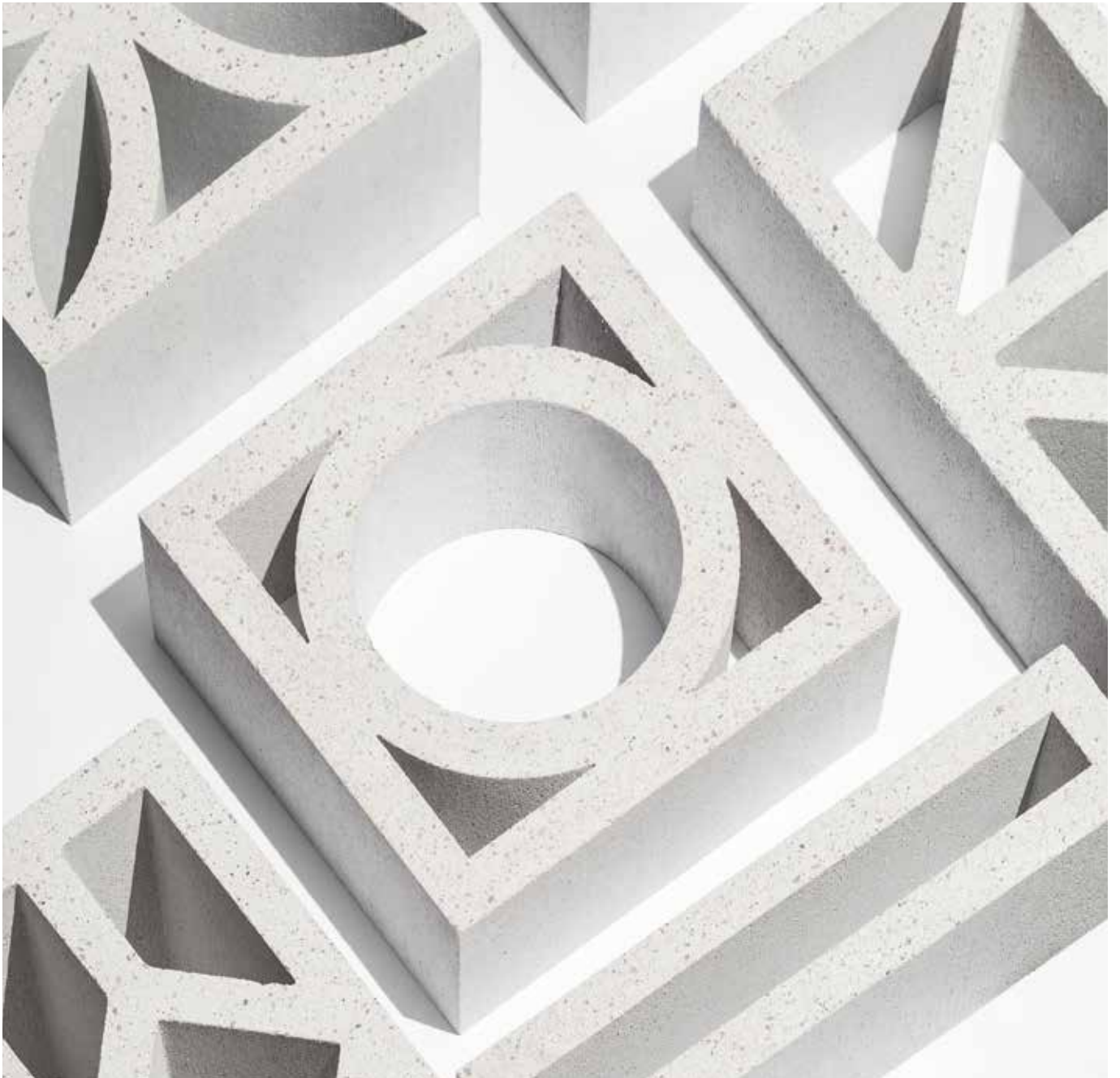


# BREEZE BLOCK MASONRY

*design guide*







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# INTRODUCTION



# INTRODUCTION

## *Breeze Block*

*Contemporary colours and effortless style created in concrete. The GB Masonry Breeze Block range has been designed to complement leading designs.*

*The range is currently available in seven designs which have already drawn an enthusiastic response from our customers looking for a distinctive walling option that offers a unique aesthetic and ventilation.*

## *The Story*

*The GB Masonry collection has been a symbol of quality in the masonry industry since 1978.*

*After many years producing standard grey masonry blocks, the business's founders came up with the idea to develop a concrete block resembling natural sandstone.*

*With the idea in place the innovative team at GB Masonry brought the idea of sandstone styled concrete masonry to life and never looked back. GB Masonry quickly carved out a niche in the market by specialising in sandstone style concrete blocks with distinctive veins of colour in the block used to create an authentic sandstone appearance.*

*With the launch of the sandstone range GB Masonry developed a strong reputation for quality, style, and unmatched attention to detail which became the hallmarks of its brand.*

*Today the products made at the plant have expanded, but those same hallmarks remain with a strong focus on quality achieved by carefully sourcing the finest sands and aggregates and combining them in the Gympie plant's unique oxide and sand mixing process to create blocks that are unequalled in the market.*

## *The Difference*

### ***The best quality sands and aggregate***

*GB Masonry source only the brightest white sands and mix these with quality aggregate to create blocks with striking colours and finishes.*

