

Association of Australasian Acoustical Consultants

Guideline for Interpretation and Application of New Zealand Building Code Clause G6

Version 1.0

TABLE OF CONTENTS

1.0	INTRODUCTION	3
2.0	NZBC CLAUSE G6 REQUIREMENTS	4
3.0	DETERMINATIONS RELATING TO CLAUSE G6	5
3.1	Multi-unit buildings: Determination 2012/070	5
3.2	Apartment doors: Determination 2015/004	5
3.3	Specialist accommodation: Determination 2015/004	5
3.4	Common area definition and retirement villages: Determination 2015/004	6
3.5	Horizontal impact noise: Determination 2015/007	6
4.0	ON-SITE AIRBORNE SOUND INSULATION TESTING AND THE INCLUSION OF FLANKING	6
5.0	COMMUNAL CARPARKS ADJACENT TO RESIDENTIAL UNITS	7
6.0	COMMUNAL CORRIDORS AND BREEZEWAYS	7
7.0	APPLICATION OF FUNCTIONAL REQUIREMENT G6.2 TO INTERTENANCY WALLS AND FLOORS	8
7.1	Airborne Sound Insulation	8
7.2	Impact Sound Insulation	9
8.0	BALCONY IMPACT SOUND INSULATION REQUIREMENTS	11
9.0	TESTING OF SMALL SEPARATING ELEMENTS	13
9.1	Impact Insulation of Shower Floors	13
10.0	ON-SITE SOUND INSULATION TESTING	14
10.1	Loudspeaker Selection	14
10.2	Extent of Testing	14
11.0	MODIFICATION OF EXISTING BUILDINGS	15
12.0	DISCLAIMER	16
13.0	REFERENCES	16

1.0 INTRODUCTION

Clause G6 of the New Zealand Building Code (NZBC) was first published in 1992 and was most recently updated in 1995. The main clause consists of four paragraphs and uses sound insulation criteria defined in ASTM Standards (Sound Transmission Class and Impact Insulation Class) to provide objective performance requirements for separating elements between residential dwellings. There are a number of issues arising out of the somewhat brief wording of Clause G6 and the application of the ASTM Standards. Although there have been several legal Determinations clarifying the meaning and application of parts of G6, there are also a number of areas that remain ambiguous and open to interpretation.

The objective of this guideline is to outline the AAAC's position on how to interpret and apply the unclear parts of Clause G6 for consistent application in multi-residential buildings across New Zealand. The primary audience of this guideline is intended to be acoustical consultants, building designers, developers and local authorities.

In this guideline, AAAC recommendations (identified in grey boxes) are offered where it is considered that the NZBC requirements are inadequate to provide reasonable acoustic quality. These recommendations are not mandatory.

2.0 NZBC CLAUSE G6 REQUIREMENTS

Below is a reproduction of the main section of the NZBC's Clause G6 from the Ministry of Business, Innovation and Employment.

Clause G6—AIRBORNE AND IMPACT SOUND

Provisions	Limits on application
OBJECTIVE	
G6.1 The objective of this provision is to safeguard people from illness or loss of <i>amenity</i> as a result of undue noise being transmitted between abutting occupancies.	
FUNCTIONAL REQUIREMENT	
G6.2 <i>Building elements</i> which are common between occupancies, shall be constructed to prevent undue noise transmission from other occupancies or common spaces, to the <i>habitable spaces</i> of household units.	
PERFORMANCE	
G6.3.1 The <i>Sound Transmission Class</i> of walls, floors and ceilings, shall be no less than 55.	
G6.3.2 The <i>Impact Insulation Class</i> of floors shall be no less than 55.	

This is supplemented by Verification Methods which involve on-site sound insulation testing.

Verification Method G6/VM1

1.0 Airborne Sound Insulation Field Tests

1.0.1 The performance for airborne sound insulation may be verified using the procedures detailed in ASTM E 336, and the field *sound transmission class* may be verified using the method described in ASTM E 413. Field test results shall be within 5dB of the performance requirement.

2.0 Impact Sound Insulation Field Tests

2.0.1 The performance for impact sound insulation may be verified using the procedures detailed in ISO 140: Part VII, and the field *impact insulation class* may be verified using the method described in ASTM E 989. Field test results shall be within 5dB of the performance requirement.

The Definitions G6/VM1 & AS1 section of G6 outlines the following useful definitions:

- **Household unit** means any building or group of buildings, or part of any building or group of buildings, used or intended to be used solely or principally for residential purposes and occupied or intended to be occupied exclusively as the home or residence of not more than

one household; but does not include a hostel or boardinghouse or other specialised accommodation.

- **Habitable space** is a space used for activities normally associated with domestic living, but excludes any bathroom, laundry, watercloset, pantry, walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods.

