- Strict *compliance* with the AAAC targets can lead to undesirable outcomes in terms of excessive noise barrier heights, as with the *Beis Efraim College Limited v Bayside CC* matter.

- The AAAC Guideline does not consider the range of other factors that can affect noise impact. In the *Meriden School v Pedavoli* matter, for example, the Land and Environment Court's consideration of the other factors led to a finding that the noise from children playing was not offensive even though the AAAC noise goals were exceeded by 8 dB (i.e. noise levels from play were 13 dB above the background level).
- The conservative nature of the guideline targets has also been identified by VCAT (Refer *Basic Element Pty Ltd v Hobsons Bay*).

D6.3 Revised approach

Based on the above considerations, the noise goals presented in the AAAC Guidelines are primarily referenced as a means of providing contextual information about predicted noise impacts relative to existing conditions and to inform the design of noise control treatments. This assessment:

- Assesses noise from children playing in terms of the average noise level (L_{Aeq}) at nearby receptors, and
- Compares these levels to the underlying background noise levels (L_{A90}).

In particular, the assessment has considered the predicted impacts with respect to a 10 dB margin above background noise levels.

However, consistent with the outcomes of key VCAT decisions, comparisons based on the 10 dB margin do not constitute a definitive assessment of acceptability in isolation of other considerations. Instead, the comparison contributes to an overall assessment based on the range of factors identified above.

D7 Industrial Waste Collection

EPA Victoria Publication 1254.2, *Noise Control Guidelines* (EPA Publication 1254) 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.

EPA Publication 1254 recommends that collections should be restricted to the following times:

<u>One collection per week</u>

6:30am-8pm Monday to Saturday

9am-8pm Sunday and Public Holidays

<u>Two or more collections per week</u>

7am-8pm Monday to Saturday

9am-8pm Sunday and Public Holidays.

D8 Deliveries

The EPA Publication 1254 also states the following concerning store deliveries:

> *Where a residential area will be impacted by noise from deliveries, the deliveries should be inaudible in a habitable room of any residential premises (regardless of whether any door or window giving access to the room is open) outside the hours contained in the schedule*
>
> *Schedule: Deliveries to shops, supermarkets & service stations*
>
> *7am-10pm Monday to Saturday*
>
> *9am-10pm Sunday and Public Holidays.*

D9 Reversing alarms

EPA Victoria Publication 1890 *Managing noise from reversing alarms* includes example controls to help eliminate or reduce off site impacts from reversing alarm noise, as reproduced in Table 19.

Table 19: Publication 1890 control options

Control option
Design your site access and vehicle thoroughfares to minimise vehicles reversing.
Remove or reduce the need to reverse vehicles and powered mobile plant.
Modify activities to minimise the amount or duration of reversing required to perform a task while not reducing safety.
Adopt alternative types of warning devices that meet occupational health and safety (OHS) requirements and are less intrusive or disturbing for neighbours, such as: – *flashing or warning lights* – *broadband reversing alarms* – *self-adjusting (variable level) alarms* – *reversing cameras.*
Choose reversing alarms appropriate for the powered mobile plant and where they will be used. Consider differences across alarm models, such as: – *loudness (in decibels, dB)* – *directionality (related to the ability to detect where the sound is coming from)* – *urgency (related to how well the signal is heeded when it is heard).*
Minimise operating mobile powered plant outdoors for night-time operations
Use noise barriers to reduce the noise carrying to sensitive receivers.

D10 Managing truck noise

EPA Victoria Publication 1891 *Managing truck noise* provides example controls for eliminating or reducing the risk of harm from truck noise, as reproduced in Table 20.

Table 20: Publication 1891 control options

Planning and design controls
Locate site vehicle entrances away from sensitive areas, such as residences.
If trucks are likely to arrive before site opening hours, nominate a truck waiting area away from residences.
Designate a truck route to and from the site that avoids sensitive areas.
Design internal road layout and traffic flow to avoid reversing.
Locate loading docks or truck parking to take advantage of any shielding from buildings on the site.
Fit internal loading docks where necessary with fast opening roller doors.
Install solid noise barriers between truck activities and sensitive areas to reduce noise.
Operational controls
Wherever possible, plan for deliveries or collections to happen during day-time hours.
Signpost site vehicle movement requirements and, where appropriate (e.g. larger sites), consider traffic controllers to direct traffic.
Minimise diesel engine idling. While diesel motors may need to idle before use, manufacturers advise this can be limited to 3 to 5 minutes for modern engines.
Modify activities to minimise the amount or duration of reversing required to perform a task, while not reducing safety. See the Managing noise from reversing alarms guidance sheet (publication 1890).
Turn off engines when vehicles are stationary.
Turn off stationary external motors such as refrigeration units.