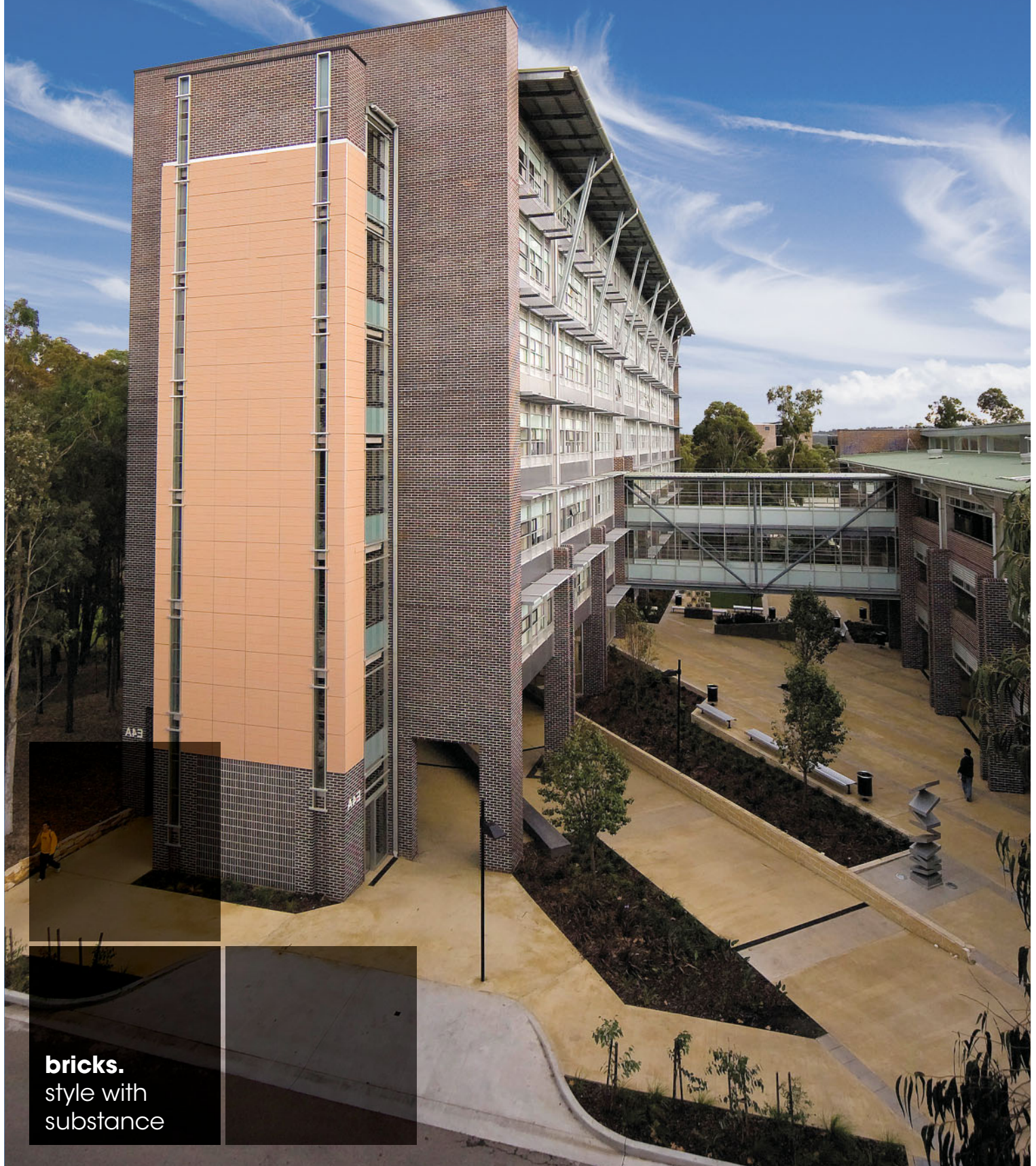


# Clay Commons



**bricks.**  
style with  
substance

Technical Manual

# Austral Bricks Clay Commons

Austral Bricks is Australia’s leading manufacturer of advanced brick and clay products. With display centres in every State you can now choose from a wide range of quality bricks designed for even the smallest jobs.

Austral’s clay commons include Dry Pressed Bricks, Wirecut Bricks and our certified engineering strength bricks - Mighty Bricks™.

**Make a difference with Austral Bricks Clay Commons**  
Austral Bricks clay commons are strong, easy to handle and available in many different sizes.

Designed for today’s building and design environment, our bricks can make all the difference when it comes to meeting your construction needs.

