



ENVIRONMENTAL NOISE REPORT DEVELOPMENT APPLICATION

(REVISION 2)

ST MARK'S ANGLICAN COMMUNITY SCHOOL STAGE 2 – SPORTS PRECINCT & LEARNING HUB

29th July 2026



For

EIW ARCHITECTS

**Level 12, 109 St Georges Tce
PERTH WA 6000**

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Gabriels Hearne Farrell Pty Ltd is a Member Firm of the Association of Australasian Acoustical Consultants. The report author is a full member of the Australian Acoustical Society.

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1. INTRODUCTION

Gabriels Hearne Farrell Pty Ltd was commissioned to assess the environmental noise emissions from the proposed Stage 2 works (Sports Precinct and Learning Hub) at St Mark's Anglican Community School.

The purpose of this report is to demonstrate that the proposed development is capable of complying with the Environmental Protection (Noise) Regulations 1997, at the Development Application stage.

Note – The proposed development is not located within the trigger zone of State Planning Policy 5.4 'Road and Rail Noise'.

2. PROJECT BACKGROUND

The proposed Sports Precinct and Learning Hub will be located on the north side of the existing campus of St Mark's Anglican Community School, adjacent the existing school ovals.

The development will consist of a two-court sports hall, with eight classrooms, fitness room, and support spaces around the perimeter.

The nearest residences to the proposed Sports Precinct and Learning Hub are identified in Figure 1 below. This includes residences on Lindfield Retreat to the north, on Anson Court to the west, and on Brockwell Place to the south-west.



Figure 1 – Site context

3. NOISE LEVEL CRITERIA

The noise transmission from the Sports Precinct and Learning Hub to the nearest noise sensitive premises must comply with the Environmental Protection (Noise) Regulations 1997. The nearest noise sensitive premises are the residences identified in Figure 1 on the previous page.

3.1 Applicability of the Environmental Protection (Noise) Regulations 1997

The Sports Precinct and Learning Hub is part of an educational institution and therefore is subject to certain exemptions under the Environmental Protection (Noise) Regulations 1997.

As per Item 4 of Schedule 2 of the Environmental Protection (Noise) Regulations 1997, generally noise emissions from educational facilities are considered to be 'community noise':

4. Noise emitted as a consequence of a recreational or educational activity from premises occupied for educational purposes if the activity —
 - (a) is conducted under the control of the occupier of the premises; and
 - (b) does not include the use of mechanical equipment other than musical instruments.

As per Regulation 16(4), the 'Assigned Levels' do not apply to community noise. In summary, the general noise emissions from educational facilities (ie students talking, playing sports, etc) is not required to comply with the 'Assigned Levels'. However, the following noise sources are required to comply with the 'Assigned Levels':

- Amplified music played within the Sports Precinct and Learning Hub (irrespective of whether it is during school hours or after hours usage);
- Sporting activities within the indoor courts outside of school hours (ie courts hired out for sporting event); and,
- The mechanical services associated with the Stage 2 works.

This environmental noise assessment focusses on the above scenarios.

3.2 'Assigned Levels' for the residences on Brockwell Place

The 'Assigned Levels' for the residences on Brockwell Place are provided in Table 1 below. This is based on an *Influencing Factor* of 0 dB (only 7.3% of land-use in the 450 circle is commercial, which is not significant enough to contribute to the *Influencing Factor*).

Part of premises receiving noise	Time of day	Assigned Level (dB)		
		LA10	LA1	LA max
Noise sensitive premises: highly sensitive area	7 am to 7 pm Monday to Saturday	45	55	65
	9 am to 7 pm Sunday and public holidays	40	50	65
	7 pm to 10 pm all days	40	50	55
	10 pm to 7 am Monday to Saturday and 10 pm to 9 am on Sundays and public holidays	35	45	55

Table 1 – Assigned Levels for the residences on Brockwell Place

The statistical levels in Table 1 are defined below:

- L_{Amax} - the noise level which is not to be exceeded at any time.
- L_{A1} - the noise level which is not to be exceeded for more than 1% of the time (eg for more than 144 seconds over a 4 hour period).
- L_{A10} - the noise level which is not to be exceeded for more than 10% of the time (eg for more than 24 minutes over a 4 hour period).

