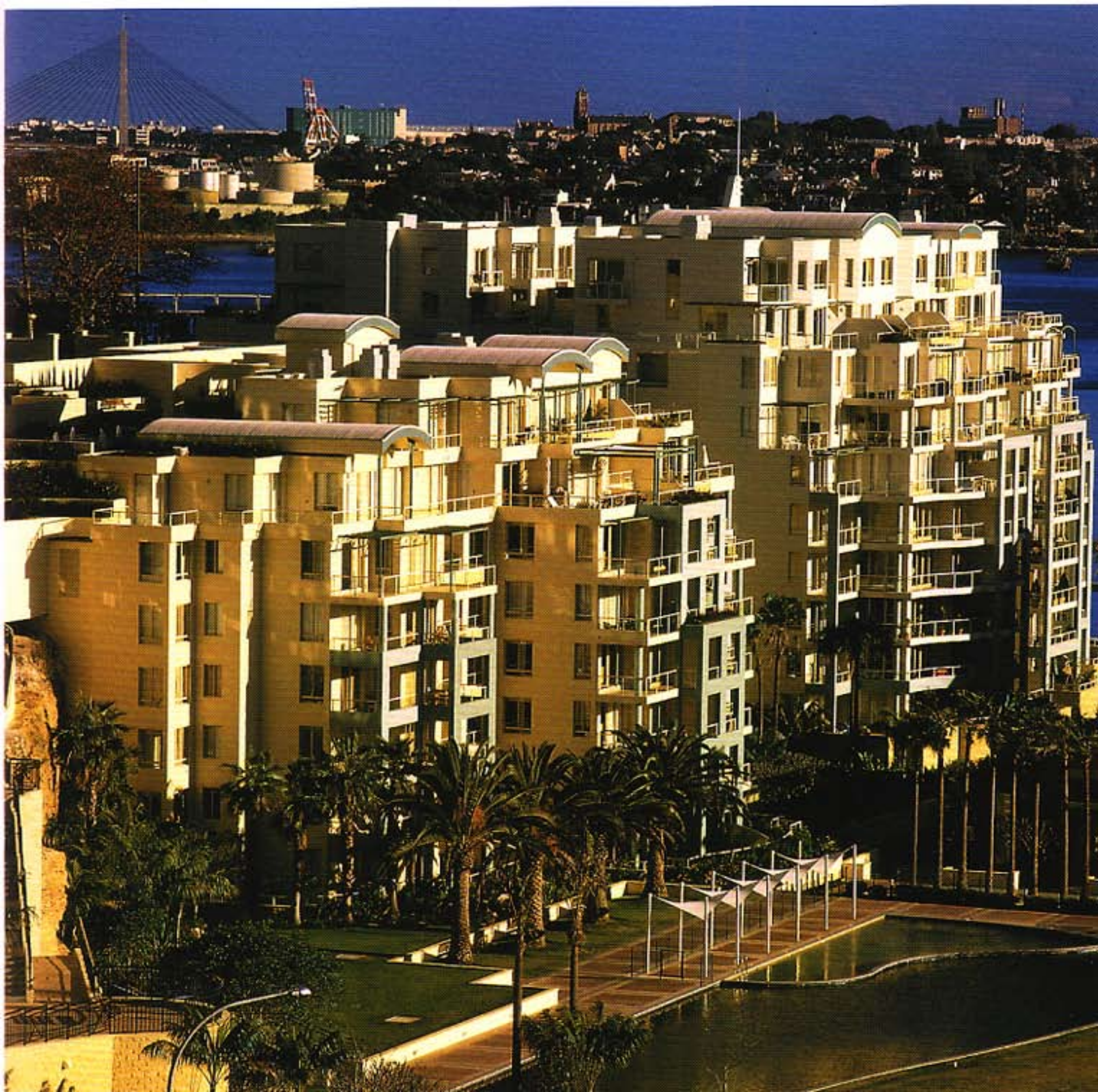




# Clay Commons Ratings



# Strength of Brickwork

The strength of brickwork is a function of the strength of the masonry unit combined with strength of the mortar. Typically, manufacturers provide the characteristic unconfined compressive strength of masonry units (bricks),  $f'_{uc}$ . It is from this value that the engineer derives the strength of masonry (wall),  $f'_m$ , appropriate to the unit type and strength with a particular mortar, using Section 3 of the Australian Standard for Masonry Structures, AS 3700.