	LIGHT WEIGHT BOXER SERIES				MAXI			STANDARD SERIES					SOLIDS	THROUGH WALL	
	Boxer 76	Boxer 76 Smooth	Boxer 119	Boxer 162	Maxi 76	Maxi 119	Maxi 162	Standard 76	Standard 119	Standard 162	Universal 76 GP*	Universal 76 EXP*	Dry Press	Through Wall 76	Through Wall 119
Size	230x110x76	230x110x76	230x110x119	230x110x162	290x90x76	290x90x119	290x90x162	230x110x76	230x110x119	230x110x162	230x110x76	230x110x76	230x110x76	230x150x76	230x150x119
Weight - kg	2.4	2.4	3.8	4.8	2.8	4.4	6.0	3	4.5	6	3	3	3.7	4	6.3
Brick Wall Density - kg/m² (with mortar)	150	150	148	129.5	134.7	132.0	131.7	177.5	169.7	165.9	177.5	177.5	211.5	236.2	230.2
Units per Square Metre	48.5	48.5	32.3	24.25	38.8	25.8	19.4	48.5	32.3	24.25	48.5	48.5	48.5	48.5	32.3
Fire Resistance Levels, FRL (mins) #															
Structural Adequacy	120	120	120	120	180	180	180	240	240	240	240	240	180	240	240
Integrity	120	120	120	120	180	180	180	240	240	240	240	240	180	240	240
Insulation Unrendered	90	90	90	90	60	60	60	120	120	120	120	120	90	120	120
Insulation Rendered – both sides (10mm)					120	120	120	180	180	180	180	180		180	180
Insulation – 13mm Render one side <sup>(a)</sup> – 13mm Plasterboard one side <sup>(b)</sup> – 13mm Plasterboard both sides <sup>(c)</sup>								120 (a) (b)	120 (a) (b)	120 (a) (b)	120 (a) (b)	120 (a) (b)		240 (c)	240 (c)
Sound Insulation, R <sub>w</sub>															
Unrendered	43	43	43	43	39	39	39	48	48	48	48	48	45	50	50
Rendered (13mm both sides)	47	47	47	47	45	45	45	49	49	49	49	49	52	55	55
Plasterboard	41	41	41	41	53	53	53	53	53	53	53	53	56	56	56
Number per Strapped Pack	520	520	345	260	416	276	208	400	265	200	400	400	384	280	185
Perforation Volume - %	<40	<40	<40	<40	<30	<30	<30	<30	<30	<30	<30	<30	FROG - 5	24	23
Minimum Face Shell Thickness - mm	12	12	12	12	15	15	15	15	15	15	15	15	N/A	15	15
Characteristic Unconfined Compressive Strength - f <sub>uc</sub> (MPa)	>15	>15	>15	>15	>15	>15	>15	>20	>25	>20	>25	>20	>15	>15	>15
24 hour Cold Water Absorption %	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<12%	<10%	<10%
Coefficient of Expansion - mm/m over 15 years	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<1.2mm/m	<0.5mm/m	<1.2mm/m	<1.2mm/m
Durability Class	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	GP	EXP	EXP	GP	GP
Liability to Effloresce	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight	Slight

\*Universal & Exposure Commons have one face and one header smooth and the other face and header wire cut. #FRL's shown in the table are test results where the structural adequacy is specific to a 3 metre high wall restrained on the top and bottom. The design of fire rated walls should be checked by a qualified structural engineer. All specifications are nominal.

Austral reserves the right to change specifications without notice - June 2011. Check the Austral Bricks website for updated results.  
All testing is carried out in Austral Bricks' NATA accredited laboratory to Australian Standards AS/NZS4455 & AS/NZS4456.  
Fire and acoustic tests are carried out by independent NATA accredited laboratories.



# Mighty Bricks

## Certified Engineering Strength Bricks

Austral Bricks special range of certified engineering strength bricks enables the structural engineer to achieve the full potential of the building design by delivering massive load bearing ability.

Austral Bricks has all 'Mighty Bricks™' certified by an independent testing authority with batch certificates being supplied to each project.

	Mighty GP 76	Mighty GP 119	Mighty Through Wall 76	Mighty Through Wall 11
Size	230x110x76	230x110x119	230x150x76	230x150x119
Weight - kg	3	5.3	4	6.2
Brick Wall Density - kg/m² (with mortar)	177.5	195	238	233
Units per Square Metre	48.5	32.3	48.5	32.3
Fire Resistance Levels, FRL (mins) †				
Structural Adequacy	240	240	240	240
Integrity	240	240	240	240
Insulation Unrendered	120	120	120	120
Insulation Rendered - one side (13mm)	180	180	180	180
Sound Insulation, R <sub>w</sub>				
Unrendered	48	48	50	50
Rendered (13mm both sides)	49	49	55	55
Number per Strapped Pack	400	265	280	185
Perforation Volume - %	22	17	27	27
Minimum Face Shell Thickness - mm	15	15	15	15
Strengths of Masonry (MPa)#				
Characteristic Compressive Strength of Masonry (f'ₘ) M3** Mortar	>10	>10	>8	>8
Characteristic Compressive Strength of Masonry (f'ₘ) M4** Mortar	>15	>15	>10	>10
24 hour Cold Water Absorption %	<10%	<10%	<10%	<10%
Coefficient of Expansion mm/m 15 years	<1.0mm/m	<1.0mm/m	<1.0mm/m	<1.0mm/m
Durability Class	GP	GP	GP	GP
Liability to Effloresce	Slight	Slight	Slight	Slight

Austral Bricks recommends engineers and builders take special precautions to ensure a trouble-free project. MIGHTY BRICKS™ will only be supplied after acceptance of Austral Bricks' terms and conditions in our order confirmation.

The Austral Brick Company has tested and certified the masonry products delivered under this contract fully in accordance with the governing industry standards. It is the onus of the recipient to ensure that the products are used in accordance with the relevant codes, and in particular with sections 2.6, 2.7 and 2.8 of the Australian Standard Masonry Structures AS3700 and the Earthquake Loading Code AS1170.4. If any doubt exists as to compliance, then the advice of a registered structural engineer experienced in masonry construction should be sought prior to construction.

Austral Bricks also recommends suitable quality control systems be implemented on site and be confirmed by testing to AS3700, Appendix C for special masonry.

†FRL's shown in the table are test results where the structural adequacy is specific to a 3 metre high wall restrained on the top and bottom. The design of fire rated walls should be checked by a qualified structural engineer.

#Using Austral Bricks MIGHTY BRICKS™ and M3 or M4 mortar in accordance with AS3700 this strength will be the minimum achieved.

\*\* M3 and M4 mortar as per Table 11.1 AS3700.

Austral Bricks mark all MIGHTY BRICKS™ with blue tape to avoid on-site confusion.

All specifications are nominal. Austral bricks reserves the right to change specifications without notice - 2012.

