Ambrose Early Learning Centre Expansion Modification Noise Impact Assessment

Catholic Diocese of Parramatta Services Ltd

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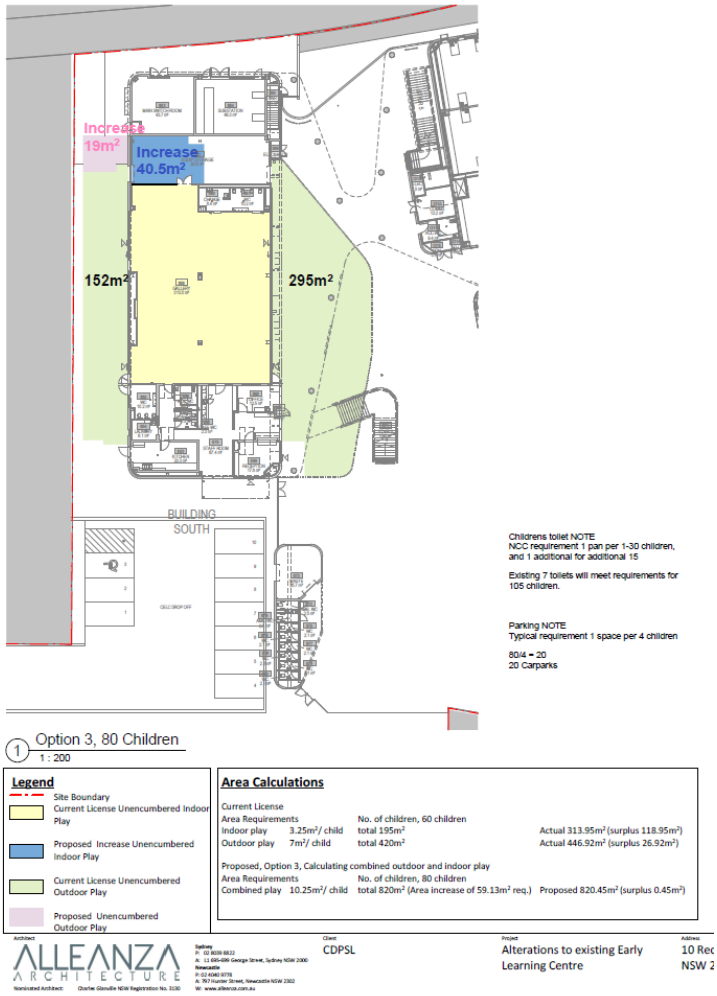
1 INTRODUCTION

Catholic Diocese of Parramatta Services Limited (CPDSL) is proposing an expansion of the student capacity at the existing Ambrose Early Learning Centre (ELC), located at Santa Sophia Catholic College, 1 Lakefront Crescent, Gables (the site). The proposal is to expand the existing approved ELC student capacity from 60 to 80 students. The proposal would include physical alterations of the existing ELC facility on site to accommodate the additional students and any required additional staff.

The development for Santa Sophia College and the associated ELC was approved by the Department of Planning via a State Significant Development (SSD) application. As such the ELC is currently operating under the approved SSD-9772 for a centre based childcare facility for 60 children.

Figure 1 Proposed layout plan



Pulse White Noise Acoustics (PWNA) has been engaged to undertake the Noise Impact Assessment of the proposed expansion of the existing ELC facility.

This assessment includes the acoustic investigation into the potential for noise impacts from the operation of the increased number of children and activity noise emission associated with the use of the expanded external play area and internal playroom.

As the proposal does not include any addition or changes to the existing industrial noise sources such as building service associated with the operation of the ELC, this report will not include any assessments relating to industrial noise.

1.1 Development Description

The current Ambrose ELC is located at the southern end within the Santa Sophia Catholic College site at 1 Lakefront Crescent, Gables. The site comprises of existing school buildings for K-12 education, including the ELC which is the subject of this proposed expansion.

