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WAVEFORM ACOUSTICS

Albert St Blackburn
T: 0402477774
info@waveformacoustics.com.au
www.waveformacoustics.com.au

Project – Ashwood Medical Centre
Date – 8.8.2024
23024

[redacted]

ACOUSTIC REPORT INFORMATION SHEET

Project
Ashwood Medical Centre Acoustics Assessment

Prepared for
[redacted]

Prepared by
Rohan Barnes from Waveform Acoustics

REVISIONS REGISTER	ISSUE DATE
Draft Acoustic Report	3.2.23
1st Acoustic Report	9.2.23
2nd Acoustic Report	8.8.24

DOCUMENT REGISTER	ISSUE DATE
Letter of engagement	16/1/23
Updated Plans	30/07/24

1.0 – EXECUTIVE SUMMARY

Waveform Acoustics has been engaged by [redacted] to provide an Acoustic Report in relation to the proposed medical facility at 31-33 High St Ashwood. In particular, demonstrating that the proposed use and level of noise generated can be appropriately contained in the venue without unreasonable impact on the residences and accommodation in close proximity.

The client has informed us the hours of operation will be:

- Monday – Friday, 08:00 – 18:00
- Saturday, 08:00 – 13:30

The site is under the Monash planning scheme, situated in a General Residential Zone, which is immediately adjacent commercial zoning to the south and west. The site is close to Warrigal Road, which has reasonably high traffic, which would contribute to elevated background noise.

The nearest Noise Sensitive Receivers (NSR) share the boundary to the north of the proposed site, with other receivers to the east, across Kennett St. As the proposed medical centre is multiple stories, positioning of plant and machinery will be important as to avoid direct line of sight to NSRs.

The facility will need to demonstrate compliance with the EPA 1826.4 noise protocol requirements during the Day, Evening and Night Periods.

Testing was conducted from 30/1/23 to 31/1/23 over the Day, Evening and Night Periods.

It is our opinion that the facility can comply with their EPA 1826.4 Noise Protocol obligations during the Day, Evening and Night Period with strict application of the recommendations contained in this report.

Best Regards,

Rohan Barnes
MAAS Principal
Consultant

2.0 – LEGISLATION AND GUIDELINES

In the preparation of the report the following legislation and guidelines were used:

EPA publication 1826.4: 'Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues' (Noise Protocol).
This publication provides a protocol for the purpose of determining noise limits for new and existing commercial, industrial and trade premises and entertainment venues as defined by the Regulations. It sets the methodology for assessing the effective noise level to determine unreasonable noise under Regulations 118, 125 and 130. The measurement procedures of this Noise Protocol are also used to determine aggravated noise under Regulations 121, 127 and 131.

Environment Protection Regulations 2021
The objectives of these Regulations are to further the purposes of, and give effect to, the Environment Protection Act 2017 by imposing obligations in relation to environmental protection in Victoria.

State Environmental Protection General Environmental Duty 2021
New environment protection laws will mean that anyone engaging in an activity posing a risk of harm to human health and the environment, from pollution or waste, must manage that risk to prevent harm as far as reasonably practicable. This general environmental duty applies to all Victorians. It means you will need to proactively assess and manage the risks of harm from your activities. Eliminating or reducing risk is important because industry activities could impact - Noise – affecting people's sleep; communication, cognition and learning; domestic or recreational activities; tranquillity and enjoyment inside and outside

3.0 – ACOUSTIC ASSESSMENT

An ARL Ngara noise logger recorded the environmental noise data calibrated prior to and after measurement. This equipment recorded background noise levels at the rear of the proposed site.

EQUIPMENT REGISTER	S/N	CALIBRATION DATE
ARL Ngara Noise Logger	878153	due 2.11.24
SV 33A Calibrator	73304	due 28.7.24

DETAILS OF TESTING

DATE & TIME	LOCATION
30/1/23, 11:15 – 31/1/23, 17:45	At the rear of the site, adjacent the nearest NSR

ATMOSPHERIC[1]

Date	Temperature (C°) min/max	Rain (mm)	Windspeeds (km/h) 9am/3pm
30/1/23	17.9/21.7	0.0	9/13
31/1/23	15.6/No data	0.0	7/13

[1] http://www.bom.gov.au/climate/dwo/202211/html/IDCJDW3033.202211.shtml

3.1 – 1826.4 NOISE PROTOCOL, cont.

