





# Design Guide

## MASONRY BLOCKS AND BRICKS

### About National Masonry®

National Masonry® has quickly established itself as the industry leader with exceptional product quality and outstanding customer service with a clear vision of customers for life. We are obsessed with ensuring every customer has a memorable experience with us and to leave you with no doubt that you have made the right choice.

**National Masonry®, the new benchmark in masonry.**

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Product Disclaimer: Concrete Blocks, Bricks, Pavers and Retaining Wall products supplied by National Masonry® are manufactured using raw materials that inherently vary in nature. Whilst all effort is made to produce uniformity in our range of products, variation in colour, texture, and finish can be present. The dimensional characteristics of all products are nominal and variations in length, height, and width can occur from unit to unit which needs to be taken into consideration when installing these products.

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## Fast Finder

For PDFs, simply click the button below to go directly to that section.



### National Masonry® Construction Solutions

National Masonry® offers a comprehensive range of proven products and systems including Masonry Blocks, Masonry Bricks, Fire and Acoustic Wall Systems, Segmental Block Retaining Walls and Paving Products.

#### What's in this Guide

The National Masonry® Blocks and Bricks guide, (this book), details a comprehensive selection of decorative, structural, fire and acoustic walling solutions not available with other materials. This guide has been prepared as a comprehensive National Masonry® Product Reference Guide. It does not attempt to cover all the requirements of the Codes and Standards which apply to masonry construction. All structural detailing should be checked and approved by a structural engineer before construction. National Masonry® reserves the right to change the contents of this guide without notice. Please note that this guide is based on products available at the time of publication from National Masonry® Victoria sales region. Different products and specifications may apply to National Masonry® products sourced from other regions.

### Additional Assistance and Information

- **Contact Details:** Please refer to the outside back cover of this publication for National Masonry® contact details.
- **Colour and Texture Variation:** The supply of raw materials can vary over time. In addition, variation can occur between product types and production batches. Also please recognise that the printed colours in this brochure are only a guide. Please, always ask to see a sample of your colour/texture choice before specifying or ordering.
- **Terms and Conditions of Sale:** For a full set of Terms and Conditions of Sale please contact your nearest National Masonry® sales office.

For technical support and sales office details please refer to the outside back cover.

### National Masonry® Feature Face Masonry



#### Overview

For External and Internal Walls

#### Designer Range

7 Contemporary Colours.

4 Innovative Textures — Smooth, Honed, Polished or Split Face

Suitable for loadbearing and non-loadbearing walls.

#### Standard Grey Block

Hollow Concrete Block suitable for loadbearing and non-loadbearing applications.

#### Core-Fill Block

Grey Concrete Block or Designer Range coloured and textured finishes for reinforced retaining walls and loadbearing walls requiring increased robustness.

### National Masonry® Bricks



#### Render Bricks

Standard Brick: Concrete-Basalt material for 90 minute fire rating.  
Quick Brick: Low density non load bearing, high fire rated.

#### Designer Range Smooth Face Bricks

Smooth face coloured bricks for decorative appearance.

#### Aspect Range Polished/Honed Bricks

For innovative, stylish and distinctive work.



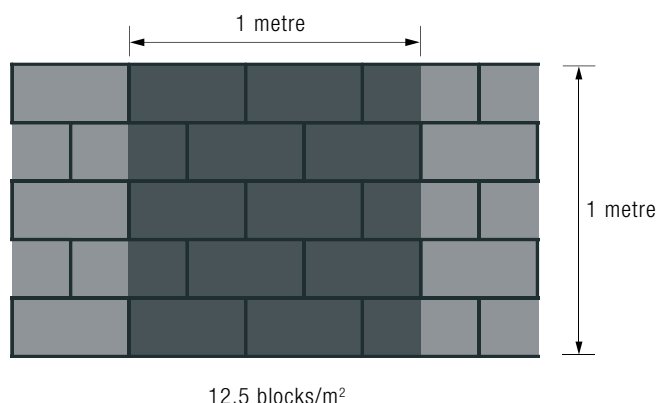
# Planning and Design

**MASONRY BLOCKS AND BRICKS**

## Face Blockwork Design Considerations

### Sizes

Blocks have a face dimension (nominal) of 400mm long x 200mm high. Because an allowance is made for 10mm wide mortar joints, the actual face size of the block is 390mm x 190mm. There are 12.5 blocks per m<sup>2</sup>.



**Fig B1 — Typical Block Dimensions**

Most blocks are available in five thicknesses of 90mm (Series 100), 110mm (Series 120), 140mm (Series 150), 190mm (Series 200) and 290mm (Series 300).

National Masonry® Victoria offers many 'fractional' sized blocks to reduce the need for on-site cutting. However to maintain better colour consistency with coloured blocks, part size blocks for these applications are best prepared on-site by cutting or splitting from full size blocks.

Other block types such as lintel blocks, capping pieces, corner returns are made in various product ranges.

National Masonry® Victoria also manufactures a range of Concrete Bricks. The Bricks are either 76mm or 162mm high to match two standard size brick courses, with mortar. They are generally used to construct one leaf of a wall, while the other is constructed with standard size bricks. National Masonry® concrete Render Bricks are also made in 230mm lengths to match standard block modules. Refer to technical information later in this section.