Example: A 119mm high clay unit with an  $f'_{uc}$  of 50 MPa laid with full bed M4 mortar will achieve a characteristic unconfined strength of the masonry,  $f'_m$  of 13.0 MPa.

The tables below provide the values for the strength of masonry that can be achieved using a 119mm high clay brick of a particular strength coupled with either M3 or M4 mortar.

## Characteristic Unconfined Compressive Strength of Masonry, $f'_m$ (MPa) for a 119mm high clay brick with full bed M3 mortar\*

Characteristic Unconfined Compressive Strength of a Unit (brick) $f'_{uc}$ (MPa)	10	20	25	30	40	50
Characteristic Unconfined Compressive Strength of Masonry (wall) $f'_m$ (MPa)#	5.0	7.7	8.6	9.4	10.9	12.1

## Characteristic Unconfined Compressive Strength of Masonry, $f'_m$ (MPa) for a 119mm high clay brick with full bed M4 mortar\*

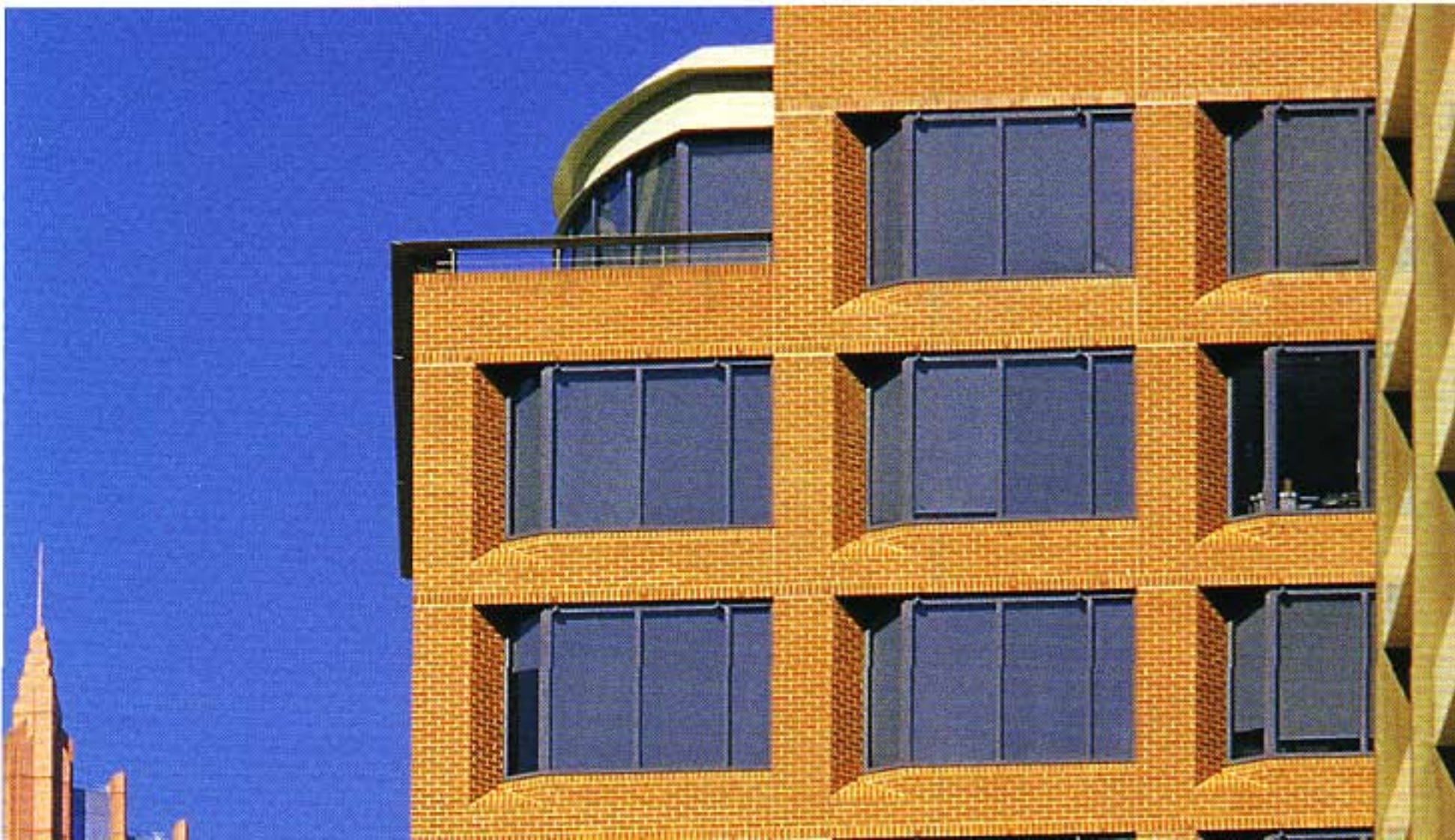
Characteristic Unconfined Compressive Strength of a Unit (brick) $f'_{uc}$ (MPa)	10	20	25	30	40	50
Characteristic Unconfined Compressive Strength of Masonry (wall) $f'_m$ (MPa)#	5.8	8.2	9.2	10.1	11.6	13.0

