



MARSHALL DAY
Acoustics



SACRED HEART COLLEGE OAKLEIGH
TOWN PLANNING REPORT
Rp 002 R01 20210194 | 4 August 2021

Project: SACRED HEART COLLEGE OAKLEIGH

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Report No.: Rp 002 R01 20210194

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Document Control

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1.0 INTRODUCTION

Williams Ross Architects (WRA) has engaged Marshall Day Acoustics (MDA) to provide acoustic design advice for the proposed redevelopment of Sacred Heart College, Oakleigh.

This town planning report provides details of potential noise impacts that may arise from the proposed development and suitable mitigation measures to minimise any potential noise impacts.

The potential noise impacts discussed in this report include:

- Extension of existing school building with new rooftop mechanical plant
- Extension of staff carpark
- Waste collection and deliveries
- Redevelopment of external learning and play area

Acoustic terminology used throughout this report is detailed in Appendix A.

2.0 DOCUMENTATION REVIEWED

The documentation reviewed for this report is listed in Table 1.

Table 1: Documentation reviewed

Document Title.	Revision	Drawing No.	Date received	Author
Traffic Design Advice	-	-	2 August 2021	Traffic Works
Services Sketch Plan	-	-	28 June 2021	BRT
Town Planning Application		TP01 - TP14	2 August 2021	Williams Ross

3.0 CRITERIA, STANDARDS AND GUIDELINES

A range of guidelines and legislation is used in Victoria to assess environmental noise. This section provides an overview of the key documents and guidelines that are applicable to the proposed development.

Legislation relevant to the proposed development are detailed in Table 2.

Table 2: Relevant Victorian noise legislation

Document	Overview
Environment Protection Act 2017 (the Act), as amended by the Environment Protection Amendment Act 2018	<p>The Act provides the overarching legislative framework for the protection of the environment in Victoria. It establishes a general environmental duty to minimise the risks of harm to human health or the environment from pollution or waste, including noise, so far as reasonably practicable.</p> <p>The Act does not specify noise limit values, but prohibits the emission of unreasonable or aggravated noise from non-residential premises.</p> <p>The 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).</p> <p>Section 93 of the 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).</p>
Environment Protection Regulations 2021 (the Regulations)	<p>The objectives of the Regulations are to further the purposes of, and give effect to, the Act.</p> <p>Part 5.3 of the Regulations sets out requirements that are specific to environmental noise. It states that the prediction, measurement, assessment or analysis of noise within a noise sensitive area for the purposes of the Act or the Regulations, must be conducted in accordance with the Noise Protocol (see below).</p> <p>Division 3 of Part 5.3 stipulates requirements that are specific to commercial, industrial and trade premises. In particular, noise from these types of premises is prescribed as unreasonable if it exceeds a noise limit or alternative criterion determined in accordance with the Noise Protocol. Additional matters addressed in this Division 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.</p>
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> dated May 2021 (Noise Protocol)	<p>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.</p> <p>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.</p> <p>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.</p>

A summary of relevant guidelines referenced in Victorian noise assessments is presented in Table 3.

Table 3: Relevant Victorian guidelines

Reference	Overview
EPA Publication 1254 <i>Noise Control Guidelines</i> (EPA Guidelines)	Provides an overview of noise policies and legislation in Victoria for a range of different noise sources, and provides supplementary guidance for situations where there is not policy or legislation.

4.0 DEVELOPMENT DESCRIPTION

4.1 Site location

The site is located at 113 Warrigal Rd, Hughesdale and is bounded by:

- Residential properties directly to the west, across Latrobe St
- Residential properties directly to the north, across Kangaroo Rd
- Warrigal Road to the East
- Residential properties directly to the south

A planning map showing the land use zones around the subject site is attached in Appendix B.

The location of the new development and the most affected residential properties are shown in Figure 1.

Figure 1: Site location, new development and nearest residential properties (Source: Nearmap)



4.2 Proposed development

The proposed development includes the following:

- A 3-storey extension to the Learning and Teaching Building
- Redevelopment of landscaping adjacent to existing sports court, including outdoor learning area
- Removal of existing Learning Support building to be replaced by 8 car parks

The proposed layout showing the locations of the above is provided as Figure 2.

Figure 2: Proposed layout of internal and external areas



5.0 EXISTING NOISE ENVIRONMENT

A survey of the existing noise environment was undertaken on Monday 2 August 2021 at the entrance to the Latrobe Street carpark.

