

Fire & Acoustic Brochure



FIRE & ACOUSTIC DESIGN

In additions to the need for walling to have the strength not to collapse under structural loads, the Building Code of Australia (BCA) also requires most walls to have minimum levels of resistance to fire & sound. These requirements are spelled out in detail in the BCA but, for quick reference, are summarized in this information.

FIRE RESISTANCE

BCA requirements for Fire - resisting Construction expressed as “Fire Resistance Levels” (FRL). FRL’s are given in the form of three numbers FRL 60/120/120 - meaning Structural Adequacy for 60 minutes/ Integrity for 120 minutes/ Insulation for 120 minutes.

STRUCTURAL ADEQUACY

This is the “ability to remain stable”, that is, the ability of the wall not to collapse (fail structurally) from the effects of the fire. AS 3700 defines the stability of the wall by limiting the slenderness ratio. The effects of this that for a particular thickness of wall there is a limitation on the height. The height limits for various Apex Masonry walls are show in the following table. The values given are based on the code criteria of “basaltic aggregate content less than 45%”. All values are based on the walls having no lateral supports, but if they are closely-spaced cross wall providing lateral support, then the maximum height values may increase.

INTEGRITY

Integrity is the “ability to resist the passage of flames and hot gases” through the wall. AS 3700 does not give separate rules for integrity, but requires the wall to meet the integrity value for insulation.

INSULATION

Insulation is the “ability to limit the passage of heat” through the wall. AS 3700 defines insulation by specifying a minimum value of “material thickness”. For unity of less than 30% coring, the material thickness (alternatively called the “equivalent thickness”) is the overall thickness. For blocks with greater than 30% coring, the material thickness is the volume of the block divided by the face area. If all the cores are grout filled, the material thickness is the overall thickness. If the wall is cement rendered on both faces, the thickness of the thinner coat (up to a maximum of 20mm) can be added to the material thickness.

OPTIONS FOR INCREASING FRL

The Structural Adequacy can be increase by adding wall stiffeners, by increasing the overall thickness, by adding reinforcement & core filling or by protecting the wall with particular fire resistant wall linings. Insulation FRL’s can be increased by core filling, adding another leaf or masonry or by rendering both sides of the wall.

ACOUSTIC PERFORMANCE

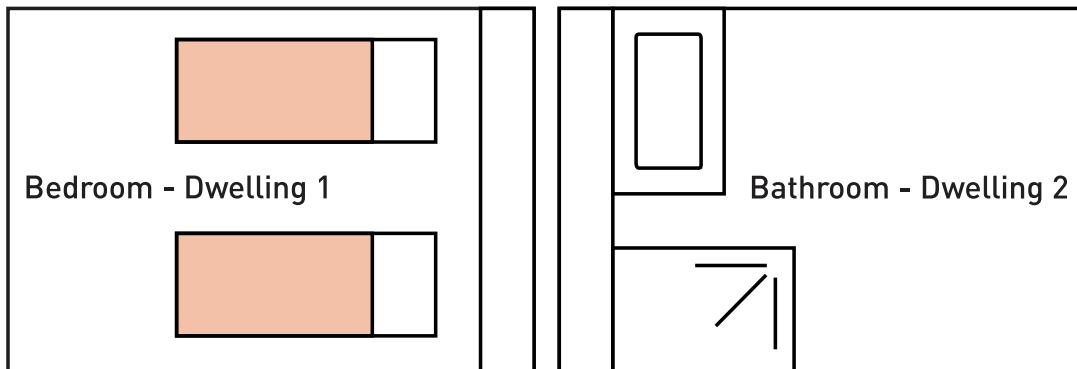
Sound insulation provides insulation from airborne and impact sound in separating walls between two or more Class 1 buildings.

BCA Requirements now states that between a bathroom, sanitary compartment, laundry or kitchen; a habitable room (other than a kitchen) (see figure below) an impact related walls of; discontinuous construction: must be used.

