HERRING STORER ACOUSTICS

EDGE VISIONARY LIVING

MULTI-RESIDENTIAL DEVELOPMENT
CANNING BEACH PROMENADE
APPLECROSS

DEVELOPMENT APPLICATION
ACOUSTIC REPORT

JUNE 2019

OUR REFERENCE: 24419-3-19119

DOCUMENT CONTROL PAGE

DA ACOUSTIC REPORT

MULTI-RESIDENTIAL DEVELOPMENT; APPLECROSS

Job No: 19119

Document Reference : 24419-3-19119

FOR

EDGE VISIONARY LIVING

DOCUMENT INFORMATION			
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Date of Issue :	06 June 2019		

REVISION HISTORY

Revision	Description	Date	Author	Checked
1	For Clients Comments	14/06/19	TR	PLD
2	For Clients Comments	24/06/19	TR	PLD

DOCUMENT DISTRIBUTION

Copy No.	Version No.	Destination	Hard Copy	Electronic Copy
1	1	Edge Visionary Living Attn: Lincoln Jones Email: lincoln@edgevl.com.au		✓
1	2	Edge Visionary Living Attn: Lincoln Jones Email: lincoln@edgevl.com.au		✓
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Herring Storer Acoustics

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EXECUTIVE SUMMARY

As part of the Development Application, Herring Storer Acoustics has undertaken a review / preliminary assessment of the acoustic aspects of the proposed development.

The review shows that there are no areas of concern and we believe that the development can easily comply with all the acoustical requirements. These being :

- Part F5 of the NCC;
- State Planning Policy 5.4; and
- Environmental Protection (Noise) Regulations 1997.

With regards to each of the acoustic aspects / requirements, the following summarises our findings:

ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

Food & Beverage

A preliminary assessment of noise emissions from the development has been undertaken of noise that would be received at the neighbouring premises. Noise modelling indicates that noise received at the neighbouring residences from patrons within the ground floor food and beverage tenancies would be 33 dB(A) at the worst case location, which easily complies with the Regulatory criteria at all times.

It is noted that background music associated with these food and beverage tenancies would also achieve compliance with the Regulatory criteria. The modelling indicates that noise received at the neighbouring residences from music associated with the ground floor food and beverage tenancies would be 32 dB(A) at the worst case location, which also easily complies with the Regulatory criteria at all times.

Men’s Shed / Makers Space

It is noted that the men’s shed and the makers space will contain power tools and other equipment that generates reasonably high noise levels. However, the building will be designed (i.e with airlocks and appropriate acoustic treatment) to ensure that the building construction can contain the noise generated within these spaces. Thus, compliance with the Regulatory requirements would easily be achieved. To ensure compliance, a full assessment will be undertaken once equipment requirements within these spaces has been confirmed.

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Mechanical Services

As part of the design, full assessment of the mechanical services will be undertaken. This includes the exhaust systems (ie car park, kitchen and general exhausts) and air conditioning systems (from both the tenancies and Apartments).

For this development, we believe that compliance would be easily achieved, and any noise mitigation would be minimal.

SPP 5.4 - NOISE INGRESS

The preliminary analysis, using the worst case noise levels shows that compliance with the requirements of State Planning Policy 5.4 can easily be achieved.

During the design, a full assessment with regards to State Planning Policy 5.4 will be undertaken to ensure compliance with the acoustic criteria as outlined in the policy.

BCA PROVISIONS

During the design stages, a full assessment will be undertaken to ensure that the development complies with the requirements of Part F5 of the NCC.

1.0 INTRODUCTION

Herring Storer Acoustics was commissioned by Edge Visionary Living to conduct a preliminary assessment of the proposed Canning Beach Promenade Multi-residential development to located at 55 - 61 Canning Beach Road; and 2 and 6 Moreau Mews, Applecross for the Development Application.