Short term noise measurements were taken with a Brüel and Kjær precision integrating sound level meter mounted at a height of 1.5m above local ground level and fitted with a wind-shield. The equipment was checked prior to and after measurements were taken and no significant calibration drift was observed.

The noise environment during the survey was dominated by noise from vehicles on Warrigal Road and noise from an outdoors gym class at the school site.

The measured noise levels are summarised in Table 4.

Table 4: Measured noise levels, dB

Location	Date	Time	Ambient noise level, L_{Aeq}	Background noise level, L_{A90}
Latrobe Street carpark entrance	2 August 2021	1030 hrs	56	49

6.0 ENVIRONMENTAL NOISE LIMITS

As of 1 July 2021, the Environmental Protection Amendment Act 2018 supersedes the Environmental Protection Amendment Act 1970. The current legislation includes new Environmental Noise Regulations (the Regulations) which stipulates requirements specific to commercial, industrial and trade premises.

In particular, noise from these premises (such as mechanical services noise from roof-mounted plant or deliveries) is prescribed as unreasonable if it exceeds a noise limit or alternative criterion determined in accordance with the *EPA Publication 1826 Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (the Noise Protocol). These new instruments replace the previous State Environmental Protection Policy (SEPP N-1) for the control of noise from commercial premises.

The Regulations discuss three different time periods - day, evening and night which are defined as follows:

- Day: 0700 to 1800 hrs, Monday – Sunday
- 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

The noise limits for each time period are based on the background noise levels and the zoning types of the surrounding area. The noise limits must be complied with at the nearest noise sensitive receiver locations, including residences and schools.

For the day period, measured background noise levels as presented in Section 5.0 have been used to derive the noise limits which is likely to represent the majority of the time that the development will be operating. The assumption of neutral background noise levels has been made in order to derive the evening and night period noise limits.

Table 5: Environmental noise limits – based on neutral background

Period	Day of week	Start time	End time	Measured background, LA90 dB	Zoning level, dB	Background relative to zoning level	Noise limit, Leff dB
Day	Monday-Sunday	0700hrs	1800hrs	49	51	High	55
Evening	Monday-Saturday	1800hrs	2200hrs	42 ¹	45	Neutral	45
	Sunday, Public holidays	0700hrs	2200hrs				
Night	Monday-Sunday	2200hrs	0700hrs	37 ¹	40	Neutral	40

¹Background noise for the evening and night periods has not been measured. Neutral backgrounds have been assumed for the purposes of the noise limit derivation. It is unlikely that mechanical plant or equipment will be operating outside of the day period.

7.0 NOISE FROM MECHANICAL SERVICES

Noise from mechanical services is required to comply with the noise limits provided in Section 6.0 at nearby noise sensitive receiver locations.

7.1 Proposed external mechanical services

Outdoor condenser units are proposed to be located on the roof as shown in Figure 3 and Figure 4.