Core-Fill Blocks for reinforced wall construction are made in thicknesses of 140mm (Series 150), 190mm (Series 200) and 290mm (Series 300).

Before specifying your choice, please contact your local National Masonry® sales office to confirm availability in your region.

## Material and Dimensional Variation

Concrete Blocks are formed in steel moulds using relatively stable materials enabling the size of individual units to be controlled to within small tolerances. The code for concrete masonry units, AS/NZS4455.1, permits a general tolerance of  $\pm 3\text{mm}$  on the overall dimension of each unit.

## Modular Planning

The concrete block was one of the first building components to be designed with modular construction in mind. Originally it was based on a 4 inch module (as it remains in the USA) but when the metric system was adopted in Australia during the 1970's, this was changed to a 100mm module.

### Module Selection

For greatest ease and efficiency when constructing with masonry blockwork, it is recommended to plan a building using a 200mm module, as a significant reduction in the number of 'special' or cut blocks can be achieved.

Providing the design of a building is based on this module, cutting of blocks can generally be avoided. Coloured face blocks are generally made in only full length units (390mm) with part sizes (halves, etc) being cut on-site when required (or factory cut to order) from the full length units, to maintain colour consistency.

**Note** All saw grindings must be washed off the cut blocks as they are cementitious. They are invisible while wet, but if allowed to dry, they appear as a pastel colour and are difficult to move.

Most building materials work to a 600mm module. Blocks can also work to a 300mm

module by using part sizes, which include half height blocks, (e.g. A skirting course of half high blocks and 5 courses of full blocks = 2100mm to suit typical door head height).

Nominal widths of doors and windows are also based on this module, e.g. 900mm wide single door; and 1200mm, 1800mm or 2400mm windows and doors.

The preferred way of dimensioning drawings is to show the 'Nominal Sizes' on openings. However, because the blocks are made 10mm shorter than the nominal (or modular) size, the actual openings will be different. Openings include one more mortar joint than units. For this reason, window and door frames are manufactured to suit openings which are 10mm wider than the module, e.g. 910mm 1210mm, 1810mm, 2410mm.

Note also that the length of piers and walls is 10mm less than the modules, i.e. 890, 1790 etc., due to the omission of the last vertical joint at the end of the pier/wall.

## Face Blockwork Design Considerations

The following items should be considered carefully during the design stage to maximise the long-term beauty and to minimise the need for maintenance of face masonry.

### Setout of Face Blockwork

When designing with split face blocks, special consideration should be given to the distances between openings and between corners and openings to facilitate the bolstering of block ends where required. Refer to additional information on Corner Details in the Designer Range section of this guide.

### Colour and Texture Selection

The colour and texture of the unit should take into account the location of the masonry and the building. Dark coloured units can mask unsightly staining from dirt and pollution. On the other hand, darker units can accentuate the presence of any efflorescence or calcium carbonate caused by poor construction detailing, materials or cleaning.

### Mortar Selection

Less staining and more aesthetically pleasing walls are achieved by ensuring the mortar colour is similar to the masonry unit. The colour of mortar is determined by the colour of the cement and sand used, and by the use or not of different iron oxides. For colours other than greys, off-white cement and clean sand will assist colour matching.

Construction of sample walls is recommended to determine the appropriate mortar colour. Staining on light coloured units can be reduced by the use of off-white cements.

### Copings, Sills, Parapets

Sills should shed stormwater from the masonry by projecting at least 30mm beyond the wall face. Copings or parapets should also shed water by having a 'fall' towards the unexposed (inner) face. Copings and parapets should be covered with a metal capping to prevent any water from penetrating the wall.

### In-built Elements

Where there are in-built elements (e.g. signage support frames etc.) they should slope away from the masonry. The soffit of major elements, such as balconies, should be provided with a drip mould.

### Protecting Face Masonry

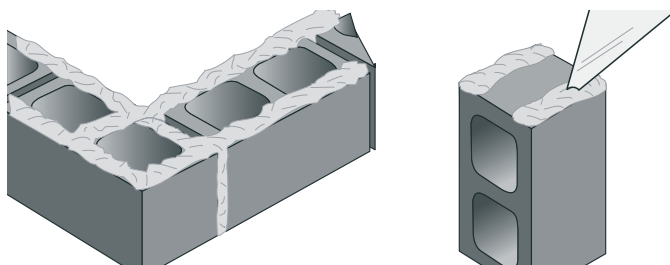
The additive used in the manufacture of Designer Range and its mortar is designed to reduce water absorption, reduce mould growth and lower the risk of staining.

Designer Range can be sealed with a quality penetrating sealer following installation, to manufacturer guidelines.

## Blockwork Mortar Joints

**IMPORTANT:** Because acid cannot be used to dissolve mortar without affecting the masonry units' appearance, mortar smears should be cleaned off face blockwork before it sets hard onto the face.

Hollow blocks are normally laid with face shell bedding, i.e. there are two strips of mortar which are laid over the face shells with no mortar being laid on the web (except at corner construction). These two strips of mortar are continued up the vertical (or perpend) joints. Refer to Fig B2.