The objective of the preliminary assessment was to review the proposed development and to provide commentary on the acoustic aspect and requirements for this development. As part of the acoustic review / assessment, the following was undertaken :

- Review of the design & drawings.
- Comment on the Part F5 National Construction Code (NCC) requirements relating to acoustics.
- Undertaken preliminary noise measurements relating to road traffic noise and undertake a preliminary assessment with regards to State Planning Policy 5.4.
- Undertaken a preliminary assessment with regards to noise emissions from the development to the surrounding premises for compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. This includes noise emissions from the food and beverage tenancies, proposed community spaces (such as the maker space and men's shed) and the mechanical services.

This report has been based on the Development Application drawings provided.

2.0 PROPOSED DEVELOPMENT

The proposed development site is located on the southern side of Canning Beach Road and eastern side of Moreau Mews, Applecross. The project address is 55 – 61 Canning Beach Road; and 2 & 6 Moreau Mews, Applecross.

The development is comprised of three residential towers of 15 levels each. The individual towers rest on a shared 3 level podium. The development will comprise of mixed-use development, consisting of community and commercial facilities located on the ground floor, with sleeved residential development located at the podium levels and residential development in the towers. Parking is located at ground and podium levels. In summary, the development comprises :

- Ground Floor: Consisting of community use, commercial and sleeved car-parking;
- Mezzanine, Level 01 & Level 02: Residential apartments with sleeved car-parking;
- Level 03 (podium roof-top): Residential apartments and residential amenities; and
- Tower levels 04-14: Residential apartments.

For reference, it is noted that the ground level consists of carefully curated community use and commercial facilities consisting of :

i. Commercial facilities:
    1. Day Spa, Bike Store, Medical Suites and Aging in Place service provider.
    2. Food & Beverage precinct, consisting of 5 centrally located tenancies.

ii. Community Use:
    1. Community Hub, effectively a multi-functional library facility.
    2. Maker's Space, workshop environment for craft activities.
    3. Men's Shed, workshop environment for craft activities

3.0 CRITERIA

3.1 ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

The *Environmental Protection (Noise) Regulations 1997* stipulate the allowable noise levels at any noise sensitive premises from other premises. The allowable or assigned noise levels for noise sensitive premises are determined by the calculation of an influencing factor, which is added to the baseline criteria set out in Table 1 of the Regulations. The baseline assigned noise levels are listed in Table 3.1. For commercial premises, the allowable or assigned noise levels are the same for all hours of the day. Table 3.1 also lists the assigned noise levels for commercial premises.

TABLE 3.1 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises within 15 metres of a dwelling	0700 - 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	35 + IF	45 + IF	55 + IF
Commercial Premises	All Hours	60	75	80
Industrial Premises	All hours	65	80	90

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at other premises, defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Where the above characteristics are present and cannot be practicably removed, the following adjustments are made to the measured or predicted level at other premises.

TABLE 3.2 – ADJUSTMENTS FOR ANNOYING CHARACTERISTICS

Where tonality is present	Where modulation is present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB

From the planning scheme, it is understood that the surrounding premises, apart from those premises west of Moreau Mews and north of Tweeddale Road, would be a mixed-use development. Therefore, for the purposes of determining the Influencing Factor, these premises would be considered as commercial. Thus, the influencing factor for this development would be 4 dB, based on the following :

Major Road within outer circle;
Canning Highway Highway + 2 dB

Commercial Premises within the inner circle;
25 % + 1.25 dB

Commercial Premises within the outer circle;
20 % + 1.0 dB

Total IF **+4.25 dB (round down to 4 dB)**

Hence the influencing factor would be +4 dB and the assigned noise levels would be as listed in Table 4.3.

TABLE 3.3 - ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises within 15 metres of a dwelling (highly sensitive area)	0700 - 1900 hours Monday to Saturday	49	59	69
	0900 - 1900 hours Sunday and Public Holidays	44	54	69
	1900 - 2200 hours all days	44	54	59
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	39	49	59

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.

We note that noise emissions from the premises need to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*. This not only includes noise associated with mechanical services (ie air conditioning and ventilation systems), but also noise from the commercial and community areas.