Note – The ‘Assigned Levels’ for the residences on Linfield Retreat are 2 dB higher than those stated in Table 1, given that Whitfords Avenue is a Secondary Road (>6,000 vehicle per day) and is located within the 100 m circle. Furthermore, No 1 and No 3 Anson Court are located within 100 metres of Whitfords Avenue, therefore the ‘Assigned Levels’ for these residences are 2 dB higher than those stated in Table 1.

3.2 Noise Character

Regulation 7 requires that the noise emission must be ‘free’ of annoying characteristics, namely tonality (eg whining, droning), modulation (like a siren), and impulsiveness (eg thumping). Where the noise emission contains these characteristics, the following adjustments shall be made to the predicted/measured noise levels:

- *Tonality* 5 dB is added to the measured/calculated level
- *Modulation* 5 dB is added to the measured/calculated level
- *Impulsiveness* 10 dB is added to the measured/calculated level
- *Amplified music* 10 dB is added to the measured/calculated level

4. ASSESSMENT OF NOISE BREAK-OUT FROM THE SPORTS PRECINCT & LEARNING HUB

The break-out calculations have been undertaken to determine the potential noise transmission to the surrounding residences.

4.1 Basis of noise break-out calculations

The noise break-out calculations have been based on the following factors:

- Octave-band calculations have been undertaken, inclusive of the third-octave frequency range between 63 Hz and 8 kHz;
- Attenuation of noise over distance in accordance with ISO 9613-2;
- Meteorological conditions in accordance with the DWER Guidance Note (Temperature 20°C, Humidity 50%, Wind speed 4 m/s in all directions, and Pasquil Stability Class of E);
- Topography obtained from the architectural drawings and the PlanWA mapping tool; and,
- The calculations have been based on the building envelope construction outlined in Section 4.1.1.

4.1.1 *Building Envelope construction of the indoor courts space*

The noise break-out calculations have taken into account the following building envelope construction for the two-court space:

- Roof construction – Colorbond roof sheeting, with minimum 75 mm glasswool roofing blanket. The insulation is to be faced with an ‘acoustically transparent’ lining such that the roof insulation acts as a sound absorptive material (eg perforated foil, or Ultraphon, or Soundmesh G8 from Megisorber, or a fine metal mesh).
- External walls – Tilt-up concrete panel walls, minimum thickness of 150 mm.
- External fixed glazing – 6 mm laminated glass in a commercial aluminium frame.
- External ventilation louvres – Operable aluminium louvres.
- Sound absorption panels on the wall surfaces within the two-court space – Minimum 580 m² of sound absorption panels, with a minimum NRC of 0.8 (eg 25 mm Autex Quietspace Panels or the like).

4.2 Assessment of noise break-out – Sporting Activities

Whilst sporting activities within the Sports Precinct and Learning Hub are generally exempt from compliance with the 'Assigned Levels', the exemption does not apply if the area is hired out to third parties outside of school hours.

The assessment of noise break-out from the two-court space when used for sporting activities has been based on noise level measurement undertaken in a secondary school sports hall where multiple courts were being used simultaneously for basketball games, inclusive of balls bouncing, players shouting, foot-fall noise, and referee whistles. The measurement data indicates compliance for an indoor multi-court space is governed by the L_{10} noise emissions (ie the difference between the measured L_{10} , L_1 , and L_{max} levels was less than the difference between the L_{10} , L_1 , and L_{max} 'Assigned Levels'.

Table 2 below provides the octave-band sound pressure levels for sporting activities utilised in the assessment.