# Derived from Table 3.1 AS 3700, utilising a  $K_h$  factor of 1.15.

\*M3 and M4 mortar classifications as per Table 10.1 AS 3700.

Austral's Mighty Bricks™ are marked with identifiable batch numbers and are tested in an independent laboratory with M3 and M4 mortars to provide certified values of  $f'_m$ .

The certified values demonstrate strengths that exceed the values published in this brochure.



# Fire Resistance

Fire resistance levels are specified in the Building Code of Australia (BCA). This system provides an accurate method of predicting the ability of a wall to maintain its strength in a fire and to resist the spread of the fire. The fire resistance level (FRL) specifies the fire resistance periods (FRP) for structural adequacy, integrity and insulation. These components can be defined as:

- **Structural Adequacy** - The ability of a wall to continue to perform its structural function.
- **Integrity** - The ability of a wall to maintain its continuity and prevent the passage of flames and hot gases through cracks in the wall.
- **Insulation** - The ability of a wall to provide sufficient insulation, such that the side of the wall away from the fire does not exceed a predefined rise in temperature.

The fire resistance level is expressed in minutes and lists the three components as Structural Adequacy, Integrity and Insulation. For example, an FRL of 90/90/90 means a minimum fire resistance period of 90 minutes each for structural adequacy, integrity and insulation. FRLs can be determined from Australian Standard AS 3700 (Masonry Structures) or by testing in accordance with AS 1530.4.

The fire resistance level of a wall depends not only on the thickness of the wall but also on its height, length and boundary conditions (i.e. how it is connected to other building elements).

The Fire Resistance Levels expressed in this brochure are based on test results. Contact Austral Bricks technical department for further details.

# Sound Transmission

The Building Code of Australia (BCA) requires that building elements have certain levels of insulation from airborne noise and impact sound.  $R_w$  is the weighted sound reduction index, which is used to measure the acoustic performance of a construction system. It is a single number quantity for the airborne sound insulation rating of building elements. As the acoustic performance of a material or construction improves, the higher the  $R_w$  value will be.

The  $R_w$  rating system has two correction factors (C and  $C_w$ ) which take into account different spectra of noise sources. C relates mainly to high frequency noise while  $C_w$  relates to lower frequency noises. These correction factors are used to indicate the performance drop of the wall in the corresponding frequency range.

For example, if a wall is measured as  $R_w$  (C; $C_w$ ) of 55 (-1;-4) the  $R_w$  rating is 55 and  $R_w + C_w$  is  $55 + (-4) = 51$ .  $R_w + C_w$  is the value of the index when the low frequency correction factor ( $C_w$ ) is applied.