3.2 STATE PLANNING POLICY 5.4

Noise received within noise sensitive premises from external background noise (ie road traffic and other noise sources in the area) are to comply with the requirements of State Planning Policy 5.4 "Road and Rail Transport Noise and Freight Considerations in Land Use Planning" and residential premises are to be designed to attenuate ambient noise so that internal noise levels would comply with Australia Standard AS2107 "Recommended Design Sound Levels and Reverberation Times for Building Interiors". Both of the above policies/standards provide congruent internal acoustic criteria, which are :

INTERNAL
$L_{Aeq(Day)}$ of 40 dB(A) in living and work areas; and
$L_{Aeq(Night)}$ of 35 dB(A) in bedrooms.

3.3 BCA PROVISIONS

For Class 2 or 3 buildings, Part F5 of the National Construction Code (NCC), outlines the minimum acoustic isolation of apartments and in this case, the hotel rooms. The following summarises the acoustic criteria:

3.3.1 Walls

Wet to wet	$R_W + C_{tr}$ not less than 50
Living to living	$R_W + C_{tr}$ not less than 50
Wet to living	$R_W + C_{tr}$ not less than 50 plus discontinuous
Kitchens to living	$R_W + C_{tr}$ not less than 50 plus discontinuous
Apartments to corridors	R_W not less than 50
Apartments to stair wells	R_W not less than 50
Apartment to other areas	R_W not less than 50 plus discontinuous

Note: Where kitchens are part of an open living area, we consider the kitchen to be part of the living area and in these cases discontinuous construction is required. This also includes cases where kitchens are back-to-back, however, discontinuous construction is only required on one side.

3.3.2 Floors

Floors	$R_W + C_{tr}$ not less than 50
Impact Isolation	$L_{n,w}$ not more than 55 is recommended

Note: The impact isolation criteria under the BCA is an $L_{n,w}$ of not more than 62. However, as a member firm of the Association of Australasian Acoustic Consultants, (AAAC) we recommend a criteria of an $L_{n,w}$ of not more than 55 be adopted for a development of this type.

3.3.3 Service Risers

to Habitable Rooms	$R_W + C_{tr}$ not less than 40
to Non-Habitable Rooms	$R_W + C_{tr}$ not less than 25

3.3.4 Hydraulics

The above requirements also apply to storm water down pipes.

3.3.5 Doors

Door (Connecting)	R_W not less than 30.

4.0 NOISE FROM DEVELOPMENT TO NEIGHBOURING BUILDINGS

The main source of noise from the proposed development will be from mechanical services consisting of ventilation fans and air-conditioning condenser units. However, for this development, noise emissions from the alfresco areas associated with the food and beverage tenancies will also need to be considered. Noise received at neighbouring premises from these items need to comply with the assigned noise levels as determined under the *Environmental Protection (Noise) Regulations 1997*.

4.1 COMMERCIAL TENANCIES

Noise emissions from any retail tenancies, including Cafes and restaurants which would include patron noise and possibly music, needs to comply with the requirements of the environmental regulations. A full assessment of these noise emissions will be undertaken when the details of the proposed areas are known. However, from preliminary modelling and analysis undertaken, based on the alfresco areas indicated on the plans, the noise received at the worst case neighbouring premises would be 33 dB(A). At a level of 33 dB(A), noise received at the neighbouring premises would easily comply with the Regulatory criteria at all times.

It is also noted that any background music played would also be designed to achieve compliance with the Regulatory Requirements. Preliminary modelling indicates that within the alfresco area associated with the food and beverage tenancies (ie central on northern side) noise received at the neighbouring residences from background music would in the worst case be 32 dB(A), which even with the inclusion of the penalties for music, easily achieves compliance with the regulatory noise levels at all times.

It is noted that as part of the design process, a full assessment would be undertaken to ensure compliance is achieved.

4.2 MECHANICAL SERVICES

The main source of noise from the proposed development will be from mechanical services consisting of ventilation fans and air-conditioning plant and condenser units. Noise received at residence (neighbours and residence within the development) from these items need to comply with the assigned noise levels as determined under the *Environmental Protection (Noise) Regulations 1997*.

As the mechanical services could operate during the night, noise emissions from the development needs to comply with the assigned L_{A10} night period noise level of 39 dB(A) at residential premises. Potentially, noise emissions from mechanical services could be tonal, in which case an +5 dB(A) penalty for a tonal component could be applied to the resultant noise levels. Therefore, the criteria at the neighbouring residential premises would be 34 L_{A10} dB.