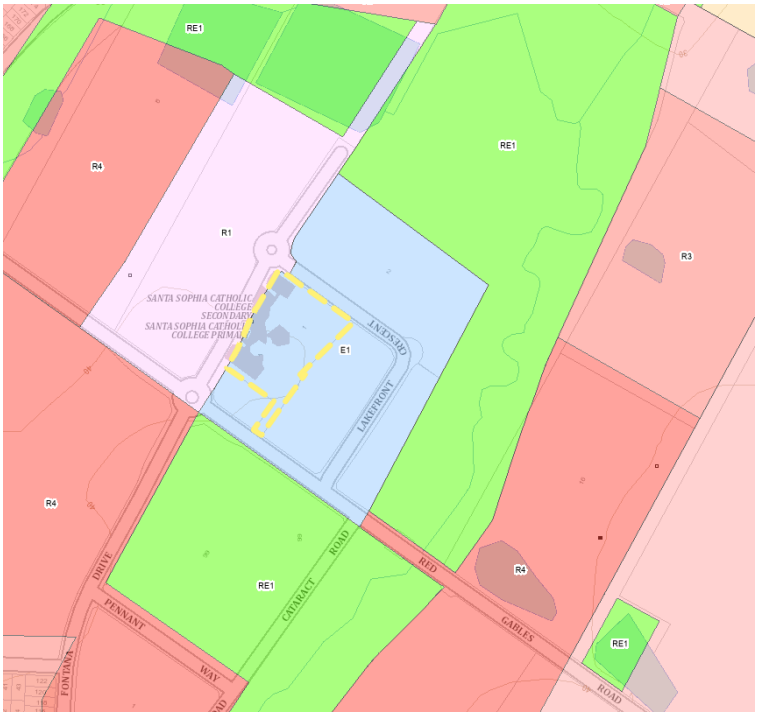
The site is bound by Lakefront Crescent and Fontana Drive to the north-east and north-west respectively, a temporary food and drink premises with associated parking and landscaping adjoining the south-west of the site with the future Gables Town Centre on the adjoining eastern lot.

The site is zoned E1 Local Centre (the E1 zone) pursuant to THLEP. The ELC is characterised as a 'centre-based childcare facility' which is a land use permitted with consent in the E1 zone.

The nearest distance between the edge of the proposed expanded outdoor play area and the nearest residential zone (assessed residential receivers) is the R1 zone to the west across Fontana Drive, located approximately 30m away. The nearest commercial receiver is the current Bobby Bakehouse Gables adjoining the southern boundary of the ELC outdoor play area. The proposed expanded outdoor play area and its relationships to the nearby receivers are presented in Figure 2. Land zonings of the site and surrounding areas are presented in Figure 3.

Figure 2 Aerial photograph of Childcare Centre

Figure 3 Land zoning map



1.2 Operating Schedule

The operating schedule of the ELC and use of the outdoor areas will remain unchanged from the existing operational schedule. The approved Development Consent for the ELC within the site specifies the following operating hours:

CELC Operational plan

E29. Prior to the commencement of operation of the CELC, an operational plan for the use of the CELC must be submitted to the Certifier for approval and a copy submitted to the Planning Secretary for information. The operational plan must include:

(a) details confirming that the operating hours of the premises would be between 6.00am and 6:30pm, Monday to Friday;

(b) outdoor play times for the CELC children are restricted between 7am and 6pm;

(c) a playtime programme with specific reference to management measures during the use of the outdoor play space that would be integrated with the Level 1 play space of the school;

(d) details confirming that the windows on the south-western elevation must not be open prior to 7am and later than 6pm; and

(e) access control measures for the CELC child and separation from the school use.

2 ACOUSTIC CRITERIA

Pulse White Noise Acoustics (PWNA) has reviewed the Development Consent for SSD 9772 approved on 21 April 2020 by the Independent Planning Commission and finds the following conditions which are applicable to the ELC.