PLANT AND MACHINERY

EPA 1826.4 DETERMINED LIMITS FOR MECHANICAL SERVICES

PERIOD	1826.4 ZONING LEVEL dB(A)	EXISTING LEVEL L_{A90}	DETERMINED 1826.4 NOISE LIMIT, L_{AEQ}
DAY (07:00 – 18:00)	55	54	60 (High)
EVENING (18:00 – 22:00)	48	51	54 (High)
NIGHT (22:00 – 07:00)	43	45	48 (High)

This table describes the external noise limits set in the EPA 1826.4 Noise Protocol in relation to mechanical services type noise, not music.

DETERMINED LIMITS:

Day: **60dB L_{Aeq}**

Evening: **54dB L_{Aeq}**

Night: **48dB L_{Aeq}**

Any items of plant and machinery must be chosen to be within the limits as set out above, measured at the NSR.

4.0 – SITE INSPECTION

During our visit to the venue, we inspected the current structure, nearest NSRs, and any potential factors that could be a concern regarding noise level compliance.

The existing site is 2 dwellings which will be demolished to make room for the new facility.

There is commercial zoning to the west and to the south, which would contribute to elevated background levels.

The east and northern areas however are largely residential. The nearest NSR is directly adjacent to the northern boundary of the site. It is our opinion that if compliance can be maintained at this location, compliance will be achieved at all NSR locations.

The unattended logger was set up in the backyard of the existing site, close the NSR at 7 Kennett St.

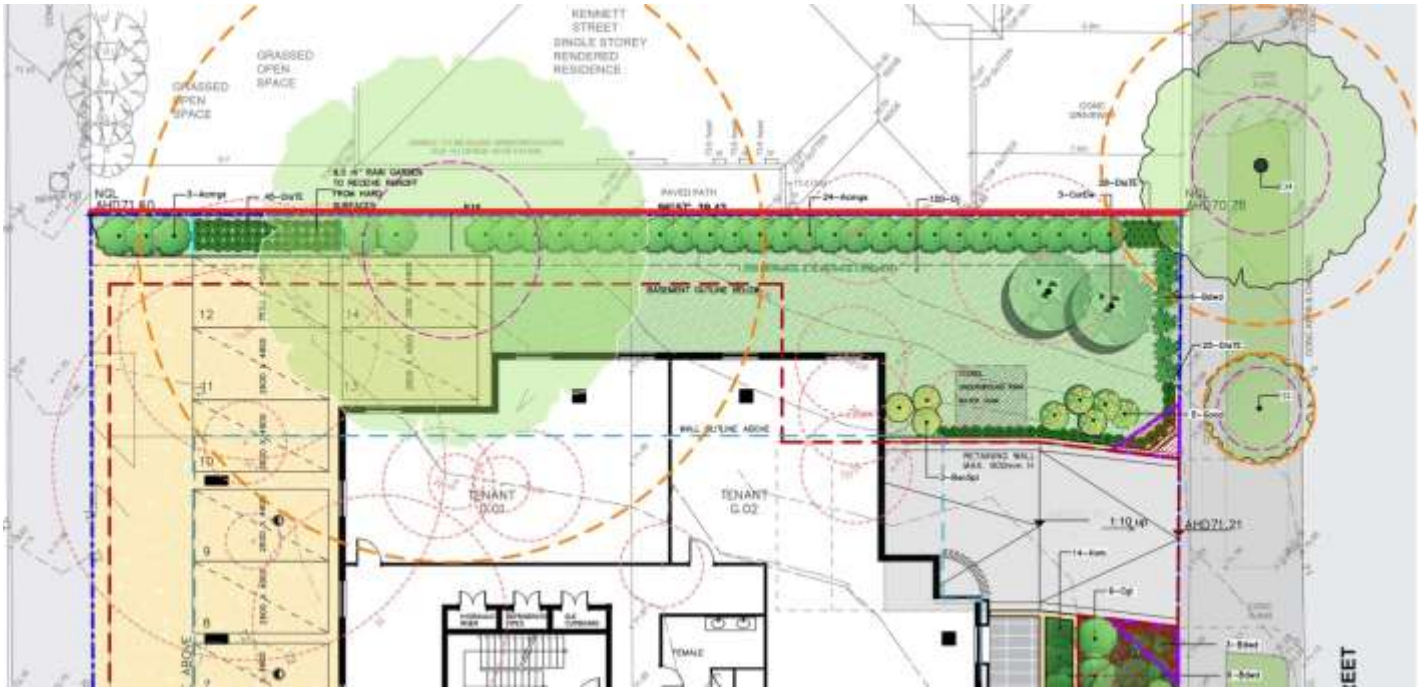
5.0 – RECOMMENDATIONS

REAR FENCE

In order to mitigate noise from cars and foot traffic, coming and going from the facility, we recommend at a minimum for the rear fence to be inspected for penetrations, and to be repaired appropriately so that there is no gaps for noise to leak through to the NSR.

