

# Building With Timbercrete

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# BUILDING WITH Timbercrete ®



“Clean” bricklaying can make a difference to your dream home – see above

YOUR BRICKLAYER’S AND BUILDER’S PERFORMANCE IS VITAL TO THE FINAL QUALITY AND AESTHETICS OF YOUR TIMBERCRETE HOME. IT IS ESSENTIAL THAT THEY ARE FULLY ACQUAINTED WITH ALL ASPECTS OF THE ENCLOSED DOCUMENT PRIOR TO COMMENCEMENT. IN PARTICULAR, PLEASE ENSURE THE BLOCK LAYER IS FOLLOWING THE SIMPLE “ON SITE AUDIT & CHECKLIST” THAT IS ATTACHED TO THIS DOCUMENT

**THE FOUR FUNDAMENTALS IN ACHIEVING THE BEST POSSIBLE RESULT ARE:**

1. OBSERVE INCREMENTAL BLOCK LAYING PROCEDURE
2. CLEANING OFF EXCESS MORTAR DURING BLOCK LAYING EVERY DAY
3. USE CORRECT TIMBERCRETE MORTAR MIX; NOT YOU’RE FAVORET MORTAR
4. ONLY LAY BLOCKS AFTER THE “USE AFTER” DATE ON EACH PALLET

**IGNORING THESE ISSUES WILL RESULT IN A SECOND RATE EFFECT**

All tradesmen should fully acquaint themselves with BCA building procedures. The accompanying recommendations are in no way meant to supplant BCA procedures or good engineering recommendations, but are given as a guide after years of practical experience in the installation of this product.

**If ever in doubt ~ please ask us!**

**SAFETY** ~ the same care, precautions & professional conduct should be exercised when building with Timbercrete as when building with any other brick or masonry product. In particular, always wear hearing & eye protection when cutting, nailing, and fixing or otherwise working with Timbercrete blocks.

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# BUILDING WITH Timbercrete®

## INTRODUCTION:

### Context

The “Building with Timbercrete” manual should be considered in the context of the recommendation that Timbercrete houses be designed in accordance with AS 3700.

### Tolerances

Timbercrete Bricks and Blocks can be manufactured in accurately fabricated steel, plastic and poly moulds. As such we can achieve a tolerance of AS/NZS 4455 tolerance DW1

However, because some of our products require a ‘rustic’ visual effect (as in the “Cobblestone” series), there are no specific tolerances on this range of product, such units are manufactured to AS/NZS 4455 tolerance DW0 (No requirement).

### Brick & Block Types

Timbercrete manufactures several different **types** of blocks, but all are made from the same raw material. These **types** include:

- ❑ **“Cobblestone”** (solid blocks with a “slumped” appearance that vary in size. Mortar joints ranging 10mm to 30mm),
- ❑ **“Smooth faced sandstone”** (flat faced sandstone style blocks with internal cavity or styrene insert, mortar joints 8mm to 10mm),
- ❑ **“Bevel limestone”** (rough faced with bevelled edges, 8mm mortar joints), and
- ❑ **“Mud brick series”** (solid blocks plus internal cavity with a “slumped” appearance, in typical mud brick sizes, mortar joints ranging 10mm to 20mm).
- ❑ **“Tri-Brick”** (small solid brick that can be laid showing one of 3 faces textures)

The information contained in this document refers primarily to the “cobblestone” type block, except where nominated to the contrary. A summary of the standard cobblestone block range appears on page 24 of this document entitled “Cobble Stone Series”

### Note re Large Cobble Stone Series

Full block horizontal increments are at 420mm for the “200 & 120mm wide Cobble Stone” series. If you are using straight sided blocks (as against normal “slumped” blocks) the horizontal increments will be **405 to 410mm**.

Apply to Timbercrete to obtain an appropriate Incremental benchmark table.

- **Cobblestone Series Block**



The "Cobblestone Series" is our most popular in the range and is our unique signature block. Each block is individually hand crafted with slight variations of curved faces and dimensions, due to the hand made process. This variation is intentional in order to create the unique cobblestone appearance. The mortar thickness will also reflect this variation.

Timbercrete blocks and bricks are not stamped out in their millions, as in the traditional cookie cutter method.

**Available in:** 3 types with BLOCKS for single-leaf (200,250 &300mm thick) load bearing frame-free construction or BRICKS for tradition **veneer** and **full brick** construction at 120mm thick

- **Cobblestone Small Brick**

This brick shares a similar appearance to its larger big brother (above) but all its dimensions are smaller. (95mm thick)

**Available in:** **Veneer** bricks for traditional veneer and or **full brick** construction.

- **Mud Brick Series**



The Mud Brick Series (made from Timbercrete *not* mud) also shares the same unique free form characteristics as the rest of our cobble stone series. This block was developed as a "drop-in" replacement for traditional mud bricks, due to the fact that it shares the same physical dimensions. However *unlike* standard mud bricks Timbercrete "mud bricks" *are far*

*more durable, will not erode under water spray, do not need to be bagged or rendered and have a much higher insulation value (R value).*

**Available in:** Blocks for **single-leaf** (single skin) for load bearing frame-free construction.



- **Smooth Faced Sandstone Series**

The Smooth Faced Sandstone Series is more uniform in shape and size. It has the appearance similar to that of smooth cut sandstone or Western Australian lime stone. Like sandstone and limestone it displays subtle or dramatic colour variations (you can decide as to colour tone variations). The finished product has a more formal look. Unlike sandstone or limestone Timbercrete is far more cost effective per m<sup>2</sup>, it is far lighter and easier to build with and offers a far superior insulation value. This means on going savings due to reduced energy bills.

**Available in:** Several sizes with blocks for **single-leaf** (single skin) load bearing frame-free construction or bricks for traditional **veneer** and **full brick** construction.



- **Smooth Faced Sandstone Series, Super Insulator**

The Smooth Faced Sandstone block is also available in a “super insulator version” This block is 250mm thick and has a **60mm thick** (or more if requested) extruded styrene slab running through the centre, with Timbercrete on both sides (a laminate). The styrene slab has a tongue & groove at the perp ends.



It was originally designed for the Canadian and North American climate. Even though most of the Australian populated areas have a relatively mild climate, it is still an ideal block for areas subjected to more extreme weather conditions, such as the alpine region. As with all Timbercrete blocks and bricks this clever block is uniquely energy efficient, because unlike other Styrene/cement combinations the styrene runs down the centre. With no areas for thermal bridging, this means that the wall still enjoys all the benefits of thermal lag (thermal momentum), but with increased thermal resistance (R value).

**Available in:** **single-leaf** (single skin) load bearing frame-free construction.

- **Beveled Limestone Series**



The Beveled Limestone series has the most accurate perimeter dimensions, which means the mortar joint, can be reduced down to only 8mm in thickness. As the name suggests it has an attractive bevel framing and rugged textured face. As in all our range the texture and colour diversity is almost limitless. This is our largest brick (up to 900mm) yet it is the same width as a standard clay brick (110mm). This means it can be easily used as an alternative replacement for a common clay brick. With this beautiful brick your house will look anything but “common”. This is the ideal brick for those who desire a grand sand stone/limestone look but only have a “brick veneer

budget". Due to our unique corner brick your home will not appear to have a narrow veneer brick appearance because the corner brick is 225mm wide.

**Available in:** Veneer bricks for traditional **veneer** and **full brick** construction.

- **Tri-Brik Series**

The Tri-Brik is the brick of choice for bricklayers and builders. The lighter weight, unique dimensional proportions and size, makes building a breeze. This smart little solid brick can be laid showing 3 different faces in the one brick. As a result of the method of manufacturing combined with the width / height being equal (90x90mm) this brick can be laid 3 different ways. Unlike standard clay bricks Timbercrete Tri-Briks boast a superior insulation value. In fact in most cases wall insulation can be reduced by using this product. As with all our range Timbercrete bricks and blocks do not look like our competitors. In true artistic fashion we strive to be unique.

**Available in:** Veneer bricks for traditional **veneer** and **full brick** construction.

## Block & Brick Sizes (see below)

**\*Note:** All these bricks vary in dimensions.

Brick Style	HEIGHT	LENGTH	Single Skin WIDTH	Veneer WIDTH
* "Cobblestone series block"	160mm	408mm	200mm	120mm
**"Cobblestone Small brick"	115mm	290mm	NA	95
**"Mud brick series"	125mm	390mm	260mm	NA

**Note:** The bricks series below are uniform in dimensions.

Brick Style	HEIGHT	LENGTH	Single Skin WIDTH	Veneer WIDTH
"Smooth faced Sandstone Large"	192mm	492mm	242mm	120mm
"Smooth faced Sandstone Small"	170mm	395mm	195mm	120mm
"Bevel Limestone series"	242mm	442mm	NA	110mm
"Bevel Limestone cladding"	242mm	442mm	NA	35 & 50mm
"Bevelled Limestone Large"	242mm	890mm	NA	110mm
"Tri-Brick"	90mm	290mm	NA	90mm

### Brick & Block Incremental Benchmarks:

**The key to successfully building Timbercrete walls is to work to incremental benchmarks.**

That is, both the horizontal and vertical courses need to be laid out in increments of "one block plus one mortar joint", as per the chart below:

BLOCK TYPE	HEIGHT or VERTICAL INCREMENTS	LENGTH or HORIZONTAL INCREMENTS	BLOCKS Per Square Metre (m2)
Cobblestone Block standard	175 to 180mm	420mm	13.2
Cobble Stone brick Small	125 to 130mm	300mm	25.5
Mud Brick Series	135 to 140mm	400mm	17.8
Smooth faced sandstone large	200mm	500mm	10
Smooth faced sandstone small	180mm	405mm	13.7
Bevel Limestone series	250mm	450mm	8.8
Bevel Limestone cladding	250mm	450mm	8.8
Bevelled Limestone large	250mm	900mm	4.4
Tri-Brick	100mm	300mm	33.3

By strict observance of these increments, the finished wall aesthetics will be maximized, waste eliminated and cost minimised.

**PLEASE REFER TO THE INCREMENT CHARTS ON THE FOLLOWING PAGE**



**BLOCK LAYING INCREMENTS & WINDOW SIZES (EXTERNAL DIMENSIONS) Average size : .405L x .160H x.200W**

<b>Vertical Increments 175mm to 180mm</b>		
(Increments include height of block + 1 mortar joint.)		
1.	0.180	
2.	0.360	
3.	0.540	
4.	0.720	
5.	0.900	Bench Height
6.	1.080	
7.	1.260	
8.	1.440	
9.	1.620	
10.	1.800	
11.	1.980	
12.	2.160	Lintel Course
13.	2.340	
14.	2.520	
15.	2.700	
16.	2.880	
17.	3.06	

<b>Horizontal Increments 420mm</b>				
(Increments include length of block 400 + 1 mortar joint 20 .A 20mm mortar joint has been deducted at the end of each wall length)				
Blocks	Increments		Blocks	Increments
0.5	0.190	No Mortar Joint	9.0	3.760
1.0	0.400	No Mortar Joint	9.5	3.970
1.5	0.610		10.0	4.180
2.0	0.820		10.5	4.390
2.5	1.030		11.0	4.600
3.0	1.240		11.5	4.810
3.5	1.450		12.0	5.020
4.0	1.660		12.5	5.230
4.5	1.870		13.0	5.440
5.0	2.080		13.5	5.650
5.5	2.290		14.0	5.860
6.0	2.500		14.5	6.070
6.5	2.710		15.0	6.280
7.0	2.920		15.5	6.490
7.5	3.130		16.0	6.700
8.0	3.340		16.5	6.910
8.5	3.550		17.0	7.120

For Window heights with the Large Bevelled Sill use the Vertical Increments above and deduct 7mm.