On this basis, habitable spaces include living rooms, dining rooms, bedrooms, studies, kitchens and other similar spaces which may be occupied frequently and for extended periods.

Please refer to the original document for further definitions and other relevant information. A list of references is provided at the end of this document.

3.0 DETERMINATIONS RELATING TO CLAUSE G6

From time to time, the Ministry of Business, Innovation and Employment will make a legal Determination on aspects of the NZBC in order to clarify areas of ambiguity.

At the time of writing the following Determinations have been made relating to Clause G6:

- 2012/070: Multi-unit buildings
- 2015/004: Apartment entry doors / specialist accommodation / common spaces definition
- 2015/007: Horizontal impact noise
- 2017/068: Durability of acoustic underlay on tiled decks
- 2019/010: Reduction in airborne sound insulation verification criteria

These G6-related Determinations are discussed further below and link to all determinations is included in the references section at the end of this document.

3.1 Multi-unit buildings: Determination 2012/070

This Determination concludes that while a single building containing several units may be under the same title, if the units function as independent households, i.e. they share no habitable spaces, then the building must be assessed as a multi-unit dwelling.

Therefore, compliance is determined by the provisions of the NZBC as they apply to a multi-unit dwelling.

3.2 Apartment doors: Determination 2015/004

This Determination concludes that entrance doors to apartments, i.e., door leading into an apartment of a common space is not required to satisfy the performance requirements of Clause G6.

Despite this determination, the AAAC recommends that apartment entry doors to corridors have a rating of at least STC 30 to provide a reasonable level of sound insulation.

3.3 Specialist accommodation: Determination 2015/004

This Determination concludes that specialist accommodation only includes *hostels* and *boarding houses*. As such, retirement village apartments are considered household units and are required to achieve the provisions of the Building Code.

3.3.1 Other accommodation types: Hotels and student hostels

Further to Determination 2015/004, the AAAC provides the following opinion on the classification of hotels and student hostels.

Hotel rooms are not typically *household units* – they are not used “solely or principally for residential

purposes and occupied or intended to be occupied exclusively as the home or residence of not more than one household...".

Student hostels or student accommodation typically fall under the G6 definition for *hostels*, therefore, are not *household units*.

Buildings that do not contain *household units* do not need to comply with the Performance Requirement of G6.

3.4 Common area definition and retirement villages: Determination 2015/004

In this determination, the Manager of Determinations and Assurance, adds clarification to the definition in G6 for common areas, as follows:

"A common area is not exclusively owned and therefore does not fall within the definition of 'occupancy' for G6. I consider 'exclusive ownership' in a broader sense than the person named on a certificate of title. Clause G6 is about the occupants of a building who use the building and not the 'owner' of a building in a strict legal sense."

This is particularly relevant for retirement villages with various common areas such as dining rooms, lounges, libraries, movie theatres, pools, etc., that would not be considered "occupancies" according to this definition as they do not have "exclusive ownership".

The AAAC recommends appropriate sound insulation is provided for separating walls or floors between residential units and common areas in retirement villages.

3.5 Horizontal impact noise: Determination 2015/007

This determination concludes that impact sound insulation does not apply horizontally and only applies to below where apartments share common building elements, i.e., testing of impact sound transmission diagonally to below across the line of an inter-tenancy wall is not applicable.

Despite this determination, the AAAC recommends that reasonable impact sound insulation provisions are included in the building design, such that impact sound insulation from all residential units into habitable spaces below or diagonally below achieves at least IIC 55 / FIIC 50.

4.0 ON-SITE AIRBORNE SOUND INSULATION TESTING AND THE INCLUSION OF FLANKING

Often when assessing the overall sound insulation performance of a building element (intertenancy wall or floor), acoustic flanking around the perimeter of the element can decrease the overall performance of the element. It is important that designers do not just assess the performance of the element in isolation, but rather, consider and include all flanking paths which may exist that could adversely affect the element's sound insulation performance. Typical flanking paths include doors to common spaces, floor slabs, roof voids, building services and curtain-walled facades.

G6 offers an on-site verification method for the airborne sound insulation performance of building elements through "field" testing in accordance with ASTM E 336 – 90 (1990). This (now superseded) version of ASTM Standard describes a means of determining the Field Sound Transmission Class (FSTC), which is extremely complicated if carried out in full as it requires separate assessment of all individual flanking paths to determine whether the measured FSTC value is influenced by flanking. A *minimum* FSTC value can be more simply determined using ASTM E 336 – 90 by including the presence of all flanking paths (ignoring the separate flanking assessments).

More recent versions of the ASTM E336 from 2005 onwards outline a method of "field" assessment defined as the Apparent Sound Transmission Class (ASTC), which is a standard test method for separating elements, inclusive of all flanking paths.