It is our opinion that the recommendation above should be sufficient in mitigating noise from patrons of the clinic and the associated car noise as similar commercial tenancies in the area, with what we would expect to be comparable amounts of patron and car noise generated, have standard fencing construction. However, if noise exposure to the nearest NSR does become an issue and compliance with the determined limits cannot be met, we recommend that the existing paling fence be upgraded to an acoustic fence with the following construction:

- Height of 2.4m
- There shall be no direct line of site into the neighbouring properties outdoor entertainment areas
- The fence shall be constructed out of materials with a minimum surface density of 14kg/m^2
- Alternatively, there are a variety of propriety Acoustic Fence Systems available such as:
    - o https://www.acousticandfeaturefencing.com.au/
    - o https://leebrosfencing.com.au/
- There are to be no breaks in the acoustic fence



Fence to be inspected/upgraded highlighted red.

5.1 – RECOMMENDATIONS, cont.

SIGNAGE

Due to the proximity of the NSR to the north, we recommend signage that communicates with patrons to be respectful of the neighbourhood amenity and noise generated on the site, particularly in the northern section of the site.

PLANT AND MACHINERY POSITIONING

In order to reduce noise from any plant and machinery installed at the facility, ideally, all should be installed below a fence-line, as far as reasonably practicable from NSRs. If the plant and machinery is to be roof top mounted, line of sight should be considered, so that I cannot be viewed from ground level, meaning that the structure of the facility will act as acoustic shielding to reduce the noise associated with the operation of the plant and machinery. The type and placement of plant and equipment has not been finalized at time of writing. This should be reviewed prior to installation to determine whether a suitable acoustic barrier may be needed.

6.0 – POTENTIAL RISKS & MITIGATION

PARKING AREA

Due to the proximity to the NSR to the north at 7 Kennett St, noise generated at the medical centre may negatively impact the residents in this dwelling.

An appropriate fence line will help mitigate noise that occurs on the ground level, from cars and foot traffic, as well as signage to remind patrons of the facility to keep noise down so that the residents in the surrounding area are not negatively affected.

It is our opinion that the recommendations of the fence at the rear will be sufficient in mitigating noise associated with patron and car noise.

7.0 – SUMMARY

Based on the available environmental noise data and plans received, implementation of the measures outlined in this acoustic assessment report would be expected to minimize the noise impact on the neighboring residences from the facility and any plant and machinery.

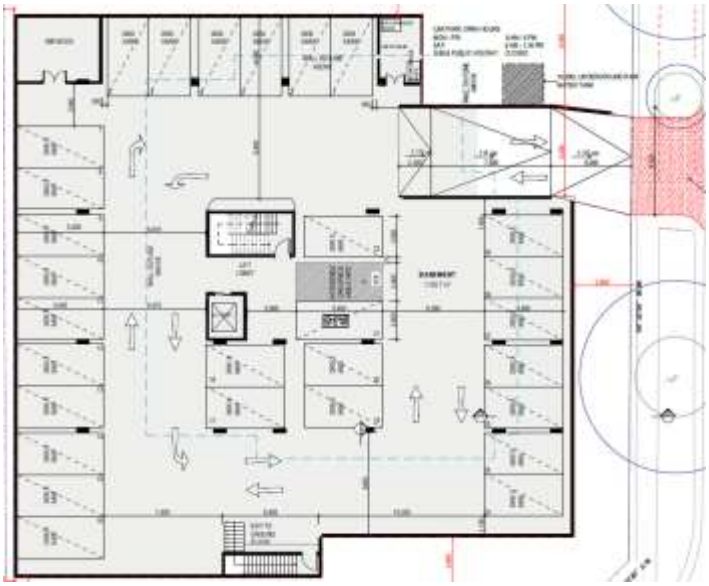
This report gives consideration to acoustic matters associated with the operation of the facility, with recommended acoustic treatments and relevant practices to maintain compliance to the EPA 1826.4 Noise Protocol.

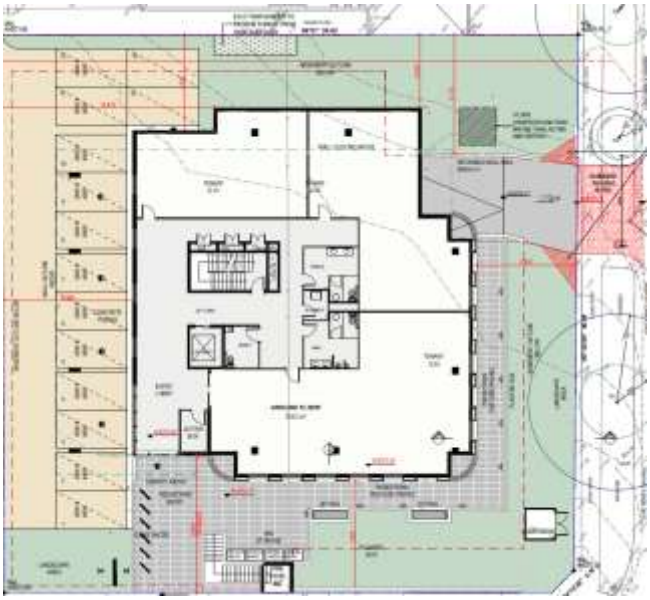
Where clarification is required or the recommended acoustic treatments may be found to impact on other services or statutory requirements, independent advice, as appropriate, is to be sought in respect to any such impact that these acoustic works may have on the building design and construction.