\*\*\*When drawing up plans these are the horizontal increments between windows, door to windows, corners to windows and corners to doors. Using these incremental measurements you will avoid having to cut any blocks.

<b>Window Sizes</b>				
Heights			Widths	
Bull nose Sill .110H or Large Beveled Sill .170H			You may select any height (on Left) with any width (below)	
Blocks	Height		Blocks	Width
Bull nose Sill	0.12	Sill + 10mm Mortar	1.0	0.455
Large Beveled Sill	0.18	Use Incr. Above	1.5	0.645
3	0.413		2.0	0.855
4	0.593		2.5	1.065
5	0.773		3.0	1.275
6	0.953		3.5	1.485
7	1.133		4.0	1.695
8	1.313		4.5	1.905
9	1.493		5.0	2.115
10	1.673		5.5	2.325
11	1.853		6.0	2.535
12	2.033		6.5	2.745
13	2.213		7.0	2.955
14	2.393		7.5	3.165
15	2.573		8.0	3.375

\*\*\*Addition Increments add 180mm

Keep adding 35mm to the Horizontal Increments above.

\*\*\* Control joints in walls are placed every 6 metres, depending the proximity of the nearest window or door.  
 \*\*\* A 7mm gap between top of window and bottom of lintel has been accommodated in the mesurments above.

Verson 2 ~ 21.11.06

600 Long x 250 Wide x 200 High Deduct a mortar joint of 8mm

**BLOCK LAYING INCREMENTS & WINDOW SIZES (EXTERNAL DIMENSIONS)**

Version 2 ~ 21.11.06

Vertical Increments 200mm (Increments include height of block + 1x 8mm mortar joint.)			Horizontal Increments 500mm (Increments include length of block + 1x 8mm mortar joint.) A deduction of 8mm representing a mortar joint has been factored in.				
Blocks	Increments		Blocks	Increments		Blocks	Increments
1.	0.200	Bench Height	0.5	0.246	No Mortar Joint No Mortar Joint	9.0	4.492
2.	0.400		1.0	0.492		9.5	4.742
3.	0.600		1.5	0.742		10.0	4.992
4.	0.800		2.0	0.992		10.5	5.242
5.	1.000		2.5	1.242		11.0	5.492
6.	1.200		3.0	1.492		11.5	5.742
7.	1.400		3.5	1.742		12.0	5.992
8.	1.600		4.0	1.992		12.5	6.242
9.	1.800		4.5	2.242		13.0	6.492
10.	2.000		5.0	2.492		13.5	6.742
11.	2.200	Lintel Course	5.5	2.742	14.0	6.992	
12.	2.400		6.0	2.992	14.5	7.242	
13.	2.600		6.5	3.242	15.0	7.492	
14.	2.800		7.0	3.492	15.5	7.742	
15.	3.000		7.5	3.742	16.0	7.992	
16.	3.200		8.0	3.992	16.5	8.242	
17.	3.400		8.5	4.242	17.0	8.492	

\*\*\*When drawing up plans these are the horizontal increments between windows, door to windows, corners to windows and corners to doors. Using these incremental measurements you will avoid having to cut any blocks.

**Window Sizes**

Heights Sizes include a Sill height of 120mm & 180mm.			Widths Select any height with any width.	
Blocks	Height	Height	Blocks	Width
Deduct Sill		Large Beveled 170mm	1.0	0.508
Bull Noise Sill Brick 110mm			1.5	0.758
3	0.474		2.0	1.008
4	0.674		2.5	1.258
5	0.874		3.0	1.508
6	1.074		3.5	1.758
7	1.274		4.0	2.008
8	1.474		4.5	2.258
9	1.674		5.0	2.508
10	1.874		5.5	2.758
11	2.074		6.0	3.008
12	2.274		6.5	3.258
13	2.474		7.0	3.508
14	2.674		7.5	3.758
15	2.874		8.0	4.008

Addition Increments add 200mm

(Add 0.250 to get next increment)

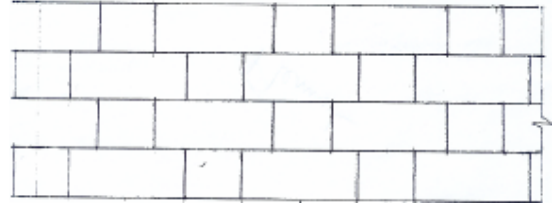
\*\*\* Control joints in walls are placed every 6 metres, depending the proximity of the nearest window or door. A 8mm gap between top of window and bottom of lintel has been accommodated in the window increments

## Block Laying Patterns:

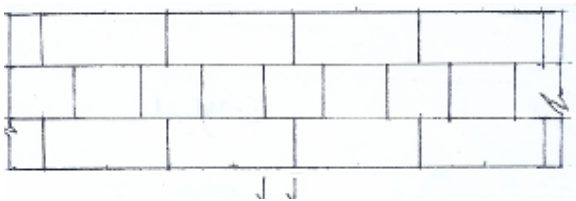
Most modern brick and block homes are constructed using a bricklaying pattern called "Stretcher Bond". This is where successive courses of bricks are laid in a standard pattern as per the diagram shown immediately below (left). This method is quick and cheap, and because 99% of homes have this same pattern, it may seem boring. It is also the only option available to mass produced products, because in almost all cases "half bricks" are simply not available. Timbercrete, however, offers almost unlimited opportunity for artistic expression. Just some of the literally hundreds of possibilities are detailed below:



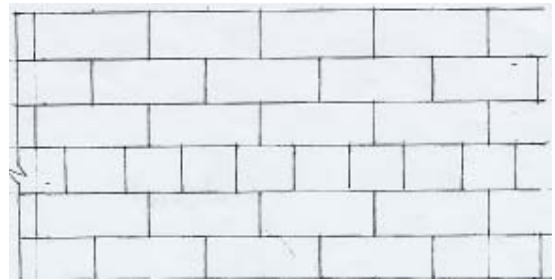
**STRETCHER BOND: (Half lap)**



**FLEMISH BOND:**



**ENGLISH BOND (Quarter lap)**



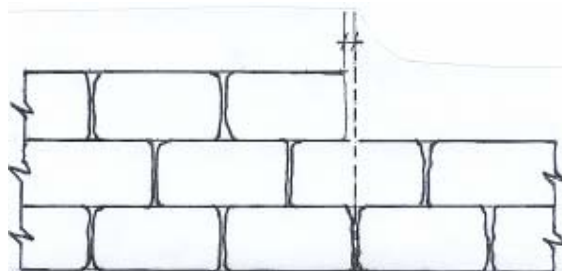
**COLONIAL BOND:**

**Note:** This is the pattern used in many early Australian & convict buildings

## TIPS for laying "Cobblestone" blocks:

The Bricklayers string line will ensure the correct thickness of horizontal mortar joints. By selecting shorter or longer blocks he will also be able to maintain straight and centre located perpendicular lines (see illustration below).

**Bricklayers' professional training will prompt them to reject a proportion of Timbercrete blocks due to the size, surface or colours irregularities. It is therefore vital that they be made aware of these significant differences from conventional bricks and blocks (which are all identical in design).**



The depth of the mortar bed is varied 10mm to 30mm to account for the variation in the height (degree of slump) from one cobblestone block to the next.

The mortar bed should **NOT** be a **SHELL** type or contain a trough down the centre as with traditional bricklaying. Instead, **all Timbercrete blocks must be surrounded by a solid, full bed of mortar (in both horizontal & vertical joints), as per BCA requirements for solid single-skin structures.** This is important for two reasons. One is to ensure maximum bond and load bearing strength, and the other is to prevent cavities in which water can pool and ultimately leak through the mortar joint. Also remember that the longer the block, the greater the slump (lower height) and more mortar will be needed. The same Incremental benchmarks should also be followed between doors and windows when setting out the job. A “Block Laying Increments & Window Size” sheet, to assist setting out your job, is attached.

**Note:** Hollow cores in Smooth Face Sandstone series are not filled with mortar unless increased structural integrity is required as per Engineer.

**TIP 1:** By running a string line on the **inside** of the wall rather than the outside, the inside wall will be more accommodating for the cornice, skirting or rendering (if applicable). Also the outside wall will have a little more "character".

**TIP 2:** Flatter faced blocks (that is, not severely slumped) can be used on the top and bottom courses, as well as around windows and door openings, to ensure flat internal surfaces to abut cornices, door & window frames, and skirting (if installed).

**Note:** Timbercrete automatically supplies a proportion of flatter blocks in every order.

**TIP 3:** “Specialty” blocks (those with grooves, slots or cut-outs) should only be used in positions where they are required to perform their specific function. As a general rule they should not be used in general block laying otherwise they may run short when needed. See Section 11 for full range of types of specialty blocks.

## A. Positioning Blocks:

- All Cobblestone Blocks have a “rough” bottom and a smooth flat “top” resulting from the method of manufacture. Ensure that blocks are always laid with the smooth flat “top” facing upwards, which provides a straight surface from which to plumb the walls



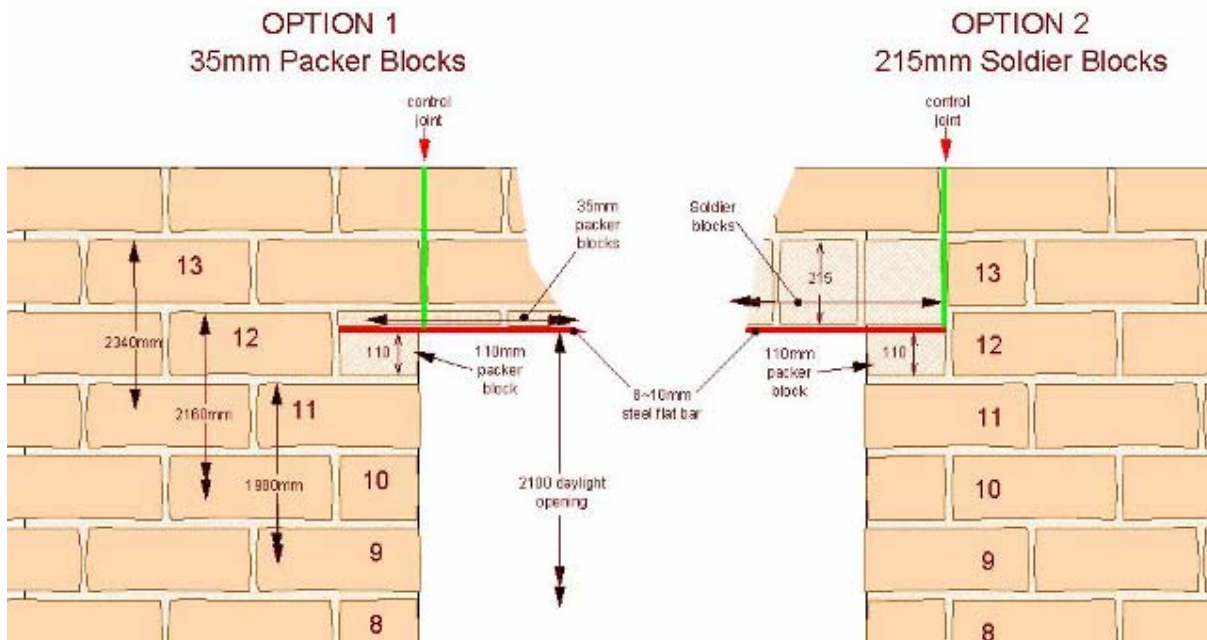
## B. Block Variations:

“Cobblestone” & “Mud brick” series blocks, being hand-crafted, all vary slightly in height, length and width. “All sizes are an average”. **This is intentional.** (See below)



The purpose for this variation is to create the **unique Timbercrete “cobblestone” appearance**. The Bricklayer needs to appreciate that the variation in block dimensions and shapes *is intentional*, and is compensated by the varying thickness of mortar joints. Also, some Timbercrete blocks will feature “split faces”, air bubble “pock marks”, and various other surface and colour “irregularities”. These are all standard Timbercrete features which are purposely created during the hand-crafted production process. (Please note that Timbercrete can vary the features of each block order, as required by the customer. For example, if all blocks are required with straight surfaces, without “slump”, this is easily achieved.)