### ***Unique and consistent oxide mixing***

*Quality oxides create vibrant colours that remain strong for the life of the product. Once the finest oxides are sourced these are blended using customised mixing machinery developed on site.*

### ***Distinctive finishes***








*While many of our finishes are now created using state of the art technology, GB Masonry still carries on the master block makers craft by hand chiselling our unique rock face blocks for a truly authentic finish.*

### ***Extensive expertise***

*Quality products result from the knowledge and expertise of experienced people. Our team have established years of solid experience and attention to detail, resulting in a concrete masonry block that is unrivalled in the building industry*

# INTRODUCTION

## *Breeze Block Specifications*

	<i>Flower</i>	<i>Cloud</i>	<i>Diamond</i>	<i>Wedge</i>	<i>Arc</i>	<i>Circle</i>	<i>Linear</i>
<b>Size (LxWxH)</b>	290x90x290	390x90x190	390x140x190	390x140x190	390x180x190	290x90x290	390x95x90
							
<b>Colours</b>	Porcelain Nickel Pewter	Porcelain Nickel Pewter	Porcelain Nickel Pewter	Porcelain Nickel Pewter	Porcelain Nickel Pewter	Porcelain Nickel Pewter	Porcelain Nickel Pewter
<b>Core Percentage</b>	36%	38%	45%	45%	38%	43%	33%
<b>Dimensional Category</b>	DW2	DW2	DW2	DW2	DW2	DW2	DW2
<b>Weight</b>	9.4kg	8.3kg	12.5kg	12kg	14.5kg	9.2kg	4.7kg
<b>F<sub>uc</sub></b>	5 MPa	3 MPa	4 MPa	7 MPa	6 MPa	3 MPa	3 MPa
<b>IRA</b>	1.9	1.9	1.9	1.9	1.9	1.9	1.9
<b>CWA</b>	< 7%	< 7%	< 7%	< 7%	< 7%	< 7%	< 7%
<b>Durability Class</b>	GP	GP	GP	GP	GP	GP	GP
<b>No. Per Pallet</b>	120	120	90	90	75	120	300

**Note:**

Dimensional category as per AS4455.1 and 4456.3

Durability class: GP = General purpose



# DESIGN CONSIDERATIONS



# DESIGN CONSIDERATIONS

## *Breeze Block | Stack Bond*

### **Stack Bonded Masonry**

*Stack bond is bold use of masonry with a strong visual impact expressed through the verticality of this laying method. Stack bond is ideal in a non-structural capacity where it may be used as an interior veneer or as a landscape wall. Various masonry sizes and textures may be used to create different visual effects.*

The load bearing capacity of stack bond walls is reduced significantly in comparison to stretcher bond due to the vertical alignment of mortar joints and consequent lack of block-to-mortar bond strength. The most likely location of cracking is in the vertical mortar joint. As such consideration should be made towards the use of an added structure or tie-backs to increase the load bearing capacity of stack bond walls.

Unlike stretcher bonded masonry, unreinforced stack bonded masonry has a comparatively low horizontal bending strength, and is deemed to have zero horizontal bending capacity when calculated in accordance with section 7.4.3 'Design for Horizontal Bending' of AS 3700 (2018).

This is because the stack bonded pattern provides no unit overlap, meaning the perpend spacing factor (according to section 7.4.3.4) is set to zero.

However, testing showed that although the horizontal bending capacity of a stack bonded wall is less than a stretcher bonded wall, it does provide some degree of bending resistance. This is because its horizontal bending capacity is similar to its vertical bending capacity (according to section 7.4.2) where in both cases; the failure mode runs along the perpend and bedding joints respectively.

The 2018 version of AS 3700 provides detailing requirements and a structural design methodology that accounts for the true structural strength of stack bonded masonry walls.

### **Detailing Requirements**

The following detailing approaches are highly effective at improving the horizontal bending strength of stack bonded masonry and this is included in section 4.12 'Stack Bonded Masonry' of AS 3700 (2018).

*Anchored bed joint reinforcing with an area not less than  $0.00035 \times$  gross vertical cross sectional area of the wall and complying with sections 5.9.3, 5.9.5 and section 11.8 of AS 3700 should be inserted at the following locations:*

- *the first bed joint above or below an unrestrained horizontal edge of the masonry*
- *at least one bed joint within 300 mm above and below any horizontal lines of lateral support*
- *the reinforcing should be vertically spaced at centres not exceeding six times the thickness of the stack bonded leaf*

*Please note that for the purposes of a stack-bonded wall, these detailing requirements shall take precedence over the reinforcement requirements (for bending) set by sections 8.6 (a) and 8.6 (b).*

### **Design Requirements**

Stack bonded members should be designed as:

- *The design requirements under AS 3700 (2018) Clause 4.12 shall take precedence over the requirements of Clause 8.6, Item (a) and (b).*
- *Unreinforced masonry for compression, shear and vertical bending, complying with sections 7.3, 7.5 and 7.4.2 accordingly.*
- *Reinforced masonry for horizontal and two-way bending in accordance with section 8.6, provided that the detailing requirements elaborated within this manual have been adhered to.*



# DESIGN CONSIDERATIONS

## Breeze Block

### Excerpt from AS3700

#### 4.12.1 Solid masonry

Solid masonry laid in a stack bond pattern, including masonry in veneer walls, shall be reinforced using anchored bed joint reinforcement, of area not less than  $0.00035 \times$  gross vertical cross-sectional area of the wall. The reinforcement shall comply with Clauses 5.9.3 and 1.8, shall be continuous between lateral supports and shall be spaced vertically at centres not exceeding six times the thickness of the stack bonded leaf.