CELC Operational plan

E29. Prior to the commencement of operation of the CELC, an operational plan for the use of the CELC must be submitted to the Certifier for approval and a copy submitted to the Planning Secretary for information. The operational plan must include:

(a) details confirming that the operating hours of the premises would be between 6.00am and 6:30pm, Monday to Friday;

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(c) a playtime programme with specific reference to management measures during the use of the outdoor play space that would be integrated with the Level 1 play space of the school;

(d) details confirming that the windows on the south-western elevation must not be open prior to 7am and later than 6pm; and

(e) access control measures for the CELC child and separation from the school use.

Fence

E43. A 1.8m high solid fence must be constructed along the southern boundary of the site, adjoining the outdoor play area for CELC.

Operational Noise Limits

F11. The noise generated by operation of the school, the CELC, the OOSH and the community uses within the site must not exceed the noise limits in *Noise and Vibration Impact Assessment for Santa Sophia Catholic College*, prepared by *JHA Acoustics* and dated *12 September 2019*.

In accordance with Condition F11 presented above, PWNA reviewed the applicable Noise and Vibration Impact Assessment report prepared by JHA Acoustics. The following extract presents the conditioned Operational Noise Limits and applicable to the ELC and adopted for this assessment.

4.5.2 OPERATIONAL NOISE EMISSION CRITERIA

Council legislation does not establish any noise level criteria for noise emissions from the use of the premises. Given that the activities within the school will only operate during day-time and evening-time, a noise criterion of "background noise level + 5dB" has been adopted for this assessment. This noise level limit is assessed at the boundary of the neighbouring residential properties.

This noise criteria is based on the premise that if intrusive noise is greater than the existing background noise level, there is a potential risk of disturbance and annoyance. However, the noise impact is considered marginal if the difference between the existing background noise level and the intrusive noise is 5 dB(A) or less. This concept has resulted in the commonly used criterion of "background noise level + 5dB" – applicable between 7am and midnight.

This criterion is more stringent during midnight and 7am, being the commonly used criterion of "background noise level + 0dB".

Australian Standard AS 1055.3:1997 provides a guide of estimated average background noise levels for different areas containing residences. These background noise levels will be used in order to establish the operational noise emission criteria. Table 5 shows the background noise levels.

Noise Area Category	*Description of the neighbourhood*	*Average Background A-weighted noise level ($L_{A90,T}$)*		
		07.00-18.00	*18.00-22.00*	*22.00-07.00*
R3	Areas with medium density transportation or some commerce or industry	50	45	40

Table 5: Average background noise levels as per AS 1055:2018.

The worst-case scenario for operational noise emissions from the school premises will be during early morning – 6am – from the ECLC premises. Therefore, the noise level criteria between 6am and 7am will be L_{Aeq} 40 dB(A). For evening time period the noise level criteria is set to L_{Aeq} 50 dB(A).

4.5.3 AAAC GUIDELINE FOR CHILD CARE CENTRE

There are no prescribed regulations or legislation that apply to noise from child care centres or outdoor playgrounds. Therefore, there is no prescribed noise criteria that can be used. Furthermore, we understand

that common approach of "offensive noise" criteria is not appropriate for a planning situation such as this proposal.

Our noise assessment approach is based on:

- NSW tribunal decisions when assessing noise from the use of child care centres.
- 'Guideline for Childcare Centre Acoustic Assessment' prepared by the Association of Australasian Acoustical Consultants (AAAC).

The AAAC guideline is addressed for assessment of childcare centres and its noise level criterion for outdoor spaces have been considered as adequate by NSW tribunal decisions. As children do not play outdoors continuously for long periods of time, and as the duration of time for children playing outside is reduced, the overall noise annoyance reduces. Therefore, it is reasonable to allow a higher level of noise impact for a shorter duration.

Whilst the AAAC guideline does not apply for schools, there are similarities in noise emissions from uses of outdoor playground areas for schools and child care centres. Therefore, we recommend that the following noise criteria shall be applied to noise impacts arising from the school's outdoor playgrounds.