## Door Lintel & Block Patterns Detail (see diagram below)



Normally an increment of .180mm does not work to block work to door height (2.1m) nor does a standard concrete block at a 200mm increment.

## There are several options to solve this problem.

1. If you tighten the increment to .175mm it will work exactly 12 courses. (with the standard large cobble stone series) Remember that if you adjust here the window sizes also need to be adjusted. My advice is to first check the door frame height against the brick or block size and determine whether you prefer to use a packer block at either side of the door jam, or adjust the mortar joint.
2. Use a packer block. This is a block that shares the same width and length but is cut or manufactured lower to bring the course under the lintel up to door height
3. Another option is to run a course of lower blocks or bricks on the 1<sup>st</sup> course.
4. Build a step down into the slab at a depth that corresponds to the adjustment needed for the door height.

## Mortar

The recommended mortars are both M3 mortars. This is based on AS 3700.

We also acknowledge that construction in some locations (e.g. severe marine environments – within 1 km of a surf coast or 100 m of a non-surf coast) will require M4 mortar.\* Note when changing the cement/lime proportions to reflect a M4 grade, be sure to use the same sand selection and testing procedure. (See below)

## Mortar Thickness and Compressive Strength

- AS 3700 Clause 4.9.1
- Characteristic Compressive Strength of Masonry = 3.8 Mpa For joint thickness in range of 10 mm to 25 mm. (see specification sheet “Physical Properties of Timbercrete”).
- The Characteristic Compressive Strength of Masonry,  $f'_m$ , determined from AS 3700 Clause 3.3.2 and Table 3.1 should be modified by appropriate adjustment to  $k_m$ .

## Mortar Mix's:

**Mortar Mixes A & B are “M3 Grade”:** and have a **FLEXURAL STRENGTH (BOND WRENCH) OF = 0.36 (MPa)**

Even though test strength of 0.36 MPa has been previously determined, it is recommended that design be based on a Characteristic Flexural tensile Strength,  $f'_{mt}$  of 0.2 MPa. This is because design based on 0.2 MPa does not require any further site control, but design based on 0.36 MPa would need to be treated as “special masonry”, with increased site control in accordance with AS 3700 Clause 11.7.

There are two mortar mixes listed below. If **Aalborg White** cement/lime mix is available, use Mix A. If not, use Mix B. Both these mixes are M3 grade.

### Mortar Mix A:

- A. One 20kg bag of Aalborg White\* mortar mix (cement & lime combo).
- B. Four 20 litre buckets of mixed sand. (The sand should be a 50/50 mix of two types: 50% pre-washed coarse sand, and 50% local yellow fatty Brickies sand. Most sand suppliers will deliver this sand pre-mixed if requested.) \*
- C. 400ml (.4kg) of **KIM**. During hot/windy conditions add Dynex or Pozz, to prevent the mortar from going off too quick. (use cup that comes with Dynex).
- D. 1 ½ to 2 cups (500ml total) of yellow oxide as per colour taste.

\* **Aalborg “Bricklayers White”** is a mixture of white cement and lime and is normally available from your local Timbercrete supplier.

### Mortar Mix B:

- A. One 10 litre bucket off-white cement (**13kg**)
- B. One 10 litre bucket lime (**6.6kg**)
- C. Three 20 litre buckets of mixed sand (The sand should be a 50/50 mix of two types: 50% pre-washed coarse sand, and 50% local yellow fatty Brickies sand. Most sand suppliers will deliver this sand pre-mixed if requested.) \*
- D. 400ml (.4kg) of **KIM**. During hot/windy conditions add Dynex or Pozz to prevent the mortar from going off too quick. (use cup that comes with Dynex).
- E. 1 ½ to 2 cups (500ml total) of yellow oxide as per colour taste.

**WARNING** ~ Be certain to BATCH the ingredients into buckets first – don’t just throw shovels full into the mix, or the proportions will be inaccurate and the mortar strength and colour will vary.

- **Note** – The sand particle size can be **up to 6mm diameter**. As a general rule the thicker the mortar joint the larger the particle. Ideally, particle size of the sand mix should be variegated from very fine up to **1/3 of the thickness of the joint**.
- **Note** – When using our smaller veneer bricks such as the “Bevel Limestone series” or Tri-Brick” with a 10mm joint. The sand particle size variegates up to **1/3 of the thickness of the joint (up to 3mm in diameter)**. The larger particle size up to 6mm in diameter is also workable with these thinner joints providing that you iron the joints.

Do **NOT** use a fatty (or fine) Brickies’ sand straight, as this will result in high shrinkage and joints cracking

### Mortar Additives: **Always use KIM**

To maintain the “workability” of the mortar, during hot or windy weather, **DYNEX (Mortar flex)** or “**Pozz 400Ri**” may be added to the mortar mix. These additives will prevent the mortar from setting too quickly making it workable for longer and helping to prevent fast drying cracks. These additives will not compromise the structural integrity or the bond-wrench ability, and are normally available from your local Timbercrete manufacturer.



### Why use KIM?

KIM is used as it makes the mortar waterproof and self healing, closing micro cracks (up to .5mm) that may occur between block and mortar. As well as being a water proofing agent, it also reduces mortar shrinkage or “creep”.

KIM is similar to cement in that it produces a calcium crystal growth that is activated when water is present. However unlike cement it is able to be reactivated when water is present even after it is set.

If KIM is present in the mortar mix KIM crystals will continually grow into any cavity where ever water is present. In so doing KIM helps fill and heal small cracks and cavities.

**WARNING: DO NOT USE FATTY BRICKIES SAND STRAIGHT with Timbercrete**

**WARNING: DO NOT USE BICOL or any other detergents in mix with Timbercrete**

**WARNING: DO NOT USE any MORTAR ADDITIVES unless approved by Timbercrete in writing.**

### Selecting & Testing Sand Suitability re their Suitability for Timbercrete Mortar

1. Test the sand/mortar mix for excess shrinkage **BEFORE** you lay a Block.

### Procedure:

1. Select a very coarse washed (river) sand 2.1 litres by volume. Note; the ideal large particle size is up to 1/3 the size of the mortar joint. Therefore if the mortar joints are approximately 20mm (as per the cobblestone series) the large particle sizes need to range from 6mm or 7mm down. This is typically a washed River Sand.
2. Select a typical brickies Lome (sand) 2.1 litres by volume. Note; this sand will be smaller in particle size and contain some clay, approximately 10% is standard. (See photo below)
3. Cut out a piece of ply board (not laminated) 15mm thick by .500mm by .500mm. Nail four strips of timber around the outside of the ply to a height of 15mm. **Do note seal or coat the board.** (see photo below)





2. This is a simple tried and proven method that has been used throughout Europe.

4. Knock up a small batch of mud with the selected sands intended to be used.

5. The mix being; Mortar mixes **A.** (4.1.) or **B.** (6.1.1.) both are a M3 grade.

**A.**

- 2.1 litres of Coarse washed sand
- 2.1 litres of brickies sand
- 1.05 litre of Aalborg White mortar mix (1 litre + 50ml) (cement/lime mix)
- enough water to make a workable mix

**B.**

- 2.1 litres of Coarse washed sand
- 2.1 litres of brickies sand
- 700 ml of off/white cement
- 700 ml of Builders lime
- enough water to make a workable mix

Place the mortar mud on the test board and level with a screeding tool, screed off any excess. Place the test sample inside for one week. If there is going to be cracking problem it will show up within the week. (**Do not cover the test sample**).

(See photo over page)



To contrast the performance of difference sands select a fine or a fatty sand and repeat the exercise.

- **Problem solving;** If cracks still appear after blending the two sands then the overall (average) particle size is too small, or the clay content of the fatty sand is too high. remedy; try a 3 part blend –
- 1 part coarse washed sand (1.4 litres)
- 1 part washed sand (1.4 litres)
- 1 part fine or fatty sand (1.4 litres)

If you are unable to conduct these preliminary tests than **LET US HELP YOU.** Simply send your local Timbercrete Licensed Manufacture 2.1 litres of each sand sample (4.2 litres in total) and He will carry out this test, it will take between one and two weeks for a result.

- Finally, your local Timbercrete manufacture will have already spoken with his local sand supplier to arrange what we refer to as “The Timbercrete Blend”. However it is still advisable to carry out this test because sands have a habit of changing without notice.

## Joint Types:

Several different visual effects can be achieved by varying the technique for “raking or ironing” joints (or a combination of both) after blocks have been laid.

**Tools include:** a common breakfast spoon, a 1" garden hose about 8" long, or a purpose built jointer made from 25mm steel tubing.

An attractive combination is to have the 8mm deep raked (then ironed) effect on the outside of the walls, and the smooth “ironed” joints on the internal walls. An advantage of internal ironed joints is that dust will not be trapped in the joints.

1. **Flush joint:** only to be used if the wall is to be rendered or bagged.
2. **Struck Joint:** good for external or internal because it sheds water dust and dirt well.
3. **Ironed Joint:** works well inside or outside as they also shed water, dust and dirt well. “Ironed Joints” leave the mortar slightly concave to the blocks. Due to the varying thickness of the mortar joint, traditional ironing tools are in most cases unsuitable. A spoon is an excellent improvisation.
4. **Raked joint:** looks great externally and makes the blocks appear more defined and rustic. But it does tend to collect more dust and dirt therefore it is not recommended internally.

**Note\***If using this type of joint externally we recommend **ALLWAY’S ironing** the joints **after raking**. This will make the joint more water proof, heal over a separation cracks and smooth out the rough appearance.