# 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'ₐ. 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'ₐ of 50 MPa laid with full bed M4 mortar will achieve a characteristic unconfined strength of the masonry, f'ₘ of 16.1 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 standard masonry, f'ₘ (MPa) for a 119mm high clay brick with full bed M3 mortar\*

Characteristic Unconfined Compressive Strength of a Unit (brick) f'ₐ (MPa)	10	20	25	30	40	50
Characteristic Unconfined Compressive Strength of a Unit (brick) f'ₘ (MPa)#	5.0	7.2	8.0	8.8	10.0	11.3

## Characteristic unconfined compressive strength of standard masonry, f'ₘ (MPa) for a 119mm high clay brick with full bed M4 mortar\*

Characteristic Unconfined Compressive Strength of a Unit (brick) f'ₐ (MPa)	10	20	25	30	40	50
Characteristic Unconfined Compressive Strength of a Unit (brick) f'ₘ (MPa)#	7.2	10.1	11.4	12.4	14.5	16.1

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.

\*M3 and M4 mortar classifications as per Table 11.1 AS 3700.

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

# Derived from Table 3.1 AS 3700, utilising a Kh factor of 1.14.

# 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 it's 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. FRL's 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 the 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  $C_{tr}$ ) which take into account different spectra of noise sources. C relates mainly to high frequency noise while  $C_{tr}$  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; $C_{tr}$ ) of 55 (-1;-4) the  $R_w$  rating is 55 and  $R_w + C_{tr}$  is 55 + (-4) = 51.  $R_w + C_{tr}$  is the value of the index when the low frequency correction factor ( $C_{tr}$ ) 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.

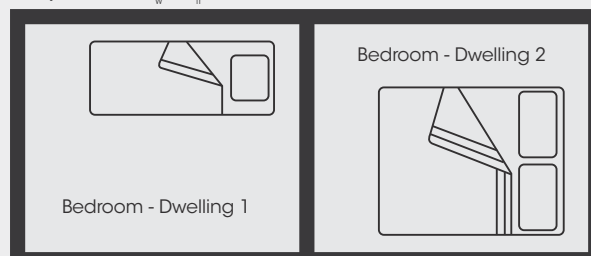
## Building Code of Australia Acoustic Requirements

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  $R_w + C_{tr}$  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))

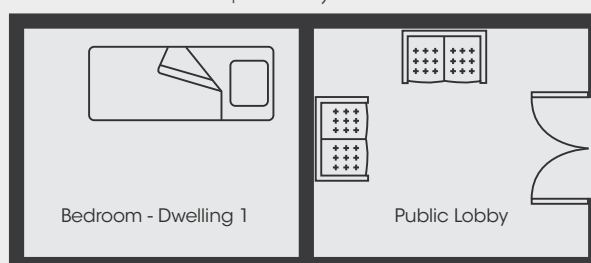
**Construction:** Habitable To Habitable  
**Requirements:**  $R_w + C_{tr} \geq 50$



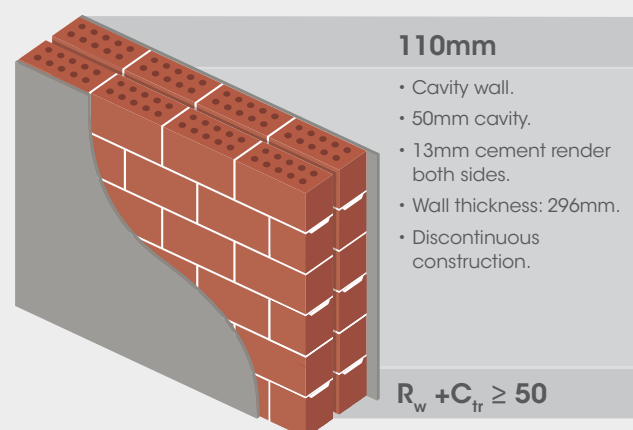
**Construction:** Habitable To Wet  
**Requirements:**  $R_w + C_{tr} \geq 50$  plus discontinuous construction.



