

## **DESIGN ADVICE**

Project:	Swift Street Albury	Document No.: Da 001			
То:	Joss Construction	Date: 9 November 2023			
Attention:	Martin Reid	Cross Reference:			
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From:	Alistair Bavage	No. Pages:	1	Attachments:	No
Subject:	Response to Council Requests				

Marshall Day Acoustics Pty Ltd (MDA) has been requested to respond to the following request for additional information from Albury City Council:

5. Following the site inspection, the Panel noted an air ventilation outlet on the building located to the south-west of the proposed development. To address this concern, please provide an acoustic report and/or identify sound attenuation measures to ensure the impact on the internal amenity of future residents is adequately addressed and managed.

The ventilation outlets appear to be associated with the car park exhaust system for the adjoining shopping centre. MDA has completed a noise survey of the existing fan noise levels and also conducted background noise measurements to determine Project Noise Trigger Levels as detailed below.

Receiver	Period	Project Noise Trigger Level, LAeq, 15min, dB
Residential	Day	55
(Urban)	Evening	48
	Night	43

Table 1: Project Noise trigger level

Fan noise levels have been calculated at the facade of proposed development based on measured noise levels at the site and the documented elevations and sections detailed in the following drawings.

- Cohen Leigh Architects, Drawing No. 5.50, Site Section 7 Sheet 1, Issue F, dated 1 November 2023
- Cohen Leigh Architects, Drawing No. 5.51, Site Section 8 Sheet 2, Issue F, dated 1 November 2023
- Cohen Leigh Architects, Drawing No. 5.52, Site 3D Views Sheet 1, Issue F, dated 1 November 2023
- Cohen Leigh Architects, Drawing No. 5.53, Site 3D Views Sheet 2, Issue F, dated 1 November 2023

The calculations have included the effects of the documented parapet walls, which extend to a height in the order of 1m above the height of the ventilation outlets.

Our calculations indicate that the resultant noise levels would range from 46dB  $L_{Aeq}$  at Level 1 to 52dB  $L_{Aeq}$  at Levels 5 & 6. On this basis, the calculated noise levels indicate compliance with the Project Noise Trigger Level for the day period.

If the fans operate during the evening and night periods, the Project Noise Trigger Levels for both periods would be exceeded and further noise control measures would be required as previously advised. This could include noise control treatment or management controls in collaboration with the operators of the adjoining premises.

Anecdotally, the fans appear to operate during the day period only. Further investigation is required to confirm the current operating times.





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10 November 2023

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#### **Attention: Martin Reid**

Dear Martin

## SHOPPING CENTRE NOISE IMPACTS - PROPOSED DEVELOPMENT

This letter presents our comments and recommendations following our assessment of existing noise impacts on the proposed residential development at 481-487 Swift Street, Albury.

## **INTRODUCTION**

Joss Construction has commissioned Marshall Day Acoustics Pty Ltd (MDA) to provide acoustic design advice for the proposed residential development at 481-487 Swift Street, Albury.

The proposed development is to include basement parking and commercial tenancies and communal spaces at ground level. Six (6) levels of residential apartments and a roof terrace will be constructed above. The roof terrace will include a swimming pool.

The site is located adjacent to the Albury Central/Myer Centrepoint shopping centre. MDA has been requested to assess noise impacts from existing plant and operations at the shopping centre on the proposed development.

## SITE DESCRIPTION

The proposed development site is located at 481-487 Swift Street, Albury and is bounded by the shopping centre to the south, the shopping centre carpark to the east and Arnold's Lane and commercial premises to the west. Arnold's Lane provides access to the Woolworths loading dock to the south-west. Swift Street is located to the north, with a licensed premises further to the north.



#### Figure 1: Site and surrounds





Mechanical services plant associated with the shopping centre carpark is located in close proximity to the site and noise levels are clearly audible. This includes the following:

1. Carpark exhaust fan adjacent to the south-east corner of the site

Figure 2: Carpark exhaust fan south-east of site



It was noted that the fan flaps/covers were only 50% open during operation of the fan.

2. Carpark exhaust fan adjacent to south-west corner of the site

Figure 3: Carpark exhaust fan south-west of site



Significant noise was apparent from the high-level louvre. A second louvre is located on the rear of the riser.



3. Plantroom louvre above shopping centre loading dock

#### Figure 4: Plantroom louvre



Significant noise was apparent from the louvre above the loading dock, which appeared to be associated with carpark exhaust. When the carpark exhaust was not operating, noise from compressors and chillers was noted.