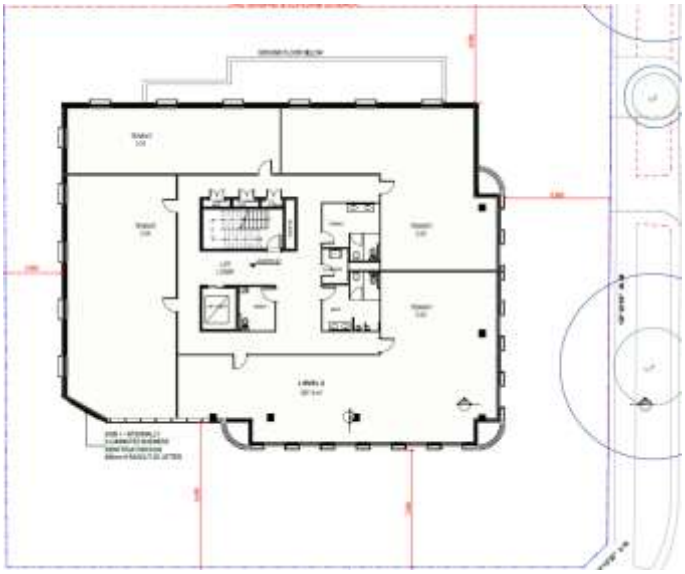
Rohan Barnes
Waveform Acoustics.

