

Section B

Acoustic Requirements

10/2025

ACOUSTIC REQUIREMENTS

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INTRODUCTION

Multi-residential Buildings

Any wall or floor/ceiling system separating sole-occupancy units in townhouses (Class 1a) or multi-residential buildings (Class 2, 3 and 9C) must comply with the acoustic provisions of the NCC (refer to the Multi-Residential section for a summary of NCC acoustic requirements).

While NCC specifies minimum levels for sound insulation between attached dwellings, these levels may not always be sufficient to meet the expectations of the building occupants. In view of this, a higher degree of sound insulation, commensurate with the expectations of the end user, may need to be considered.

To this end the Association of Australian Acoustical Consultants (AAAC) developed the Guideline for Apartment and Townhouse Acoustic Rating providing a 'Star Rating' system that ranks the acoustical quality of multi-residential buildings on a scale from 2 (worst performing) to 6 (best performing) stars.

The Star Rating system covers noises associated with inter-tenancy activities such as voices, home theatre, internal building services and appliances (ie. air conditioning, lifts, water supply systems) as well as external noise intrusion (ie road, rail, and air traffic).

Provided on pages B3 are the performance indicators for star ratings meeting or exceeding NCC requirements (4 to 6 stars) for separating walls and floors. The full description of Star Rated system refer to the Guideline for Apartment and Townhouse Acoustic Rating available at the AAAC web site aaac.org.au

Commercial Buildings

Concerned with the limited building regulations governing acoustical quality of commercial buildings, the AAAC has developed the Guideline for Commercial Building Acoustics focusing in particular on office buildings.

In developing this Guideline, the AAAC aimed at encouraging consistency between different developments and highlighting the importance of buildings acoustics to the apparent quality of commercial buildings.

This Guideline is intended to complement the relevant AS/NZS Standards (in particular AS/NZS 2107 *Acoustics — Recommended design sound levels and reverberation times for building interiors*) and Green Building Council Australia (GBCA) rating tools for Office Design and Office Interiors. It addresses such major issues as external noise, noise from building services, noise transfer between separate tenancies and noise transfer within the same tenancy.

Extracts from the Guideline for Commercial Building Acoustics specific to noise isolation are provided on pages B4 and B5.

The full Guideline can be found at aaac.org.au

Educational Buildings

In the absence of consistent Australia-wide regulations and standards encompassing all aspects of the acoustic qualities of Educational buildings, the AAAC has developed the Guideline for Education Facilities Acoustics.

This Guideline is intended to be complimentary to local authority building requirements and individual and state guidelines (where they exist) and is consistent with the requirements of the NCC.

The Guideline is aimed at achieving appropriate sound levels within teaching spaces while taking into account not only the activities that occur inside classrooms and teaching spaces, but also the activities that typically occur in adjacent spaces and outside during the course of a day.

Extracts from the Guideline for Education Facilities Acoustics are provided on pages B6 and B7. The full Guideline can be found at aaac.org.au

Health Care Buildings

The design of health care facilities in Australia must comply with the NCC, the relevant Australian Standards and state regulations. In addition, Australasian Health Facility Guidelines (AusHFG) provide general guidance on various aspects of typical Health Care Facilities in order to facilitate the provision of appropriate physical environments.

In relation to acoustic requirements for health care buildings, AusHFG refers to AS/NZS 2107 *Acoustics — Recommended design sound levels and reverberation times for building interiors*.

As a further guide for designers and builders of health care facilities, included on page B8 are acoustic rating recommendations contained in the AAAC Guideline for Health Care Facilities. The full Guideline can be found at aaac.org.au

MULTI-RESIDENTIAL BUILDINGS

Extract from AAAC Guidelines

TABLE B1: INDICATIVE SOUND INSULATION PERFORMANCE OF THE VARIOUS STAR RATINGS IN RESPECT TO CONTROLLING TYPICAL DOMESTIC NOISE			
TYPE OF NOISE SOURCE	SOUND INSULATION EXPRESSED AS $D_{nT,w} + C_{tr}$		
	45*	50	55
	4 STAR	5 STAR	6 STAR
Normal Speech	Not Audible	Not Audible	Not Audible
Raised Speech	Just Audible	Not Audible	Not Audible
Dinner Party/Laughter	Just Audible	Not Audible	Not Audible
Shouting	Audible	Just Audible	Not Audible
Small Television/Small Entertainment System	Audible	Just Audible	Not Audible
Large Television/Large Hi-fi Music System	Clearly Audible	Audible	Just Audible
DVD With Surround Sound	Clearly Audible	Audible	Audible
Digital Television With Surround Sound	Clearly Audible	Audible	Audible

*Min NCC requirement.

