Australian Building Code Revision

Jon Farren
Marshall Day Acoustics Pty Ltd, Sydney, email: jfarren@marshallday.com.au

In May 2004, the Sound Insulation Requirements of the Building Code of Australia (BCA) changed significantly. This brief paper outlines the major changes.

Note that this paper is intended only as a guide, and should not be used in place of the BCA documents.

Introduction

Part F5 of the Building Code of Australia (BCA) refers to the sound insulation requirements for dwellings.

For some time the current BCA requirements for sound insulation have been considered inadequate.

Amendments increasing the sound insulation requirements of the BCA have been made to reflect community expectations.

"...the requirements for airborne sound insolation under the new BCA [are] much more onerous..."

What has changed?

There have been a number of changes the sound insulation requirements of the BCA. The main changes are:

- Increased airborne sound insulation requirements for walls and floors separating dwellings and sole occupancy units
- Introduction of impact isolation requirements for floors separating dwellings and sole occupancy units
- Introduction of on-site testing as an option for verifying performance of walls and floors
- Sound insulation requirements for services extended to cover water supply pipes, duct work and storm water pipes

What type of buildings does this code apply to?

This section of the BCA essentially applies to all dwellings and sole occupancy units. These include:

- single dwellings that share a common wall such as an attached terrace or townhouse
- boarding houses, hostels and guest houses
- apartment buildings
- hotels and motels
- aged care facilities.

The BCA considers two basic room types in dwellings — wet areas and dry areas. Wet areas are bathrooms, kitchens and laundries and dry areas are lounge rooms, dining rooms and bedrooms.

Noise control, what does the BCA consider?

The BCA specifies the minimum requirements for sound insulation performance between dwellings, between dwellings and plant rooms, lift shafts, stairways, public corridors or the like.

The BCA specifies the minimum sound insulation performance between dwellings and risers and including the control of noise from waste pipes etc. The new BCA also sets maximum allowable levels for impact noise from floors separating dwellings.

When do the new regulations come into force?

The amendments to the BCA sound insulation provisions came into force on 1 May 2004.

How do the new provisions for airborne sound insulation affect wall and floor constructions?

The new BCA provisions not only increase the rating to be met but this new rating includes a spectrum adjustment factor to account for the low frequency performance of the wall.

The need to consider the low frequency performance of a wall has come about as a result of many home entertainment systems having a high bass frequency output.

The spectrum adjustment factor is a negative number and its value depends on the wall construction. This makes the requirements for airborne sound insolation under the new BCA much more onerous.

Table 1 compares the airborne sound insulation requirements under the current and new BCA. The spectrum adjustment factor will vary depending on the wall construction.

For masonry constructions the spectrum adjustment factor is less than for a stud and plasterboard or dry wall construction.

This means that to comply with the new BCA a stud and plasterboard partition will need to have a higher acoustic rating if simply compared on the basis of the current BCA.

Table 1 compares the rating required **without** adjustment for the current BCA and for the proposed BCA. For the proposed BCA the acoustic performance

Table 1: Code Requirements	**Current BCA**	**New BCA**	
		Masonry	**Dry wall**
Walls between dwellings	45	56*	60*
Walls between bathroom sanitary compartment, laundry or kitchen in one dwelling, and a	50	56*	60*
Walls separating a dwelling from a plant room lift	–	50	50
Floors between dwellings 45 56* 56*	45	56*	56*
Floors separating a dwelling from a plant room lift	–	56*	56*

* The sound insulation criteria for the new BCA is $R_w + C_{tr}$. C_{tr} is the spectrum adjustment factor for the low frequency performance of the wall. The value of C_{tr} varies depending on the wall construction. C_{tr} is a negative value.

rating required is provided for two construction types.

Note that higher performance is required for dry wall construction.

Part F of the BCA details a number of "deemed-to-satisfy" constructions that will meet the new requirements. The new BCA includes provisions for the performance of dwelling entry doors where the entry door adjoins a common area such as a hallway.

A door in a wall that separates two dwellings must meet the same requirements as the wall. A door in a wall that separates two dwellings occurs in adjoining hotel rooms.

What are the new floor impact isolation performance requirements?

Under the current BCA there are no requirements for the impact isolation performance of floors.

The new BCA introduces a minimum impact isolation performance of floors separating dwellings and floors separating dwellings and plant rooms, public corridor etc..

Typical floor "deemed-to-satisfy" construction to meet new BCA requirements (impact noise and airborne sound insulation):

- 150mm thick concrete slab, 28mm metal furring channel and insolation mounts, 65mm thick insulation (min density 8kg/m^3), 1x13mm plasterboard or
- 200mm thick concrete slab with carpet on underlay

How is compliance tested?

The new BCA has introduced provision for on-site performance testing of wall and floor constructions. On-site testing must be carried out in accordance with the relevant standard.

The performance rating used for on-site testing is slightly different from that measured in the laboratory. Numerically the rating is 5 units below that for laboratory testing. This is to allow for the difference in the measurement procedure, flanking and weaknesses caused by wall penetrations.

On-site testing is not a requirement as compliance can be achieved by using "deemed-to-satisfy" wall and floor constructions described in the BCA.

Compliance can also be achieved by using constructions that have been laboratory tested or by employing a suitably qualified acoustic consultant to determine compliance of constructions that aren't "deemed-to-satisfy".

What are the changes to the requirements for services noise control?

The performance of any wall or floor must not be compromised by the incorporation or penetration of a pipe or other service element.

The current BCA includes requirements for soil and waste pipes only. The new BCA extends the requirements to wall supply pipes, duct work and storm water pipes.

How does the new BCA compare with the Central Sydney DCP?

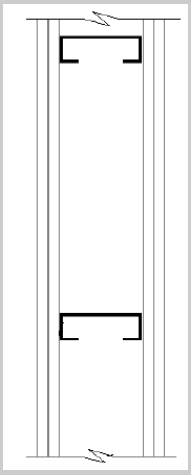
The requirements of the new BCA exceed those of the Central Sydney Development Control Plan (DCP) except for impact isolation requirements of floors.

The impact isolation requirements of the Central Sydney DCP exceed the new BCA requirements by two to seven units depending on the location of the floor.

The new BCA requirements, although improved and more stringent, will be the new minimum requirements. For prestige developments, higher acoustic performance is likely to be required. ❑

Wall construction required to meet current BCA requirements

- 110mm thick concrete brickwork or
- 2x16mm plasterboard, 64mm steel stud, 2x16mm plasterboard



Wall construction required to meet new BCA requirements

- 150mm thick plain off form concrete or
- 1x13mm plasterboard, 100mm concrete panel, 64mm steel stud, 50mm thick insulation (min density 11kg/m^3), 2x13mm plasterboard