Figure 3: Rooftop mechanical plant

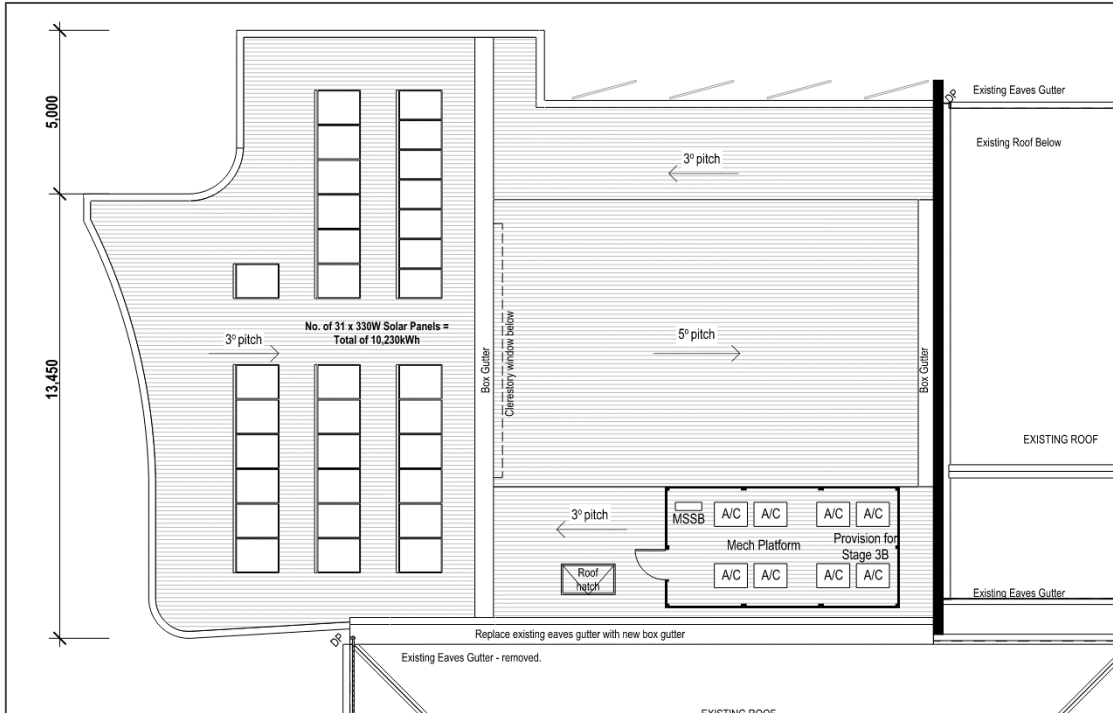
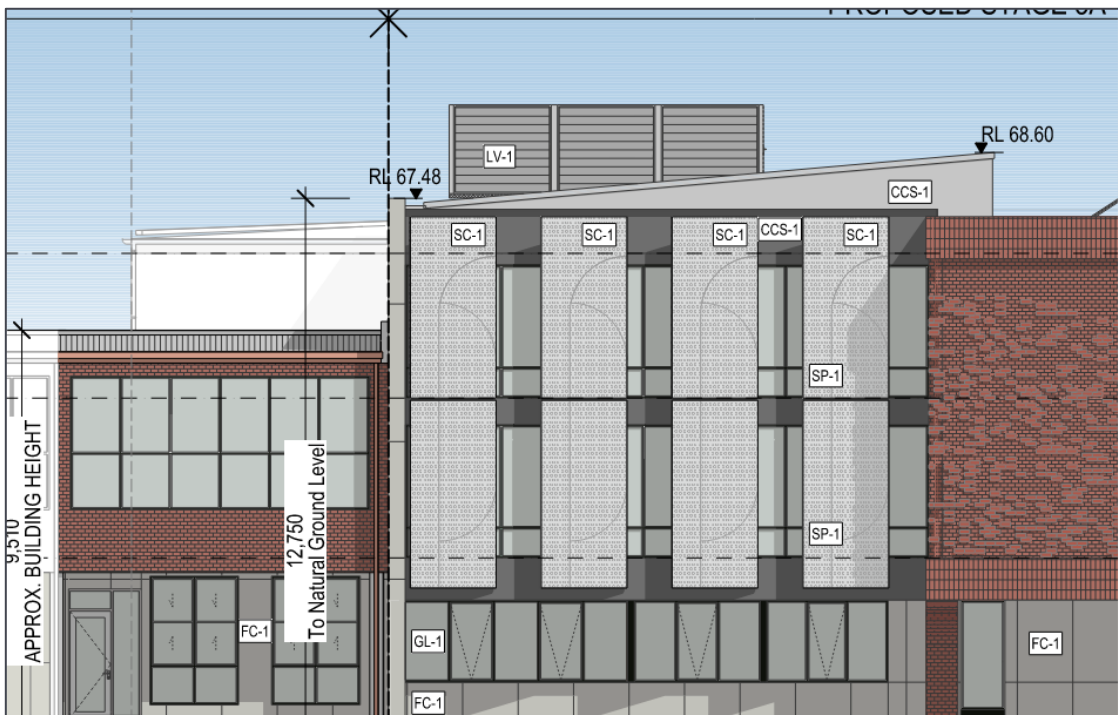


Figure 4: Rooftop mechanical plant, west elevation



Eight condensing units are proposed to be located on the roof platform. The preliminary unit selection is provided below in Table 6.

Table 6: External condenser units preliminary selection

Type	Model	Quantity	Air flow rate (L/s)	kW	Maximum sound power levels, L _{WA}
External Condenser Unit	PURY-P300YNW-A (-BS)	8	4000	33.5	87 dB

7.2 Predicted noise levels

The predicted noise levels from the roof mounted mechanical plant based on the preliminary unit selection and the provision of either a solid barrier around the plant, or an acoustic louvre around the plant, are provided and assessed in Table 7.