**Fig B2 — Applying Mortar**

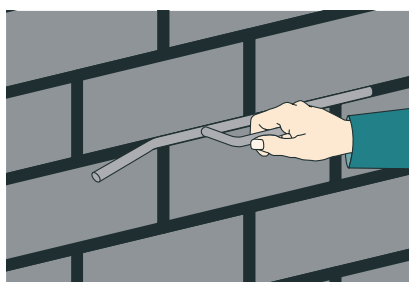
## Joint Finishing

AS3700, Clause 4.9.2 requires mortar joints in 'exposure environments' to be ironed.

### Ironed Joint

The preferred finish for mortar joints in face blockwork is an ironed finish which provides the following benefits:

- The ironing tool compresses the mortar at the face of the masonry, making it denser and more durable; and
- The mortar is pushed against the top and bottom faces of the blocks, improving the bond between the mortar and block.
- The finish is obtained by ironing the joints with an ironing tool when the mortar is firm to touch (about 20 to 30 minutes after laying) and then lightly scraping off the surplus mortar with a trowel, or by lightly brushing. Refer to Fig B3.
- The ironing tool should be made of 12mm diameter round rod and be more than 400mm long to ensure that a straight joint is produced.



**Side**

**Fig B3 — Ironed Joint**

### Flush Joint

Where a plaster or textured coating is to be applied to the blockwork, a flush joint may be used. Rub surface with a piece of block when the mortar is firm to provide a flat surface for the coating.



**Fig B4— Flush Joint (side)**

### Raked Joint

Although the raked joint is sometimes used in face brickwork for aesthetic reasons, it should NOT be used with hollow blocks which are not to be rendered. This is to avoid:

- Reducing the face shell mortar width; and
- Adversely affecting the weatherproofing.

## Brickwork Design Considerations

### Sizes

The dimensions of standard brick are: 76mm high x 230mm long x 110mm thick.

National Masonry® Victoria manufactures a range of Concrete Bricks and Blocks in various modular sizes to complement standard blockwork and brickwork construction.

The Quick Brick is 162mm high x 230mm long x 110mm wide. This height matches two standard size brick courses, with mortar. These are very popular for more cost effective laying. Refer to the Concrete Brick section of this guide for product details.

**Table B2 — Brick Quantities per Square Metre  
(No allowance for wastage)**

Face Size	Bricks per m <sup>2</sup>
76 x 230	50
162 x 230	25
162 x 390	14.5

Additional information is provided on individual product pages in the following sections of this guide.

**Table B1 - Brickwork and Blockwork Dimensions****(with 10mm mortar joints)**

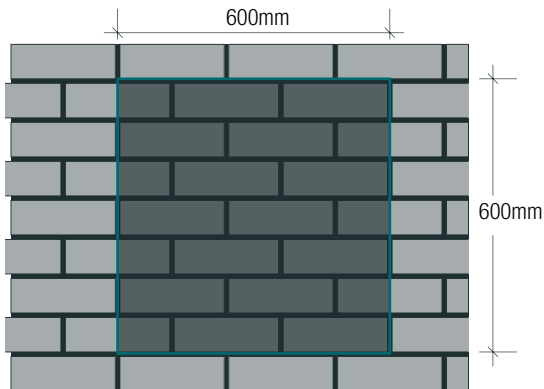
Number of Bricks or Blocks	Brickwork	Opening	Brickwork Height (mm)		Blockwork	Opening	Blockwork Height (mm)		
	Brick Length (mm)		Brick Height (mm)		Block Length (mm)		Block Height (mm)		
	230		76	162	390		40	90	190
1	230	250	86	172	390	410	50	100	200
2	470	490	172	344	790	810	100	200	400
3	710	730	258	516	1190	1210	150	300	600
4	950	970	344	688	1590	1610	200	400	800
5	1190	1210	430	860	1990	2010	250	500	1000
6	1430	1450	516	1032	2390	2410	300	600	1200
7	1670	1690	602	1204	2790	2810	350	700	1400
8	1910	1930	688	1376	3190	3210	400	800	1600
9	2150	2170	774	1548	3590	3610	450	900	1800
10	2390	2410	860	1720	3990	4010	500	1000	2000
11	2630	2650	946	1892	4390	4410	550	1100	2200
12	2870	2890	1032	2064	4790	4810	600	1200	2400
13	3110	3130	1118	2236	5190	5210	650	1300	2600
14	3350	3370	1204	2408	5590	5610	700	1400	2800
15	3590	3610	1290	2580	5990	6010	750	1500	3000
16	3830	3850	1376	2752	6390	6410	800	1600	3200
17	4070	4090	1462	2924	6790	6810	850	1700	3400
18	4310	4330	1548	3096	7190	7210	900	1800	3600
19	4550	4570	1634	3268	7590	7610	950	1900	3800
20	4790	4810	1720	3440	7990	8010	1000	2000	4000
21	5030	5050	1806	3612	8390	8410	1050	2100	4200
22	5270	5290	1892	3784	8790	8810	1100	2200	4400
23	5510	5530	1978	3956	9190	9210	1150	2300	4600
24	5750	5770	2064	4128	9590	9610	1200	2400	4800
25	5990	6010	2150	4300	9990	10010	1250	2500	5000
50	11990	12010	4300	8600	19990	20010	2500	5000	10000
100	23990	24010	8600	17200	39990	40010	5000	10000	20000