Bed joints in the following locations shall be reinforced, see Figure 4.1:

- (a) In the first bed joint above or below an unrestrained horizontal edge of the masonry.
- (b) With at least one bed joint within 300 mm above a horizontal line of lateral support.
- (c) With at least one bed joint within 300 mm below a horizontal line of lateral support. Such masonry shall be designed as follows:
  - (i) As unreinforced for compression in accordance with Clause 7.3.
  - (ii) As unreinforced for shear in accordance with Clause 7.5.
  - (iii) As unreinforced for vertical bending in accordance with Clause 7.4.2.
  - (iv) As reinforced for one way horizontal bending in accordance with Clause 8.6, except that the requirements of this Clause 4.12 shall take precedence over the requirements of Clause 8.6, Items (a) and (b).

#### 4.12.2 Hollow unit masonry

Hollow unit masonry laid in a stack bond pattern shall be reinforced or prestressed and designed for the actions it is required to resist in accordance with Section 8 or Section 9.

#### 4.13 Arches and lintels

Unreinforced masonry over openings shall be supported by arches, lintels or frames. Lintels shall comply with the following:

- (a) End bearings of lintels on each side of an opening shall be not less than 100 mm in length for openings up to 1000mm wide and 150mm for wider openings.
- (b) Maximum deflection under serviceability loads shall not exceed  $\text{span}/360$  or 10mm, whichever is the lesser.

Arches shall have sufficient rise to carry the loads and shall be provided with buttresses capable of taking the horizontal thrust from the arch.

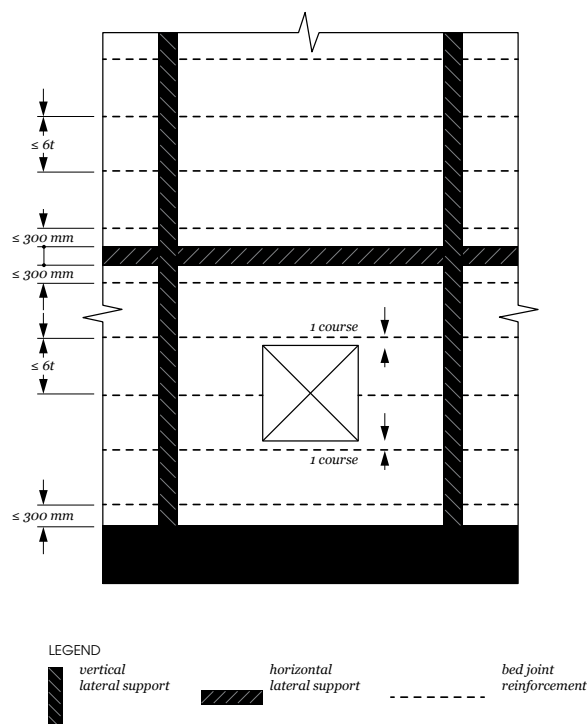
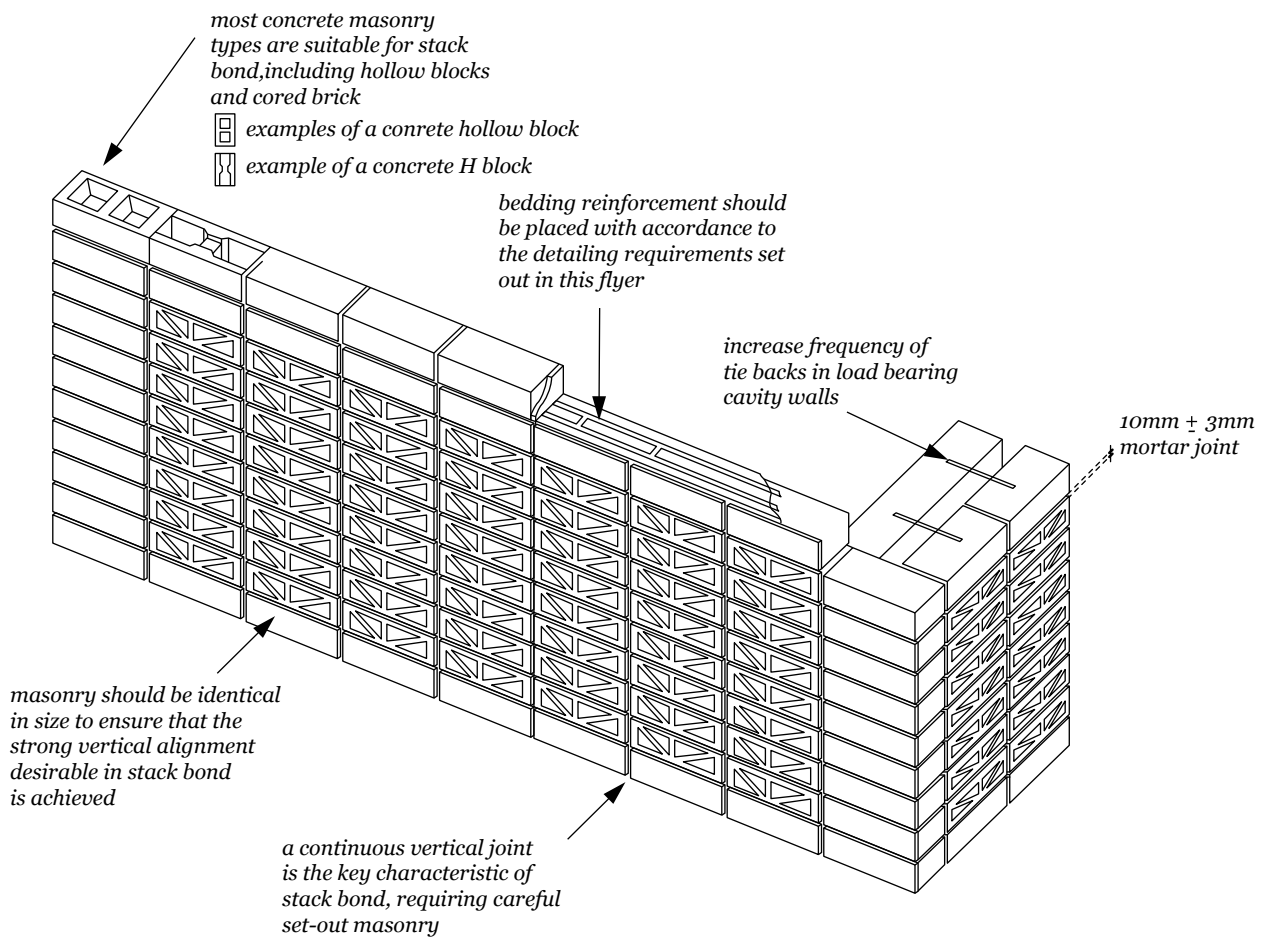