The mortar can be raked out of the joints between blocks to a depth of (say) 8mm, allowing the blocks to “stand out” as a feature. A standard Bricklayer’s raking tool can be used for this purpose.

## Cleaning & Pointing:

Timbercrete blocks must be brushed clean approximately three hours after they are laid (depending on the weather). This normally happens immediately after final ironing or raking the joints, when the mortar is stiff. (If done when the mortar is too wet it will result in smearing the walls.) A “Java Fill” broom or a stiff bristle or banister brush works best. An alternative method is sponging the wall with a wet sponge. **Ensure the water is not too dirty as it will leave smears.** Take great care NOT to leave mortar smears on the blocks overnight, as removing the marks later becomes very hard work. If mortar smears are allowed to set on the blocks, they can only be removed with a “carborundum grinding stone” (as used for sanding rough concrete) or a wire brush and lots of elbow grease. However this procedure will expose cellulose material within the block. **It is therefore critically important that the Bricklayer cleans the block faces thoroughly, before the mortar is set, as this will save a lot of heartache, work and expense to remedy.**

**Timbercrete walls can not be cleaned later with acid & high pressure cleaners.**

Unlike traditional clay fired bricks, we do **not** recommend the use of **acid washes** to clean off mortar smears on Timbercrete bricks and blocks.

## Stain Removal:

**Calcium (Lime) Removal:** If the blocks receive a heavy rainstorm during or just after laying, a white powdery substance may appear on the surface of the block, emanating from the fresh mortar joints. This is calcium oxide (efflorescence) and can usually be brushed off. If staining is persistent, rub with a “carborundum stone” and **lightly** pressure wash. Try this first on a small area of the affected wall. If it does not work to satisfaction, a liquid Efflorescence Remover can be purchased from your local Timbercrete Licensee, which can be brushed or sprayed on and then **gently** pressure washed off.

**Hardwood Stain Removal:** If blocks get stained by leaching of tannins or vanadium from hardwood materials, apply Oxalic Acid followed by a **light** pressure wash (as per directions on pack). If stains are particularly deep and the above fails to remove all the marks, then rub with a carborundum stone followed by a **very light** pressure wash. Blocks and Bricks will be stained with leaching tannins during wet weather, if they are placed under gum trees, under hardwood pallets, under hardwood roof trusses, timbers rafter or floor joists. (As seen below).

Where hardwood roof timber has to be installed on top of Timbercrete walls, it is advisable to either seal the walls prior to the timber installation, or to lay sheets of plastic temporarily along the top of walls during construction.



Hardwood Stains

## Curing Blocks & Moisture Content:



As soon as Timbercrete blocks arrive at your building site, they should be unwrapped (plastic removed) so as to allow free flow of air around each block. **WARNING: If blocks are built into walls prior to the “USE AFTER” date as detailed on every pallet label, walls may develop cracks as block shrinkage takes place.** If you are in a period or area of high rainfall, it would be wise to cover the top of each pallet with a sheet of corrugated iron or similar. The intention is to prevent the blocks from becoming soaked, but still allow free air flow to the sides of all pallets so that the

curing process may continue uninterrupted. This is particularly important in freeze/thaw conditions.

## Wall Movement:

### ACCOMMODATING WALL SHRINKAGE:

It's common knowledge that all concrete masonry products are subject to shrinkage. The reason for this is that all cement products are manufactured "wet". As moisture is lost over time shrinkage occurs. (Clay fired products such as bricks expand over time; because clay fired products are manufactured and then fired. Coming out of the kiln they are completely dry. In time they take up moisture from rain and humidity, and expand. As a result walls made with clay fired bricks grow in size; that is, expand. This problem is simply addressed by the installation of expansion joints.)

Because shrinkage in cement based products is three dimensional, provision needs to be made to accommodate these phenomena. **Most** movement will be seen on the **horizontal plane** (length) and some on the **vertical** (height) and a fraction on the **width** (depth). Walls tend to be longer than they are in height, and higher than they are wide, which means that shrinkage is most noticed in the horizontal, and then the vertical, planes.

Providing all Timbercrete blocks used in construction are completely cured (as indicated by the "Use After" date clearly indicated on every pallet of blocks), and providing the correct mortar mix and other procedures in accordance with this document are followed to the letter, there is no reason to anticipate wall movement other than that caused by potential movement of slab or foundations.

#### **Confidence in wall stability is based on 4 points. (See below)**

- The AS/NZS 4455.12 shrinkage tests and previous NATA Laboratory tests;
- In-house shrinkage monitoring;
- The use of hoop iron strapping to control shrinkage;
- The ductile nature of timber aggregate, when compared to stone aggregate.

However, according to the Australian Building Code (BCA), no masonry product can span more than six metres without an expansion or control joint. **All masonry products (such as Timbercrete) may be subject to movement, and therefore require "expansion or control" joints.**

These Control joints **must** be installed in every wall every 6 metres, or as per your Engineer's specifications.

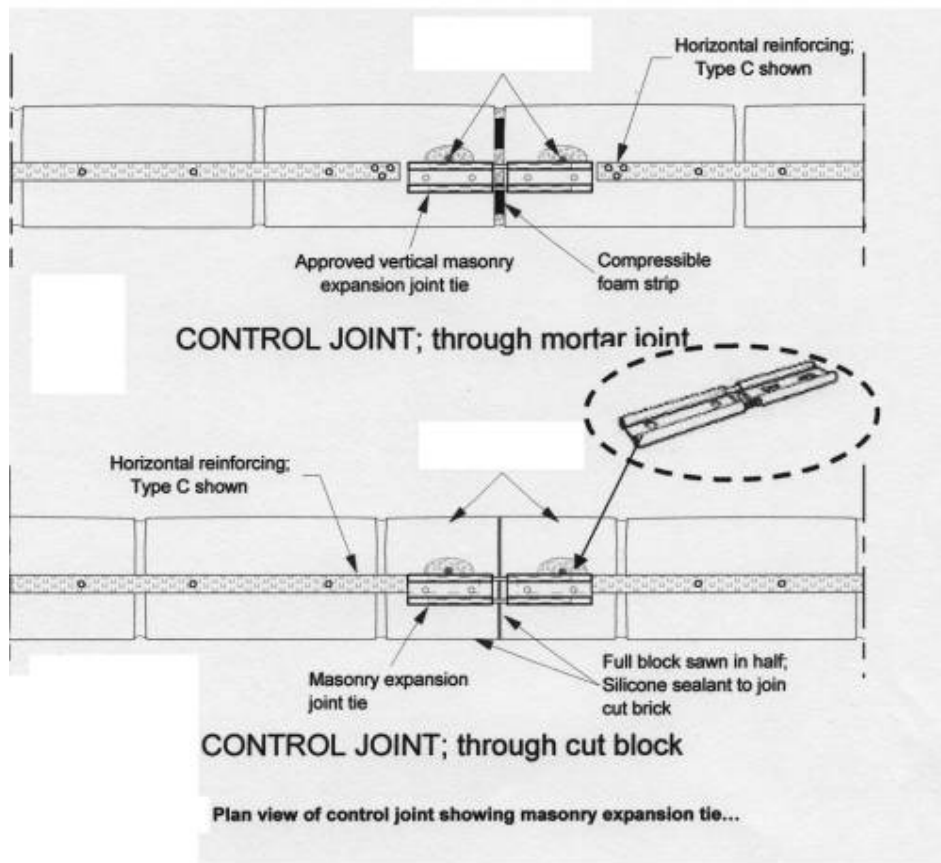
(Windows and doors can be a handy and unobtrusive position and represent a natural joint location. For example, a control joint could be installed from the top of a door to the top of the wall, allowing the door space to form part of the control joint. The same principle applies for above and below windows.) Remember, when using timber lintels, run the control joint to the outside edge of the lintel.

Control joints are installed as follows:

- Where ever a Control Joint is required, a 'break' needs to occur in the wall. This is achieved by utilizing the natural 'break' at the perpendicular end of one full Block, and then cutting the Block above it in half so that the 'break' continues up the wall. The "gap" will tent to open rather than close because typically the wall will not expand; only contract.
- Blocks are laid in the normal manner, except that "Masonry Expansion Ties" (M.E.T.s) **MUST** be installed to "rejoin" all the Blocks that have been cut in half. This retains the lateral stability of the wall.
- The M.E.T.s (type 3-3) should be screwed into position using 50mm Tec screws. Mortar is then laid across the top of the M.E.T. as the next course of blocks is laid. Ensure the hoop iron strap is secured to the M.E.T. with a Tec screw.
- Fill the 'breaks' with colour matched "Timbercrete Final Filler" to hide them. To save using large amounts of "final filler", a compressible foam strip can be jammed into wide control joint cavities prior to sealing.
- **MET contact details are "21 Garema Circuit, Kings grove, NSW. Telephone 02 9740 4444"**



See over page for the diagram depicting installation



Every good Builder and Block Layer will build in a vertical control joint which is strategically placed in the wall to accommodate shrinking on the horizontal plane. (Approx 6 metres where there are many windows or doors closely spaced, and up to six metres in walls where there are no windows or doors.) This is commonly achieved by cutting through Blocks on every second course and rejoining using M.E.T. expansion ties (Type 3-3). A semi flexible “Timbercrete Final Filler” colour matched compound is forced into the control joint on both sides of the Block to seal off against water ingress.

**Ensure your Engineer is satisfied with the above information relating to Control Joints, and incorporates the appropriate standards in your particular plans and Specifications.**

### **Vertical Shrinkage:**

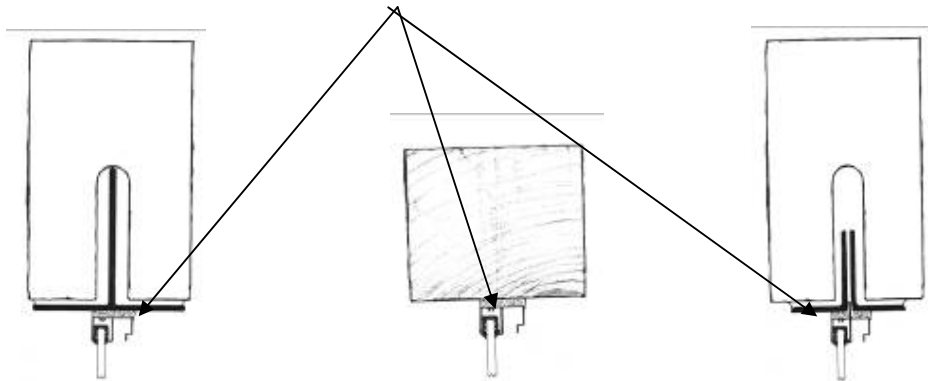
Due to the fact that vertical shrinkage often goes unnoticed (due to the relatively short heights of most walls) allowance for shrinkage is often overlooked. Allowance for vertical shrinkage can be accommodated as follows:

Allow a gap of at least 7mm between the top of all windows and doors and the bottom of the corresponding lintels.

**Note:** Do not under any circumstances place the lintel on top of the window or the door without allowing for this gap.