## Modular Planning

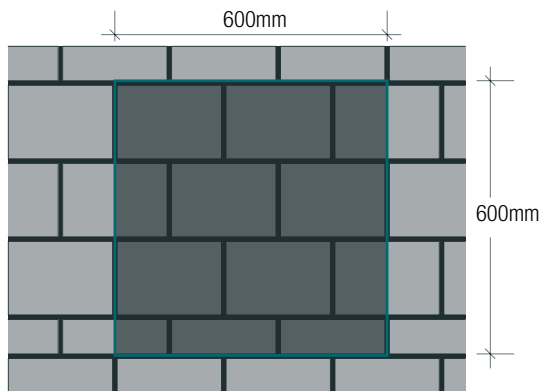
Standard size bricks (Standard Bricks), as with most building materials, work to a 600mm module.

In standard height bricks, this module is 7 bricks high x 2.5 bricks long (for standard length brick).



**Fig B5. 600mm Module for Standard Height/Standard Length Brick**

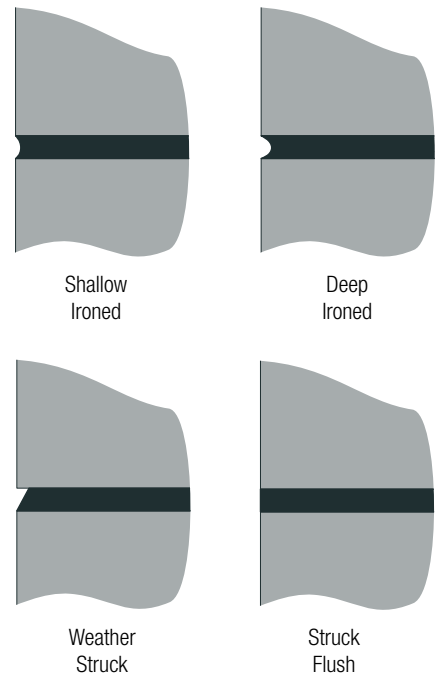
In double height bricks (Quick Bricks), it is 1 standard course plus 3 courses of double height brick x 2.5 bricks long (for standard length brick).



**Fig B7. 600mm Module for Double Height/Standard Length Brick**

## Mortar Joints

Mortar joints (both bed and perpend) are usually specified as 10mm in thickness. Any raking, if specified, should not exceed 10mm depth and should not penetrate closer than 5mm to any core or perforation in cored units. Tooling of joints is particularly beneficial in improving durability and must always be carried out as specified. Joint finishing options are illustrated in Fig B8.



**Fig B8 — Joint Finishing Options**

## Control Joints

### (Expansion/Contraction Gaps)

Blocks and bricks (both concrete and clay) expand when heated and contract as they cool. They both expand when they absorb moisture and contract as they dry.

As they cure however, clay units expand and concrete units contract. For this reason, they should not be banded in the same wall.

Control joints are constructed and spaced to allow for these movements and in some cases, movement due to foundation settlement. Control joints should be used beside large openings, at changes of level in footings and at other points of potential cracking.

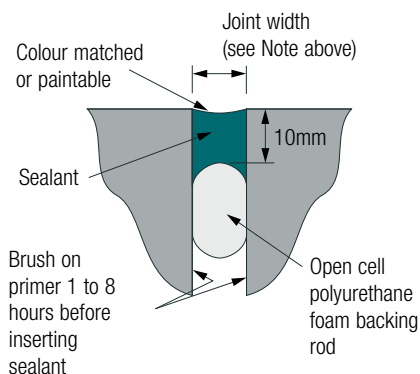
Table B3 details the recommended maximum control joint spacing for non-reinforced concrete walls.

The design and construction of control gaps in the external leaf of a full brick wall is identical to that in a brick veneer wall. Except at re-entrant angles in long walls, control gaps are not usually required in internal brick masonry. Where an internal gap is required, it can usually be located at a full-height opening such as a door or window.

**Table B3 — Control Joint Spacing**

Product	Spacing
Masonry Brick (Residential)	Max. 6 metres
Masonry Block	Max. 8 metres

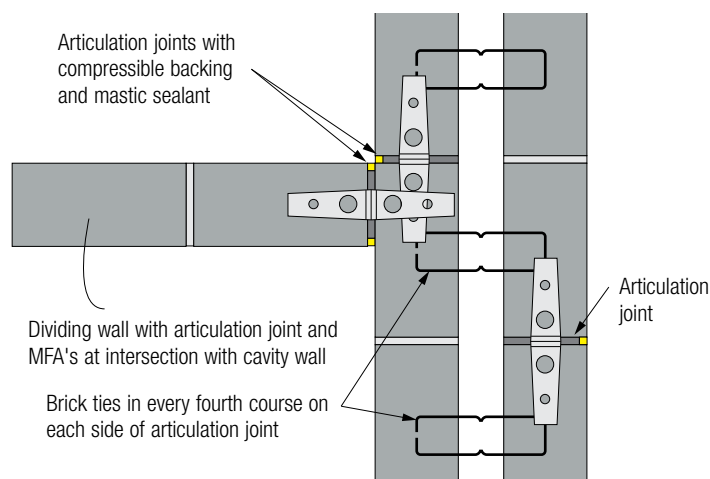
**Note** Joint width is 10mm for panels up to 6000mm long. For panels over 6000mm and up to 8000mm, joint width is 14mm. Joint sealants should be applied towards the end of construction to minimise the effect of panel movement.