Figure 4.1  
Reinforcement placement for stack bonded masonry

# DESIGN CONSIDERATIONS

## *Breeze Block*

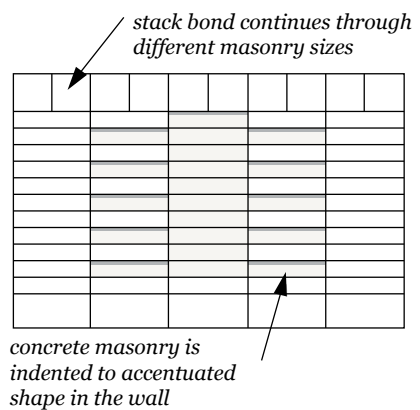
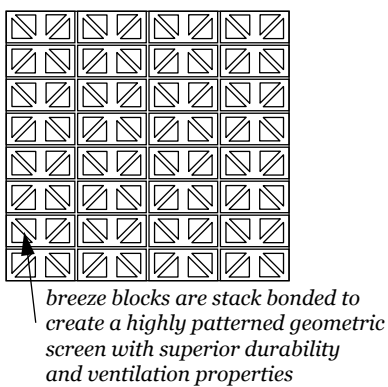
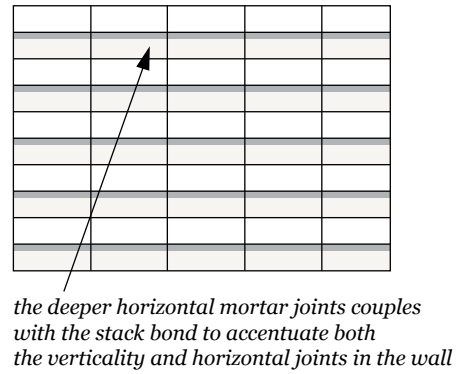
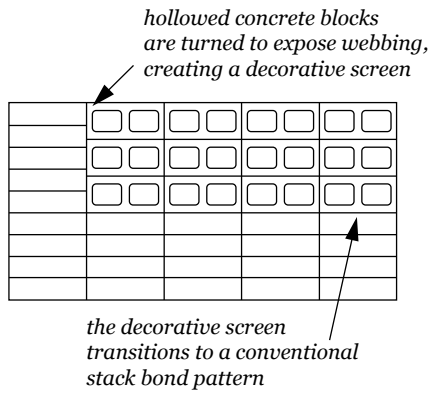
### **Guideline Basics**