4.2.1 Retail (Food & Beverage)

Noise emissions associated with the retail tenancy of the project will be assessed and appropriate noise controls will be incorporated into the design to ensure compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. However, we do not believe that compliance will be difficult to achieve, given the location of the retail tenancies within the development and the separation to the apartments within the development.

Noise emissions associated with the kitchen exhaust systems and other associated mechanical services will be assessed and appropriate noise controls will be incorporated into the design to ensure compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*.

4.2.2 Community Areas (Men's Shed / Makers Space)

It is noted that the men's shed and the makers space will contain power tools and other equipment that could generate reasonably high noise levels.

Noise emissions associated with the community areas (ie men's shed and makers space) will be assessed and appropriate noise controls will be incorporated into the design to ensure compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. The building will be designed (i.e with airlocks and appropriate acoustic treatment) to ensure that the building construction can contain the noise generated within these spaces. Thus, compliance with the Regulatory requirements would easily be achieved.

4.2.3 Apartments

The air conditioning is understood to be proposed to be a VRV system with condensing units located at each level.

Once the design of the system is finalised, an acoustic assessment will be carried out of noise emissions from the mechanical plant and any noise amelioration required will be incorporated into the design to ensure compliance with the *Environmental Protection (Noise) Regulations 1997*. However, we believe that compliance would be easily achieved and any noise mitigation would be minimal, with the proposed design.

4.2.4 Car Park Exhaust Fan

Noise emissions from the carpark exhaust fan, located on the podium level, will also need to comply with the Regulatory requirements. From previous projects, we believe that with careful fan selection and the incorporation of either 1D or 2D unpodded silencers, compliance with the *Environmental Protection (Noise) Regulations 1997* is normally achieved.

An assessment of noise emissions will be carried out once equipment has been selected and submitted for approval.

4.2.5 Miscellaneous Equipment

We note from the drawings that other equipment (i.e. pool pumps, gym and men's shed are located away from the neighbouring premises Therefore, noise emissions would comply with the acoustic requirements.

5.0 NOISE INGRESS

To review the noise ingress requirements, hand held noise level measurements were recorded of road traffic noise associated with both Canning Beach Road and Canning Highway. These measurements were recorded between 8:00 and 8:30am on Wednesday 29th May 2019. From the traffic data available, this time in the morning represents the peak traffic flows. Thus, the measurements would represent the worst case noise level. The noise levels recorded are listed in Table 5.1.

TABLE 5.1 – NOISE LEVEL MEASUREMENTS

Location	Noise Level Measurements (dB(A))	
	L_{A10}	L_{Aeq}
Canning Beach Road (4m from edge of road)	60.3	57.9
Canning Highway (7m from edge of road)	74.9	72.5

The noise level parameters used in Table 6.1 are:

L_{A10} is the noise level exceeded for 10% of the time.
L_{Aeq} is the equivalent continuous noise level.

Note : The noise level recorded on Canning Beach Road also contained influence from vehicles travelling along the Kwinana Freeway.

The criteria used for noise ingress was:

Bedrooms - L_{Aeq} of 35 dB(A)
Living and work spaces - L_{Aeq} of 40 dB(A)

To determine the acoustic requirements of the development's construction, preliminary noise modelling was undertaken using the computer noise modelling programme, "SoundPlan". The results of the noise modelling showed that noise received at some facades of the development could exceed the acoustic criteria as outlined in State Planning Policy 5.4. Based on the preliminary analysis, using the worst case noise level, the acoustic rating for the glazing could be required to be up to an R_w of around 34 dB for bedrooms and 29 dB for living spaces. These ratings can be easily achieved with 10.38mm and 6.39mm laminated glass. However, to confirm the glazing / façade requirements, a full analysis and assessment, as required under State Planning Policy 5.4 will be undertaken during the design to ensure compliance with the requirements of the Policy, as outlined above, is achieved.

6.0 BCA REQUIRMENTS

The proposed development will be constructed to comply with the requirements of Part F5 of the NCC.