4. Roof mounted chillers or refrigeration plant above loading dock

The roof mounted plant appears to consist of chillers or refrigeration condensers, possible surrounded by air-conditioning condensers.



Figure 5: Roof mounted chillers/refrigeration plant



The plant is screened from the proposed development site by an existing barrier of unknown construction.

#### Figure 6: Roof plant barrier



Noise from the roof mounted plant was not apparent at the site, due to the influence of the carpark exhaust fans. It is likely that this plant will contribute to the ambient noise level at the proposed development site, particularly at higher elevation where the barrier will become less effective.

The supermarket loading dock is accessed from Arnold's Lane. It is understood that trucks reverse along the lane from Swift Street to access the loading dock. Further investigation would be required to determine the time and frequency of truck movements.

It was noted during our site visits that the carpark exhaust fans did not operate during the evening period. Further measurements would be required to confirm the actual operating times.

Roof mounted plant as well as compressors and chillers above the loading dock appeared to be operating at all times.

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## NOISE MEASUREMENTS

MDA visited the site to inspect the site and undertake noise levels measurements at the following times:

- 19 October 2023 ; 1630-1800hrs
- 19 October 2023 ; 2000-2300hrs
- 20 October 2023; 0800-0830hrs

The measured noise levels are detailed in the following sections.

#### **Traffic noise measurements**

Traffic noise level measurements were conducted at the northern site boundary to assess the noise impact from traffic movements. The measurement results are presented in Table 1.

#### Table 1: Traffic noise measurements

			Octave Band Centre Frequency (Hz)					
Description	Α	63	125	250	500	1000	2000	4000
19 October 2023 ; 2000-2015hrs								
Average, dB L <sub>eq</sub>	56	61	57	53	50	52	50	41
Maximum, dB L <sub>max</sub>	69	71	58	58	49	50	48	39
20 October 2023 ; 0800-0815hrs								
Average, dB L <sub>eq</sub>	62	64	61	59	54	57	55	51
Maximum, dB L <sub>max</sub>	77	73	77	69	68	69	62	57

Noise levels at the site predominantly consist of noise from cars, trucks and buses passing the site.

## **Background noise measurements**

Attended noise measurements indicated that background noise levels were typically in the order of 51dB  $L_{A90}$  during the day period and 44dB  $L_{A90}$  during the evening.

A noise logger was installed at the northern facade of the existing residential dwellings on the site to measure background noise levels between 1800hrs on 19 October 2023 and 0830hrs on 20 October 2023.

The lowest measured background noise level during each time period was as follows:

- Day: 50dB L<sub>A90</sub>
- Evening: 45dB L<sub>A90</sub>
- Night: 39dB LA90

To meet the monitoring requirements of the relevant noise policy, further long term noise logging will be undertaken at a later stage to confirm the measured background noise levels. However, the above measurements were conducted during ideal weather conditions and are expected to be an accurate representation of the background noise environment at the site.

## Plant noise measurements

Plant noise level measurements were conducted at a number of positions around the site between 1630-1800hrs and 2000-2300hrs on 19 October 2023.

The measurement positions and measured noise levels are detailed in Figure 7. All measurements were conducted at ground level.



#### Figure 7: Plant noise level measurements





## **ROAD NOISE POLICY**

The RNP provides noise level criteria for increased traffic flow as a result of a land-use development with the potential to create additional traffic, as detailed in Table 2.

#### Table 2: Road traffic noise assessment criteria for residential land uses

Type of development	Day (0700-2200 hrs)	Night (2200-0700 hrs)
Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	60 dB L <sub>Aeq, 15 hr</sub> (external)	55 dB L <sub>Aeq, 9 hr</sub> (external)
Existing residences affected by additional traffic on existing local roads generated by land use developments	55 dB L <sub>Aeq, 1 hr</sub> (external)	50 dB L <sub>Aeq, 1 hr</sub> (external)

Additionally, the RNP requires that the relative increase in noise levels at residential receivers not exceed 12 dB for land use developments with the potential to generate additional traffic on existing freeways, arterial or sub-arterial roads. The relative increase criterion does not apply for local roads.

The RNP notes that in assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

Where night-time construction traffic is likely to occur, an assessment of sleep disturbance is appropriate. The RNP provides guidance:

- Maximum internal noise levels below 50–55 dB LAmax are unlikely to awaken people from sleep
- One or two noise events per night, with maximum internal noise levels of 65–70 dB L<sub>Amax</sub>, are not likely to affect health and wellbeing significantly.