# DESIGN CONSIDERATIONS

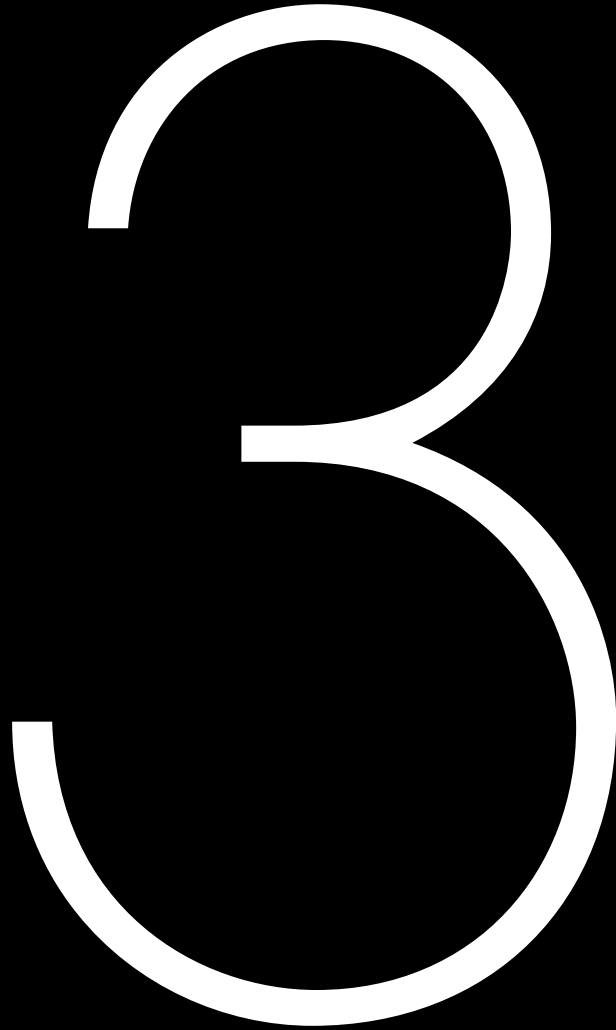
## *Breeze Block*

### **Stackbonding Patterns**





WALL TIES  
AND RESTRAINING FIXINGS



# WALL TIES AND RESTRAINING FIXINGS

## *Breeze Block*

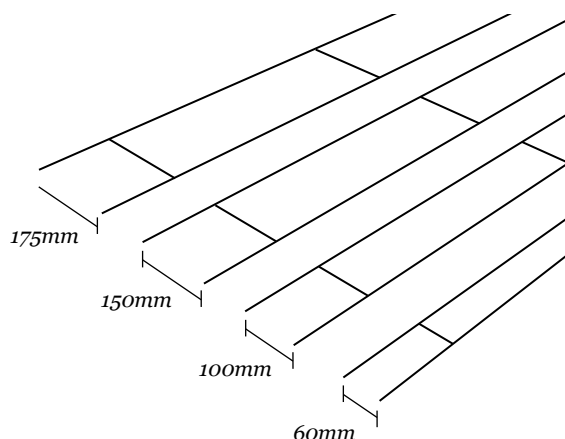
Ladder style bed joint reinforcement like Ancon AMR can be used to improve the structural performance of masonry walls by providing additional resistance to lateral loads e.g. wind. They can also be used to reduce the risk of cracking either at stress concentrations around openings or as a result of movement. Available in various standard configurations, the Ancon AMR suits a wide range of structural load conditions and wall widths. The longitudinal wires have a minimum characteristic yield strength of 500MPa.

### **Widths**

Available in four standard widths (60, 100, 150, 175mm), the Ancon AMR can be used in wall widths from 100mm to 215mm.

### **Applications & Product Width**

<b>Brick/Block Thickness</b>	<b>AMR Width</b>
100mm-125mm	60mm
140mm-150mm	100mm
190mm-200mm	150mm
215mm	175mm



### **Wire Diameters**

The Ancon AMR is manufactured from five wire sizes which, after flattening, have an equivalent wire diameter of 3.0, 3.5, 4.0, 4.5, and 5.0mm. This range suits the majority of load conditions.

### **Materials**

Ancon AMR is available in Austenitic stainless steel (ref. S) and galvanised steel (ref. G). Stainless steel provides the greatest corrosion resistance and life-cycle costing benefits, and is suitable for use in any application. Galvanised steel is not suitable for use in the external leaf of a cavity wall.

### **Depth**

The main longitudinal wires are flattened to less than 3mm. These wires are joined by cross wires welded in the same plane at 450mm centres. This profile ensures good mortar cover is maintained, even when the product is lapped or used with wall ties.

### **Length**

Ancon AMR is manufactured in standard lengths of 2700mm.

### **Product Identification**

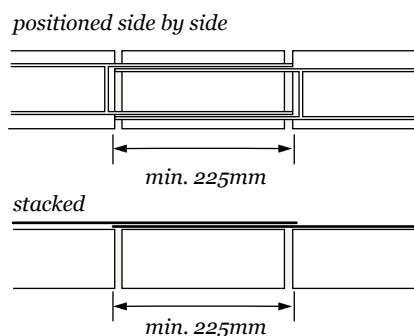
Each length of AMR is marked with a product reference.

### **Corners**

Prefabricated corner units can be manufactured to provide true continuity of reinforcement. Alternatively, Ancon AMR can be cut and bent on site.

### **Laps and Positioning**

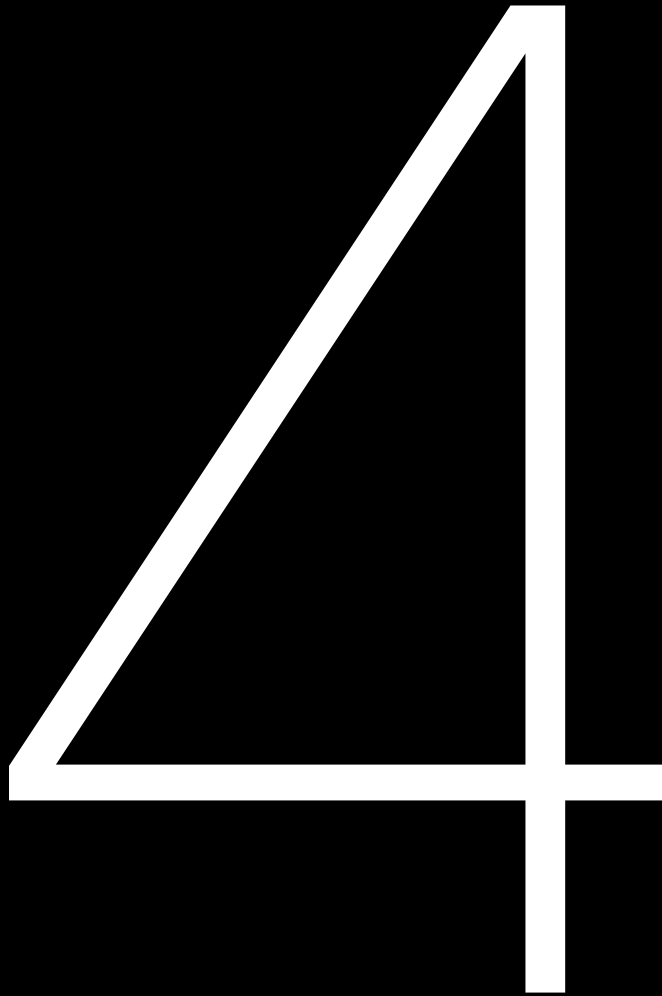
Laps should be a minimum of 225mm in length and can be achieved by either stacking the product or positioning lengths side by side. The position of laps should be staggered throughout the masonry panel.