APPENDIX – SITE MAP

APPENDIX – SITE PLAN







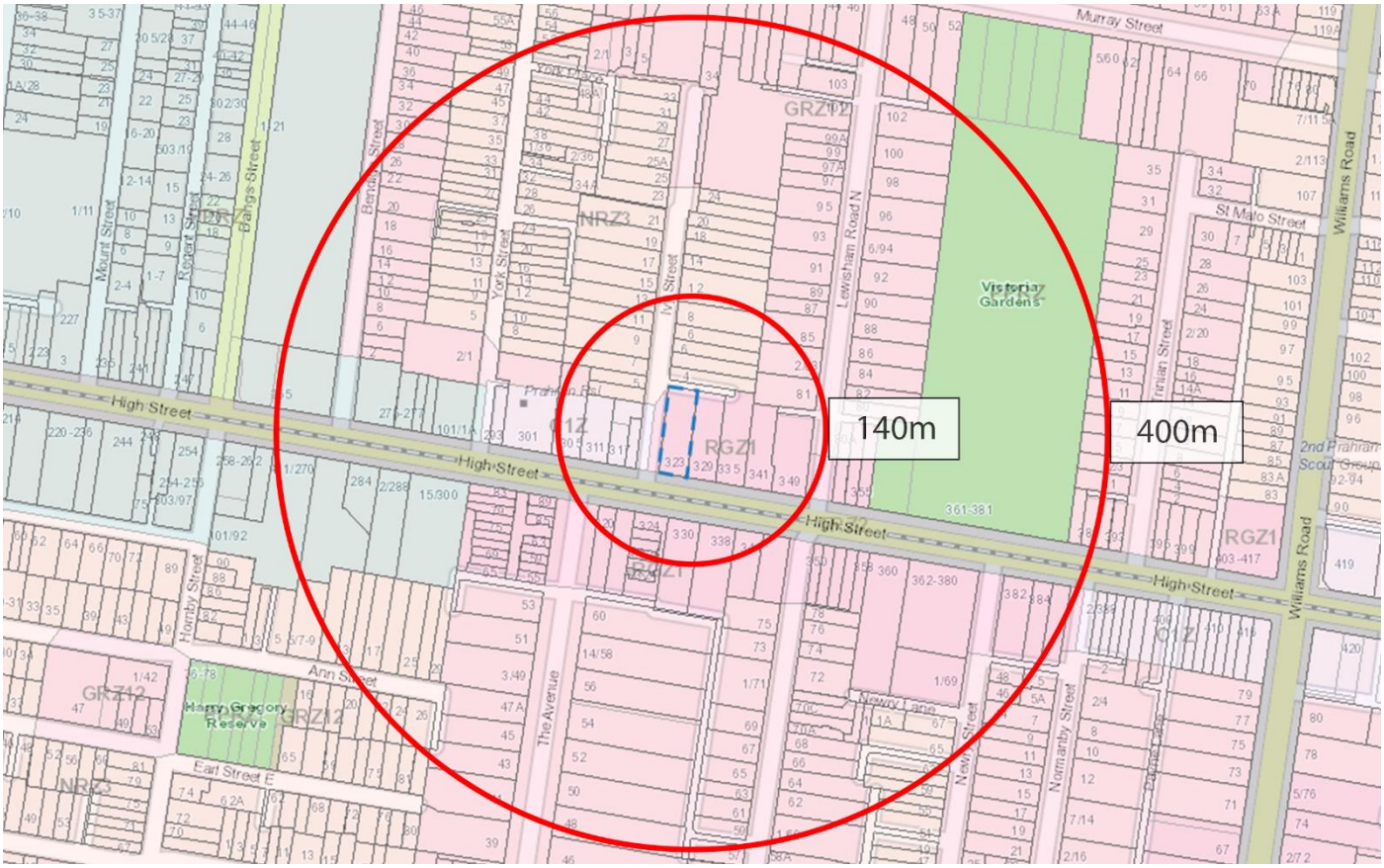
APPENDIX – SITE PHOTOS

To the west of the proposed site, is largely commercial tenancies, along Warrigal Road. There is a narrow service road between the commercial tenancies and the proposed site.

Logger positioned on site.

Proximity of the rear fence of the existing site to the NSR to the north, at 7 Kennett St. The existing paling fence is somewhat old and should be inspected and repair any penetrations at a minimum.

APPENDIX – ZONING MAP



Zoning maps are used to determine the zoning level to determine the noise limits. This zoning method is measured from the NSR and not the noise generating site.

APPENDIX – PLANNING REPORT

From www.planning.vic.gov.au at 01 February 2023 02:18 PM

PROPERTY DETAILS

Address:	**31 HIGH STREET ROAD ASHWOOD 3147**
Lot and Plan Number:	**Lot 20 LP12951**
Standard Parcel Identifier (SPI):	**20\LP12951**
Local Government Area (Council):	**MONASH**
Council Property Number:	**180324**
Planning Scheme:	**Monash**
Directory Reference:	**Melway 60 G10**

www.monash.vic.gov.au

Planning Scheme - Monash

UTILITIES

Rural Water Corporation:	**Southern Rural Water**
Melbourne Water Retailer:	**Yarra Valley Water**
Melbourne Water:	**Inside drainage boundary**
Power Distributor:	**UNITED ENERGY**

STATE ELECTORATES

Legislative Council:	**SOUTHERN METROPOLITAN**
Legislative Assembly:	**ASHWOOD**

OTHER

Registered Aboriginal Party: **Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation**

View location in VicPlan

Planning Zones

GENERAL RESIDENTIAL ZONE (GRZ) (MONASH)

GENERAL RESIDENTIAL ZONE - SCHEDULE 3 (GRZ3) (MONASH)

Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

Designated Bushfire Prone Areas

This property is not in a designated bushfire prone area.
No special bushfire construction requirements apply. Planning provisions may apply.

Where part of the property is mapped as BPA, if no part of the building envelope or footprint falls within the BPA area, the BPA construction requirements do not apply.

Note: the relevant building surveyor determines the need for compliance with the bushfire construction requirements.

Designated BPA are determined by the Minister for Planning following a detailed review process. The Building Regulations 2018, through adoption of the Building Code of Australia, apply bushfire protection standards for building works in designated BPA.

Designated BPA maps can be viewed on VicPlan at https://mapshare.vic.gov.au/vicplan/ or at the relevant local council.

Create a BPA definition plan in VicPlan to measure the BPA.

Information for lot owners building in the BPA is available at https://www.planning.vic.gov.au

Further information about the building control system and building in bushfire prone areas can be found on the Victorian Building Authority website https://www.vba.vic.gov.au. Copies of the Building Act and Building Regulations are available from http://www.legislation.vic.gov.au. For Planning Scheme Provisions in bushfire areas visit https://www.planning.vic.gov.au.

Native Vegetation

Native plants that are indigenous to the region and important for biodiversity might be present on this property. This could include trees, shrubs, herbs, grasses or aquatic plants. There are a range of regulations that may apply including need to obtain a planning permit under Clause 52.17 of the local planning scheme. For more information see Native Vegetation (Clause 52.17) with local variations in Native Vegetation (Clause 52.17) Schedule.