## Articulation Joints

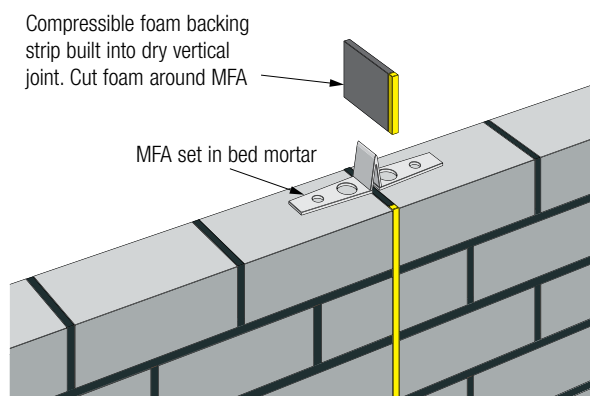
Articulation joints are vertical gaps in brick walls or gaps between brick masonry and windows or doors, that allow for minor footing movements without causing distress or significant wall cracking.

Articulation joints provide the flexibility needed when building on reactive clay soils. Articulation is not required for masonry on stable sites. Control joints are still required. The basic design and construction of articulation joints in the outer leaf of a full brick house is similar to that in a brick veneer. The principles are illustrated in Fig B10.



**Fig B10 - Articulation Joint - Plan View**

Where it is not possible to provide ties to the other leaf on either side of an articulation joint, it is necessary to provide a structural connection across the joint. This is made with Masonry Flexible Anchors (MFAs) mortared into bed joints of brick masonry. See Fig B11.



**Fig B11 - Articulation Joint Construction**

Where MFAs are used in walls over 3m high or exposed to high winds, they must be built into the masonry at half-height then at every seventh course (600mm) above. Articulation joints can usually be placed so that they function also as control joints/gaps.

## Mortar Mixes for Concrete Block and Brick

The three principal functions of mortar are:

1. Provide even bedding for blocks and allow level coursing by taking up small variations in unit height
2. Transmit compressive loads
3. Hold the blocks together in the wall by bonding to them, so that tensile and shear force can be carried - often referred to as 'bond strength'. This is particularly important so that units on top of the wall are not easily dislodged.

In order to provide a good bond between the units and the mortar, the following guidelines should be followed:

- An appropriate mortar mix should be selected (refer to Table B5 together with the following section on 'Mortar for Laying Designer Range').
- The mortar should be batched accurately using some consistent form of volume measurement.
- The sand used in the mortar should be clean sand containing moderate amount of clay<sup>#</sup>.
- Mortar should be discarded and not retempered, after the initial set of the cement has occurred.

**# Note:** Concrete masonry units tend to shrink. If mortar is prepared with a high shrinkage (high clayey loam), cracking of the joints may result.

## Sand

Mortar for concrete blockwork and brickwork should be prepared using clean sand with low salt and low organic impurities. Clayey loam sand can lead to cracking, affect the mortar strength and should not be used.

Sand should have:

- minimal salt impurities.
- low organic impurities.
- moderate amount of clay
- fines below 75 micron at less than 10% by weight (dry sieving).
- sub-angular or sharp edge particles.

**Note:** Lime or Methyl cellulose can be added to increase workability. Do not use Lime or Methyl Cellulose in mortar used for laying Designer Range products. Refer to the section detailing mortar mixes in this guide.

## Mortar for Laying National Masonry® Designer Range

- The additive used in the manufacture of Designer Range and its mortar is designed to be water resistant (reduce water absorption), reduce mould growth and lower the risk of staining.
- Designer Range can be laid in conventional mortar, however for the best result, Designer Range should be laid in mortar containing Designer Range Additive. Refer to Table B5 for mortar mixture details.
- Lime or plasticisers must NOT be added to mortar with Designer Range additive.

## Other Admixtures

- Additives may be used with products other than Designer Range, however caution should always be exercised when using lime replacing additives such as plasticisers or workability agents. They should be cellulose based, and only be used if specified by the architect or engineer and then strictly in accordance with the manufacturer's instructions. Detergent and air entrainers should never be used.





**Table B4 - Block Quantities per Square Metre**

Block & Brick Estimator	Full Height	Half Height	Quarter Height
Masonry unit face size (L x H mm)	390 x 190	390 x 90	390 x 40
No. Units per m2	12.5	25	50

**Material Quantities for 1m3 of Mortar**

- For every 800 full height blocks (390 long x 190 high) or 64m2 of wall, approximately 1m3 of mortar mix is required, allowing for wastage.
- There are 12.5 full blocks per square metre of wall surface area.