Table 6 shows the noise level criteria proposed by the AAAC guideline for assessing noise from outdoor spaces. These are the noise levels at which it is considered that complaints are unlikely.

Use of outdoor area	*Noise Level Criteria*	*Criteria*
Up to 2 hours (total) per day	$L_{Aeq,15min}$ noise level from outdoor area not to exceed the existing background noise level ($L_{A90,15min}$) plus 10 dB **$L_{Aeq,15min} < L_{A90,15min} + 10$ dB(A)**	$L_{Aeq,15min} \leq 65$ dB(A)
More than 2 hours (total) per day	$L_{Aeq,15min}$ noise level from outdoor area not to exceed the existing background noise level ($L_{A90,15min}$) plus 5 dB **$L_{Aeq,15min} < L_{A90,15min} + 5$ dB(A)**	$L_{Aeq,15min} \leq 60$ dB(A)

Table 6: Noise level criteria for the playground areas as per AAAC guideline.

For commercial receivers, the AAAC guideline stipulates the following 65 dBA as the criteria.

3.3 Commercial Receptors

The cumulative $L_{eq,15min}$ noise level emitted from the use and operation of the child care centre shall not exceed 65 dB(A), from all activities (including outdoor play), when assessed at the most affected point on or within any commercial property boundary.

3 NOISE IMPACT ASSESSMENT

An assessment of noise generated on the site has been undertaken on this section of the report. The assessment of noise levels generated on the site are detailed in the following sections.

3.1 Activity Noise Assessment

This section of the report details the assessment of activity noise levels generated from the proposed ELC expansion.

3.1.1 Assessment methodology

This section of the report details the activity noise assessment which has been undertaken for the proposed ELC expansion. Assessment has been undertaken based on the following:

1. Outdoor play area operational scenarios of the current capacity up to 60 children and the proposed capacity up to 80 children have been assessed.
    - 3 – 5 years: 60 for current, 80 for proposed
    - To assess the worst-case scenarios, all of the proposed updated outdoor play area in conjunction with the current south end outdoor play area have been modelled to be in use simultaneously with the maximum number of children for the respective scenario outside at any given time.
    - The outdoor play areas have been modelled with all children partaking in 'Active Play' as a worst-case scenario.
2. Indoor play area operational scenarios of the proposed capacity up to 80 children with windows opened and closed.
    - 3 – 5 years: 80 for proposed
    - The indoor play areas have been modelled with all children partaking in 'Passive Play' as a worst-case scenario.
    - For window closed scenario, the internal reverberant noise level has been calculated based on the volume of the room, dimensions of the southern façade of the room, and an assumed Reverberation Time of 0.8s within the room.
    - For windows closed scenario, a calculated internal reverberant sound pressure level of 74 dBA has been used.
    - For windows closed scenario, transmission loss from the façade of Rw 30 (typical of 6mm monolithic glass) have been included.
    - For windows opened scenario, no internal reverberant noise level correction or transmission loss from the façade have been included. Calculations assumed direct noise propagation from the opened space.
3. Noise levels generated by the children are based on the source noise levels of the AAAC for external play areas and internal noise levels. Details of the source noise levels used in this assessment are detailed in the following table. All noise sources were modelled at a height of 1 m, representative of the height of the children. Area corrections and internal reverberant noise corrections have been applied according to the modelled scenarios.
4. The assessed residential receiver location has been is considered to be the residential zone to the west across Fontana Drive at the approximately 30m away (distance attenuation of ~38dB).
5. The commercial receiver location has been assessed to be Bobby Gatehouse Gables (nearest affected point) adjoining the southern boundary of the ELC at approximately 5m (distance attenuation of ~22dB).
6. Acoustic shielding from conditioned or required 1.8m high acoustic barrier (barrier attenuation of ~15dB) on the southern (and other as required) boundary have been included in the calculations.
7. All recommended acoustic treatments and controls detailed in this report are included in the construction and operation of the site.

