GABRIELS HEARNE FARRELL

Revision 0

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21st March 2023

HAMES SHARLEY
Level 3, 712 Hay St
PERTH WA 6000

Attention: Ryan Dunham

LATHLAIN PARK ZONE 1 (PERTH FOOTBALL CLUB)
DEVELOPMENT APPLICATION STAGE

COMPLIANCE WITH THE ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

Dear Ryan,

This document considers the potential environmental noise emissions from the proposed Lathlain Park Zone 1 development (Perth Football Club), at the Development Application stage. The noise emissions must comply with the Environmental Protection (Noise) Regulations 1997. Figure 1 illustrates the context of the site.

Figure 1– Site context

The Zone 1 development will be located immediately north of the existing stadium building on Goddard Street. The nearest residences are located to the west, across Goddard St.

The noise sources requiring consideration include:

- Mechanical services, including air-conditioning plant, exhaust/extract plant, refrigeration equipment, fire-pumps, etc
- Amplified music within the Main Lounge and Member's Lounge; and,
- Amplified music within the Community Space.

1. ASSIGNED LEVELS

The Environmental Protection (Noise) Regulations 1997 establish the 'Assigned Levels, which are the noise levels that must not be exceeded at the surrounding noise sensitive premises.

The following 'Assigned Levels' are applicable at the nearest residences.

Part of premises receiving noise	Time of day	Assigned Level (dB)		
		L_{A10}	L_{A1}	$L_{A\,max}$
Noise Sensitive Premises: highly sensitive area (eg within 15 metres of a house)	7 am to 7 pm Monday to Saturday	**47**	57	67
	9 am to 7 pm Sunday and public holidays	**42**	52	67
	7 pm to 10 pm all days	**42**	52	57
	10 pm to 7 am Monday to Saturday and 10 pm to 9 am on Sundays and public holidays	**37**	57	57

Table 1– Assigned Levels for the residences on Goddard St

Note – The above 'Assigned Levels' are based on an *Influencing Factor* of 2 dB, due to the presence of a sporting facility (with an associated building) within the inner circle (100 metres).

2. NOISE BREAK-OUT FROM THE MEMBER'S LOUNGE AND MAIN LOUNGE

The Member's Lounge and Main Lounge will be used for private events such as weddings in the evenings and at night. These events may include amplified music in the form of DJ entertainment or the like. In our experience of similar projects, the amplified music break-out from function spaces requires a combination of the following, in order to comply with the 'Assigned Levels':

- A building envelope construction with an appropriate level of sound reduction; and,
- Management of the volume of amplified music, particularly after 10 pm at night.

2.1 Assessment methodology

An assessment of potential amplified music break-out from the function spaces (Member's Lounge and Main Lounge). The octave-band noise break-out calculations have taken into account the following factors:

- The octave-band sound pressure level within the space (at the perimeter of the perimeter);
- The sound reduction of the building envelope elements (walls, roof/ceiling, glazing, doors, etc);
- Acoustic reflections and barrier attenuation; and,
- Attenuation of noise over distance in accordance with ISO 9613-2.

We have previously measured noise levels of between 85 and 90 dB(A) at weddings with DJ Entertainment. For the purpose of our assessment we have assumed an amplified music volume of 90 dB(A), based on the spectrum outlined in Table 2.

Frequency (Hz)	63	125	250	500	1k	2k	4k	8k	**dB(A)**
Internal music volume	92	89.3	85.5	88.2	86.7	77.5	75.3	70.4	**90**

Table 2 – Amplified Music sound pressure level at perimeter of the lounge spaces

2.2 Building envelope construction of the Member's Lounge and Main Lounge

The assessment of noise break-out has been based on the following building envelope construction for the lounge spaces:

- Roof construction – Colorbond roofing with Anticon 60 insulation held to the underside.
- Ceiling construction – Acoustically absorbent ceiling with 'barrier' performance. Options include:
  - *Option 1* – Install a layer of 13 mm plasterboard to the underside of the roof purlins (all penetrations well sealed), with 75 mm glasswool insulation over the plasterboard layer. Then suspend a perforated acoustic ceiling (NRC >0.75) such as perforated timber or seamless perforated plasterboard beneath the aforementioned plasterboard layer, with 75 mm glasswool insulation directly above the perforated ceiling; or,
  - *Option 2* – Install an acoustic Mineral Fibre Tile ceiling within the lounge spaces, with minimum R2.0 glasswool insulation over. The selected product shall achieve a minimum CAC/D_{nCw} of 39 and a minimum Noise Reduction Coefficient (NRC) of 0.7 (eg Armstrong Ultima or OWA Sinfonia Privacy).
- External walls – Minimum sound reduction of R_w 50. Concrete panel walls will comfortably achieve this requirement. In relation to lightweight external walls, a sound reduction of R_w 50 can be achieved via 9 mm fibre-cement cladding + top-hats + 92 mm studs with R2.5 glasswool insulation + 13 mm plasterboard.
- External glazing of on the east façade of the lounge spaces – Minimum sound reduction of R_w 31 (eg single 6.38 mm laminated glass).
- Fixed external glass on the south façade of the Main Lounge – Minimum sound reduction of R_w 37 (eg single 10.5 mm VLAM Hush glass).
- Bi-fold or sliding doors on the south façade of the Main Lounge – Minimum sound reduction of R_w 34 (eg single 10.5 mm VLAM Hush glass).