Table 7: Predicted noise levels, external mechanical plant

Location	Predicted Noise Level, L _{eff}	Time Period	Noise Limit, L _{eff}	Exceedance
16 Latrobe Street (south)	38	Day	55	-
		Evening	45	-
		Night	40	-
7/9 Latrobe Street (west)	39	Day	55	-
		Evening	45	-
		Night	40	-

It is predicted that the external condenser units will not exceed the applicable environmental noise limits for any time period based on the proposed unit selection, location and provision of acoustic screening.

The minimum required transmission loss for 300 mm thick acoustic louvres is provided in Table 8. Louvres must extend to the height of the units.

Table 8: Acoustic Louvre Minimum Transmission Loss, dB

Description	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Transmission loss	5	5	7	12	18	21	16

The requirements of acoustic screening including louvres and barriers can be refined as the design progresses in consultation with the mechanical engineers and finalisation of unit selection.

8.0 NOISE FROM CARPARK EXTENSION

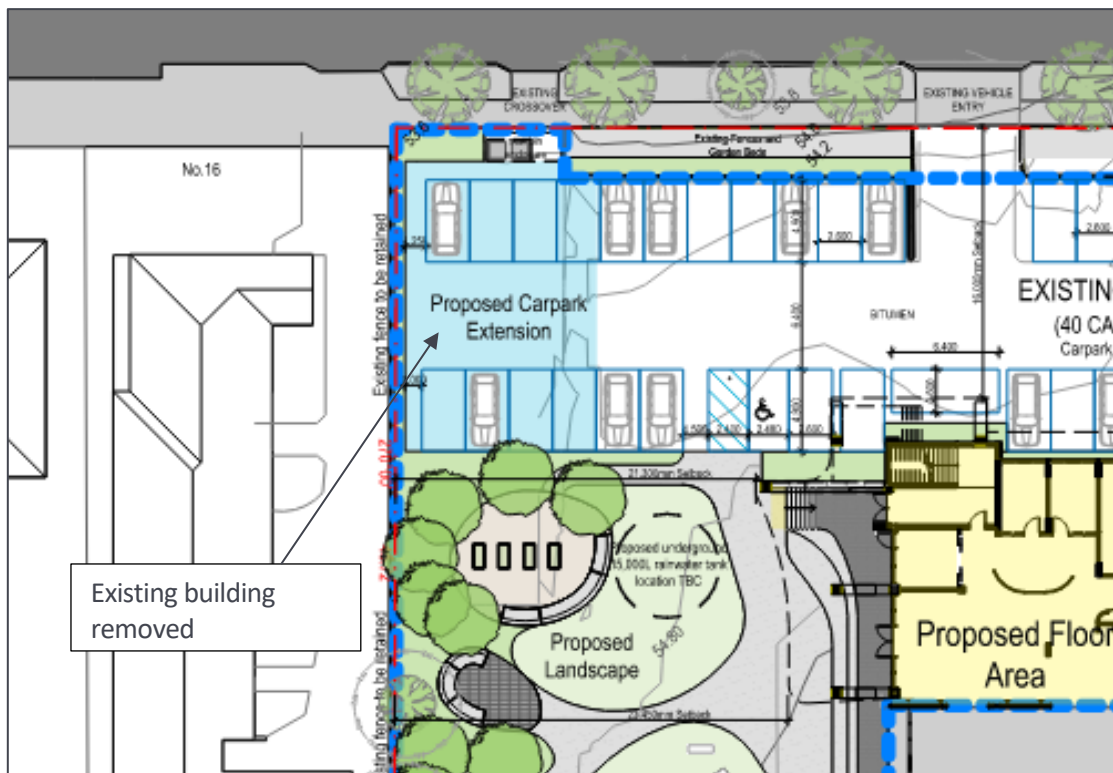
Noise from staff carparks is not assessable under the environmental noise limits. The potential risk of noise impacts from the carpark extension is discussed here in relation to the General Environmental Duty as prescribed by the Act.

The proposed redesign of the carpark maintains the existing number of car parking spaces currently provided on site as there is no intended increase to student or staff populations.

The existing Learning Diversity building at the southern boundary of the site is to be demolished with eight carpark spaces relocated to this area, abutting the adjacent residence.