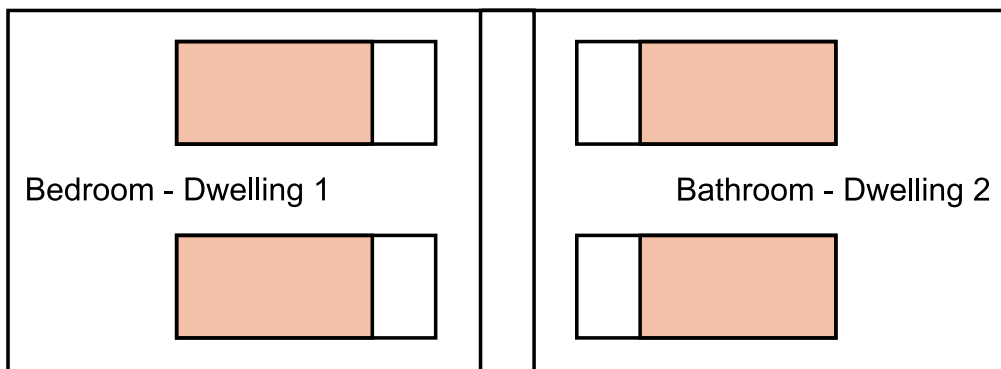
For further information see Part 3.8.6 Sound Insulation - BCA 2012 (Class 1).

STC (Sound Transmission Class)
 Rw (Weighted Sound Reduction Index)
 STC is no longer used in the BCA

All impact related walls in Queensland must now have a rating of $R_w + C_{tr} = 50$



$R_w + C_{tr} = 50$ and
 discontinuous construction
 Adjoining bedroom/bathroom

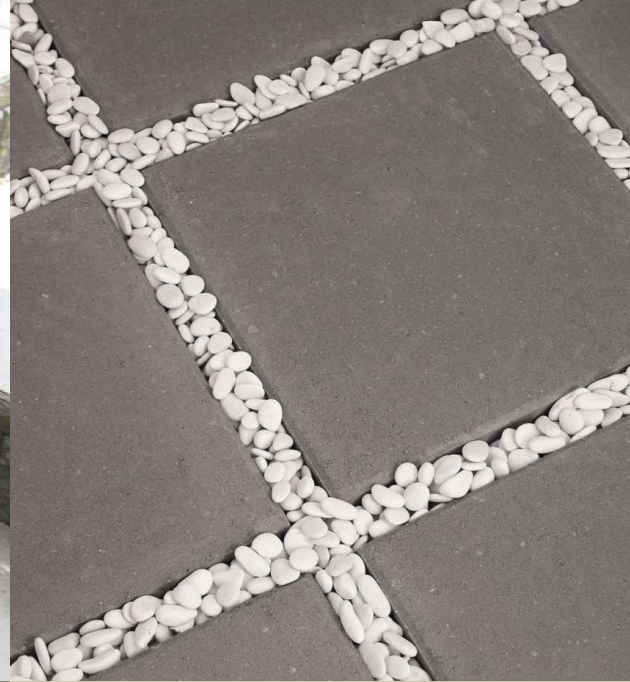


$R_w + C_{tr} = 50$ and
 Adjoining bedroom/bathroom

SPECIFICATIONS

Product Code	Type	Unit Mass (kg)	Material Thickness (mm)	Fire resistance period for INSULATION; INTEGRITY (mins)	Maximum wall heights for unreinforced blockwork (mm) Fire-resistance period for STRUCTURAL ADEQUACY (mins) 45% Basaltic-Aggregate Masonry Units					Rw (13mm Render both faces)
					60mins	90mins	120mins	180mins	240mins	
10.01	Hollow	10	90	60	2700	2420	2400	-	-	46
10.01	13mm render both faces	10	114	90	2700	2420	2400	-	-	46
12.709	Hollow	13.88	110	90	2700	2420	2400	-	-	46
15.01	Hollow	13.3	140	60	4200	3920	3720	3360	3170	47
15.01	13mm render both faces	13.3	160	90	4200	3920	3720	3360	3170	47
15.48	Reinforced; Grout Filled	12.82	140	120	4200	3920	3720	3360	3170	53
15.801	Reduced Core	18.18	140	120	4200	3920	3720	3360	3170	50
20.01	Hollow	14.49	190	90	5700	5320	5060	4560	4300	48
20.48	Reinforced; Grout Filled	15.15	190	240	5700	5320	5060	4560	4300	56* *Rw+Crt=50
30.48	Reinforced; Grout Filled	20	290	240	5700	5320	5060	4560	4300	59

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COLOUR VARIATION

Due to the changes in raw materials, variation in colour can occur. When ordering your product, order all elements of your project together to reduce the possibility of colour variation. We do not guarantee different batches will be the same colour.



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