**\*\*Failure to follow the above procedure may result in the walls “shrinking down” onto the window and door frames, which causes them to become load bearing. (See diagram below)**

**\*\*Leave a 7mm gap with builders foam sandwich between lintel & top of sill\*\***



### Wall Reinforcement:

The system described below **must** be used with **all** types of single skin Timbercrete blocks. It is also advisable to use a lighter variation of this system in our veneer range instead of “brick mesh” for it offers a **superior structural outcome** that will manifest itself in three areas.

1. It reduces the accumulative effect of shrinkage (creep) which can be one of the main causes of cracking in all types of brick and block walls.
2. It increases bracing strength (racking strength).
3. It increases lateral strength (face loading)

Longer (un-interrupted) walls benefit most from this strapping, whereas shorter runs benefit little. Therefore strapping is unnecessary for any length of wall that is less than 1.8 m (unless your engineer specifies to the contrary).

When building with our single skin (single leaf) blocks use **“Hoop iron strapping” (30mm wide x .8mm thick)**. This is the same strapping commonly used to brace roofs and timber frames, and is to be used instead of traditional Brickies mesh. The hoop iron strapping should be screwed directly into the Timbercrete blocks on **every 2<sup>nd</sup> or 3<sup>rd</sup> course**. A 50mm long roofing Tec screw should be screwed through the SMALL hole at each end of the block (two per block) to affix the strapping. A continuous piece of strapping is to be used between Control Joints. It is particularly important to use a continuous strip of strapping above all doors and below all windows (except those windows and doors extending all the way to the floor, and/or ceiling).

When building with our veneer series bricks use **“Hoop iron strapping” (25mm wide x .6mm thick)**. It is to be used instead of traditional Brickies mesh. The hoop iron strapping should be screwed directly into the Timbercrete bricks on **every 2<sup>nd</sup> or 3<sup>rd</sup> course** when using bricks that are 160mm or more in height.

In **every third course** when using bricks that are less than 160mm high.

When laying with a thinner mortar bed (approximately 10mm thick) use a 50mm long stainless steel decking (countersunk square drive) screw. Use one screw through the strapping hole into each brick. A continuous piece of strapping is to be used between Control Joints. It is particularly important to use a continuous strip of strapping directly above all doors and below all windows. The addition of strapping here in these problem areas will minimise the chance of cracking. (With an exception to those windows and doors extending all the way to the floor, and/or ceiling)

The purpose of using this strapping is twofold.

- It reduces the affects of “creep” (accumulative shrinkage) which can be one of the main causes of cracking in all types of brick and block walls.
- It dramatically increases the horizontal, lateral and bracing strength of the wall.

**Tensioning the strapping:** Tensioning the strapping is simple.

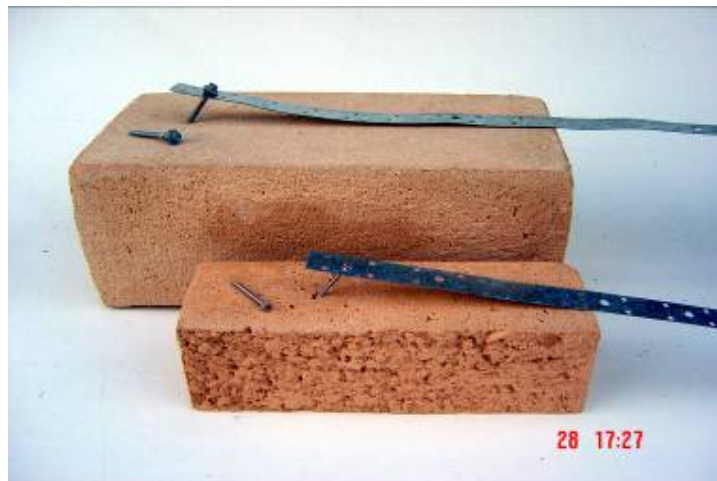
1<sup>st</sup>. Lay out the full length of strapping from end to end i.e. from corner to corner or from window to window door to window etc. Cut to length.

2<sup>nd</sup>. Fix the strapping with a screw directly into the first block or brick at one end.

3<sup>rd</sup>. At the other end place the screw all the way through the **LARGE** hole in the strapping.

4<sup>th</sup>. Simply screw into the block or brick at a 45 degrees angle this will cause the strapping to stretch out tort. (See below)

5<sup>th</sup> Finally, just screw through the **SMALL** holes into each brick from end to end.

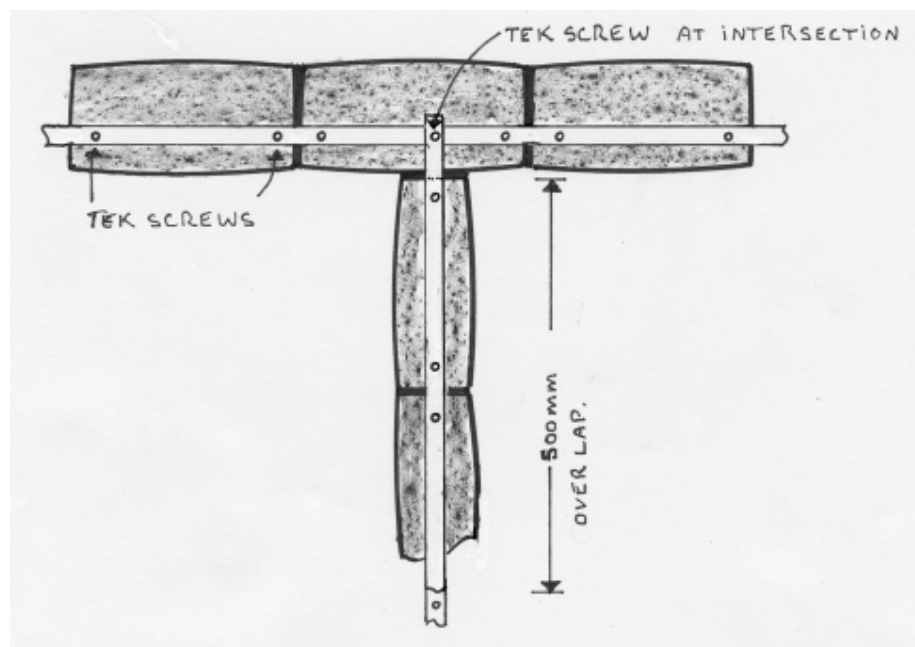


### **Intersecting Wall Junction (Block/Brick):**

Where two walls intersect; for example where an internal wall meets an external wall, hoop iron strapping needs to be installed, this is the method used to “tie” the two walls together.

If the two walls are being laid at the same time, then the hoop iron should overlap from one wall into the other. This means that the hoop iron in the two walls will come to meet at a “T” intersection at the corner of the walls, and a Tec screw should be placed to ensure that both strips of hoop iron are secured to one another. (See diagram over page) This needs to be done on every second course.

If the two walls are NOT being laid at the same time, ensure that a length of hoop iron at least 500mm long is secured with a Tec screw to one of the walls at the point of intersection (in the mortar joint), so that the loose length can be incorporated (and affixed) into the other wall when constructed. This needs to be done on every second course.



### Intersection Wall Junction (Gyprock Walls)

- When using Gyprock sheeting There are two techniques to work into/with Timbercrete
1. Cut a groove into the block wall where the gyprock needs to abut. The groove needs to be about 10mm deep and 10mm wide. Remember to paint along the outside edge of the gyprock this will eliminate the need to have to carefully cut in with painting later.
  2. Run a small timber cornice or beading, and then grout some “Timbercrete Final Filler” into the nooks and crannies. This product is excellent and ideal as gap filler.

### Warning; Wetting Down Pre-layed Blocks

- The wetting down of blocks is something that Timbercrete **STRONGLY** advises **NOT** to do for the following reasons.
  1. If blocks are moist or wet then they will have an **INFERIOR** bond strength.
  2. The wall may exhibit problems with water ingress once the house is complete.
  3. Small separation cracks often appear between blocks and mortar if the blocks are pre-moistened.

If weather conditions are hot and windy then the wall may be moistened **AFTER** the blocks are laid **NOT** before. If the mortar is setting too fast then ask your Timbercrete supplier for one of 2 mortar additives. They are “Dynex” or “Pozz400 RI”. We do not approve any other mortar additive.

### **Installing Windows & Doors** (e.g. before block work or after.)

- With our single skin series our recommendation is to install windows and door jams as the blocks are being laid. This is the best way to insure a perfect fit. If using aluminium windows then the fin will need to be **left ON**.
- If it is not possible to install windows and door jams as the blocks are being laid, then build and install (as you lay) timber frames that are the same size as your planned windows and doors. However, if using aluminium windows then the fin will need to be removed and an alternative fixing method will need to be implemented.

### **Installing Sill Blocks & Windows:**

Special “grooved vertical service blocks” and “grooved solid blocks” and “grooved half blocks” are straight sided to facilitate abutting straight surfaces such as window frames. They also feature a small groove to accommodate the window fin (see Block Range Sheet)



Special “large bevel sill blocks” and “bull nose sill blocks” (see below) are available for positioning under windows as sills. To ensure a waterproof seal on the base of windows, a groove can be cut on the top of the sill blocks to accommodate the window fin. This groove needs to be filled with fresh silicon sealer a minute or two before the window with its fin is inserted.

Large **custom made** single piece window sills are available upon request. Talk to your helpful Timbercrete manufacture.

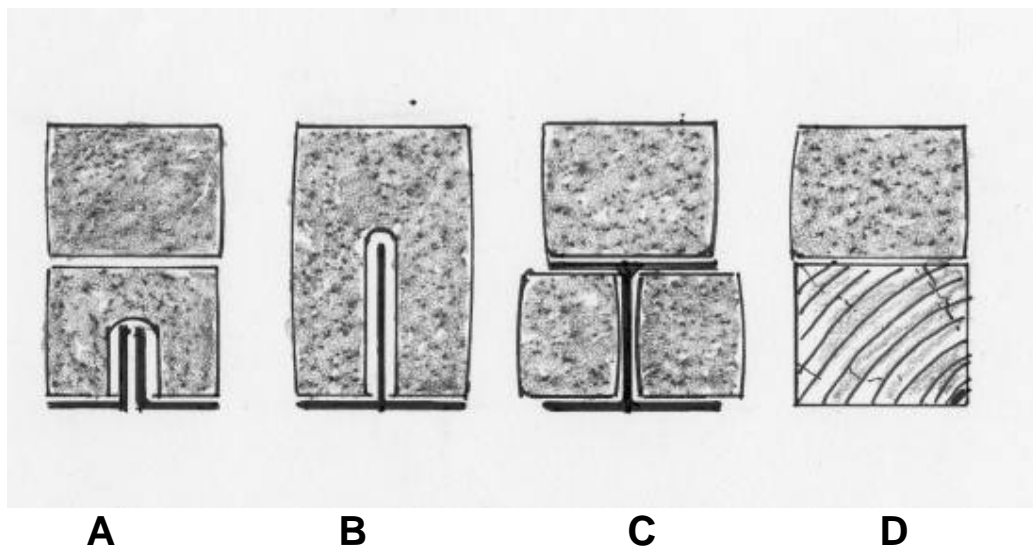


### Installing Skirting Boards and Cornices (Fix Out):

- When considering the “Skirting Boards and Cornices” remember to run a course of straight sided blocks behind the skirting or cornice. If you don’t like look of a flatter or different shape course of blocks, simply use the standard blocks and apply “Timbercrete Final Filler” to fill in the gaps. If you run the string line on the inside of the blocks rather than the outside, this will minimize the size of the gaps needing to be filled.