overall thickness when lapped is less than 6mm



# DESIGN CHARTS



# DESIGN CHARTS

## Breeze Block

*It is a requirement that all masonry walls in Australia need to be designed to withstand a minimum applied load specified in AS3700 Clause 4.6, this load forms the basis of our design charts.*

*For further information please refer to CMAA MA55 document.*

*Please check with your consulting engineer for final design to meet site and load conditions for your project. These charts are a guide only.*

### 90mm Series

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**10-908 Flower Breeze**  
Size: 90W x 290H x 290L



**10-906 Circle Breeze**  
Size: 140W x 190H x 390L



**10-938 Cloud Breeze**  
Size: 90W x 190H x 390L



**10-960 Linear Breeze**  
Size: 140W x 190H x 390L

### 140mm Series

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**15-936 Diamond Breeze**  
Size: 390W x 140H x 190L



**15-937 Wedge Breeze**  
Size: 390W x 140H x 190L

### 190mm Series

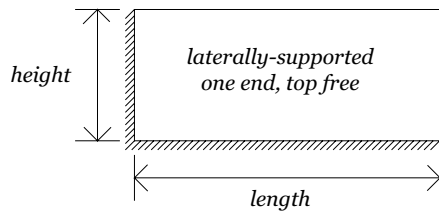
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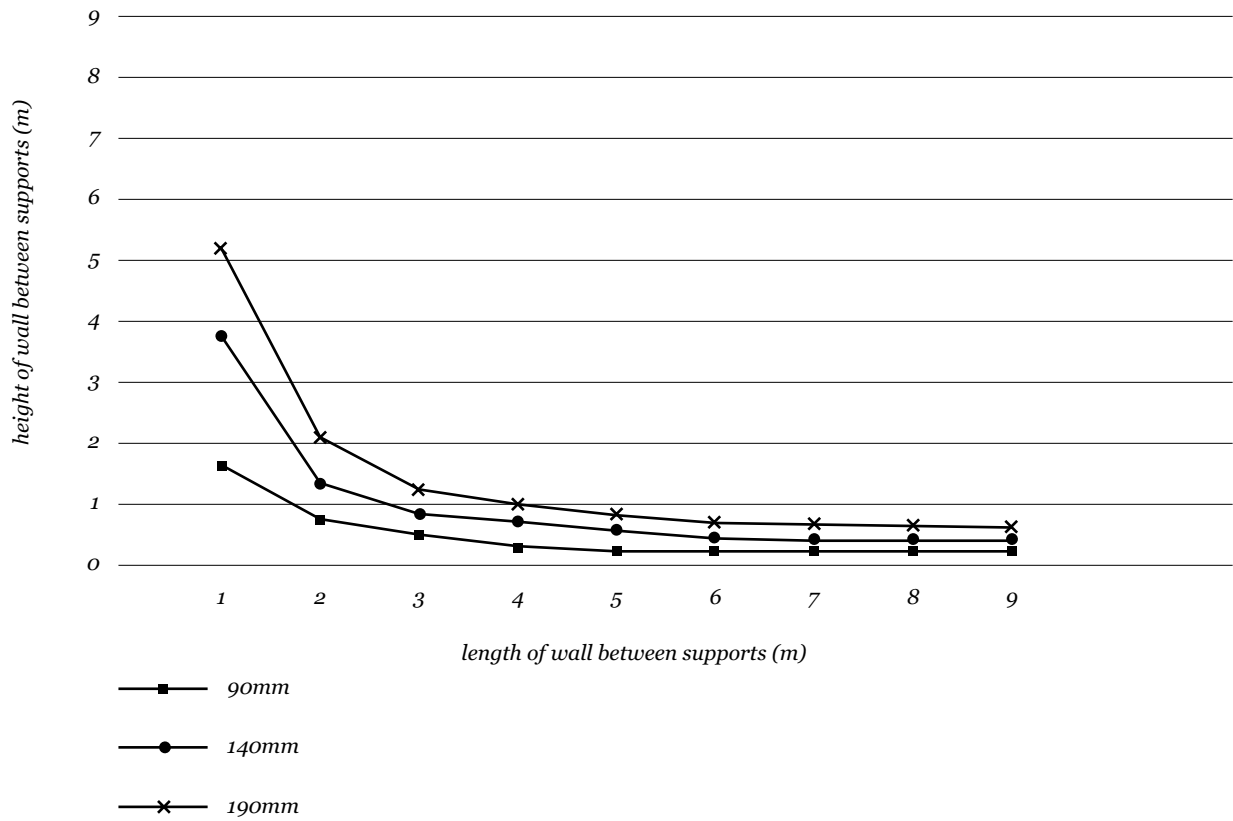
**20-414 Arc Breeze**  
Size: 390W x 180H x 190L