Determining the ASTC is the more appropriate method of assessment as it encapsulates the overall

subjective sound insulation performance of an intertenancy wall or floor of a multi-residential building, and therefore, better aligns with the Objective of Clause G6. Some territorial Authorities, including Auckland City Council, have required that on-site testing is undertaken by ignoring the separate flanking assessments outlined in ASTM E 336 – 90, essentially making the on-site verification method an ASTC test.

In summary, when completing on-site G6 verification testing of building elements, any flanking paths which may exist should be included in the test, essentially making it an ASTC test. If one or more flanking paths is considered to be significant, is it worthwhile noting this in the test report.

For clarity and simplicity, the term ASTC will be used in place of FSTC throughout the rest of this document.

5.0 COMMUNAL CARPARKS ADJACENT TO RESIDENTIAL UNITS

Communal carparks have the potential to create a noise intrusion issue when adjacent to residential units. However, under the G6 Functional Requirement (G6.2), carparks are not typically considered to be “occupancies” and therefore the Performance requirements (STC and IIC ratings) do not apply.

The AAAC recommends a minimum sound insulation performance for separating walls or floors between residential units and carparks in line with the G6 Performance requirements is applied, i.e., STC55 / ASTC 50.

6.0 COMMUNAL CORRIDORS AND BREEZEWAYS

Determination 2015/004 has made it clear that entry doors from communal corridors and breezeways do not need to meet the Performance requirements of G6. This determination also implies that the walls themselves between communal areas and residential units need not meet the Performance requirements of G6.

The AAAC, however, recommends that reasonable airborne and impact sound insulation provisions are included in the building design to reduce noise from communal corridors and breezeways into residential units, as follows:

- Impact sound insulation from corridors and breezeways into habitable spaces below or diagonally below: IIC 55 / FIIC 50
- Airborne sound insulation from corridors into habitable spaces without entry doors: STC 55 / ASTC 50
- Airborne sound insulation from breezeways without windows into habitable spaces without entry doors: STC 55 / ASTC 50
- Airborne sound insulation of glazing units between breezeways and habitable spaces: STC 45 / ASTC 40
- Airborne sound insulation from corridors/breezeways into habitable spaces with entry doors:
 - Entry door: Minimum STC 30
 - Wall: Minimum STC 45

It is often not possible to test corridors and breezeways in accordance with the relevant sound insulation Standards, therefore ensuring that the wall/floor constructions are designed and built to meet the nominated laboratory rated constructions is important.

7.0 APPLICATION OF FUNCTIONAL REQUIREMENT G6.2 TO INTERTENANCY WALLS AND FLOORS

Based on the wording of Functional Requirement G6.2, Definitions and the subsequent Determinations, the following sections outline the required and recommended sound insulation performances of intertenancy walls and floors. As discussed previously, there are two categories of space within a household unit:

- **Habitable space:** Living rooms, dining rooms, bedrooms, studies, kitchens and other similar spaces which may be occupied frequently and for extended periods.
- **Non-habitable space:** Bathrooms, laundries, waterclosets, pantries, walk-in wardrobes, corridors, hallways, lobbies, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.

Non-residential occupancies include offices, retail, gyms, hairdressers, restaurants or other commercial uses.

The tabulated ratings represent the minimum sound insulation performance requirements. The AAAC suggests it may be appropriate to apply higher performance in situations where spaces adjacent to household units are expected to produce high noise levels, e.g., gyms, night clubs, etc.

7.1 Airborne Sound Insulation

The table below shows the relationship between different spaces and their airborne sound insulation requirements. The following should also be noted:

- These requirements apply horizontally and vertically to any inter-tenancy walls/floors which share an overlapping area with spaces in an adjacent occupancy.
- These requirements do not apply to walls/floors within the same occupancy.
- For simplicity, this table is based on airborne sound insulation ratings being reciprocal, i.e., the same rating will be achieved regardless of which space is selected as the source room.