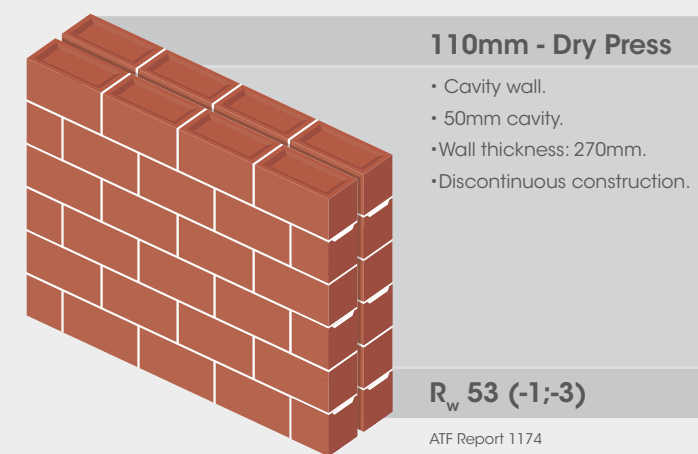
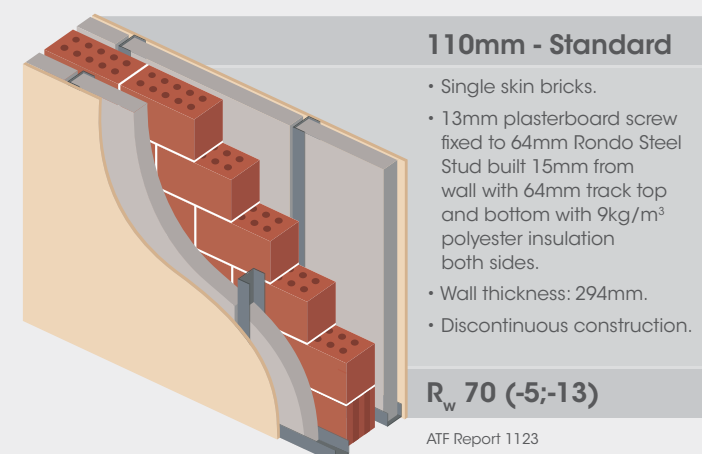
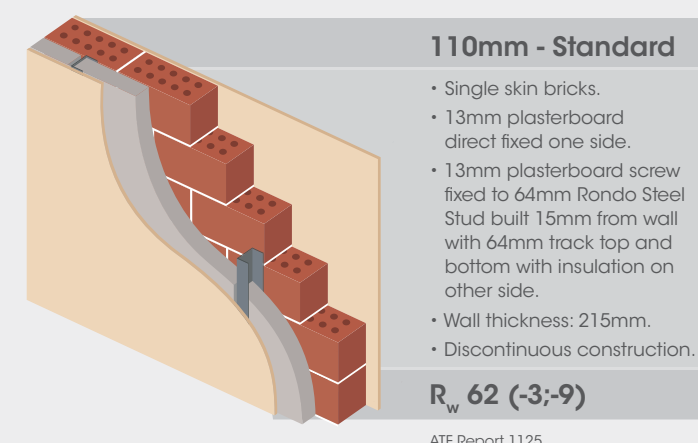
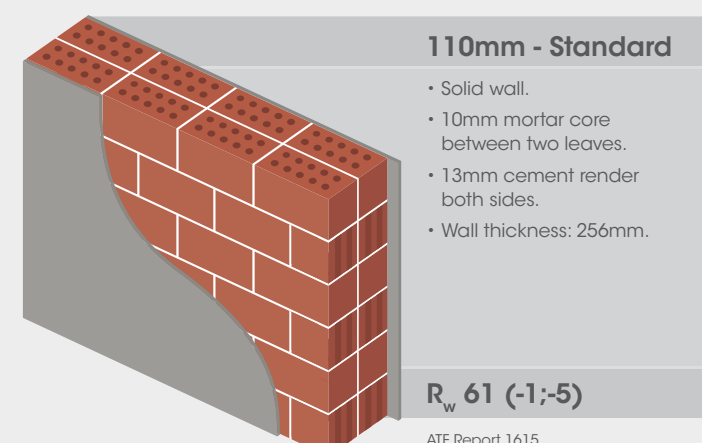
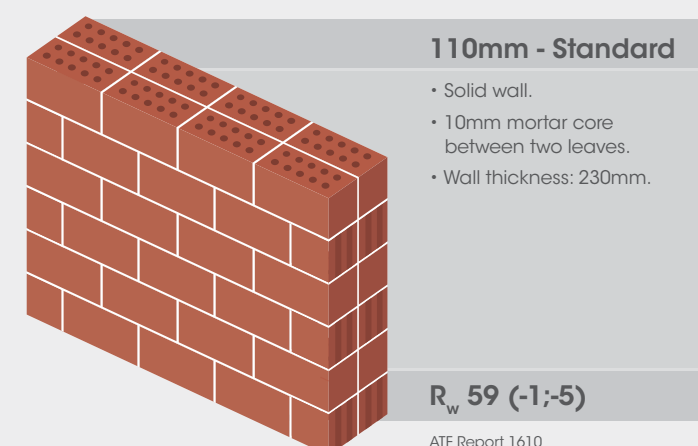
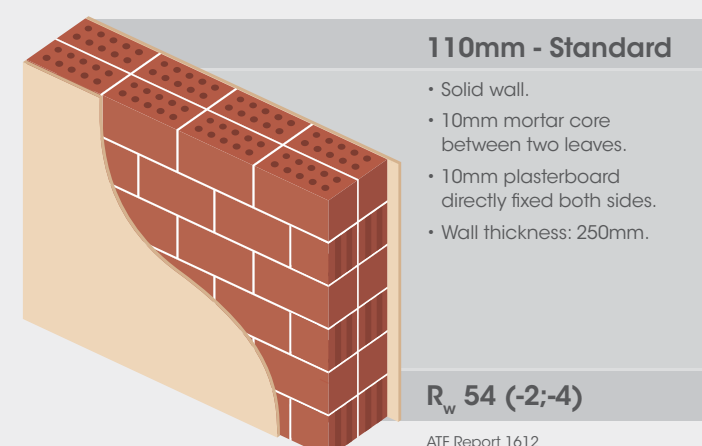
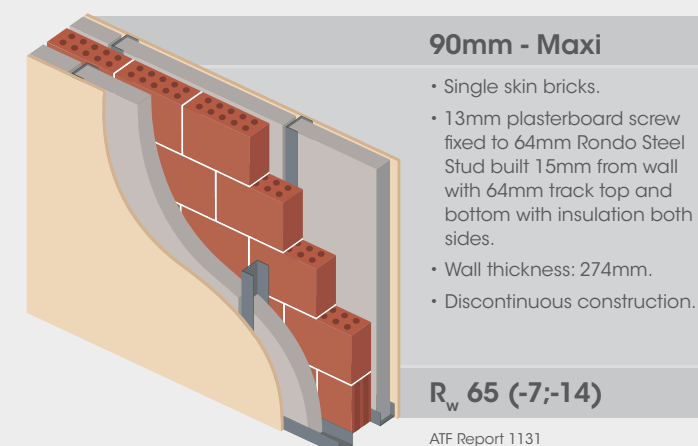
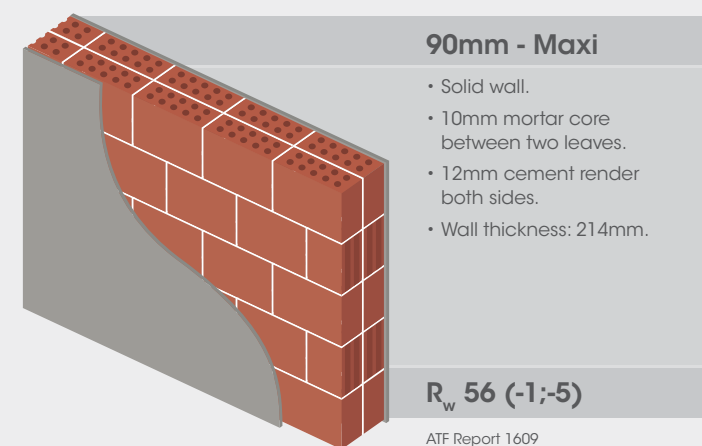
**Construction:** Habitable To Corridor or Public Area  
**Requirements:**  $R_w \geq 50$  (plus discontinuous construction if lift shaft or plant room)