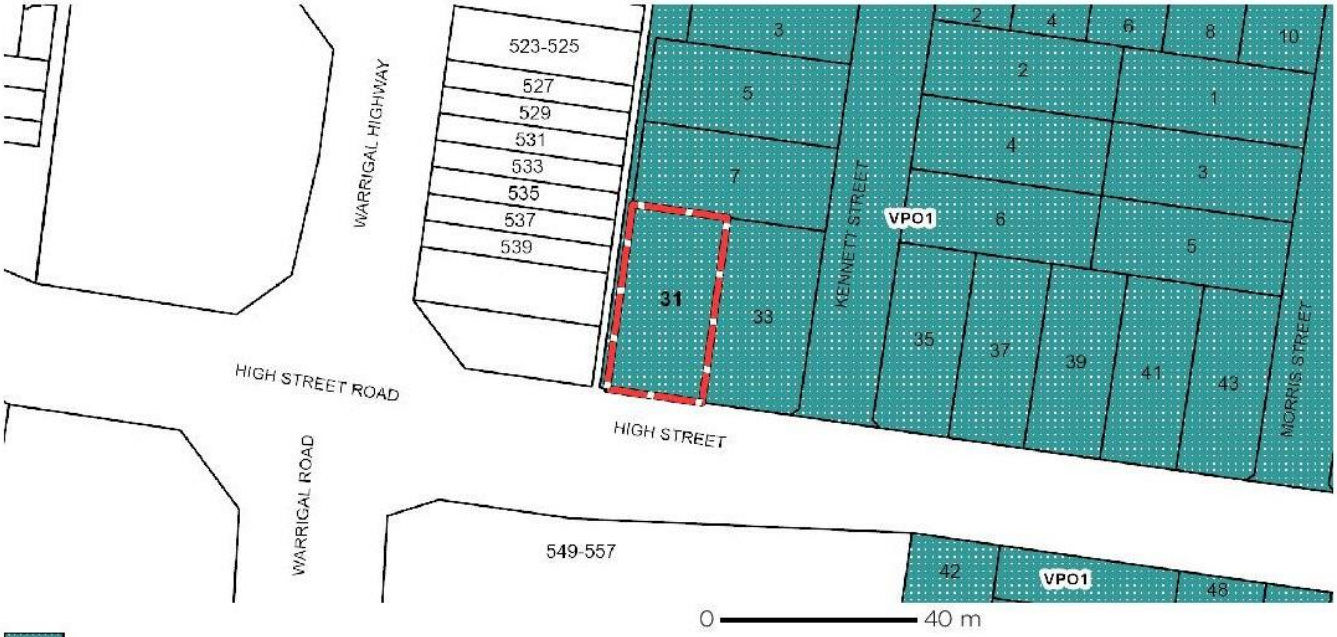
To help identify native vegetation on this property and the application of Clause 52.17 please visit the Native Vegetation Information Management system https://nvim.delwp.vic.gov.au/ and Native vegetation (environment.vic.gov.au) or please contact your relevant council.

You can find out more about the natural values on your property through NatureKit NatureKit (environment.vic.gov.au)

Planning Overlays

VEGETATION PROTECTION OVERLAY (VPO) (MONASH)

VEGETATION PROTECTION OVERLAY - SCHEDULE 1 (VPO1) (MONASH)



VPO - Vegetation Protection Overlay

Note: due to overlaps, some overlays may not be visible, and some colours may not match those in the legend

OTHER OVERLAYS

Other overlays in the vicinity not directly affecting this land

PUBLIC ACQUISITION OVERLAY (PAO) (BOROONDARA)

PAO - Public Acquisition Overlay

Note: due to overlaps, some overlays may not be visible, and some colours may not match those in the legend

APPENDIX – ASSESSING NOISE FROM COMMERCIAL, INDUSTRIAL AND TRADE PREMISES

1. Assessment location, alternative assessment location and alternative assessment criteria.

1.1 Assessment location

(56) Noise from commercial, industrial and trade premises must be assessed at a location in a noise sensitive area where the maximum effective noise level occurs or, for proposed premises, is predicted to occur.

1.2 Alternative assessment location

(57) Notwithstanding clause 56, an alternative assessment location may be specified where:
a. two or more premises contribute to the effective noise level and a measurement point is required that is not influenced by any noise source from any other commercial, industrial or trade premises;

b. atmospheric conditions affect the effective noise level at the noise sensitive area and a measurement point is required closer to the commercial, industrial or trade premises under investigation that is not affected by atmospheric conditions;

c. a measurement point in a noise sensitive area is not readily accessible and a more suitable measurement point is required; or

d. extraneous noise affects the effective noise level at the noise sensitive area and a measurement point is required at a location that is not affected by extraneous noise.