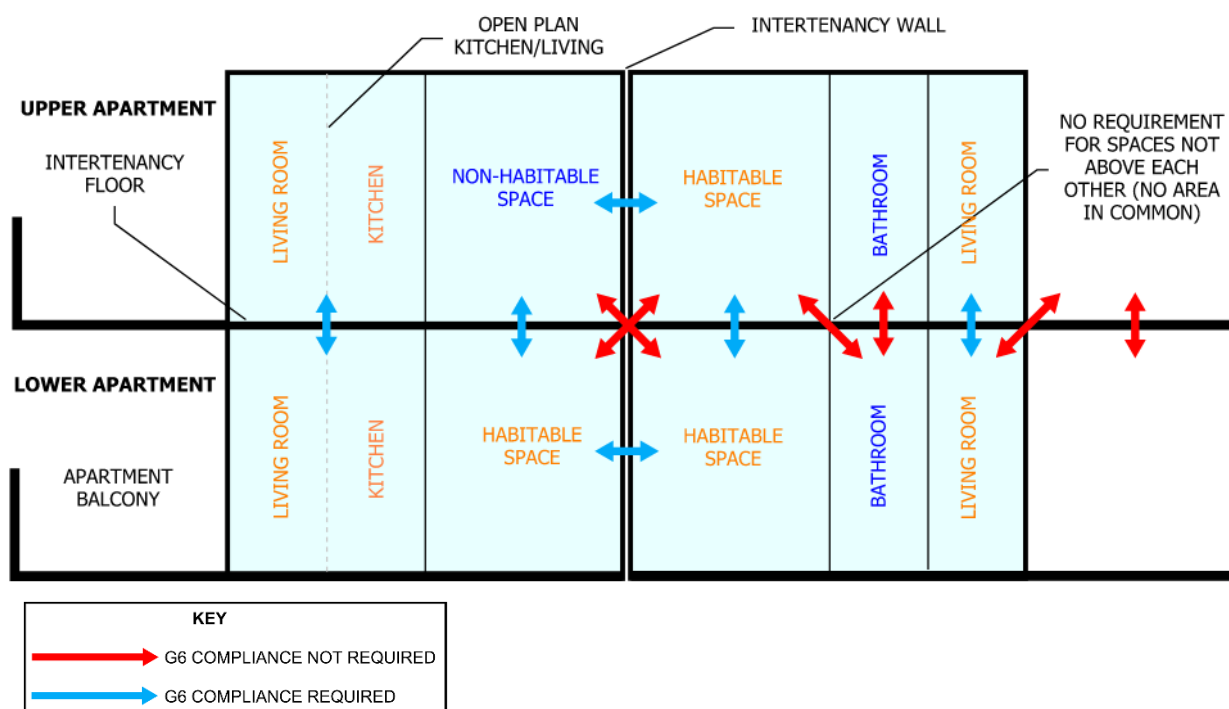
Table 1 – G6.2 airborne sound insulation compliance requirements and AAAC recommendations.

	Bedroom	Living / dining room	Other habitable space	Bathroom / laundry	Other residential non-habitable space	Balcony	Non-residential occupancy	Communal corridor*	Communal carpark*
Bedroom	STC 55 / ASTC 50	STC 55 / ASTC 50	STC 55 / ASTC 50	STC 55 / ASTC 50	STC 55 / ASTC 50	-	STC 55 / ASTC 50	Refer to section 6.0	STC 55 / ASTC 50
Living / dining room		STC 55 / ASTC 50	STC 55 / ASTC 50	STC 55 / ASTC 50	STC 55 / ASTC 50	-	STC 55 / ASTC 50	Refer to section 6.0	STC 55 / ASTC 50
Other habitable space			STC 55 / ASTC 50	STC 55 / ASTC 50	STC 55 / ASTC 50	-	STC 55 / ASTC 50	Refer to section 6.0	STC 55 / ASTC 50
Bathroom / laundry				STC 55 / ASTC 50	STC 55 / ASTC 50	-	STC 55 / ASTC 50	Refer to section 6.0	STC 55 / ASTC 50
Other residential non-habitable space					STC 55 / ASTC 50	-	STC 55 / ASTC 50	Refer to section 6.0	STC 55 / ASTC 50
Balcony						-	-	-	-
Non-residential occupancy							-	-	-
Communal corridor*								-	-
Communal carpark*									-

AAAC recommendation, not mandatory

*Not considered an occupancy

Figure 1 – Examples of G6.2 airborne sound insulation requirements.



7.2 Impact Sound Insulation

The table below shows the relationship between different spaces and their impact sound insulation requirements. The following should also be noted:

- These requirements apply to inter-tenancy floors, from occupancies above to spaces vertically or diagonally below.
- These requirements do not apply to floors within the same occupancy.
- Note that the direction of the test is important.
- The G6 test Standard ISO 140/VII: 1978 does not explicitly exclude impact sound insulation testing into spaces which are diagonally below the floor upon which the tapping machine is placed, i.e., the source room floor and receiving room do not need to be vertically stacked. Determination 2015/007 clarifies that testing diagonally across a vertical intertenancy wall line is not required, however, it is silent on testing diagonally across internal partitions within the same occupancy. The table and diagram below reflect these requirements.

Table 2 – G6.2 impact sound insulation compliance requirements and AAAC recommendations.