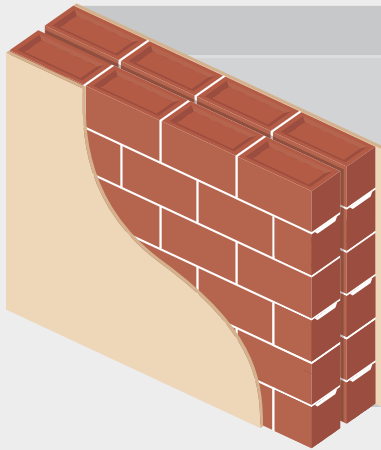
### BCA deemed-to-satisfy wall



## $R_w + C_{tr} \geq 50$ Test Results



$R_w + C_{tr} \geq 50$  Test Results

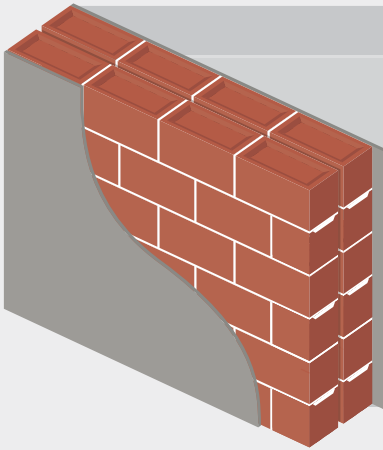


**110mm - Dry Press**

- Cavity wall.
- 40mm cavity.
- 10mm plasterboard direct fixed both sides.
- Wall thickness: 280mm.
- Discontinuous construction.

**$R_w$  54 (-1;-4)**

ATF Report 1463A

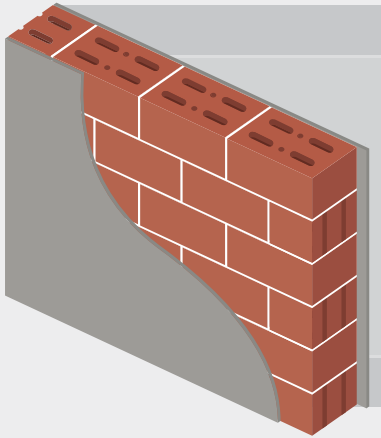


**110mm - Dry Press**

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

**$R_w$  55 (-1;-4)**

ATF Report 1175

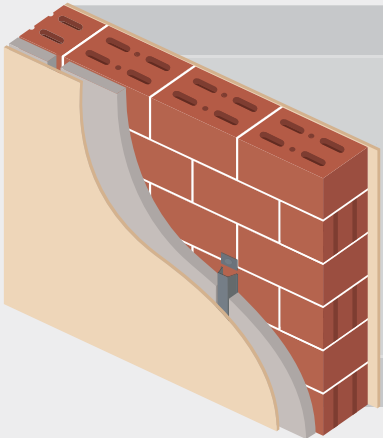


**150mm - TW**

- Single skin bricks.
- 12mm cement render both sides.
- Wall thickness: 174mm.

**$R_w$  55 (-1;-5)**

ATF Report 1596

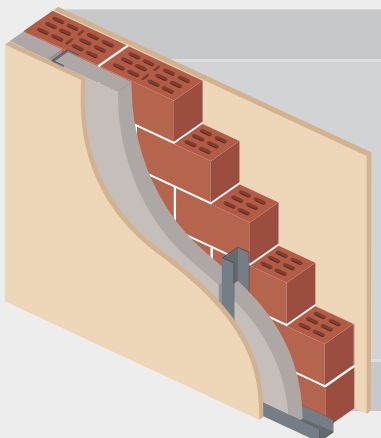


**150mm - TW**

- Single skin bricks.
- 13mm sound resistant plasterboard direct fixed one side.
- 13mm sound resistant plasterboard screw fixed to resilient mounted furring channels with 9kg/m³ polyester insulation on other side.
- Wall thickness: 217mm.

**$R_w$  60 (-2;-8)**

ATF Report 1595

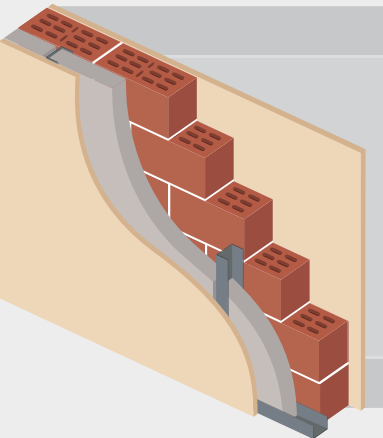


**110mm - Boxer LW**

- Single skin bricks.
- 13mm fire-rated plasterboard direct fixed one side.
- 13mm fire-rated plasterboard screw fixed to 64mm steel stud built 20mm from wall with 64mm track top and bottom with Autex ASB5 insulation other side.
- Discontinuous construction.
- Wall thickness: 220mm.