(58) The alternative assessment location must be chosen so that the noise at the alternative assessment location is representative of the noise exposure within noise sensitive areas.

(59) An alternative assessment location may be specified either within or outside a commercial, industrial or trade premises.

1.3 Alternative assessment criterion

(60) Where an alternative assessment location is used, an alternative assessment criterion must be determined for that location, for each relevant operating time period.

(61) The alternative assessment criterion must be set so that compliance with this noise level will result in the noise limit at the noise sensitive area not being exceeded, for the relevant operating time period.

(62) The alternative assessment criterion must be calculated having regard to:
a. the sound paths to the noise sensitive area and other factors which may affect the propagation of sound.

b. the character of the noise from commercial, industrial and trade premises that will be experienced in noise sensitive areas, and the value of the relevant duration or noise character adjustments as described in clauses 79 to 81 and clauses 82 to 88.

c. the cumulative contribution from other industrial, commercial or trade premises affecting noise sensitive areas, as required in Regulation 119.

d. the uncertainty of the calculation method used.

Note: The value of a specific alternative assessment criterion is determined from the relevant noise limit, the difference between the sound paths from the industry being assessed to the noise sensitive area, and the sound paths to the alternative assessment location. It may also be influenced by the character of the noise. However, to ensure that meeting an alternative assessment criterion is consistent with complying to the relevant noise limit that applies within the considered noise sensitive area, an alternative assessment criterion is not subject to the base noise limits set out in Regulation 118(2) or to the maximum value of 55 dB(A) for the night period set out in Regulation 118(3).

2. Effective noise levels

(63) The effective noise level is determined, for noise from commercial, industrial and trade premises, as a 30-minute equivalent sound pressure level LAeq,30min adjusted, where relevant for:
a. duration (A_{dur})

b. noise character i. tonality (A_{tone})

ii. impulse (A_{imp})

iii. intermittency (A_{int})

c. measurement position

i. reflection (A_{refl})

ii. indoor (A_{ind})

(64) The effective noise level is calculated using Equation 1:

ENL = L_{Aeq} + A_{dur} + A_{tone} + A_{imp} + A_{int} + A_{refl} + A_{ind} (Equation 1)

(65) For the purpose of determining the effective noise level the noise is measured using the Fast time weighting and the A-frequency weighting network.

(66) The L_{Aeq} and relevant adjustments must be applied to one decimal place.

(67) The effective noise level is rounded to the nearest decibel.

Existing premises
(68) For existing premises, the effective noise level is determined based on measurements within the noise sensitive area or at an alternative assessment location, in accordance with clauses 71 to 90.

(69) Notwithstanding clause 68 the effective noise level for existing premises can be calculated in accordance with clause 70 to facilitate the assessment of noise.

Proposed premises or proposed extensions of existing premises
(70) For proposed premises or proposed extensions of existing premises, the effective noise level must be calculated having regard to:
a. all existing noise sensitive areas or future noise sensitive areas relevant to approved developments;

b. the sound paths to the noise sensitive area and other factors which may affect the propagation of sound;

c. the character of the noise that will be experienced in noise sensitive areas, and the value of the relevant duration and noise character adjustments to apply (clauses 79 to 81 and clauses 82 to 88);

d. the cumulative contribution from existing and approved premises affecting noise sensitive areas;

e. the uncertainty of the calculation method used.

3. Measurement of noise from commercial, industrial and trade premises

3.1 Measurement point

Outdoor measurement
(71) The measurement point must be located within a noise sensitive area or at an alternative assessment location.

(72) If the measurement point is in a noise sensitive area, it must be located outdoors unless the conditions for an indoor measurement apply in accordance with clause 74.

(73) The measurement point within a noise sensitive area must be located at a point where the maximum effective noise level occurs.

Indoor measurement
(74) The measurement point must be located indoors, in a sensitive room within a noise sensitive area, when:
a. the noise (including vibration induced noise) is transmitted into the affected room through a solid wall, floor or ceiling from another part of the same building or an adjoining building; or

b. an outdoor measurement that represents noise exposure within the noise sensitive area cannot be made (neither within the noise sensitive area, nor at an alternative assessment location), even when a microphone is placed through a window opening on a boom. (75) If an indoor measurement is made in a sensitive room, all its windows and doors must be closed.

3.2 Atmospheric conditions

(76) Where the effective noise level at the noise sensitive area is likely to be affected by atmospheric conditions, an alternative assessment location located near to the commercial, industrial or trade premises must be used unless there is no appropriate alternative assessment location (refer clause 77).