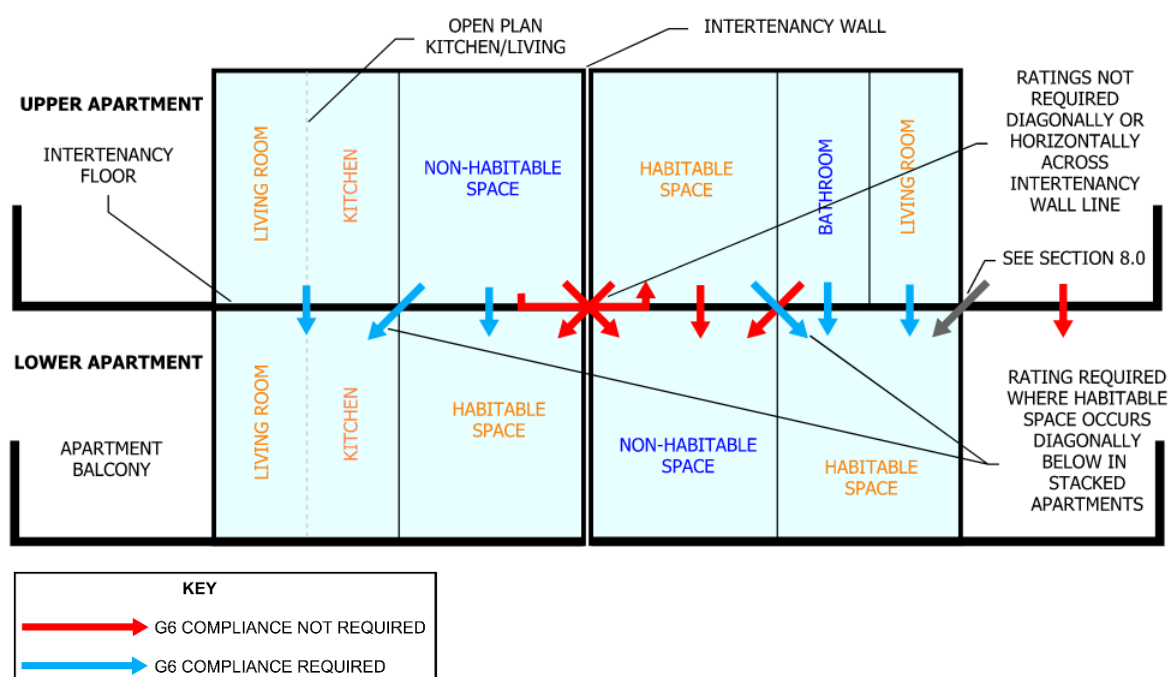
		Space above (impact source room)					
		Internal floor within a household unit	Balcony directly above an internal room	Cantilevered balcony exterior to room below	Non-residential occupancy	Communal corridor*	Communal carpark*
Space on floor below (receiving room)	Bedroom	IIC 55 / FIIC 50	IIC 55 / FIIC 50**	See discussion (section 8.0)	IIC 55 / FIIC 50	IIC 55 / FIIC 50	Consideration recommended
	Living room	IIC 55 / FIIC 50	IIC 55 / FIIC 50**	See discussion (section 8.0)	IIC 55 / FIIC 50	IIC 55 / FIIC 50	Consideration recommended
	Kitchen	IIC 55 / FIIC 50	IIC 55 / FIIC 50**	See discussion (section 8.0)	IIC 55 / FIIC 50	IIC 55 / FIIC 50	Consideration recommended
	Bathroom / laundry	IIC 55 / FIIC 50	IIC 55 / FIIC 50	IIC 55 / FIIC 50	IIC 55 / FIIC 50	IIC 55 / FIIC 50	Consideration recommended
	Other residentail non-habitable space	IIC 55 / FIIC 50	IIC 55 / FIIC 50	IIC 55 / FIIC 50	IIC 55 / FIIC 50	IIC 55 / FIIC 50	Consideration recommended
	Balcony	-	-	-	-	-	-
	Non-residential occupancy	-	-	-	-	-	-
	Communal corridor*	-	-	-	-	-	-
	Communal carpark*	-	-	-	-	-	-

AAAC recommendation, not mandatory

*Not considered an occupancy

**See discussion on the practicalities of field testing balconies (section 8.0)

Figure 2 – Examples of G6.2 impact sound insulation compliance requirements. Note that only intertenancy floors are required to meet the G6 impact sound insulation criterion of IIC 55.