# DESIGN CHARTS

## *Breeze Block*



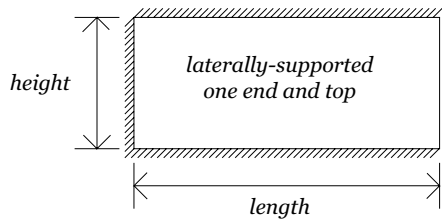
design pressure,  $w_d$  (0.5kPa)



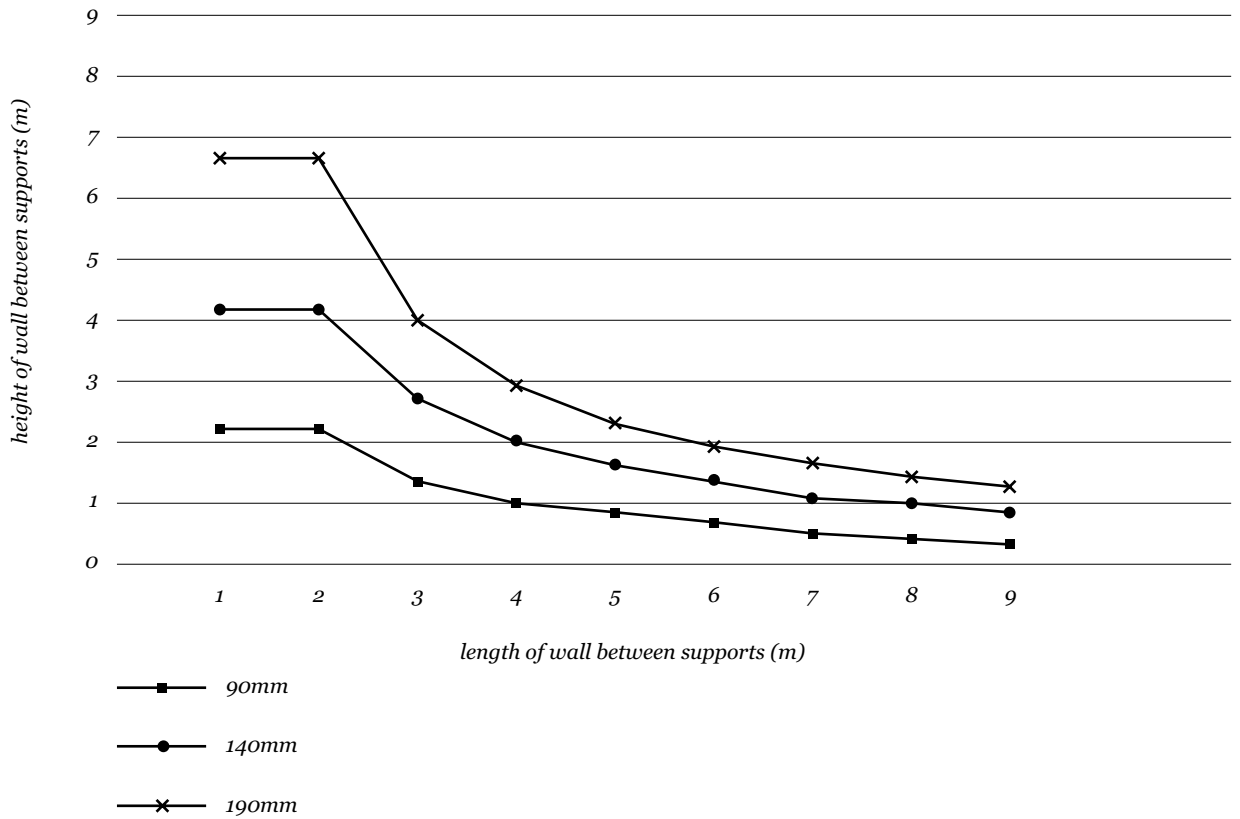


# DESIGN CHARTS

## *Breeze Block*

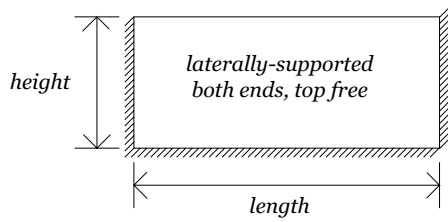


design pressure,  $w_d$  (0.5kPa)