Frequency (Hz)	63	125	250	500	1k	2k	4k	dB(A)
Sporting activities L_{10} Sound Pressure Level	82	78	73	73	69	66	63	74

Table 2 – Sporting Activities – Sound Pressure Level at the perimeter of the space

4.2.1 Results of noise break-out assessment

The assessment has been based on all of the external operable louvres in an open position, given that the indoor court space is naturally ventilated. The results of the assessment are provided in Table 2 below:

Receiver location	Calculated noise level	Adjusted noise level (5 dB penalty due to 'Tonality')	Compliance comment
No. 20 Brockwell Place	L_{10} 34 dB(A)	L_{10} 39 dB(A)	Complies, except for the night period between 10 pm and 7 am
No. 3 Anson Court	L_{10} 31 dB(A)	L_{10} 36 dB(A)	Complies, except for the night period between 10 pm and 7 am
No. 22 Linfield Retreat	L_{10} 31 dB(A)	L_{10} 36 dB(A)	Complies at all hours

Table 3 – Calculated noise break-out – Sporting Activities

The assessment confirms that sporting activities will be compliant with the 'Assigned Levels', except during the night period between 10 pm and 7 am (9 am on Sundays and Public Holidays). It is therefore recommended that the indoor courts not be hired out for sporting activities after 10 pm at night, or prior to 7 am in the morning on Monday to Saturday, or prior to 9 am on Sundays and Public Holidays..

4.3 Assessment of noise break-out – Amplified music

It is very likely that amplified music will be occasionally played within the indoor courts, which may include:

- Occasional amplified music as part of a school assembly;
- Background music during sports activities; and,
- Amplified music for Dance and Fitness Classes (ie space hired out to a third-party).

4.3.1 Results of noise break-out assessment

For the purpose of the assessment, a music volume of 75 dB(A) has been assumed within the space, as measured at the perimeter of the indoor courts area. We have measured this level of music within children's dance classes. Again, the assessment is based on the ventilation louvres in an open position. The results of the assessment are provided in Table 4 on the following page.

Receiver location	Calculated noise level	Adjusted noise level (+10 dB penalty for music)	Compliance comment
No. 20 Brockwell Place	L ₁₀ 35 dB(A)	L ₁₀ 45 dB(A)	Music volume needs to be managed for compliance
No. 3 Anson Court	L ₁₀ 32 dB(A)	L ₁₀ 42 dB(A)	Music volume needs to be managed for compliance
No. 22 Linfield Retreat	L ₁₀ 32 dB(A)	L ₁₀ 42 dB(A)	Music volume needs to be managed for compliance

Table 4 – Calculated noise break-out – Amplified music

When relating the adjusted noise levels to the 'Assigned Levels', it is evident that careful management of the music volume will be necessary for achieving compliance. With the external ventilation louvres open, the maximum permitted music volume (as measured at the perimeter of the indoor courts area) is:

- Daytime (7 am to 7 pm), Monday to Saturday – 75 dB(A)
- Daytime (9 am to 7 pm), Sundays and Public Holidays – 70 dB(A)
- Evenings (7 pm to 10 pm), all days – 70 dB(A)
- Night (10 pm until daytime) – 65 dB(A)

It is important for all Stakeholders to be made aware that the above music volumes are moderate at best, given that music at 65 to 70 dB(A) would be perceived as background music. Therefore if the space is to be hired out for private dance or fitness classes in the evenings, the lessee(s) would need to be made aware of this limit. It may be necessary for the school to invest in a noise limiter or similar device that the lessee is required to connect their audio equipment to (<https://www.waveformacoustics.com.au/noise-and-sound-limiters>).

Furthermore it would be our recommendation that the indoor courts are not hired out for any activities after 10 pm or prior to 7 am in the morning on Monday to Saturday, or prior to 9 am on Sundays and Public Holidays.