The carpark extension is shown in Figure 5.

Figure 5: Proposed carpark extension



Due to the removal of the existing Learning Diversity building, which may have been providing some shielding to 16 Latrobe Street, there may be a slight difference in noise levels experienced at that location from carpark use.

However, it is not considered that this will cause any significant impact considering the following:

- The residence is already exposed to traffic noise from vehicles on Latrobe Street and Warrigal Road
- The existing 1.8m high fence at the boundary will provide some shielding to car park noise including from cars and staff members
- Staff using the car park would be reasonably expected to drive in a responsible manner
- The majority of vehicles using the carpark are expected to use the car park during day time school hours

Noise from the proposed carpark extension is unlikely to cause any notable impact to residential receiver locations across Latrobe Street to the west.

9.0 NOISE FROM DELIVERIES AND WASTE COLLECTION

Noise from on-site deliveries and waste collection must comply with the environmental noise limits provided in Section 6.0.

9.1 Deliveries

MDA has undertaken noise predictions of the noise levels due to a standard SRV (small rigid vehicle or van) delivery at the nearest residential properties on Latrobe Street.

The swept path diagram provided by Traffic Works that has been used for calculation purposes is provided as Appendix C.

Two movements (one in, one out) have been assumed to occur within a 30 minute period, equating to one delivery in total. MDA has sourced standard sound power levels for SRVs from an in-house noise source database for use in the calculations which are provided in Appendix D.

It is assumed that the delivery vehicle will travel at approximately 5km/hr whilst on site and will take approximately 1 minute to complete one entry or exit manoeuvre.

Delivery vehicle engines should be switched off when parked and not left idling.

The predicted noise levels from a standard delivery are provided in Table 9.

Table 9: Predicted noise levels, SRV delivery

Location	Predicted Noise Level, L_{eff}	Time Period	Noise Limit, L_{eff}	Exceedance
16 Latrobe Street (south)	34	Day	55	-
		Evening	45	-
		Night	40	-
7/9 Latrobe Street (west)	42	Day	55	-
		Evening	45	-
		Night	40	2 dB

A minor exceedance to the night period environmental noise limits may occur during the night period only. Therefore deliveries via the Latrobe Street carpark are recommended to occur during the daytime or evening.

9.2 Waste Collection

It is understood that collection of waste is currently operated by Council via kerbside collection on Latrobe Street. As the waste collection will not be occurring on site, compliance with the environmental noise limits provided in Section 6.0 is not required. The risk for potential noise impacts from waste collection are discussed here in relation to the General Environmental Duty as prescribed by the Act.

The proposed development does not alter the existing waste collection arrangements and the location of bins and waste collection will remain the same. Therefore there will be no additional impact caused by the development due to waste collection.

Notwithstanding the above, it is recommended that the schedules and practices detailed in EPA Publication 1254.2 *Noise Control Guidelines* be adopted for waste collection as follows:

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

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

One Collection per week

6:30 am – 8 pm Monday to Saturday

9 am – 9 pm Sunday and public holidays

Two or more collections per week

7 am – 8 pm Monday to Saturday

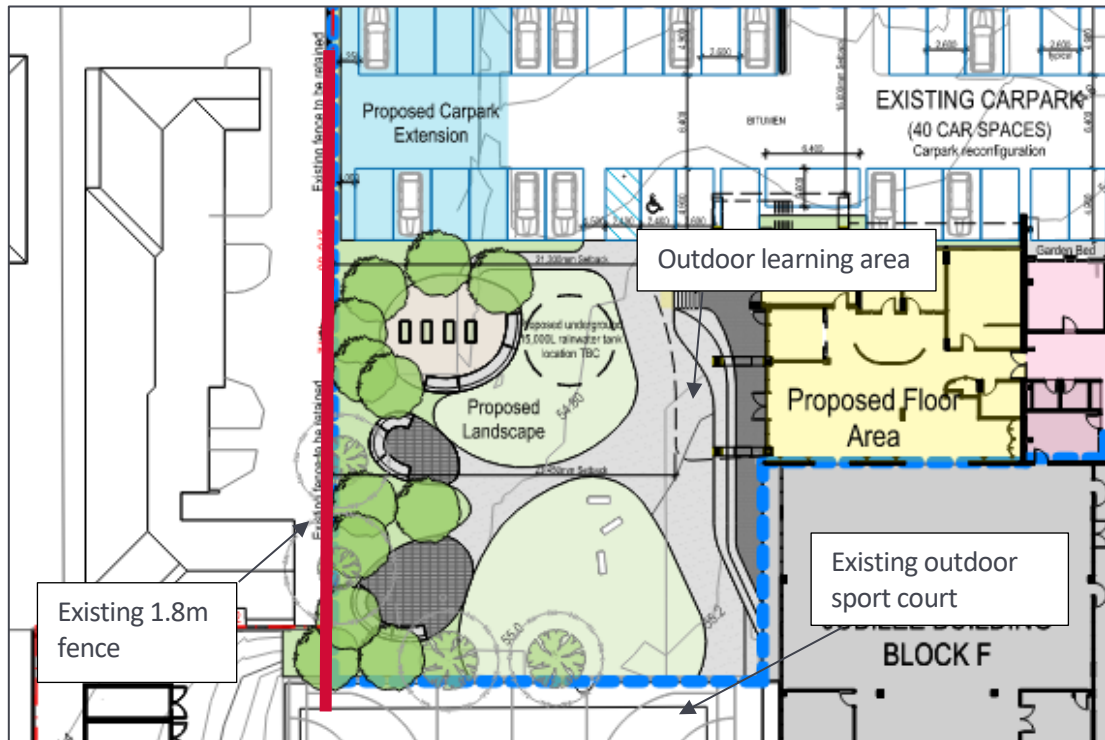
9 am – 8 pm Sunday and public holidays

10.0 NOISE FROM EXTERNAL LEARNING AND PLAY AREAS

The environmental noise limits provided in Section 6.0 are not applicable to noise from staff and students using outdoor play and learning areas. The risk for potential noise impacts from the redeveloped external play and learning areas are discussed here in relation to the General Environmental Duty as prescribed by the Act.

The external area to the east of the carpark extension is proposed to be redeveloped through varied landscaping to include seating areas and an outdoor learning area as shown in Figure 6.

Figure 6: Proposed new outdoor learning and play areas



The redevelopment of this outdoor area could potentially cause an increase in noise levels from student activities to the adjacent property, 16 Latrobe Street, compared with current conditions.

As the range of activities occurring in this area are likely to be highly varied, it is not feasible to accurately quantify the noise levels associated with it.

Nonetheless, it is considered the risk of adverse impact to the nearby noise sensitive receivers is relatively low as activities in this area are expected to occur only during school hours. Furthermore, the existing noise environment features noise from the external sport court directly adjacent the proposed redeveloped outdoor area to the east.

The existing fence to 16 Latrobe Street will also provide some shielding from noise from the outdoor area. If the fence is in poor condition (eg contain gaps or holes) then it may be required to be replaced.

The following additional noise mitigation strategies can be implemented by the school to further reduce the risk of potential impact to 16 Latrobe Street or other nearby residential receivers:

- Restriction of amplified music or use of PA systems in the outdoor area
- Relocation of noisy activities to alternative areas of the grounds that are more shielded to the neighbouring properties

- Ensure that the area is under regular teacher supervision

11.0 SUMMARY

Williams Ross Architects (WRA) has engaged Marshall Day Acoustics (MDA) to provide acoustic design advice for the proposed redevelopment of Sacred Heart College, Oakleigh.

This town planning report has presented and discussed the potential noise impacts from the development including:

- Noise from external mechanical services
- Noise from carpark extension
- Noise from deliveries and waste collection
- Noise from external learning and play areas

None of the above noise sources present significant risk to the surrounding noise sensitive receivers based on the proposed documentation.