Based on the accepted assumption that an open window provides 10 dB attenuation, noise levels below 60-65 dB L<sub>Amax</sub> outside an open bedroom window would be unlikely to cause awakening reactions.

Furthermore, one or two events with a noise level of 75-80 dB L<sub>Amax</sub> outside an open bedroom window would be unlikely to affect health and well-being significantly.

In addition to the above, internal noise level criteria for the apartments would be determined in accordance with Australian/New Zealand Standard AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* as follows.

Area	Recommended internal noise level, LAeq
Living areas	35-45
Sleeping areas	35-40
Work areas	35-45
Apartment common areas (eg, lobbies)	45-50

Table 3: AS2107 recommended internal noise levels (major roads), dB

AS 2107 does not specify the measurement procedure to determine whether compliance has been achieved but does state the following:

In situations where traffic (or other) noise levels may vary widely over a 24-hour period, measurements to assess compliance with this Standard should be taken at the relevant time according to the area of occupancy or activity in the building.



Given the above, it could be argued that compliance measurements for bedrooms should be made during the period between 2200-0700 hours (commonly referred to as the night period), although this does not allow for those occupants who may be shift workers or such like that may have a requirement to sleep during the day. For living and dining rooms, the compliance measurement should be made during the day and evening time periods of 0700-2200 hours (commonly referred to as the day/evening period).

AS2107 does not specify noise measurement/assessment duration. It is recommended that compliance generally be assessed based on the typical worst-case 15-minute  $L_{Aeq}$  noise level throughout the relevant time period (e.g. night-time for bedrooms).

## **ENVIRONMENTAL NOISE LIMITS**

In NSW, the Environmental Protection Authority's Noise Protocol for Industry (NPfI) is the guideline for assessing noise emissions from industrial facilities and other developments with noise sources that may be considered industrial in nature. The NPfI sets out a procedure where an industrial facility can be assessed against a series of noise levels. Project specific noise levels are derived from an analysis of the ambient noise environment and zoning information.

The ambient noise levels measured at the site are summarised in Table 4 below. The background noise levels shown in Table 4 are representative of the lowest measured noise levels within each assessment period.

Period	Time	Background Level (LA90, 15 min, dB)	Ambient Level (L <sub>Aeq, 15 min</sub> , dB)
Day	0700–1800hrs	50	55
Evening	1800-2200hrs	45	50
Night	2200-0700hrs	39	44

#### Table 4: NPfI Time Periods and Measured Background Noise Levels

It is noted that while the duration of this survey does not technically meet the monitoring requirements of the NPfI, the measured noise levels have been provided to estimate the noise limits that will be applicable at the residential development. Further noise monitoring of a longer duration (i.e., one week free of adverse weather) will be undertaken at a later stage to meet the requirements of the NPfI.

An NPfI assessment requires the derivation of two Project Noise Trigger Levels - one from an Intrusiveness assessment and another from an Amenity assessment.

## **Intrusive Noise Level**

The intrusiveness noise assessment is applicable to residential receivers and is based on knowledge of the background noise level at the receiver location. The intrusiveness level is the background noise level at the nearest noise sensitive location plus 5 dB. Therefore, the noise emissions from the premises are considered to be intrusive if the A-weighted source noise level ( $L_{Aeq}$ , 15min) is greater than the background noise level ( $L_{Aeq}$ ) plus 5 dB.

Based upon the data for summarised in Table 4, an estimate of the likely worst-case Intrusiveness Noise Levels has been calculated in accordance with the NPfI and are presented in Table 5.

Period	Background Level, L <sub>A90, 15min</sub> dB	Intrusiveness Noise Level (Background + 5 dB), L <sub>Aeq, 15 min</sub> dB
Day	50	55
Evening	45	50
Night	39	44

## Table 5: Estimated Intrusiveness Noise level

## **Amenity Noise Levels**

Project amenity noise trigger levels are designed to prevent industrial noise continually increasing above an acceptable level over time with the expansion of infrastructure and development. The initial stage in determining the Amenity level is to correct the acceptable noise levels set for the appropriate amenity area with the baseline noise monitoring.

A review of the site zoning context indicates that the development would be categorised as Urban residential. Modification of the recommended amenity noise levels is undertaken to account for the standardisation of the assessment time periods (as detailed in Section 2.2 of the NPfI) as well as to account for other industrial noise sources in the area. Resultant levels and the relevant modifications are shown in Table 6.