TABLE B2: MINIMUM IN-SITU ACOUSTIC PERFORMANCE OF SEPARATING WALLS AND FLOORS, $D_{nT,w} + C_{tr}$			
INTERTENANCY ACTIVITIES	4 STAR	5 STAR	6 STAR
(A) AIRBORNE SOUND INSULATION FOR WALLS AND FLOORS			
Between Separate Tenancies $D_{nT,w} + C_{tr} \geq$	45*	50	55
Between A Lobby/Corridor & Bedroom $D_{nT,w} + C_{tr} \geq$	40	45	50
Between A Lobby/Corridor & Living Area $D_{nT,w} + C_{tr} \geq$	40	40	45
(B) Corridor, Foyer To Living Space Via Door(s) $D_{nT,w} \geq$	30	35	40
(C) IMPACT ISOLATION OF FLOORS			
Between Tenancies $L_{nT,w} \leq$	50	45	40
Between All Other Spaces & Tenancies $L_{nT,w} \leq$	50	45	40
(D) IMPACT ISOLATION OF WALLS			
Between Tenancies	Yes	Yes	Yes
Between Common Areas & Tenancies	No	Yes	Yes

*Min NCC requirement.

NOTE:

Wall and floor/ceiling systems separating sole-occupancy units in a multi-residential building must comply with the minimum acoustic provisions of the NCC (refer to the Multi-Residential section for a summary of NCC acoustic requirements).

COMMERCIAL BUILDINGS

Extract from AAAC Guidelines

TABLE B3: ACCEPTABLE D_w VALUES DEPENDING ON A ROOM'S NOISE LEVEL AND THE TOLERANCE IN THE ADJACENT SPACE

NOISE TOLERANCE IN RECEIVING ROOM	SOURCE ROOM ACTIVITY NOISE			
	LOW	AVERAGE	HIGH	VERY HIGH
High	30	35	40	45
Medium	35	40	45	50
Low	40	45	50	55
Very Low	45	50	55	60

For guidance on expected noise source levels and tolerance for various room occupancies refer to table B4.

TABLE B4: ROOM NOISE SOURCE LEVELS AND TOLERANCE

TYPE OF OCCUPANCY/ACTIVITY	SOURCE ACTIVITY LEVEL	NOISE TOLERANCE
Board and Conference Rooms	High	Very Low
Cafeterias	Very High	High
Call Centres	Average - High	Low - Medium
Computer (Server) Rooms	High	Medium - High
Corridors and Lobbies	Average	High
Design Offices	Average	Low
Drafting Offices	Average	Low
General Office Areas	Average	Medium
Private Offices	Low	Low
Public Spaces	Average	High
Reception Areas	Average	Medium
Rest Rooms and Tea Rooms	High	High
Toilets	Average	High
Undercover Car Parks	Very High	High

COMMERCIAL BUILDINGS

Extract from AAAC Guidelines

TABLE B5: PERFORMANCE REQUIREMENTS BETWEEN SEPARATE TENANCIES WHERE SPACE USE IS UNKNOWN

WEIGHTED LEVEL DIFFERENCE (D_w)				
POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT
35	40	45	50	55

TABLE B5: Provides acoustic quality as it relates to the quality of the development and where the use of the spaces either side of a common wall is unknown. The AAAC Guideline suggests a minimum R_w 50 (D_w 45) between tenancies.

TABLE B6: PERFORMANCE REQUIREMENTS WITHIN THE SAME TENANCY WHERE SPACE USE IS YET TO BE DEFINED

WEIGHTED LEVEL DIFFERENCE (D_w)				
POOR	AVERAGE	GOOD	VERY GOOD	EXCELLENT
30	35	40	45	50

TABLE B6: Provides acoustic quality as it relates to the quality of the development and where the use of spaces on each side of the wall is yet to be defined, otherwise table B3 can be used.

NOTE:

For office areas where walls do not extend full height, the ceiling selected will also become critical. Refer to Ceilings — Over Partition Systems for ceiling configurations required to maintain wall acoustic rating.

EDUCATIONAL FACILITIES

Extract from AAAC Guidelines

TABLE B7 AIRBORNE AND IMPACT SOUND INSULATION REQUIREMENTS

ROOM	SOUND INSULATION		
	SOURCE ROOM IMPACT GENERATION	SOURCE ROOM ACTIVITY AIRBORNE NOISE GENERATION	RECEIVING SPACE NOISE TOLERANCE
Atria (for circulation, not teaching)	Medium	Average	High
Art / craft studios	Medium	Average	Medium
Assembly halls up to 250 seats	High	Very High	Low
Assembly halls over 250 seats	High	Very High	Low
Audio-visual areas	Low	High	Low
Cafeterias	High	Very High	High
Computer rooms – Teaching	Low	Average	Medium
Computer rooms – Laboratories	Low	Average	Medium
Conference room	Low	High	Very Low
Corridors and lobbies	Medium	Average	High
Drama Studios	Medium	High	Low
Dance Studios	High	Very High	Medium
Engineering workshops – Teaching	High	High	High
Engineering workshops – Non-teaching	High	High	High
Gymnasia / indoor sports	High	Very High	Medium
Weight training / fitness room	High	High	Medium
Interview / counselling rooms	Low	Low	Medium
Laboratories – Teaching	Low	Average	Medium
Laboratories – Working	Low	Average	Medium
Lecture rooms – up to 50 seats	Low	Average	Medium
Lecture theatres – without speech reinforcement and >50 seats	Low	Average	Low
Lecture theatres – with speech reinforcement	Low	High	Medium
Libraries – General areas	Medium	Average	Medium
Libraries – Reading areas	Low	Low	Low
Manual arts workshops	Medium	Average	Medium
Medical rooms (First aid)	Low	Low	Medium
Music practice rooms	Low	Very high	Low
Music studios	Low	Very high	Very Low
Nursery school – Play rooms	Medium	Average	Medium
Nursery school - Quiet rooms	Low	Low	Low
Office areas	Low	Average	Medium
Professional and administrative offices	Low	Average	Medium
Teaching spaces – Open plan	Low	Average	Low
Teaching spaces – Primary schools	Low	Average	Low
Teaching spaces – Secondary schools	Low	Average	Low
Teaching spaces – Hearing impaired	Low	Average	Low
Staff common rooms	Low	Low	Medium
Staff studies / collegiate	Low	Low	Low
Toilet / change / showers	Medium	Average	High
Swimming pools	Medium	High	High
Plant rooms	Low	High	High