**$R_w$  59  $C_{tr}$  -8**

Opinion PKA-A068

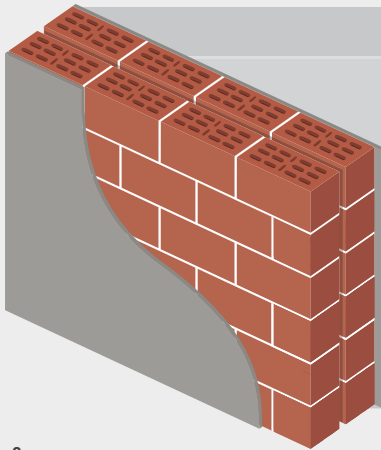


**110mm - Boxer LW**

- Single skin bricks.
- 13mm impact-rated plasterboard direct fixed one side.
- 13mm impact-rated plasterboard screw fixed to 64mm steel stud built 20mm from wall with 64mm track top and bottom with Autex ASB5 insulation other side.
- Discontinuous construction.
- Wall thickness: 220mm.

**$R_w$  60  $C_{tr}$  -7**

Opinion PKA-A068

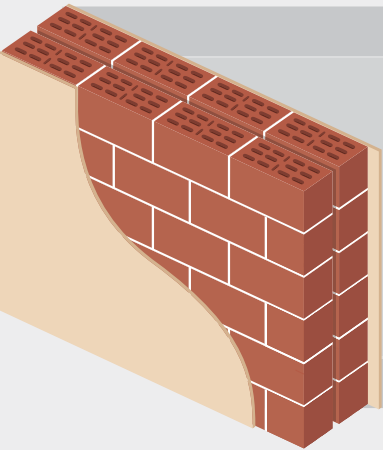


**110mm - Boxer LW**

- Cavity Wall
- 50mm cavity with no wall ties.
- 13mm render both sides
- Discontinuous construction.
- Wall thickness: 296mm.

**$R_w$  60  $C_{tr}$  -5**

Opinion PKA-A068



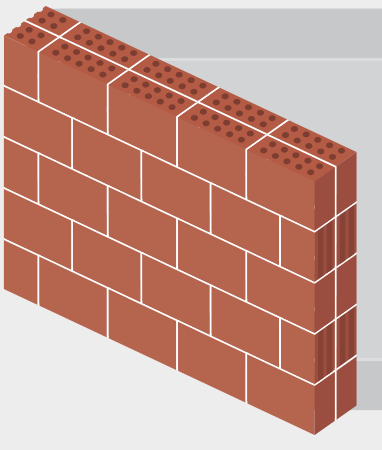
**110mm - Boxer LW**

- Cavity wall.
- 50mm cavity with no wall ties.
- 16mm fire-rated plasterboard direct fixed both sides.
- Discontinuous construction.
- Wall thickness: 302mm.

**$R_w$  58  $C_{tr}$  -6**

Opinion PKA-A068

$R_w \geq 50$  Test Results

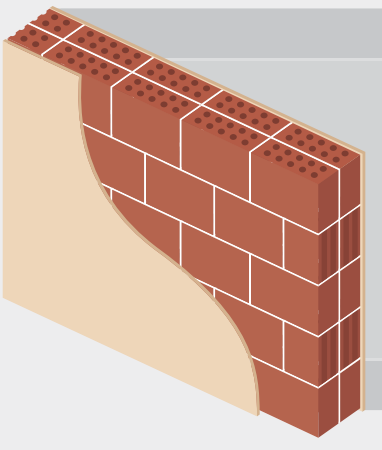


**90mm - Maxi**

- Solid wall.
- 10mm mortar core between two leaves.
- Wall thickness: 190mm.

**$R_w$  50 (-1;-5)**

ATF Report 1607

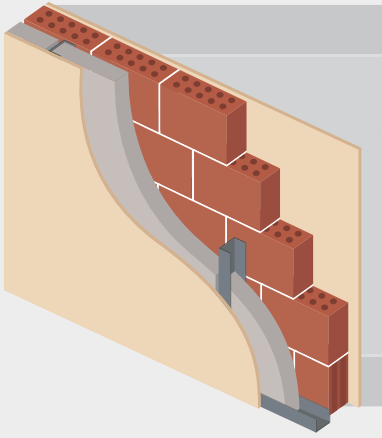


**90mm - Maxi**

- Solid wall.
- 10mm mortar core between two leaves.
- 13mm sound resistant plasterboard direct fixed both sides.
- Wall thickness: 216mm.

**$R_w$  53 (-1;-5)**

ATF Report 1608

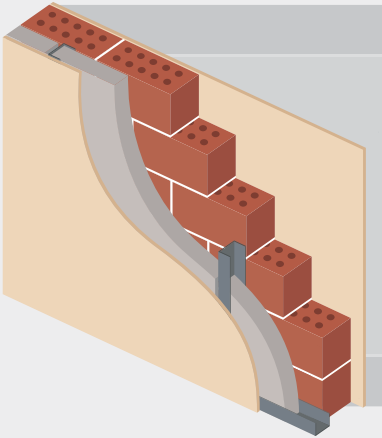


**90mm - Maxi**

- Single skin bricks.
- 13mm plasterboard direct fixed one side.
- 13mm plasterboard screw fixed to 64mm Rondo Steel Stud built 15mm from wall with 64mm track top and bottom with 9kg/m³ polyester insulation on other side.
- Wall thickness: 195mm.
- Discontinuous construction.