**Table B5 — Approximate Material Quantities for 1m<sup>3</sup> of Mortar**

Grey Block			Designer Range	
M3	Mix in 1:1:6 proportions		Mix in 1:5 proportions	
	Cement	14 bags (20kg each)	Cement	16 bags (20kg each)
	Lime	5 bags (20kg each)	Tech-Dryad Designer Range Additive	8 litres
	Sand	1.2m3	Sand	1.2m3
M4	Mix in 1:0.5:4:5 proportions		Mix in 1:4 proportions	
	Cement	18 bags (20kg each)	Cement	20 bags (20kg each)
	Lime	3 bags (20kg each)	Tech-Dryad Designer Range Additive	10 litres
	Sand	1.2m3	Sand	1.2m3
Note: Use clean, sharp sand and allow 20% for bulking.				

- Use clean, sharp sand and allow 20% for bulking.
- Normal brickwork has one cement, one Lime and six sand portions.
- Designer Range Mortar Additive available from National Masonry® is a substitute for Lime and the cost is equivalent.

**Designer Range Block Mortar Additive - Tech-Dryad**

- Primary attribute is to allow the mortar to be as water resistant as the Designer Range Blocks and Bricks (Refer Page 11).
- Aids in the minimisation of efflorescence\*

\* Efflorescence is a "whitish" deposit that can appear on the masonry surface that relates to movement of moisture to the surface and formation of soluble or semi- insoluble salts. Efflorescence can also be avoided/minimised with good trade practices occurring on site. (Refer Pages 14 and 15)

## Reinforced Core-Fill Masonry Walls

Concrete blocks (140, 190, and 290mm) have large cores which facilitate the placement of steel reinforcing rods and the pouring/ pumping of grout (grout is highly workable concrete).

If a wall is reinforced with bars spaced at 800mm centres or less and fully grouted, the wall is referred to as 'reinforced masonry'. These walls can have similar strength and 'flexure' characteristics to reinforced insitu concrete walls.

Partially reinforced block walls are only grout filled where the reinforcement is placed, usually in bond beams and vertically in cores.

For Vertical Reinforcement Bars, the first bar should start 100mm from the corner or the end of wall. All bars from the first bar will be at 200/400 mm spacing to be inside the core holes of the block depending on the engineering requirements.

All reinforced walls must be designed by a structural engineer.

## Grout For Core Filling

### Grout Specification

The correct grout specification (mix design) is critical to achieving the structural design of a reinforced wall. The grout used to fill the cores of blockwork walls should be specified as follows:

- Grout to comply with AS3700 Clause 11.7;
- Characteristic Compressive Strength 20MPa;
- Cement content not less than 300kg/m<sup>3</sup>;
- Round aggregate (if any) not bigger than 10mm;
- Clean sand (salts can leach through to the face); and

A pouring consistency which ensures that the cores are completely filled and the reinforcement completely surrounded without segregation of the constituents.

The approximate number of blocks filled per cubic metre of grout is shown in Table B6. (Based on 10mm rounded aggregate and 300kg/m<sup>3</sup> cement.)

**Table B6**  
**Blocks Filled per cubic metre of Grout**

Block Type	Blocks Filled per m <sup>3</sup> of Grout (approximate)
15.48, 15.42, 15.20	190
15.101	200
20.42, 20.20	120
20.101	125
20.48	100
30.48	65
Mortarless 200	125

### Grouting

Grout may be mixed on site and poured from buckets into hoppers placed on top of the wall. Alternatively, for larger jobs, the grout may be delivered by transit mixer and pumped into the cores, using a small nozzle on the hose.

Before commencing placement of the grout, it is important that the cores should be clean and free of mortar 'dags' projecting into the core. A steel rod is pushed down the core to knock off these 'dags' and to break up any mortar that has dropped onto the footing. The cores are then hosed or swept out from the bottom of each core through the 'clean-out' space. The vertical steel rods are tied to the starter bars, and then the clean-out blocks are covered with formwork, ready for grouting (see 'Retaining Wall Details'). An alternative method, which may be used in low height walls, is to leave a gap in the mortar bed at the bottom of each core and to hose out the dropped mortar and dags before the mortar has set.

In hot weather it may be necessary to hose the cores out with water in order to cool the blocks and so prevent 'flash-setting' of the grout. If so, this hosing should be completed at least 30 minutes before the grout is placed.

Because of the high pressures developed at the bottom of the cores when they are filled, grouting in lifts (wall height) of more than 1.2 metres should not be attempted in one pour. Where the lift is more than 1.2 metres, it is preferable to fill the cores in two stages at least 30 minutes apart.

When grouting Series 150 blocks, lifts should be reduced to 800mm (4 courses) to ensure no voids are left in the wall.

### Grout for Designer Range

Due to the high hydrostatic pressure at the bottom of freshly grouted cores, water will seep out of the wall. This MUST be cleaned off. The admixture used with Designer Range will increase the time for the grout to firm and dry, therefore more care must be used inspecting and cleaning any seepage on the surface of these walls. Clean all grout spills before they set.

Stack Bonding (below) is a decorative form of laying as opposed to traditional Stretcher Bonding (Refer Photos Page 37).