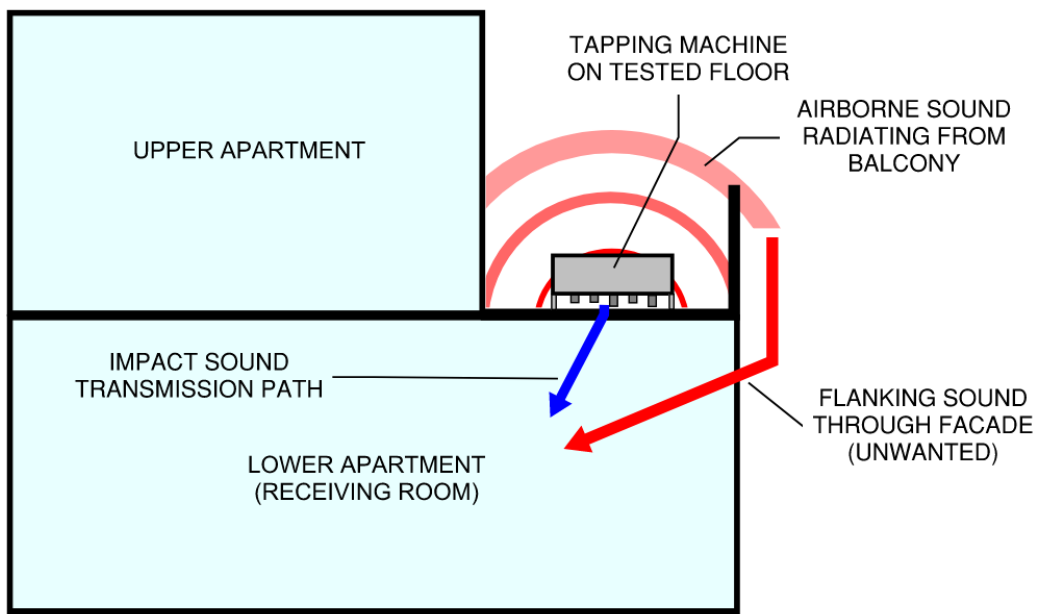


8.0 BALCONY IMPACT SOUND INSULATION REQUIREMENTS

Footfall noise on balconies can cause nuisance for occupants of residential units on the level directly or diagonally below.

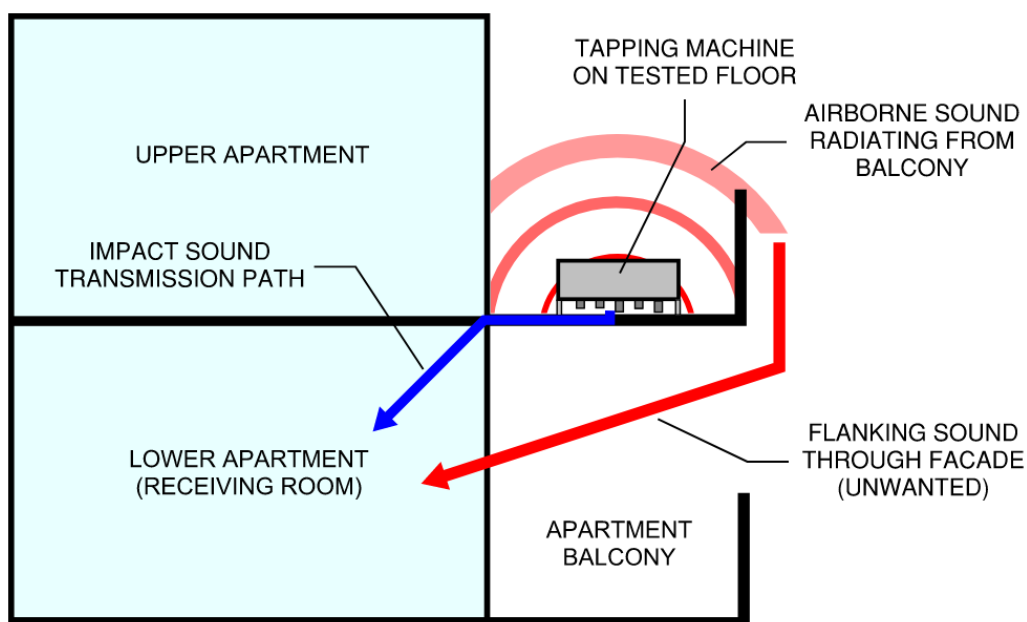
Where an apartment balcony occurs directly above the habitable space of another apartment (refer to Figure 3), the building element (balcony floor) between the two dwellings must meet the Performance requirements of G6. This means that the balcony floor must achieve an Impact Insulation Class (IIC) of 55 and the performance may be verified through on-site testing by achieving a Field Impact Insulation Class (FIIC) of 50. Due to the presence of airborne flanking through the facade of the lower apartment, however, it may be impractical to measure the FIIC rating accurately. (In this instance, it is inappropriate to include the airborne noise flanking in the test because the tapping machine generates airborne noise in a such way that is not representative of actual human footfall).