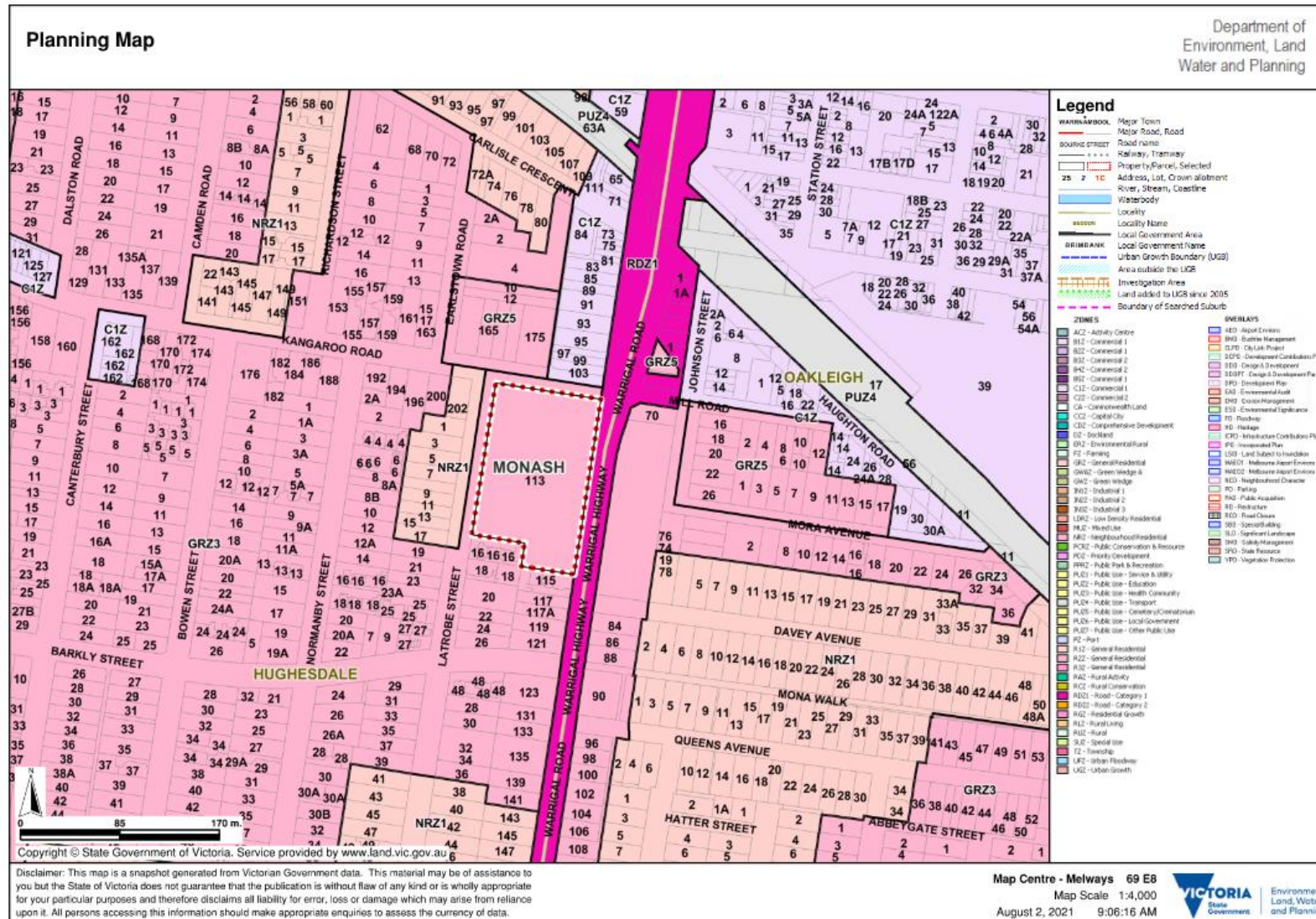
A minor exceedance to the applicable environmental noise limit may occur during SRV deliveries during the night period only. It is anticipated that deliveries will generally be made during the day or evening periods.

APPENDIX A GLOSSARY OF TERMINOLOGY

The following acoustic terminology has been used throughout this report.

dB	<u>Decibel</u> The unit of sound level.
A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
L_{Aeq}	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.
L_{A90}	The A-weighted noise level equalled or exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.
L_{Amax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
SWL or L_w	<u>Sound Power Level</u> A logarithmic ratio of the acoustic power output of a source relative to 10 ⁻¹² watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.
L_{eff}	The effective noise level of commercial or industrial noise determined in accordance with <i>State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1</i> (SEPP N-1). This is the L _{Aeq} noise level over a half-hour period, adjusted for the character of the noise. Adjustments are made for tonality, intermittency and impulsiveness.

APPENDIX B PLANNING MAP



APPENDIX D SRV SOUND POWER LEVELS

Table 10: Sound power level data, dB L_w

Source	Octave Band Centre Frequency (Hz)							A
	63	125	250	500	1000	2000	4000	
SRV	93	91	89	89	89	86	79	93