### Lintel Types:

There are numerous types of Lintels that can be used, and four popular configurations are sketched below. You’re Designer or Engineer needs to specify the lintels for your home, taking into consideration the width of the door or window openings, the number of courses above the lintel and the load being carried.



A

B

C

D

“A” shows the cross section of two pieces of gal steel angle (typically each 75mm wide, 100mm high and 10 mm thick) with “lintel bond beam” blocks laid along the top. This system maintains the “stretcher bond” block laying pattern.

“B” shows the cross section of a “T bar” gal steel lintel (typically 200mm wide, 200mm high, and 7mm or 9mm thick). This system maintains the “stretcher bond” block laying pattern.

“C” shows the cross section of an “I” beam lintel (typically 200mm wide, 180mm high, and various thicknesses) with 120mm wide Timbercrete blocks on either side of the central “I” section. Standard 200mm Timbercrete blocks are laid on top of the “T” section to maintain the “stretcher bond” block laying pattern.

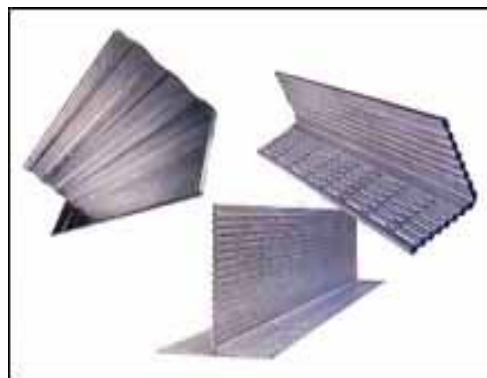
“D” shows the cross section of a timber lintel (made from graded cypress pine or hardwood, typically 190mm wide and 170mm high). Ensure timber lintels are sealed with varnish, paint or sealer to guard against leaching of tannins and stains on the Timbercrete blocks below. Install a slab of builder’s foam (same size as the lintel ends) on both ends of the lintels to allow expansion and contraction of the timber. Lay tar coated aluminium sheet (Super Alcor), (Zinc, Led or Plastic Damp Corse) along the top of the timber lintels to prevent the mortar/blocks adhering to the lintel. This will allow movement of the timber without causing the mortar to crack. It is critical to install the Alfoil so as to prevent the ingress of water along the top of the lintel; that is, on the outside of the lintel bend the Super Alcor DOWN over the timber edge, and indoors bend the Alfoil UP above the timber edge along the Timbercrete wall.

Additional technical information on lintels, spans and loadings can be obtained from a number of web sites, including [www.grahamgroup.com.au](http://www.grahamgroup.com.au)

**Note: When using any of the above systems, ensure that all cavities are filled and bedded with mortar.**



Timber lintels



Typical Gal Steel Lintels

## Installing Horizontal & Vertical Services (Single Leaf Walls)

**NOTE ~ All “specialty” blocks have a groove, trough or cut-out. When these blocks are laid the cavities (that is, grooves, troughs or cut-outs) MUST be**

**filled with mortar. Otherwise, if water enters the wall through imperfect mortar joints, it may pool in these cavities.**

Please note that the relevant tradesmen should place the various services (eg electrical cable, water pipes, TV cables, telephone lines etc) along the grooves in the various Service Blocks while the walls are being constructed. After services have been placed in the grooves, mortar should fill all cavities as subsequent blocks are laid on top. **This will ensure the structural integrity of the walls.** (See Photos below)



### **Installing Electrical Services – (single leaf)**

“To conduit or not to conduit?” Due to the thickness of the wall we have been advised by several electricians that either is acceptable. The advantage of no conduit is that it is cheaper but using a conduit means that if necessary more cables can be installed later. However this is a decision that your electrician will need to recommend.

### **Cutting and Splitting:**

If a home has been designed around the dimensions of Timbercrete blocks, virtually no block cutting will be required. However, some cutting may be required for special features such as portholes or arches. (Check with your local Timbercrete Licensee for availability or pre-made arch blocks).



**Arch**



**Bull's Eye**

Timbercrete blocks cut and split easily and rarely run off line by using the following procedure.

- First score around the entire surface with an angle grinder with a masonry blade, leaving a score approximately 10mm to 20mm deep.

- Separate the scored areas by hitting with a lump hammer and Bolster chisel. If there are any protruding pieces then the blade of a scutch am hammer will easily remove these.
- Blocks are very easily cut with a commercial brick or block saw.
- Alternatively special “arch” & “key stone” blocks can be made to order. This will eliminate the need for cutting.

### **Nailing and Screwing Timbercrete:**



One of the unique features of Timbercrete is that it can be nailed and screwed directly into without the need for pre-drilling or wall plugs. The blocks feels just like pine timber, and nails and screws go in and come out with the similar amount of resistance.

### **Joist Hangers:**

Timbercrete offers a custom-made range of Joist Hangers for use when installing timber floors with Timbercrete walls.



The Joist Hangers come in two sizes (either 250mm drop, or 180mm drop). While off-the-shelf joist hangers are made from 0.6mm material, Timbercrete Joist Hangers are made from 2mm thick galvanised steel, providing a much stronger flooring system. Contact your local Timbercrete Franchisee for supply. (Always show your Engineer a sample of our Joist Hanger to ensure it is adequate for your application.)

### **Sub floor breathing holes:**

- For vents lay a 1/2 or a 3/4 block rather than a full block in the centre of a space that would normally fit a full block. This will leave two cavities between 115mm or 65mm wide. Glue a piece of fire resistant fly screen on the basement side (inside) of the wall. The screen will prevent insect's rodents and flying ambers from getting under the house.

### **Wet areas - options**

There are 3 options;

1. Glue and nail an approved wet area board such as “Villa board” first then tile over the board.
2. The no tile approach. Simply seal the wall with our recommended sealers, then apply several coats of clear resin until all nooks crannies and small holes are filled up. This makes cleaning easier. (Check with your local building inspector to make sure he is OK with this)
3. Batten the wall first, then sheet and then tile



## Architectural Features



## Sealing Timbercrete Walls:

We recommend that an external sealer be applied after the walls are complete and thoroughly washed down with clean water. Drenching the wall with water activates the **KIM** self-healing sealer. Despite the fact that under normal wet or dry conditions water **does not** penetrate through Timbercrete blocks, tiny cracks and pinhole openings may exist between the blocks and the mortar joints. The first level of defence against these tiny cracks is to use **KIM**. The second level of defence is to use an **approved and tested sealer**. (Tested by Timbercrete)

### **External Sealers:**

For the past 5 years, Timbercrete has researched and tested many different brands of sealers, with a view to being confident that you have the best possible outcome, at the least possible expense. As a result we can offer a range of “tested sealers” to suit your needs and budget. These sealers range in performance, cost and appearance.

### **For sealing external walls, they are:**

- **Dry-Treat 40 SK:** This is a dry (non glossy) look sealer. Our tests to date demonstrate that when it comes to a totally water proof dry look sealer, there is none better. However its exceptional performance comes at a higher price. For application read the instructions supplied on the container.
- **Laticrete 190:** This is also a “dry look” sealer. It is the 2<sup>nd</sup> best sealer we have tested to date and is far less expensive than the cost of “Dry-Treat 40SK”. A very good sealer at a budget price. For application apply to one flood coat.

### **Sealing internal walls, use:**

- **Shalex Glaze:** This sealer is a semi gloss membrane type sealer. It is the best membrane type sealer in its class. While it may not be as water proof for external applications as the above mentioned sealers, it has inherited some other great qualities for sealing internal walls.  
This coating will render the wall washable, stain and dust resistant, and also hold any loose particles in the mortar.

The down side of membrane type sealers and the reason why we no longer use them on an external application is; that during very extreme weather conditions, they sometimes allow some water penetration. Once there has been some water penetration it takes a lot longer for the wall to dry out, because the moisture can get trapped inside the wall. This is the main problem with membrane sealers.

On the other hand the dry look non-membrane type sealers such as Laticrete 190 allow the wall to breath better, so if any water does comes through during extreme conditions, it will be able to escape and dry out much faster.

### **Shalex Application on internal walls:**

For Shalex sealer apply only one coat. This Coat should be applied diluted 50/50 with water

. **NOTE:** The recommended method of application is to “**flood coat**” the walls, starting at the top and working down. This involves using a high volume spray (such as typical

garden variety 15 litre back pack pump spray). The sealer should be applied so that it runs down the walls.

**WARNING:** to prevent over spray, mask and cover all windows and doors before spraying.

\*Sealer Test results are available upon request. Ask your local Timbercrete supplier.

\*\*Timbercrete HQ testing facility is constantly Testing and re examining products and sealers, to ensure the highest quality in performance and installation for the best possible outcome.

## Termite Prevention

The termite resistance of Timbercrete is scientifically unknown. However 10 years of anecdotal evidence has demonstrated that to this day no termite has ever penetrated a Timbercrete block. Samples have been placed **in**, on and near various types of termite nests. Timbercrete has even been used for Retaining walls and pavers for many years without any sign of Termite ingress. Although it is likely to be less than conventional concrete, mortar has been demonstrated to be **not termite resistant**.

Details of Australian practice are set out in AS 3660.1.

Various commercially available termite barriers are included on the following web site.

[www.electronicblueprint.com.au](http://www.electronicblueprint.com.au). Specific links are as follows:

[www.electronicblueprint.com.au/suppliers/TERMseal.html](http://www.electronicblueprint.com.au/suppliers/TERMseal.html)

[www.electronicblueprint.com.au/suppliers/ensystemex.html](http://www.electronicblueprint.com.au/suppliers/ensystemex.html)

Termites generally enter the walls close to the footings and access the timber superstructure via paths hidden from view, e.g. at control joints, tie-down anchorages and door jabs. The aim of most termite barriers is to force the termites to the surface of the structure where they are visible and can be easily eradicated. Some termite barriers also include chemicals that deter the termites from passing.

Other systems, involving chemical dosing and graded stone barriers, have not been reported herein, because of possible problems associated with their application and maintenance.

The most effective solution is to place a termite barrier in the masonry, at least 75 mm above finished ground. Such a barrier would need to extend from the outside of the masonry (and up the inside to beyond the level of the floor slab, in the case of a drop-edge beam). Such a barrier need only be physical, but could also include chemical impregnation if this is available. Options are:

- Sheet metal barrier, similar to a metal flashing.
- Stainless steel mesh barrier, joined and fixed by resistant adhesive.  
Proprietary system - Termimesh
- Non-toxic waterproof compound impregnated into a geotextile.  
Proprietary system - Term Seal
- Internal non-woven fibre blanket impregnated with deltametherin crystals (low

toxicity to warm blooded animals) which both strongly repels and (where necessary) kills termites, bonded within casing layers, top plastic layer (200 microns), which doubles as a moisture vapour layer, and bottom plastic layer (50 microns) prevents termicide leaching into soil. Proprietary system - Trithor Termite Protection.