**$R_w$  57 (-2;-8)**

ATF Report 1132

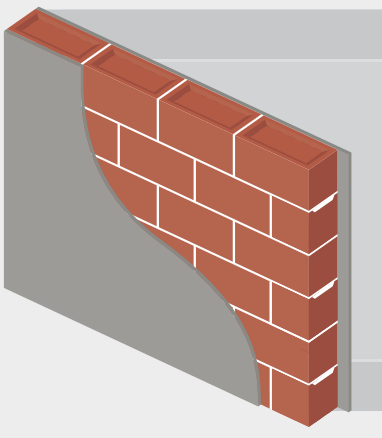


**110mm - Standard**

- Single skin bricks.
- 13mm plasterboard direct fixed one side.
- 13mm plasterboard screw fixed to resilient mounted furring channels with 9kg/m³ polyester insulation on other side.
- Wall thickness: 177mm.

**$R_w$  53 (-4;-10)**

ATF Report 951

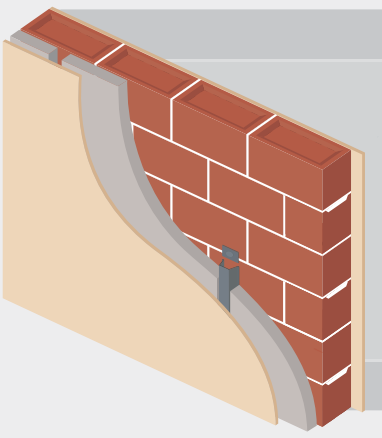


**110mm - Dry Press**

- Single skin bricks.
- 12mm cement render both sides.
- Wall thickness: 134mm.

**$R_w$  52 (-1;-5)**

ATF Report 1125



**110mm - Dry Press**

- Single skin bricks.
- 13mm plasterboard direct fixed one side.
- 13mm plasterboard screw fixed to resilient mounted furring channels with 9kg/m³ polyester insulation on other side.
- Wall thickness: 177mm.

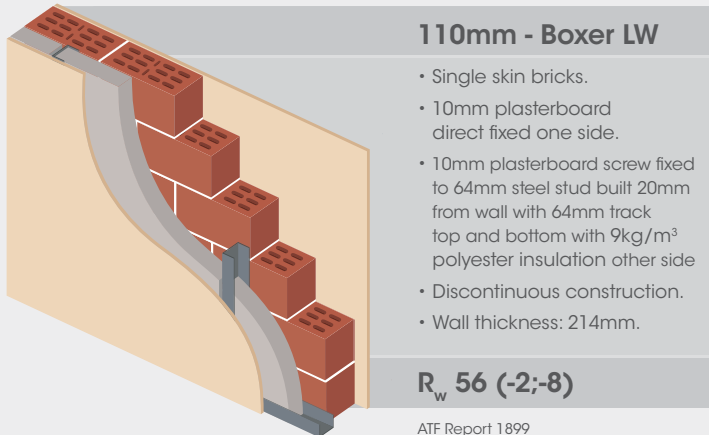
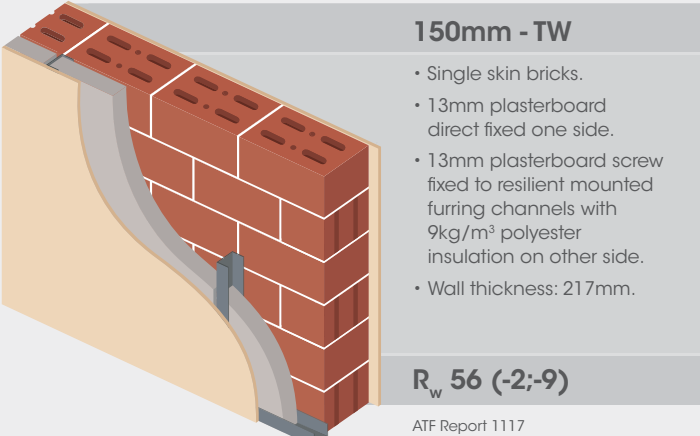
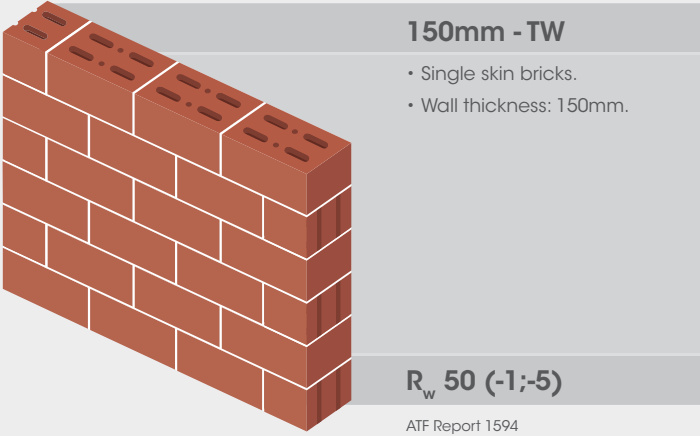
**$R_w$  56 (-3;-9)**