(77) If an alternative assessment location is not appropriate, the effective noise level is calculated as the arithmetic average of three measurements taken on different days within a 30-day period at the noise sensitive area.

(78) The measurements in clause 77 must represent the worst-case scenario of exposure, giving regard to the operation conditions of the noise source and atmospheric conditions favourable to the propagation of sound.

3.3 Duration adjustment

(79) If noise emissions from the commercial, industrial or trade premises investigated do not occur over the whole continuous 30-minute period, the duration adjustment applies.

(80) The duration adjustment is determined from the ratio of the total time for which the source is operating over the measurement period (per cent on time) using Equation 2:

A_{dur} = 10 log10 (total time source operating / measurement period) dB (Equation 2)

(81) When determining the duration adjustment for noise that is impulsive in nature, any impulse noise emission is deemed to be audible for 10 seconds after the occurrence of the emission.

3.4 Adjustments for noise character

Tonality adjustment

(82) When the noise is tonal in character then an adjustment is made based on observations of the noise.

(83) The following adjustments apply –

a. when the tonal character of the noise is just detectable then A_{tone} = +2 dB;

b. when the tonal character of the noise is prominent then A_{tone} = +5 dB. (84) When a tone is present, but observations do not provide certainty with regards to the value to apply for the tonal adjustment, the adjustment may be determined using the objective tonal method in accordance with Annex C.

Impulse adjustment

(85) When the noise is impulsive in character the following adjustments apply:

a. when the impulsive character of the noise is just detectable then A_{imp} = +2 dB.

b. when the impulsive character of the noise is prominent then A_{imp} = +5 dB. (86) When determining the duration adjustment for noise that is impulsive in character, any impulse noise emission is deemed to be audible for 10 seconds after the occurrence of the emission.

Intermittency adjustment

(87) An intermittency adjustment applies when the noise:

a. increases in level rapidly, and by at least 5 dB, on at least two occasions during a 30-minute period; and

b. maintains the higher level for at least a one-minute duration. (88) The intermittency adjustment is determined using Table 5.

Table 5: Intermittency adjustment for noise from commercial, industrial and trade premises

Time Period	Increase in level	Adjustment
Day period	> 10 dB	+ 3 dB
Evening period or Night period	5-10 dB	+ 3 dB
	> 10 dB	+ 5 dB

3.5 Adjustments for measurement position

Reflection adjustment

(89) If the microphone position is located between 1, and 2 metres from an acoustically reflective surface, the reflection adjustment is applied by subtracting 2.5 dB from the measured noise level, so that A_{refl} = -2.5 dB.

Indoor adjustment

(90) If the measurement is conducted indoors, an indoor adjustment applies and is determined using Table 6.

Note: The intent of the indoor adjustment is to allow for the assessment of noise emissions from commercial, industry and trade premises, against the noise limits that are defined as outdoor noise levels, when an outdoor measurement would not allow for this assessment. The indoor adjustment is not meant to be used to determine or assess the effectiveness of the design response and construction of buildings affected by noise from commercial, industry and trade premises.

Table 6: Indoor adjustment for noise from commercial, industrial and trade premises

Circumstances		Adjustment
• The noise reduction performance of the building envelope is known, in octave or one third octave bands, from design specifications, calculations or measurements, and; • The frequency spectrum of the indoor noise has been measured.		Site specific adjustment based on the noise reduction performance of the building envelope (taking into account the volume and acoustic properties of the room).
• Where the noise reduction performance is unknown, the adjustment is based on the following assessment of the building envelope:	- Meets or exceeds energy efficiency requirements set out in the Building Code of Australia 2006 (BCA 2006) including sealing requirements.	+20 dB
	- Does not meet energy efficiency requirements or sealing requirements set out in the BCA 2006.	+15 dB

APPENDIX – OPERATING TIME PERIODS

From the Environmental Protection Regulations 2021:

116 Definitions—operating time periods
In this Division, in relation to noise emitted from commercial, industrial and trade premises—
day period means - Monday to Saturday (except public holidays), from 7am to 6pm
evening period means – i) Monday to Saturday, from 6pm to 10pm; and ii) Sunday and public holidays, from 7am to 10pm
night period means – 10pm to 7am the following day.

GLOSSARY OF ACOUSTIC TERMS

L_{AEQ} means the equivalent continuous A-weighted sound pressure level.

L_{A90} means the A-weighted sound pressure level which is exceeded 90% of the time interval considered.

L_{Amax} means the maximum A-weighted sound pressure level during the time interval considered.

L_{Amin} means the minimum A-weighted sound pressure level during the time interval considered.

L_{OCT10} means the 'C' weighted or linear sound pressure level for a specified octave band that is exceeded for 10% of the time.