#### Table 6: Derived Amenity noise level

Receiver	Period	Recommended Amenity Noise Level L <sub>Aeq, Period</sub> dB	Modified Amenity Noise Level L <sub>Aeq</sub> , 15min dB
Residential	Day	60	58 (60-5+3)
(Urban)	Evening	50	48 (50-5+3)
	Night	45	43 (45-5+3)

Source: Table 2.2 NSW Noise Policy for Industry

## **Project Noise Trigger Levels**

The final process in determining the operational noise limits for the development is to derive the Project Noise Trigger Levels. The Project Noise Trigger Levels are levels that, if exceeded, would indicate a potential noise impact on the community, and so 'trigger' a management response; for example, further investigation of mitigation measures.

The Project Noise Trigger Levels are derived by selecting the more stringent of either the Intrusiveness or Amenity noise levels. The Project Noise Trigger Levels applicable to the Subject site are shown in Table 7.

Receiver	Period	Project Noise Trigger Level, LAeq, 15min, dB
Residential	Day	55
(Urban)	Evening	48
	Night	43

 Table 7: Project Noise trigger level

The NPfI Project Trigger Noise Levels are applicable at the property boundary of the nearest affected receivers.

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## NOISE IMPACT ASSESSMENT

Based on the measured noise levels at the site and the applicable noise level criteria, we present the following noise impact assessment for the proposed development.

## **Traffic noise**

It is expected that traffic noise can achieve the applicable internal noise level criteria within apartments with conventional and readily available glazing systems.

## Loading dock

Further detailed assessment of noise impacts from trucks accessing the loading dock will be required. However, it is expected that noise impacts can be addressed with appropriate glazing selections.

#### Supermarket carpark

Further detailed assessment of noise impacts from the supermarket carpark will be required. However, it is expected that noise impacts can be addressed with appropriate glazing selections.

## **Mechanical services plant**

Site noise measurements indicate that existing mechanical services plant, particularly the carpark exhaust fans, significantly exceed the applicable environmental noise limits during all time periods.

The level of exceedance during the day period is in the order of 5dB above the applicable noise limit at the existing residential buildings on the site.

The level of exceedance during the evening and night periods would be 12dB and 17dB respectively, however our observations at site indicate that that the carpark exhaust fans may not operate during the evening and night periods.

Further assessment is required to determine the operating times of the carpark exhaust fans.

Noise from the carpark exhaust fans and roof mounted plant above the loading dock is expected to be higher with increased elevation as the existing and future barrier become less effective. It is also noted that the proposed development will be located in closer proximity to the boundary and noise sources.

## NOISE CONTROL TREATMENT MEASURES

A number of noise control treatment measures could be implemented to enable compliance with the applicable noise limits at the proposed apartments.

## Localised screening within design of development

Localised screening could be included within the design of the proposed development. This may include the provision of a parapet wall that would screen the south-west carpark exhaust fan as indicated in Figure 8.



#### Figure 8: Localised screening



Our preliminary calculations indicate that the parapet would need to be at least 1m higher than the carpark exhaust louvre and include sound absorptive treatment. A higher parapet would provide further benefit.

A similar barrier arrangement would be required to the south-east carpark exhaust fans.

The above treatments assume that the carpark exhaust fans will not operate during the evening and night periods. Our calculations indicate that compliance with the evening and night limits is unlikely to be achieved with localised screening alone.

Further detailed modelling could be undertaken to confirm the above. Careful design of balcony balustrades may enable noise limits to be achieve on the balconies. Inclusion of appropriate glazing would also assist with maintaining appropriate internal amenity within apartments, however it must be noted that the environmental noise limits apply externally.

#### Acoustic treatment of noise sources

It is expected that suitable noise control treatment measures could be applied to the existing mechanical services plant, in collaboration with the operators of the shopping centre, to enable compliance with the environmental noise limits. This may include a combination of the following:

- Ensuring that plant operation is limited or restricted during evening and night periods.
- Investigation of the condition of existing plant and rebalancing or replacement with quieter selections.
- Relocating or decommissioning unrequired fans. It is noted that the south-west carpark exhaust fan is only servicing a small portion of the carpark. It may be practicable to decommission this fan with appropriate treatment and refurbishment or increased capacity of other fans in the system.
- Localised acoustic treatment such as internally lined elbows or silencers to carpark exhaust fans. Installation of an acoustic louvre to the plantroom above the loading dock may also be considered.
- Roof mounted chillers or condenser units may also require localised treatment such as silencers, increased barriers or acoustic enclosures.



We trust that the above meets your requirements at this me. Please feel free to contact us if you have any queries.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD

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Alistair Bavage Senior Associate