Phone: (02) 6583 6699  
Fax: (02) 6583 5699  
Email: [info@termseal.com.au](mailto:info@termseal.com.au)  
Mail: P.O.Box 5649 – Port Macquarie – NSW - 2444

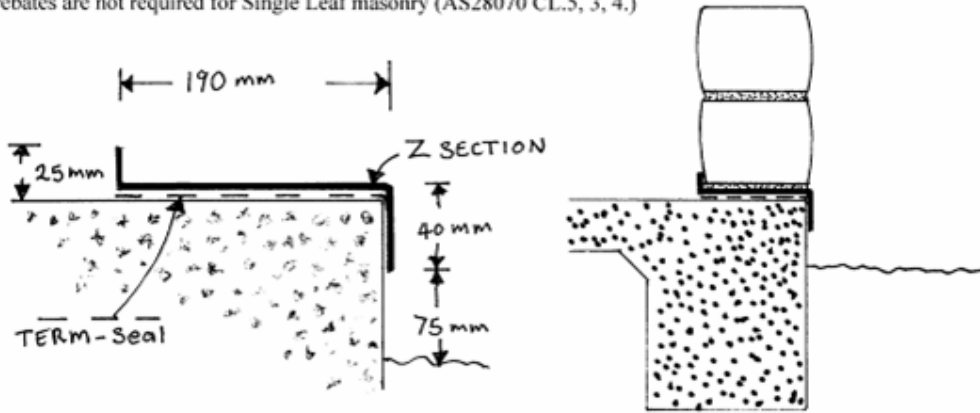


## Timbercrete Single Leaf & Veneer footing Details

### Type A

This system is typically used for the "Single Leaf range".

\* Edge rebates are not required for Single Leaf masonry (AS28070 CL.5, 3, 4.)



Use a Z section made from galvanised or Colour Bond Steel Sheet, Super Alcor, Zinc or Led as a damp proof barrier may be substituted providing that it folders up on the inside at least 25 mm and down on the outside at least 35mm. This "Z section" profile is essential in order to prevent driving (horizontal) rain from passing under the 1st course of blocks.

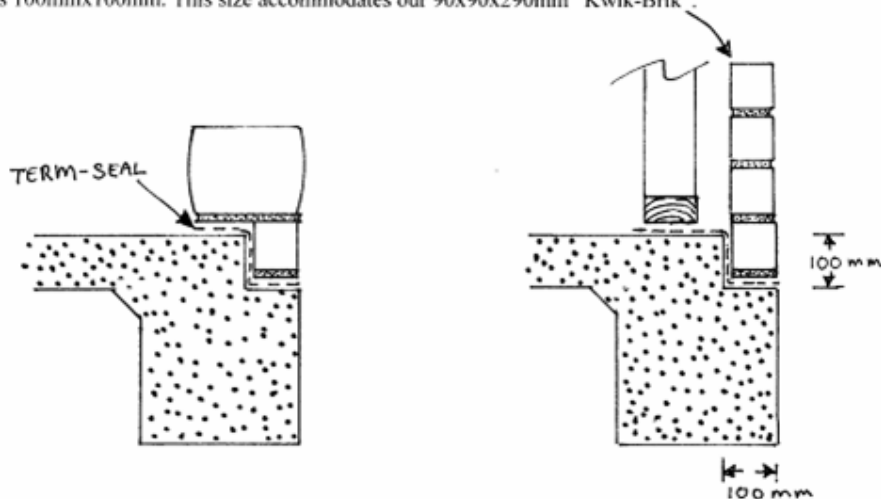
The Z section also acts as a damp course and a slip joint. This "Slip joint" helps to accommodate any differential movement between the slab and the wall.

Apply "TERM-Seal" to the top of the slab. When fully dry place the Z section over the treated area. As for footing Type B apply on top of the slab and on the step down as a termite barrier. (See [www.termseal.com.au](http://www.termseal.com.au))

### Type B

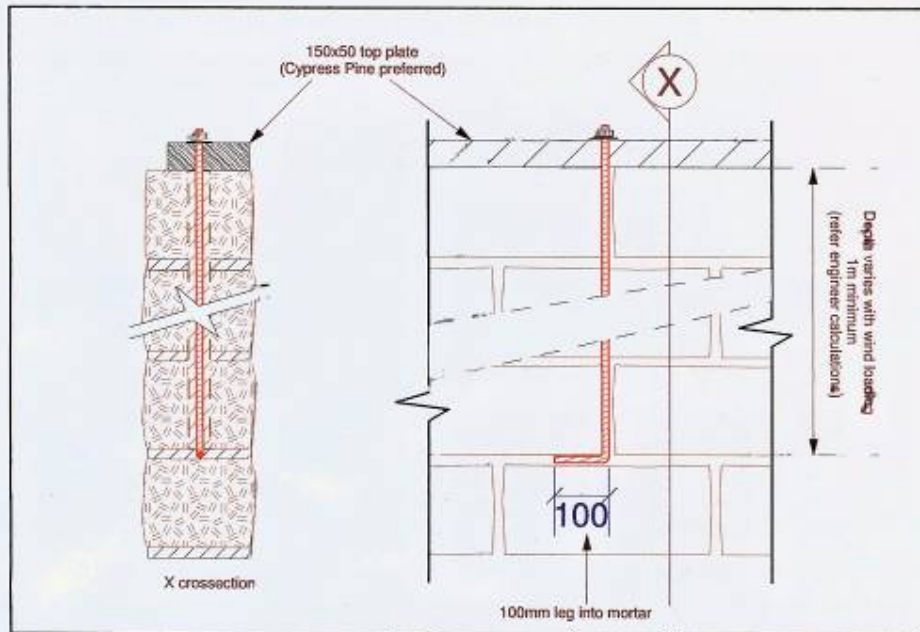
This system can be used in conjunction with single leaf or the brick veneer range.

\* Specialty size bricks can be made to order that will accommodate any type or size step down in the slab. A suggested step down is 100mmx100mm. This size accommodates our 90x90x290mm "Kwik-Brik".



## Top Plate details (Single Leaf)

### TOP PLATE and TIE DOWN RODS



#### GENERAL SPECIFICATIONS

Rods; 12mm threaded "Booker Rod or Hooker Rod"  
Rod spacing: 1245mm maximum

#### SUGGESTED ROD DEPTH

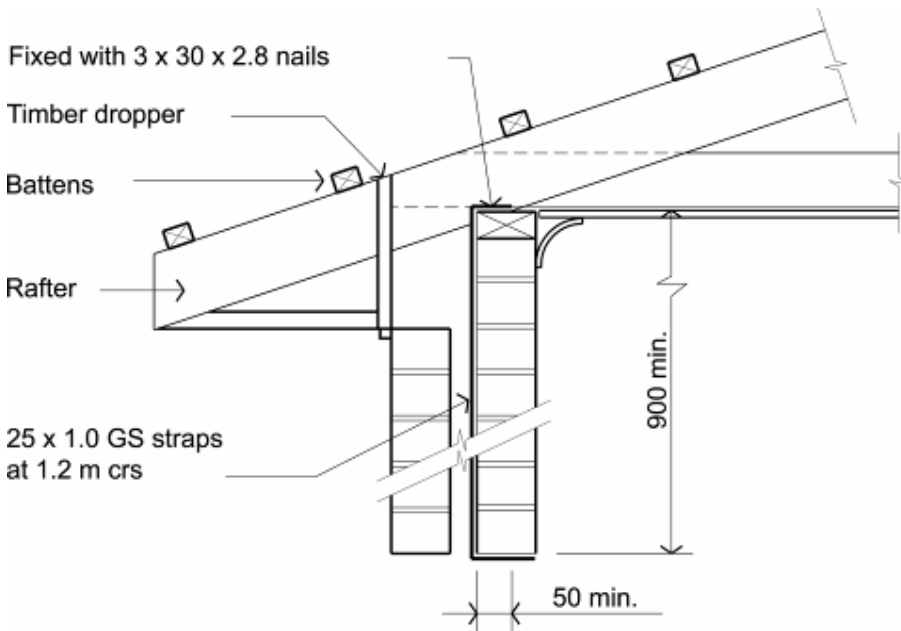
- <40WR = 1080mm depth (6 courses)  
- 40WR to 50WR = 1980mm (11 courses)...direct into slab preferred

CONSULT with your local engineer to specify rod depth & spacings to suit project

#### OPENINGS

Rods are placed hard against 1/2 blocks (200mm) from window or door jamb (both sides of opening)

## Top Plate and Fixing Details (Double Brick Walls)



### **Tie down details for double brick homes.**

(Diagram supplied by ABCB, from BCA Volume 2: section 3.3.3.3)

In addition to the relevant BCA guidelines, we at Timbercrete recommend that when placing the tie down strap in the mortar course, it is screwed to the Timbercrete brick using a 50mm stainless steel decking screw (square head). This recommendation is made because by so doing you will provide a superior anchor point for the strapping, where it is not possible to affix tie down straps to normal clay or concrete brickwork in this fashion.

**Note: For all structural details as to the length or the strap refer to your Structural Engineer**



# Finishing Touches

Timbercrete is constantly searching and researching ways to improve product installation with a view to ensure our customers achieve the best possible outcome.

As a result of this commitment we have made available a product we call: “**Timbercrete Final Filler**”. This is a semi - flexible finishing product that can be colour matched to brick, block or mortar and is a permanent non shrinking water proof filler that has a sandy texture like the mortar or the bricks.

## Uses:

- To finish gaps around doors and windows (use a cake piping gun)
- In control joints to cover “Sikaflex” expansion joints.
- To fill any large gaps or holes in damaged bricks or blocks
- To fill any tiny shrinkage (micro) cracks in the mortar.

To fill “micro cracks” caused by high shrinkage mortar there are two options:

1. For larger cracks simply rub on Final Filler with a sponge and wipe off with a clean wet sponge, as though you were grouting tiles.
2. For “micro cracks” mix 1part “Final Filler” with 1 part “Shalex’s – Sealit” and paint over the problem area. One coat is all that is needed for the very tiny cracks and two coats may be necessary for larger ones.

**Note: Always test first.** Then weight until the product dries to ensure that you are happy with the colour match before proceeding to touch up your wall.



Photo demonstrates the before and after results using Timbercrete Final Filler. All gaps and cracks are totally filled. The colour should be a little lighter to blend perfectly with the mortar. (Test first)



## On Site Timbercrete Audit

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**Now that you have decided to build a Timbercrete home,  
We want to provide you with the QUALITY you deserve!**

### **Good News #1**

Timbercrete is soon to be the FIRST brick or block manufacturer in Australia or NZ that will carry a “CodeMark” Certificate of Conformity, provided by “GlobalMark”.

CodeMark is a third-party scheme for the certification of building products and systems developed by the Australian Building Codes Board (ABCB), in consultation with the NZ Department of Building and Housing (DBH), State & Territory governments, industry groups and prospective certification bodies. CodeMark **Certificate of Conformity** provides reliable evidence that confirms Timbercrete's full compliance with the requirements of the BCA (Building Code of Australia).