4.3.2. Allowable music volume with all external ventilation louvres closed

By having all of the external ventilation louvres in a closed position, the external noise break-out will be reduced. Table 5 provides the calculated amplified music break-out if the external louvres are closed:

Receiver location	Calculated noise level	Adjusted noise level (+10 dB penalty for music)	Compliance comment
No. 20 Brockwell Place	L ₁₀ 23 dB(A)	L ₁₀ 33 dB(A)	Music volume needs to be managed for compliance
No. 3 Anson Court	L ₁₀ 21 dB(A)	L ₁₀ 31 dB(A)	Music volume needs to be managed for compliance
No. 22 Linfield Retreat	L ₁₀ 21 dB(A)	L ₁₀ 31 dB(A)	Music volume needs to be managed for compliance

Table 5 – Calculated noise break-out – Amplified music, with external louvres closed

Based on the above calculation results, the maximum permitted music volume (as measured at the perimeter of the indoor courts area) is:

- Daytime (7 am to 7 pm), Monday to Saturday – 88 dB(A)
- Daytime (9 am to 7 pm), Sundays and Public Holidays – 83 dB(A)
- Evenings (7 pm to 10 pm), all days – 83 dB(A)
- Night (10 pm until daytime) – Indoor courts not recommended to be used at this time.

The above results indicate that with the external ventilation louvres closed, the maximum permissible music volumes are less restrictive, therefore more conducive to private dance and fitness classes. However, the above approach would require a mechanical ventilation system providing outside air in accordance with Australian Standard 1668.2. In relation to indoor courts this is most commonly achieved by installing indirect evaporative cooling. The supply and relief air paths of a mechanical system would

need to incorporate attenuation to address noise break-out (attenuation requirements to be addressed based on the mechanical design).

4.4 Assessment of noise break-out from the Fitness Room

An assessment of amplified music within the Fitness Room has been undertaken. This assessment has been based on the external glazing being 6.38 mm laminated glass, with any doors and windows in a closed position – which is feasible given that this room will be air-conditioned.

If amplified music is played at 90 dB(A) within the Fitness Room, the calculated noise level at No 3 Anson Court is L_{10} 28 dB(A), inclusive of the +10 dB penalty under Regulation 9(3). This comfortably complies with the 'Assigned Levels' for all time periods.

5. NOISE EMISSIONS FROM THE MECHANICAL SERVICES

At this early stage of the project the mechanical design and equipment selection has yet to be undertaken. However, it is our understanding that the mechanical services will include:

- Condensing units associated with the eight classrooms (GLAs), Staff Room, Fitness Room, and Movement Room; and,
- Toilet exhaust fan(s).

Taking into account the distance to the surrounding residences, we do not envisage any significant issues with achieving compliance with the 'Assigned Levels'. The noise emissions from the mechanical services shall be assessed prior to the lodgement of the Building Permit based on the actual equipment selections, to confirm compliance with the Environmental Protection (Noise) Regulations 1997.

6. NOISE MANAGEMENT PLAN

Following our assessment of environmental noise emissions, it is evident that the following noise management practices are necessary for maintaining compliance with the Environmental Protection (Noise) Regulations 1997.

Amplified music within the Indoor Courts Area (naturally ventilated space)

- Between the hours of 7 am and 7 pm, Monday to Saturday, the amplified music volume at the internal perimeter of the indoor courts area shall not exceed 75 dB(A).
- Between the hours of 9 am and 7 pm on Sundays and Public holidays, the amplified music volume at the internal perimeter of the indoor courts area shall not exceed 70 dB(A).
- Between the hours of 7 pm and 10 pm, the amplified music volume at the internal perimeter of the indoor courts area shall not exceed 70 dB(A).
- The indoor courts area shall not be used at night after 10 pm or prior to 7 am in the morning on Monday to Saturday, or prior to 9 am on Sundays and Public Holidays..
- Subwoofers shall not be used within the building.
- The 'Hire Agreement' for the Sports Precinct and Learning Hub shall include the above requirements.

Note – Higher music volumes may be permitted in the indoor courts area if some form of mechanical ventilation is installed for this space, thus allowing the external ventilation louvres to be closed when music is being played. Refer to Section 4.3.2 of this report for further information.

Mechanical services

The noise emissions from the mechanical services shall be assessed prior to the lodgement of the Building Permit, based on the actual equipment selections (condensing units, exhaust fans, and the like).

Report author:

Benjamin Farrell

Director M.A.A.S.



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