Table 1 Activity Source Noise Levels

Location	Play Type	Age Group	Source Noise Level
Internal play areas	Passive Play[2]	All Ages	-6 dB compared to the corresponding Active Play sound power levels.
External Play Areas	Active Play[1] For groups of 10 children	3-5	87 dB(A) Sound Power Level
	Passive Play[2] For groups of 10 children	3-5	81 dB(A) Sound Power Level

Note 1 – Active play include areas where children can actively play and generate noise levels such as running, playing with movable items (scooters and the like). Active play noise levels are based on the medium noise level presented in the AAAC guideline.

Note 2 – Passive play includes areas where play will include less active play such as a sand pit, use of tables and the like where play includes activities do not include moving around and hence a lower noise level results. Passive play noise levels are based on the -6 adjustment from active play sound power level within the AAAC guideline.

The AAAC *Guideline for Child Care Centre Acoustic Assessment Version 3* includes the effective sound power levels of children which have been used in this report (as detailed above), including the following:

Table 1 provides recommended sound power levels for lots of 10 children, within the different age groupings, along with a recommended source height.

Table 1 – Effective Sound Power Levels ($L_{Aeq,\ 15min}$) for Groups of 10 Children Playing

Number and Age of Children	Sound Power Levels [dB] at Octave Band Centre Frequencies [Hz]								
	dB(A)	63	125	250	500	1k	2k	4k	8k
10 Children - 0 to 2 years	78	54	60	66	72	74	71	67	64
10 Children - 2 to 3 years	85	61	67	73	79	81	78	74	70
10 Children - 3 to 5 years	87	64	70	75	81	83	80	76	72

Notes:
1 If applicable, an adjustment to the above sound power levels of -6 dB could be applied in each age group for children involved in passive play.
2 For simplicity, based upon a review of World Health Organization (WHO) data, a single recommended source height of 1metre is suggested as the source heights.

3.1.2 Results for Noise Emission from Southern Outdoor Play Area

Based on the above assessment methodology, the predicted noise levels from the use of the expanded outdoor play areas of the ELC southern outdoor play area at the nearest residential receivers are presented in the below tables.

Table 2 Predicted activity noise levels to residential receiver from current and proposed ELC outdoor play areas, with 100% of children outside at any one time

Assessment Scenario	Predicted noise level at nearest residential receiver, dB $L_{Aeq,\ 15mins}$	Compliance with	
		More than 4 hours (total) per day 60 dBA	Up to 4 hours (total) per day 65 dBA
Current capacity of 60 children	56	Yes	Yes
Proposed capacity of 80 children	57	Yes	Yes

Based on the above results for all children outside at any one time, compliance for both current and proposed scenarios are predicted at the nearest residential receiver when considering the noise generating scenario described in Section 3.1.1. These complying results are expected as the proposal does not increase the number of children using the similarly sized outdoor play area as the existing.

Based on the above assessment methodology, the predicted noise levels from the use of the expanded outdoor play areas of ELC at the nearest commercial receiver are presented in the below tables.

Table 3 Predicted activity noise levels to commercial receiver from current and proposed ELC outdoor play areas, with 100% of children outside at any one time

Assessment Scenario	Predicted noise level at nearest residential receiver, dB $L_{Aeq, 15mins}$	Compliance with Commercial Receiver Criteria 65 dBA
Current capacity of 60 children	51	Yes (with inclusion of 1.8m barrier on southern boundary in accordance with current Condition E43 of Development Consent)
Proposed capacity of 80 children	52	Yes (with inclusion of 1.8m barrier on southern boundary in accordance with current Condition E43 of Development Consent and extending to include the proposed extension to the southern outdoor play area.)

3.1.3 Results for Noise Emission from Indoor Play Area

Based on the above assessment methodology, the predicted noise levels from the use of the expanded indoor play areas of the ELC at the nearest residential and commercial receivers are presented in the below tables. Two scenarios of windows opened and windows closed have been assessed.