Figure 3 – Apartment balcony above apartment, including potential flanking path via facade



In the situation where an apartment balcony occurs directly above another apartment balcony (refer to Figure 4), it is possible to interpret G6 in a number of ways, and to-date, there have been no MBIE determinations which specifically address this situation. One interpretation is that the balcony is not a building element which is common with the habitable space in the apartment below, due to the offset between the balcony and the living area; therefore G6 does not apply. Another interpretation is that G6 does apply between the whole occupancy above and the habitable space of the apartment diagonally below.

Figure 4 – Apartment balcony above balcony, including potential flanking path via facade



Again, due to the presence of airborne flanking through the facade of the lower apartment, it may be impractical to measure the FIIC rating accurately.

The AAAC recommends that balcony impact insulation achieves the FIIC 50 criterion on-site (where minimal flanking exists), or where impracticable to assess due to airborne flanking, achieves IIC 55 based on laboratory tested systems or expert opinion.

9.0 TESTING OF SMALL SEPARATING ELEMENTS

In many multi-unit residential buildings, the rooms and separating elements between occupancies may be small due to the compact nature of such dwellings, e.g., having small bathrooms/toilets. Therefore, it may not be possible to complete airborne or impact sound insulation verification tests in accordance with the Standards defined in the Verification Method.

The Standards require the following minimum sizes:

Airborne sound insulation (E 336 – 90)

- Minimum area in common with rooms on either side of separating element: 2.3 x 2.4m (5.52m²)
- Minimum volume of rooms either side of tested separating element: 40m³
- Minimum ceiling height: 2.3m
- Minimum lateral dimension: 2.75m

Impact sound insulation (ISO 140/VII-1978)

- Minimum distance between tapping machine hammers and edge of floor: 0.5m
- No minimum room volume¹ or floor dimensions

Where these minimum room dimensions cannot be met, tests cannot be completed according to the requirements of the Standards and therefore are typically considered invalid. If testing is carried out regardless, the non-conformance should be noted and the test undertaken for information only.

In the case where G6 Verification Method testing cannot be completed due to non-conforming room dimensions, it is still a requirement for the separating element (intertenancy wall or floor) to meet the G6 Performance requirements (STC and IIC ratings).

9.1 Impact Insulation of Shower Floors

Annoyance due to footfall impacts on shower flooring to occupants below is extremely uncommon on the basis that people do not wear shoes in the shower. Verification testing of shower floors is also generally impractical, since a typical shower is 900mm wide and therefore the requirement to have the tapping machine hammers placed at least 500mm away from both shower walls cannot be met.

The AAAC recommends that if bathrooms include showers that are large or not partitioned off from the remainder of the room, suitable impact insulation protection should be provided to meet the requirements of G6.

¹ Later versions of this ISO field impact sound insulation testing Standard discuss minimum receiving recommended room dimensions: "At least one room dimension should be of one wavelength and another of at least half a wavelength of the lowest band centre frequency."

10.0 ON-SITE SOUND INSULATION TESTING

10.1 Loudspeaker Selection

ASTM E 336 – 90 (1990) requires that loudspeakers conform to the following:

"7.4.4 The source(s) should be approximately nondirectional to avoid a strong direct field component; that is, the free-field directivity factor should be approximately 1 at all test frequencies."

Common practice in New Zealand is to undertake airborne sound insulation testing using a multi-driver PA loudspeaker as the noise source. This is by far the most practical source type for this application, and provides a reasonable approximation of omnidirectionality (non-directionality) at the important test frequencies. If high-frequency sound transmission is an issue in a particular test scenario, it may be necessary to utilise a dodecahedron type omnidirectional speaker.

The AAAC suggests that using a multi-driver PA loudspeaker for general on-site airborne sound insulation testing is appropriate for most applications.

10.2 Extent of Testing

Some local authorities in New Zealand require on-site Verification Method testing as part of the practical completion or Code Compliance Certificate process. On-site testing of separating elements in multi-residential building can be time-consuming and costly, and often it is not necessary to test 100% of all separating elements to infer that a building is compliant. Insufficient testing, however, can result in failing separating elements not being identified.

The AAAC provides the following guidelines for the extent of testing to cover a reasonably representative sample of the testable separating elements (intertenancy walls and floors).