ATF Report 1391

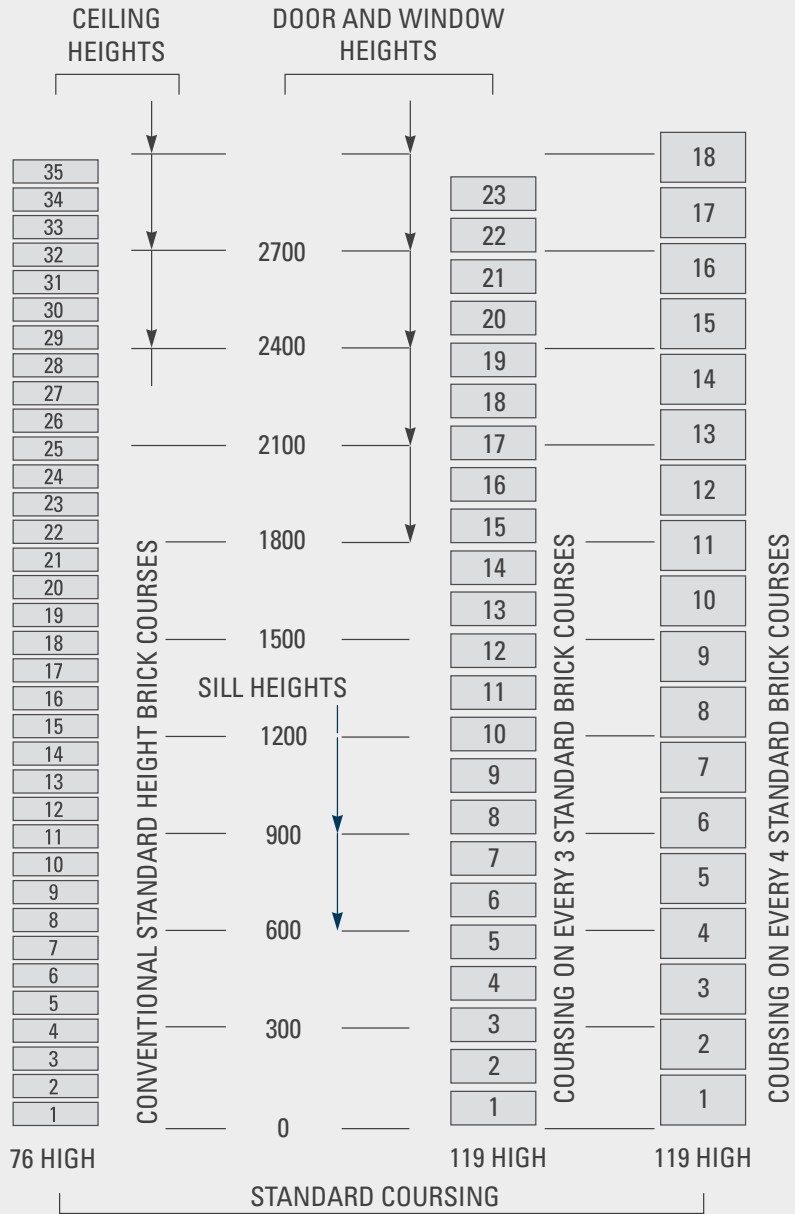


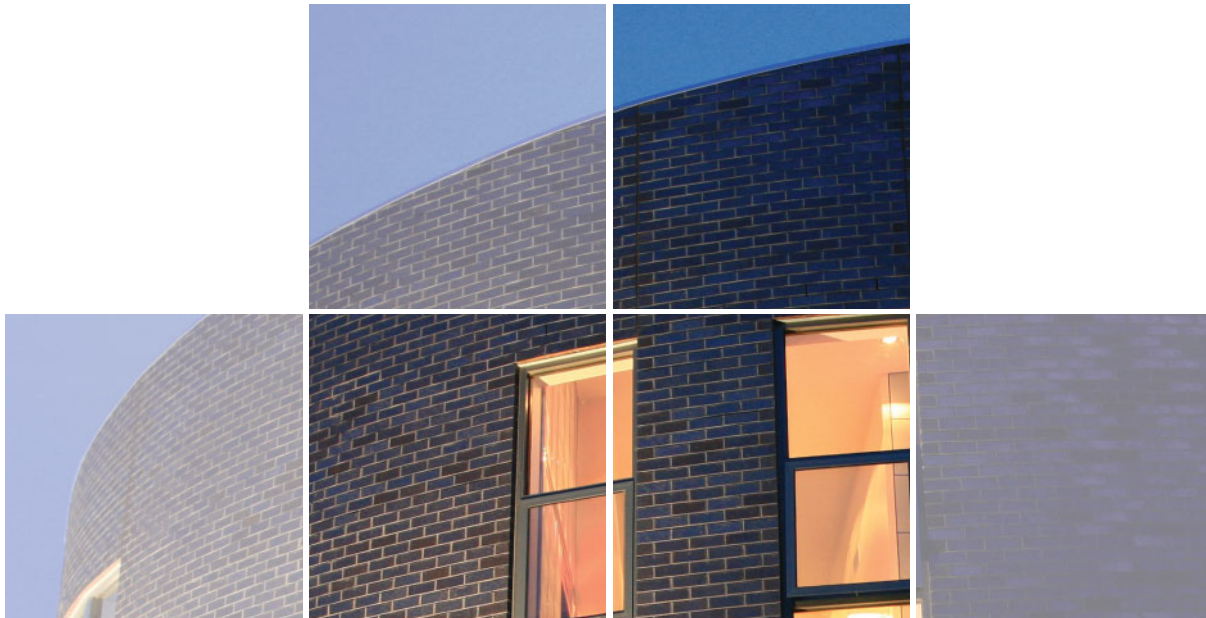


# $R_w \geq 50$ Test Results



# Coursing heights





## 13 BRICK (13 2742)

[www.australbricks.com.au](http://www.australbricks.com.au)

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Mayfield

#### Punchbowl

62 Belmore Road  
Punchbowl

#### Tuggerah

19 Bryant Drive  
Tuggerah

#### Illawarra

45 Princes Hwy  
Albion Park Rail

#### Port Macquarie

42 Jindalee Rd  
Port Macquarie

#### Coming Soon

2 Yangan Drive  
Beresfield

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Our clay bricks are made from naturally occurring minerals that are kiln fired to lock in their colour and strength for life. The composition of the raw materials as well as the firing process may cause each run to differ. The resulting colour variation is inherent in the process and part of the appeal of our natural products. The product images in our brochures give a general indication of colour for your preliminary selection. We recommend you also view current product samples before making your final selection.

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