Note – The sound reduction values for the glazing systems stated above apply to the whole of suite performance, inclusive of glass and framing. Glass only R_w values shall not be used for the purpose of selection.

2.3 Resultant noise level at the nearest residences

Table 3 outlines the calculated noise levels at the nearest residences, based on the external doors, bi-folds, etc, being in a closed position.

Receiver location	**Calculated noise level**	**Adjusted noise level (including +10 dB penalty under Regulation 9(3)**
Goddard St residences	L_{10} 32 dB(A)	L_{10} 42 dB(A)
McCarty St residences	L_{10} 26 dB(A)	L_{10} 36 dB(A)

Table 3 – Results of noise break-out calculations (function spaces)

Given the above results, the amplified music volume within the Member's Lounge and Main Lounge must not exceed the following limits:

- Before 10 pm – 90 dB(A), when measured at the internal perimeter of the space; and,
- After 10 pm – 85 dB(A), when measured at the internal perimeter of the space.

The facility management may need to consider incorporating a noise limiter or other similar device into the AV systems to ensure these noise limits are not exceeded.

Further calculations indicate that the internal music volume would need to be limited to 65 to 70 dB(A) when the external doors of the spaces are open. At this volume the amplified music would be considered low-level background music

Although the external doors, bi-folds, and windows shall be closed when amplified music is being played within the lounge spaces, it will be acceptable for the swing doors to open momentarily as people enter and exit the internal spaces – on the basis that the short increase in noise break-out will still comply with the L_1 and L_{max} 'Assigned Levels'.

2.4 Commentary on crowd/patron noise within the lounge areas

The crowd/patron noise from within the Member's Lounge and Main Lounge is expected to comply with the 'Assigned Levels', given that:

- Crowd noise levels are generally in the order of 80 dB(A) within function spaces, which is 10 dB quieter than amplified music volume that was assessed; and,
- In our experience crowd/patron noise does not exhibit annoying characteristics, therefore no adjustment or penalty applies. Whereas the amplified music attracts a +10 dB penalty under Regulation 9(3).

3. NOISE BREAK-OUT FROM THE COMMUNITY SPACE

The Community Space will be used for a variety of activities, including workshops, training sessions, presentations, meetings, and other community activities. The space will be used during the daytime and evenings, but is not intended to be used at night after 10 pm.

The majority of activities within the Community Space are not likely to generate noise levels of concern. However, noise break-out calculations have been undertaken to the maximum permissible music volume for the Community Space, based on a standard building envelope construction.

3.1 Building envelope construction of the Community Space

The assessment of noise break-out from the Community Space has been based on the following building envelope construction:

- Roof construction – Colorbond roofing with Anticon 60 insulation held to the underside.
- Ceiling construction – Acoustically absorbent ceiling achieving a minimum Noise Reduction Coefficient (NRC) of 0.75 (eg perforated timber or perforated plasterboard with minimum 75 mm glasswool insulation over)
- External walls – Minimum sound reduction of R_w 45.
- External glazing of on the west façade of the Community Space– Minimum sound reduction of R_w 31 (eg single 6.38 mm laminated glass).
- External glazing on the east façade of the Community Space (inclusive of bi-folds doors) – Minimum sound reduction of R_w 31 (eg single 6.38 mm laminated glass).

3.2 Maximum permissible music volume within the Community Space

The noise break-out assessment indicates that any amplified music within the Community Space shall not exceed the following levels, based on the external doors, bi-folds, etc being in a closed position:

- Before 10 pm – 84 dB(A), when measured at the internal perimeter of the space; and,
- After 10 pm – 79 dB(A), when measured at the internal perimeter of the space.

As per the lounge spaces, when the external doors and windows of the Community Space are kept open, the music shall only be low-level background music (<70 dB(A)).

4. NOISE EMISSIONS FROM THE MECHANICAL SERVICES

At this early stage of the project it is not possible to assess the noise emissions from the mechanical plant given that there is currently no mechanical design or equipment selections. However, compliance will be achieved with the relevant 'Assigned Levels' by implementing common place noise control strategies, including:

- Selection of the quietest condensing units /packaged units, incorporating variable speed drives;

- Selection of quiet refrigeration units which incorporate variable speed drives to achieve lower night noise emissions;
- Selection of quiet Kitchen Exhaust Fans, or potentially selection of in-line fans with discharge attenuators if necessary;
- The ventilation louvres on the western side of the plant area (Goddard St side) to be 300 mm acoustic louvres (eg Fantech SBL1). The louvres on the eastern side of the plant area can be standard louvres.
- The fire pump shall be an Allied Pumps Enviropac system with Class 1 attenuation, or similar approved unit.

The proposed mechanical plant will be assessed prior to the lodgement for the Building Permit, in order to ensure that the selected equipment is compliant with the Environmental Protection (Noise) Regulations 1997.

If you have any queries regarding this information please call the undersigned on 9474 5966.

Regards,

Benjamin Farrell
Director M.A.A.S.

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