Table 4 Predicted activity noise levels to commercial receiver from proposed ELC indoor play areas, with 100% of children inside at any one time with windows opened and windows closed

Indoor play area scenarios	Predicted noise level at nearest receivers, dB $L_{Aeq, 15mins}$	Compliance with Various Criteria, dBA
Windows opened	52 dBA at assessed residential receiver	Day 55 dBA - Yes Evening 50 dBA - No Night 40 dBA - No
	63 dBA at assessed commercial receiver	Commercial 65 dBA - Yes
Windows closed	25 dBA at assessed residential receiver	Day 55 dBA - Yes Evening 50 dBA - Yes Night 40 dBA - Yes
	36 dBA at assessed commercial receiver	Commercial 65 dBA - Yes

3.2 Recommended Acoustic Treatments and Controls

Based on the predicted results, with implementation of physical and management controls, no exceedances from the play areas are expected from a maximum capacity of 80 children. However, as there are existing Development Consent Conditions imposed on the development, it is recommended that these conditions are maintained or be applied in concept to this proposed expansion, to ensure that compliance is maintained and the existing acoustic amenity to the surrounding receivers are maintained.

The recommended acoustic treatments and controls include the following:

1. Inclusion of 1.8m barrier on southern boundary in accordance with current Condition E43 of Development Consent and extending to include the proposed extension to the southern outdoor play area. It is recommended that the barrier should be constructed from a solid material and can include masonry, 9mm FC sheet, Hebel, sheet metal, 10.38mm glass or 10mm Perspex, or lapped and capped timber fence or the like.
2. In-line with current Condition E29(c) of Development Consent, outdoor play times are restricted between 7am and 6pm. In addition, the management of the use of outdoor play areas to ensure compliance is such that:
    a. The proposed maximum number of children at the ELC of 80 should be maintained.
    b. All outdoor play areas are to include supervision when used by children by a childcare operator. Staff should monitor and minimise loud noisy events such as distressed crying children by managing or moving crying children inside the building.
    c. Children are to be encouraged to play away from the acoustic barrier.
    d. Toys or the like are not to be attached to the acoustic barrier.
    e. No music is permitted in the outdoor play area.
3. In-line with current Condition E29(d) of Development Consent, the façade on the south-western elevation of the indoor play area, including the proposed new section of the indoor play area, must not be opened prior to 7am and after 6pm
4. Contact details of a suitable site contact should be provided at a street frontage of the centre such that the public have the information should complaints regarding the operation of the centre be required..

Providing the noise control measures recommended above are incorporated in the design and operation of the proposed ELC expansion, the resulting noise impacts will comply with the relevant noise emissions criteria and result in a suitable acoustic amenity to the residential receivers surrounding the centre.

3.3 Noise Impact on Local Roads

Based on the proposed car parking included on the site, an assessment of the potential for noise impacts resulting from the additional vehicle traffic on the local roads has been undertaken.

In order to generate an increase of 2 dB on local road traffic noise, existing traffic volumes would need to increase by approximately 60% as a result of the proposed development's operations. This level of traffic volume increase is considered to be unlikely from the increase in capacity at the ELC, although it is noted that the existing traffic flows on the local roads is unknown. The probable increase in traffic noise levels due to the development's traffic generation on local roadways resulting from use of the site will be less than 2 dB and will be acoustically acceptable.

4 CONCLUSION

Pulse White Noise Acoustics (PWNA) has been engaged to undertake the Noise Impact Assessment of the proposed expansion of the existing ELC facility located at the southern end within the Santa Sophia Catholic College site at 1 Lakefront Crescent, Gables.

This assessment includes the acoustic investigation into the potential for noise impacts from the operation of the increased number of children and activity noise emission associated with the use of the expanded external play area and internal playroom.

The existing ELC currently has approval for 60 places, and the proposal will increase the existing children numbers to a maximum of 80. No change from the existing operation hours and schedule is proposed.