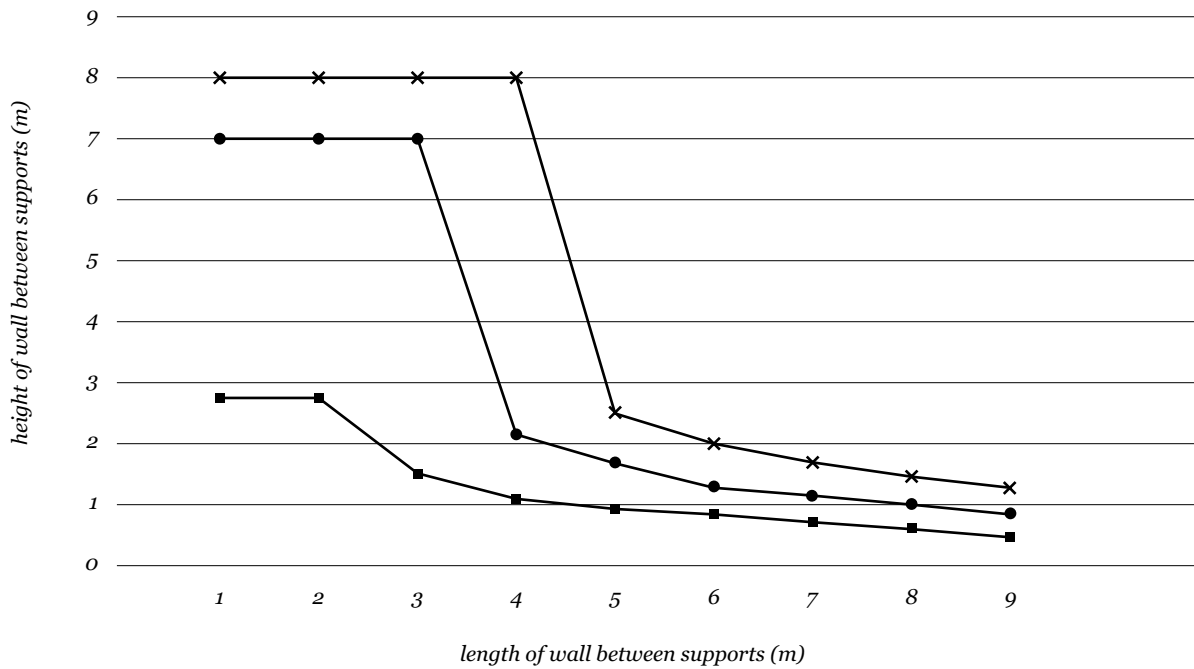


# DESIGN CHARTS

## *Breeze Block*



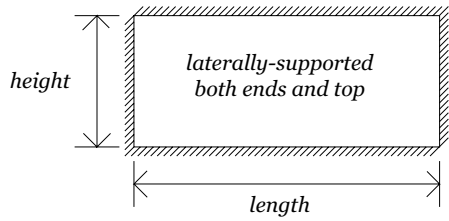
design pressure,  $w_d$  (0.5kPa)



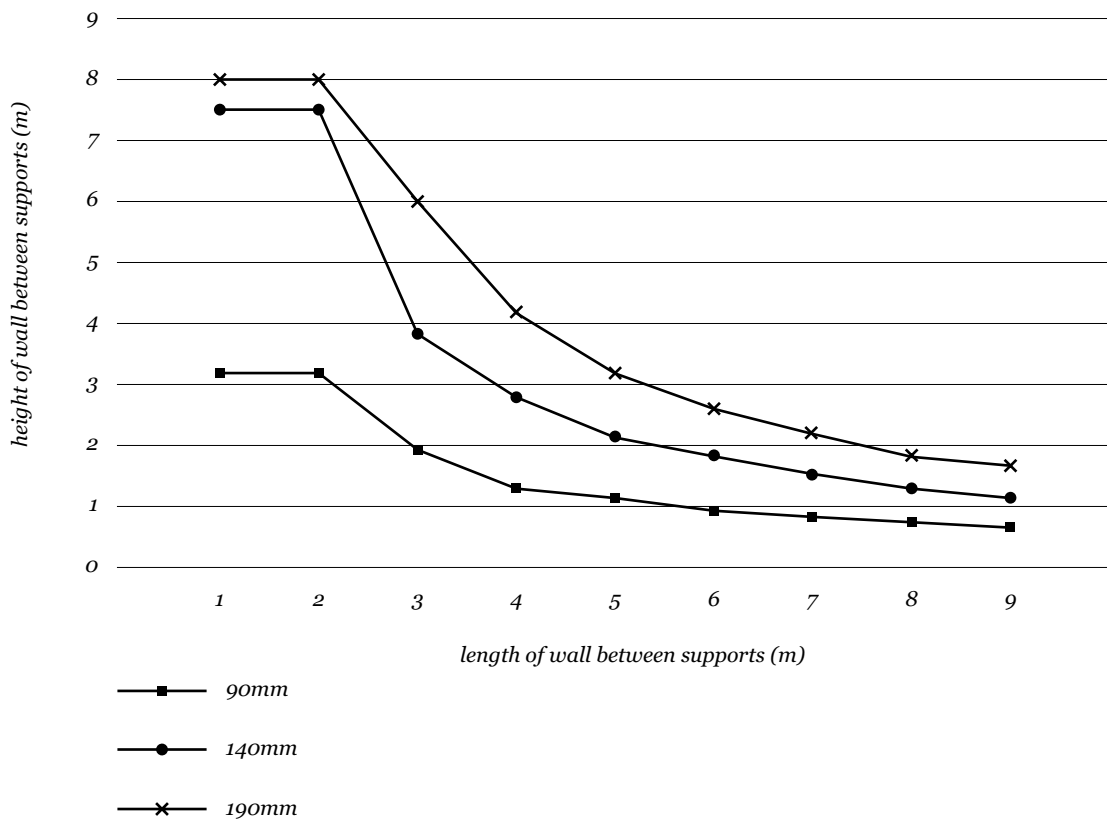
- 90mm
- 140mm
- × 190mm

# DESIGN CHARTS

## Breeze Block



design pressure,  $w_d$  (0.5kPa)









*masonry style inspired by design*

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