### **Good News #2**

A top quality home requires not only top quality products, but also top quality installation. While other brick suppliers sell you their products then may kiss you good bye, we don't.

Providing the Owner or Builder calls Timbercrete when the Bricklayer first arrives on site, we will arrange one free ON SITE AUDIT which is aimed at detecting any deficiencies in installation at the early stages of construction. (A Check List of audited items is contained over the page for your information.) The Audit will be conducted by a qualified, independent Certifier or a Timbercrete representative. Copies of the Audit Check List will be presented to the Owner, the Builder, the Bricklayer and Timbercrete. The Audit is designed to identify and eliminate problems that may occur with any brand of brick and masonry construction.

This independent audit is a FREE service provided by Timbercrete to ensure the greatest possible opportunity for quality wall construction. (Note: The free Audit will report on practices evident at the time of inspection, and alert the parties concerned of any deficiencies detected by the Certifier.

**It should be noted however Timbercrete bears no responsibility for the quality of construction before, during or after the Audit.**

**A Quality PRODUCT + a Quality INSTALLTION + Outstanding  
Customer Service= A Quality HOME**

*“Only Timbercrete goes that Extra Mile!”*

# Timbercrete On-site audit & checklist

Date.....

This audit/checklist is intended to highlight practices that do not conform to the “**Building with Timbercrete manual**”. Any item bearing a “**NO**” X requires immediate and urgent rectification.

**YES / NO**      Tick for YES or X for NO

- The builder has a copy of the Building with Timbercrete Manual (BWTM)
- The bricklayer has a copy of the Building with Timbercrete manual
- All pallets have been un wrapped and spaced to maximise drying
- Blocks being used have passed the “**use after date**” (as per pallet label)
- All the directions on the pallet label are being followed
- The bricklayer has completed a mortar test on the sand (mortar test board sighted)
- Cracks have not appeared in the mortar on the mortar test board
- The sand mix and particle size is as per the “BWTC manual”
- There is no unapproved mortar additive being used, or on the building site
- Krystol Kim mortar additive is being used and the dosage rate is correct
- The bricklayer is batching the mortar into buckets
- The sand / cement / lime blend is correct as per “BWTC manual”
- A full bed of mortar is being applied and all perp ends are full of mortar
- Service block cavities are filled with mortar or concrete grout. (Large hollow core N/A)
- A damp-course barrier is used between the slab & the first course of blocks. (As per BWTM )
- Hoop-Iron strapping is being applied to 2nd or 3rd course of blocks or bricks (as per BWTM)
- Type and size of Hoop-Iron strapping, as well as fixing method is as per BWTM
- Control joints are being placed in the wall as per the BCA & BWTimbercrete manual.

**Note:** a gap (5mm to10mm) must be left between the tops of the Windows/doors and the bottom of the lintels. However this cannot be inspected until later in the construction, but the issue was discussed with the builder or bricklayer.

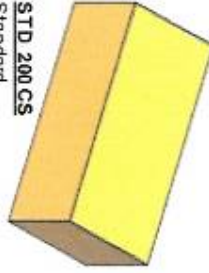
Clients name.....Client's signature.....

Audited by.....

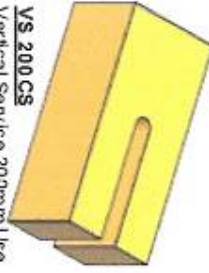
Building site address.....

Extra comments:

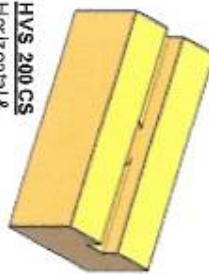
## Cobble Stone Series



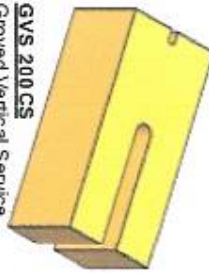
**STD 200 CS**  
Standard  
200mm.  
Quantity:



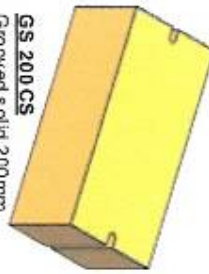
**VS 200 CS**  
Vertical Service 200mm. Use  
every 2nd course only where  
the down rods, EL cables etc.  
are used. Quantity:



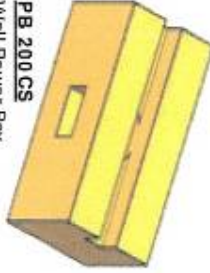
**HVS 200 CS**  
Horizontal &  
Vertical Service  
200mm. Quantity:



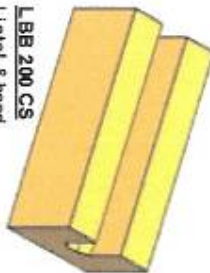
**GVS 200 CS**  
Grooved Vertical Service  
200mm. Grooved  
window & door block  
with service. Quantity:



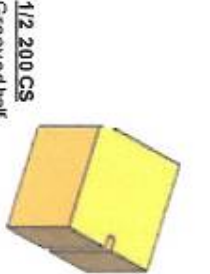
**GS 200 CS**  
Grooved solid 200mm.  
The groove houses the  
fin for windows &  
weather strips for  
doors. Quantity:



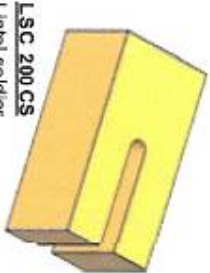
**PB 200 CS**  
Wall Power Box  
200mm.  
Quantity:



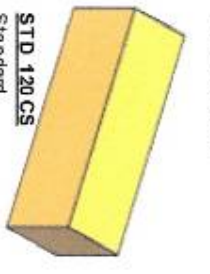
**LBB 200 CS**  
Lintel & bond  
beam block  
200mm. Quantity:



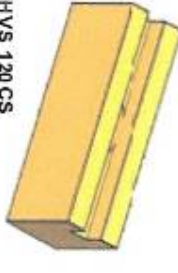
**1/2 200 CS**  
Grooved half  
200mm.  
Quantity:



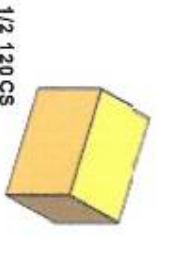
**LSC 200 CS**  
Lintel soldier  
course 200mm.  
Quantity:



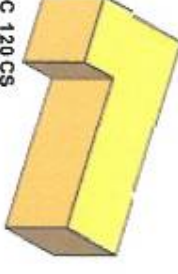
**STD 120 CS**  
Standard  
120mm.  
Quantity:



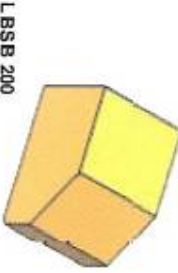
**HVS 120 CS**  
Horizontal &  
vertical service  
120mm. Quantity:



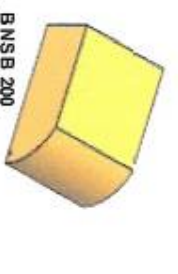
**1/2 120 CS**  
Standard half  
120mm.  
Quantity:



**C 120 CS**  
Corner block  
120mm. Quantity:

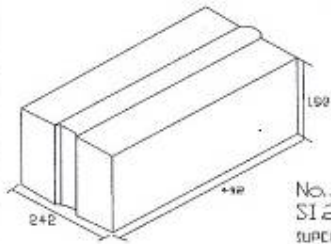


**LBSB 200**  
Large bevelled sill  
block 170h/200w/  
250l. Quantity:

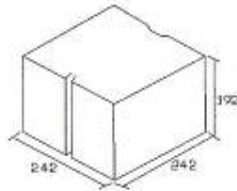


**BNSB 200**  
Bull nose sill  
block 110h/200w/  
250l. Quantity:

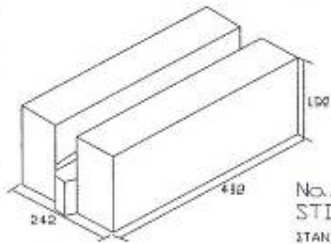
# SMOOTH FACE SANDSTONE



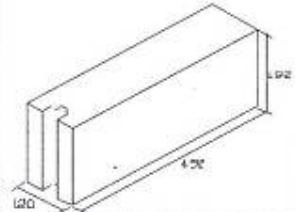
No. ....  
SI.250.SF.  
SUPER INSULATING



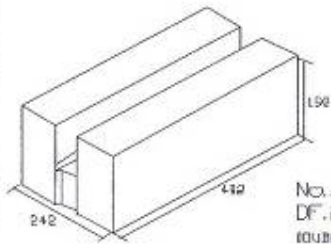
No. ....  
1.250.SF  
HALF RIB SMOOTH FACE



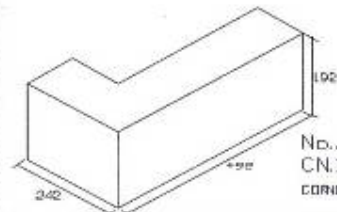
No. ....  
STI.250HC.SF.  
STANDARD HOLLOW CORE



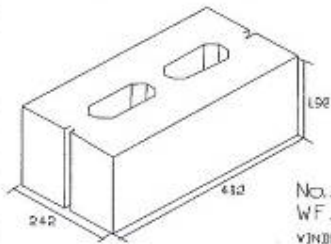
No. ....  
STD.120.SF  
STANDARD 120 SAND FACE



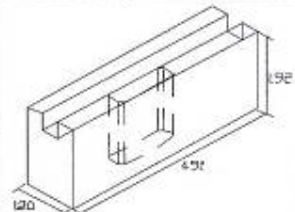
No. ....  
DF.250.HC.SF  
DOUBLE FEMALE HOLLOW CORE



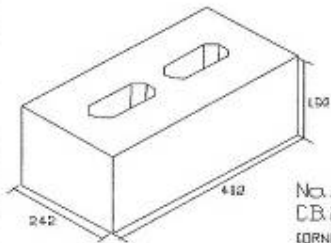
No. ....  
CN.120.SF  
CORNER 120 SMOOTH FACE



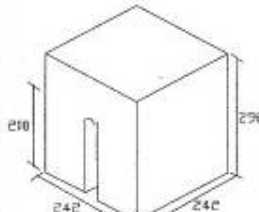
No. ....  
WF.250.HC.SF  
WINDOW FIN HOLLOW CORE



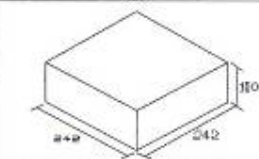
No. ....  
H.V.S.120SF  
HORIZONTAL/VERTICAL SERVICE



No. ....  
CB.250.HC.SF  
CORNER BLOCK HOLLOW CORE



No. ....  
LSCB  
LEVEL SOLDIER  
COURSE BLOCK



No. ....  
LOPB  
LEVEL AND DOOR  
PACKER BLOCK

ADD MORTAR JOINT OF 8MM  
BLOCK INCREMENTS - 300X250X200

# NOTES

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Thank you for choosing Timbercrete.

We are dedicated to providing you with outstanding support and service.