This brochure is designed to provide you with up to date data and information on the acoustic performances of Austral's masonry wall systems.

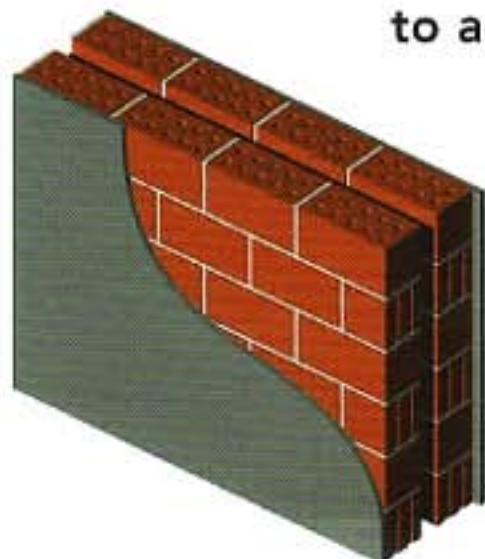
Extensive sound testing at accredited facilities such as the CSIRO and National Acoustics Laboratories makes it possible for Austral to provide you with construction solutions to economically satisfy the sound insulation levels that you require. The following pages show wall constructions that have been tested and shown to comply with the BCA requirements. Further test certificates are available on request.

# Building Code of Australia Acoustic Requirements

The Building Code of Australia (BCA) requires that walls separating sole-occupancy units in Class 1, 2 and 3 buildings are required to have an  $R_w + C_w$  of not less than 50. In addition, the construction must be discontinuous, if the wall separates a habitable room (living room, dining room, bedroom, study and the like) from a wet room (kitchen, bathroom, sanitary compartment or laundry). Walls in Class 2 or 3 buildings that separate a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like must have an  $R_w$  of not less than 50. If this wall separates a sole-occupancy unit from a plant room or a lift shaft, the construction must be discontinuous. Discontinuous construction requires a minimum 20mm cavity between two separate leaves. If wall ties are to be used they must be resilient wall ties, which are available from Matrix Industries ([www.matrixindustries.com.au](http://www.matrixindustries.com.au)).

## BCA Deemed-to-Satisfy Wall

to achieve  $R_w + C_w \geq 50$



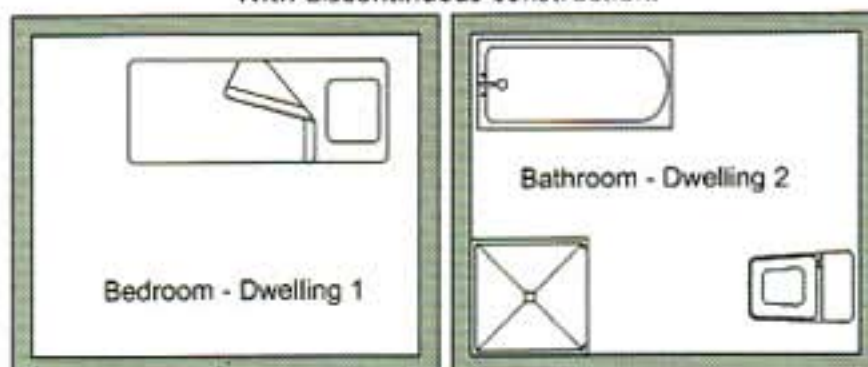
**110mm**

- Cavity wall.
- 50mm cavity.
- 13mm cement render both sides.
- Wall thickness: 296mm.
- Discontinuous construction.

CONSTRUCTION: **Habitable to Habitable**  
REQUIREMENTS:  $R_w + C_w \geq 50$



CONSTRUCTION: **Habitable to Wet**  
REQUIREMENTS:  $R_w + C_w \geq 50$   
With discontinuous construction.



CONSTRUCTION: **Habitable to Corridor or Public Area**  
REQUIREMENTS:  $R_w \geq 50$   
With discontinuous construction (if lift shaft or plant room)