## Construction Considerations

### Mortar Deposits

Mortar extruded from masonry joints during laying should be cut off with an upward stroke of the trowel. In this way a clean cut can be made without smearing the face of the unit. On completion of laying and tooling, any mortar smears which may be on the face of the work should be removed, firstly with dry brushing and secondly, if necessary, by wet brushing. Do not allow mortar smears and dags to set on the face of the masonry. If these mortar deposits are allowed to set on face masonry, high pressure water jets or in extreme cases a diluted acid solution might be needed to remove mortar stains. See 'Cleaning Concrete Masonry' before testing either water jets or acid solutions. Acid cleaning should be avoided as face concrete blocks can be discoloured.

### Scaffolding

Scaffolding planks should be placed with a clearance of at least 150mm to the wall. This gap allows mortar droppings to fall clear of the plank instead of splattering on the plank and building, disfiguring the wall. At the end of each day's work or when rain interrupts work, the plank nearest the wall should be propped on edge to prevent mortar from being splattered onto the wall by overnight rain.

### Concrete Droppings

Masonry, supporting reinforced concrete slabs and beams is frequently disfigured by droppings from the concrete pour. If such deposits are allowed to set it is sometimes impossible to rectify the damage. Protection is best achieved by covering the walls with plastic sheeting. Where this is not done, any concrete on the wall must be thoroughly cleaned off before it sets.

### Rain Interruption

Overnight, and when rain interrupts blocklaying, the top of newly laid walls should be protected with plastic sheeting or similar. This is essential with face blockwork. When newly laid masonry is saturated by rain, lime is put into solution either from portland cement, or from saline (unwashed) sands or hydrated lime in the mortar. This solution takes in carbon dioxide from the atmosphere and precipitates calcium carbonate. This whitish stain is very disfiguring and not easily removed. Frequently, new masonry is marred by bands of calcium carbonate stain confined to three or four courses of masonry - the result of rain saturating freshly laid work.

## Cleaning Concrete Masonry

### Good Building Practice

Block layers must exercise extra care when laying face concrete masonry to minimise mortar staining.

Block layers must:

- Keep face blocks as clean as possible while laying and tooling;
- Keep unused pallets of blocks and tops of unfinished walls covered during rain to prevent water penetration and excessive efflorescence;
- Clean any dags and mortar smears before they set hard. Remaining stains could be removed following the procedures set out below.

### Removal of Mortar Stains with Hand Tools

After using a bucket and brush, remove any remaining mortar dags and smears by rubbing the surface with a piece of 'like coloured' block or a piece of wood if cleaning polished masonry (to prevent scratching). Careful use of a paint scraper, wide bladed chisel or wire brush can be helpful in removing mortar buildup. However care must be taken not to scratch or damage the masonry surface.

## Pressure Cleaning

This cleaning method is not a substitute for good building practice and hand cleaning methods. It should only be used after these procedures have been carried out if further cleaning is required.

### Essential Preliminaries:

Thoroughly remove mortar smears and dags back to a flat surface with hand tools as outlined above. Hand cleaning must not leave any thickness of mortar, otherwise pressure cleaning will damage the masonry face and mortar joints before removing the thickness of mortar.

Allow the mortar to harden for a minimum of seven days prior to pressure cleaning;

Carry out a pressure cleaning trial on a typical but inconspicuous area and allow it to dry to determine:

- The effectiveness of this cleaning method; and
- That marking, damage or erosion of the surface has not been caused before proceeding with the general cleaning.

**NOTE:** If there is no inconspicuous area, a small wall could be constructed for this purpose.

Pressure cleaning may be carried out with pressure not exceeding 7MPa (1000 psi) and volume not exceeding 20 litres/minute and fan jet of a minimum 40 degree width, held not closer than 500mm from the wall. Cleaning should be continuous and even. The pressure jet should never be stationary and should not 'needle' or zero in on mortar stains as surface erosion will almost certainly occur.

**NOTE:** If this method is not totally successful, further hand cleaning and scraping should be carried out prior to further pressure cleaning.

### Caution:

High pressure water blasting can cause personal injury and damage masonry. Mortar joints can be blown out and face blockwork marked and eroded;

Zero degree or needle jets, narrow fan jets and turbo jets should not be used on blockwork because all concentrate the water pressure on too small an area which can cause damage;

Minimal pressure should be used to avoid mortar blowouts and/or damage to the face of units.

Experienced operators should carry out pressure cleaning in accordance with the above recommendations after appropriate trials have taken place.



## Acid Treatments

Only if hand cleaning and pressure washing methods have failed to fully remove mortar stains, should acid treatments be considered for cleaning of concrete blockwork.

**Note** Acids react with and dissolve cement, lime and oxide colourants in concrete blocks and mortar joints and are thus capable of etching, fading and streaking the masonry finish. When acid is applied to dry blockwork without pre-wetting, it is drawn in below the surface it is intended to clean. Salts may appear when the masonry dries out.

If it is considered necessary to use an acid for general cleaning, it should only be used after trialing in an inconspicuous area as outlined under 'Essential Preliminaries' and strictly in accordance with the following procedures.