EDUCATIONAL FACILITIES

Extract from AAAC Guidelines

TABLE B8: SOUND INSULATION RATINGS FOR INTERFACES WITHOUT PASS DOORS (D_w)

NOISE TOLERANCE IN RECEIVING ROOM	ACTIVITY NOISE IN SOURCE ROOM			
	LOW	AVERAGE	HIGH	VERY HIGH
High	30	35	40	45
Medium	35	40	45	50
Low	40	45	50	55
Very Low	45	50	55	60

NOTE: Where doors are proposed between spaces consideration must be given to the placement and performance requirements of the door since ratings for doors with no acoustic treatment are not likely to exceed D_w 20 dB while standard solid core doors with full perimeter acoustic seals could achieve a rating up to D_w 30 dB.

TABLE B9: IMPACT ISOLATION RATINGS FOR FLOOR/CEILING BETWEEN VERTICALLY SEPARATED SPACES (L'_{nTw})

		IMPACT GENERATION IN SOURCE ROOM		
		LOW	MEDIUM	HIGH
Noise tolerance in receiving room	High	70	65	60
	Medium	65	60	55
	Low	60	55	50*
	Very Low	55	50*	45*

* Where high impact generating activities are to be located above spaces with low noise tolerance, consideration should be given to the relocating of one of the spaces. Specialist advice should be sought where very high impact activities, such as gymnasia, are to occur above a sensitive space.

HEALTH CARE BUILDINGS

Extract from AAAC Guidelines

TABLE B10 RECOMMENDED ACOUSTIC SEPARATION REQUIREMENTS (D_w)

USAGE	INDICATIVE ACOUSTIC SEPARATION		USAGE	INDICATIVE ACOUSTIC SEPARATION	
	ADJACENT*	CORRIDOR**		ADJACENT*	CORRIDOR**
Single bed ward (including Mental Health, Parent Accommodation)	40	25	PUBLIC AREAS		
Multiple bed ward	40	25	Corridors and lobby spaces	-	-
Ward ensuites	40, Discont.	15	Cafeterias/ dining	40	15
Consulting, examination, interview, counselling/ bereavement	40	25	Family and parents' lounges	40	20
Treatment, procedures, surgeries	40	25	Toilets, amenities	40	15
Morgue presentation areas	45	25	Waiting rooms and Reception areas	40	-
Birthing room/delivery suites	45	25	Multi-faith, chapel, Lecture theatres, cinemas, multipurpose rooms	Specialist design input required	
Laboratories	40	20	Radio broadcast, interview or audio editing	Specialist design input required	
Clean utility/Dirty utility/ drug storage or preparation	35	15	Outdoor seating or activity areas	-	-
Speech and language therapy	40	25	STAFF AREAS		
Audiology/audiometry	As per AS1269.4	-	Enclosed nurse stations	35	-
Dental clinics	45	25	Boardroom/conference	45	25
Rehabilitation areas	40	25	Private offices	35	20
Hydrotherapy	45	25	Executive offices	40	25
General intensive care wards	45	25	Cellular offices (2-4 desks)	35	20
Neonatal or paediatric ICUs (NICU/PICU)	45	30	UTILITY ROOMS		
Pharmacy offices	35	20	Amenities, locker rooms	40	-
Kitchens, sterilisation and service areas	40	-	Morgue - Grossing stations, observation areas	55, Discont.	-
Operating theatres	40	25	INFRASTRUCTURE		
			Engineering, Workshops	55, Discont.	-
			Plantrooms, generators	55, Discont.	-

NOTE:

* Minimum values to nearby noise-sensitive enclosed rooms where no common door exists – where interconnecting doors are proposed, these criteria are very difficult to achieve without effective spatial planning. Discontinuous walls as defined by the National Construction Code are recommended for impact or wall attached noise sources.

** To circulation corridor, where the intermediate partition is a solid wall with an operable door or air lock. Subtract 5 dB for listening areas with a visual connection (easily visible to the occupants of the space). Note that walls without a door onto a corridor would fall into the "Adjacent" category.