- Testing is to be carried out by a suitably qualified acoustic consultant. The member of a AAAC firm who is also a Member of the ASNZ is preferred.
- Testing should commence once the rooms on either side of the separating element are suitably complete. Any incomplete works which may affect the acoustic rating should be noted in the test results.
- Testing should be carried out as soon as reasonably practicable to allow early identification of any defects. Early testing of prototype constructions is recommended.
- Identify all largely unique separating element construction types which exist across the project. This will require review of the architectural/structural drawings and/or discussions with the builder. Unique constructions may include different floor finishes, underlay types, stud types, lining types, floor structures, facade junction details, roof junction details, etc.
- **For each unique separating element type, test at least 10%, rounded up, of that type** across the building. For example in a large apartment building, if a unique type of intertenancy wall exists in 10 locations, at least 1 of those wall types should be tested. If only 2 walls of that type exist, then at least 1 of those wall types should be tested.
- Tests should be distributed across all levels of the building, and always include the top floor.
- Where the separating element is a wall, complete airborne sound insulation testing (FSTC/ASTC). Where the separating element is a floor, complete both airborne and impact sound insulation testing (FSTC/ASTC and FIIC).
- Carpeted floor areas do not typically require impact insulation testing, unless the flooring is very thin carpet without underlay and/or the floor structure is lightweight (timber joist, CLT, etc.). Test a selection of all hard flooring types.
- When impact testing rooms within an occupancy with mixed flooring types (e.g., an open plan kitchen/dining/living room with tiles, timber and carpeted flooring), each flooring type

should be considered for testing separately. It may be necessary to undertake more than one impact insulation test within a single room to adequately assess all floor systems present.

- If the FSTC/ASTC or FIIC test result of a unique separating element type is 52 or less, then additional investigation and/or testing is recommended to be undertaken on that element type.
- Any failed tests (less than 50) must be reported to the Contractor for rectification. Further investigation and testing of that separating element type must be undertaken to determine whether the failure is systematic. Appropriate rectification must be undertaken and retesting completed.
- The testing acoustic consultant may vary the number of tests if more/less tests can be justified. Justification should be provided in the test report.

11.0 MODIFICATION OF EXISTING BUILDINGS

Under the Building Act 2004, modifications to an existing building may be due to a *Change of Use*, or an *Alteration/Refurbishment*.

For an *Alteration/Refurbishment*, section 112(1)(b) 1 & 2 of the Building Act applies, summarised as follows:

- If the building complied with the NZBC for G6 before the alteration, it must continue to comply after the alteration.
- If the building did not comply with the NZBC before the alteration, it must comply after the alteration to the same extent it did before the alteration.

For a *Change of Use* modification, section 115(a) of the Building Act applies, summarised as follows:

- In a case where the change involves the incorporation in the building of 1 or more household units where household units did not exist before, unless the territorial authority gives the owner written notice that the territorial authority is satisfied, on reasonable grounds, that the building, in its new use, will comply, as nearly as is reasonably practicable, with the NZBC in all respects.

The justification for applying “as near as is reasonably practicable” measures must be sound and based on three key factors (adapted from Auckland Council Practice Note AC2226):

1. The work could not be undertaken without major structural alteration of the building, or there are specific site constraints.
2. The balancing of the sacrifices and difficulties of upgrading the sound insulation against the advantages of upgrading the project as a whole (Justice Gallen).
3. The alteration will improve either the means of escape or access and facilities for disabled persons (refer to section 112.2 of the Building Act).

Where modifications to existing residential buildings are undertaken, it can be difficult to determine whether certain modifications will alter the requirements to achieve G6 compliance. This issue is legally complicated and specialist legal advice should be sought.

See also Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005, clause 5 for the definition of changing the use of a building, and Schedule 2 for the definitions of various building “uses”.

As far as practicable, the AAAC recommends that minimum G6 sound insulation standards are achieved.

12.0 DISCLAIMER

The guidelines do not represent a legal opinion and further clarification in specific instances would need to be undertaken through the Determination process.

Where AAAC quality recommendations are given for items clearly not included in the NZBC, these are recommendations to developers and designers, and are not requirements that can be enforced by local authorities.

13.0 REFERENCES

G6 reference Standards:

- ASTM E 336: 1990 Method for measurement of airborne sound insulation in buildings
- ASTM E 413: 1987 Classification for rating sound insulation
- ASTM E 492: 1990 Test method for laboratory measurement of impact sound transmission through floor-ceiling assemblies using the tapping machine
- ASTM E 989: 1989 Classification for determination of impact insulation class (IIC)
- ISO 140/VII: 1978 Field measurements of impact sound insulation of floors

The current version of NZBC G6 Airborne and impact sound is available from the New Zealand government's Building Performance website:

<https://www.building.govt.nz/building-code-compliance/g-services-and-facilities/g6-airborne-and-impact-sound/>

NZBC Determinations:

<https://www.building.govt.nz/resolving-problems/resolution-options/determinations/determinations-issued/>

New Zealand Building Act 2004:

<https://www.legislation.govt.nz/act/public/2004/0072/latest/DLM306036.html>

Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005:

<https://www.legislation.govt.nz/regulation/public/2005/0032/latest/DLM313966.html>

Auckland Council Practice Note AC2226 (v.7) - Applying the term as near as is reasonably practicable:

<https://www.aucklandcouncil.govt.nz/building-and-consents/Documents/ac2226-applying-the-term-as-near-as-is-reasonably-practicable.pdf>