An assessment of the proposed use of the expanded outdoor play area and indoor play area of the ELC has been undertaken and noise management controls (including treatments and the controls) have been recommended to ensure relevant childcare activity noise emission criteria set out in the Development Consent Conditions for SSD 9772 will continue to be complied with at the assessed residential receiver location and future residences.

Providing the noise control measures recommended in this assessment as per the current Development Consent Conditions are incorporated in the design and operation of the proposed expanded to the outdoor play area and indoor play area, the resulting noise impacts will remain compliant (as it currently is) with the relevant noise emissions criteria and result in a suitable acoustic amenity to the residential and commercial receivers surrounding the updated Ambrose ELC.

For any additional information please do not hesitate to contact the person below.

Regards

Leo Tsui
Principal Acoustic Consultant

Pulse White Noise Acoustics

5 APPENDIX A – GLOSSARY OF TERMS

Ambient Sound — The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.

Audible Range — The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.

Character, acoustic — The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.

Decibel [dB] — The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds;

0dB	the faintest sound we can hear
30dB	a quiet library or in a quiet location in the country
45dB	typical office space. Ambience in the city at night
60dB	Martin Place at lunch time
70dB	the sound of a car passing on the street
80dB	loud music played at home
90dB	the sound of a truck passing on the street
100dB	the sound of a rock band
115dB	limit of sound permitted in industry
120dB	deafening

dB(A) — *A-weighted decibels* The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.

Frequency — Frequency is synonymous to *pitch*. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.

Loudness — A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on

L_{Max} — The maximum sound pressure level measured over a given period.

L_{Min} — The minimum sound pressure level measured over a given period.

L_1 — The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.

L_{10} — The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.

L_{90} — The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).

L_{eq} — The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.

Background Sound Low — The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted, external ambient noise sources. Usually taken to mean the L_{A90} value

Ctr	A frequency adaptation term applied in accordance with the procedures described in ISO 717.
dB (A)	'A' Weighted overall sound pressure level
Noise Reduction	The difference in sound pressure level between any two areas. The term "noise reduction" does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply
NR Noise Rating	Single number evaluation of the background noise level. The NR level is normally around 5 to 6 dB below the "A" weighted noise level. The NR curve describes a spectrum of noise levels and is categorised by the level at 1000 Hz ie the NR 50 curve has a value of 50 dB at 1000 Hz. The NR rating is a tangential system where a noise spectrum is classified by the NR curve that just encompasses the entire noise spectrum consideration.
R_w	Weighted Sound Reduction Index - Laboratory test measurement procedure that provides a single number indication of the acoustic performance of a partition or single element. Calculation procedures for Rw are defined in ISO 140-2:1991 "Measurement of Sound Insulation in Buildings and of Building Elements Part 2: Determination, verification and application of precision data".
R'_w	Field obtained Weighted Sound Reduction Index - this figure is generally up to 3-5 lower than the laboratory test determined level data due to flanked sound transmission and imperfect site construction.
Sound Isolation	A reference to the degree of acoustical separation between any two areas. Sound isolation may refer to sound transmission loss of a partition or to noise reduction from any unwanted noise source. The term "sound isolation" does not specify any grade or performance quality and requires the units to be specified for any contractual condition
Sound Pressure Level, L_P dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, L_W dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt
Speech Privacy	A non-technical term but one of common usage. Speech privacy and speech intelligibility are opposites and a high level of speech privacy means a low level of speech intelligibility. It should be recognised that acceptable levels of speech privacy do not require that speech from an adjacent room is inaudible.
Transmission Loss	Equivalent to Sound Transmission Loss and to Sound Reduction Index in terminology used in countries other than Australia. A formal test rating of sound transmission properties of any construction, by usually a wall, floor, roof etc. The transmission loss of all materials varies with frequency and may be determined by either laboratory or field tests. Australian Standards apply to test methods for both situations.