Hydrochloric acid (otherwise known as Muriatic Acid or Spirits of Salts) can be tested at a strength of 1 part acid to 20 parts water. A less aggressive alternative is powdered Citric Acid which can be used at strengths up to 1 Part acid to 10 parts water (by volume).

Anti-Eff from Environex is a suitable alternative.  
www.environex.net.au, Ph: 1800 999 196.

CAUTION: Acid washing of masonry products can cause irreversible acid burn and change of colour.

### Procedures for Acid Cleaning

1. Remove mortar dags and smears as described under 'Hand Tools';
2. Working from the top of the wall down in vertical 'runs', thoroughly pre-wet (SOAK) an area of blockwork of approximately 2m<sup>2</sup> at a time;
3. Apply dilute acid to the water-soaked area by brush or broom with a horizontally (sideways) action to prevent runs and streaks;
4. Within 2 to 3 minutes, rinse this area from top to bottom under tap pressure only;
5. Pressure clean this area thoroughly, gently and evenly, as outlined previously;
6. Repeat steps 1 to 5 as necessary to achieve the best compromise between cleaning and damage caused by excessive treatment.

## Other Stains

### Timber (Tannin)

These can usually be removed by the application of a chlorine solution, preferably Sodium Hypochlorite (household bleach), onto the dry surface. Re-apply as necessary to achieve the desired result.

### Clay or Loam Stains

If not too severe and intransigent, these stains may be removed with a solution of 50ml household detergent and 500 grams of oxalic acid dissolved in 4 litres of warm water. Lightly pre-wet then apply the above solution with a nylon brush. Rinse off and repeat as necessary. Pressure cleaning as outlined previously may be of assistance.

### Mosses, Moulds and Lichens

- 1 These commonly appear as a green to black area, often with a hair like growth, around damp areas such as taps, gutter overflow areas, south facing walls, etc.
- 2 Scrape off any thickness of moss/mould/lichen
- 3 Pre-wet the mouldy area;
- 4 Apply a chlorine solution, preferably Sodium Hypochlorite (household bleach), at sufficient strength to kill mould within approximately 1 hour;
- 5 Scrubbing with a stiff brush or broom will normally assist;
- 6 Thoroughly flush the surface. If mould remains, repeat steps 1 to 3 as necessary to kill and remove the mould;
- 7 Pressure cleaning, as outlined previously, may assist.

## Efflorescence

The term efflorescence is given to a white powdery deposit that forms on the surfaces of porous building materials such as masonry units, mortar and concrete. The temporary appearance of efflorescence is common on new masonry. For efflorescence to occur, three conditions must be present:

1. There must be soluble or semi soluble salts present;
2. There must be water entering the masonry; and
3. The masonry must be able to dry out.

The absence of any of the above three conditions will prevent efflorescence. Any situation which allows water to enter the wall is likely to promote efflorescence. The most common causes are:

- Poor building practice such as partially built walls left uncovered during rain. Delays in installation of window sills and downpipes can exacerbate this problem, allowing rainwater to enter block cavities and leach free lime to the surface;
- Poor storage of masonry units on site. Before units are placed in the wall they can absorb ground salts and excessive water in the stockpiled masonry and can mobilise latent salts. It is desirable to store masonry off the ground and loosely cover with a waterproof membrane during rain;
- Poor or missing copings and flashings;
- Excessively raked joints which allow water to enter the bed face of the masonry (ironed joints are recommended); and
- The use of air entraining agents in the mortar which makes the mortar act like a sponge.
- Good laying practice and site procedures are necessary for keeping efflorescence to a reasonable level. Care should also be taken to ensure that excessive lime is not used in mortar joints.

In conjunction with dry brushing, the cleaning methods outlined previously will usually remove most 'normal' levels of efflorescence. It is important to remove as much efflorescence as possible with DRY brushing because powder efflorescence is water soluble. Wet brushing can dissolve the powder and the dry block can re-absorb it. If high levels of efflorescence are present on walls exposed to continual wetting from rain or other sources of dampness over an extended period, calcification or hardening of the lime tends to take place. The powdery lime gradually becomes a very hard film of calcium carbonate. If this occurs, it will almost certainly require professional advice and specialised cleaning methods for its removal.

Wall sealers also help to prevent future efflorescence, mould growth and general staining by reducing water absorption from rain.

Although water resistant, Designer Range blocks are less likely to have water penetration than standard grey blocks. Designer Range blocks can be sealed with a quality penetrating sealer following installation, to manufacturer guidelines.

## Safety Precautions and Warnings

When using chemicals, care must be taken to avoid damage to adjacent materials and finished surfaces. Masking and plastic sheeting may be necessary;

To avoid personal injury, wear protective clothing and vapour cartridge breathing mask-particularly in confined areas, as recommended by chemical manufacturers;

NEVER mix chemicals with which you are unfamiliar, particularly chlorine and acid - it emits deadly chlorine gas. Follow the chemical manufacturer's recommendations;

Dilute acid by adding acid to water. Never add water to acid;

Harsh acidic chemicals should never be used for the cleaning of blockwork; and

Chemical wastes must not be allowed to run down drains and storm water outlets in accordance with Environmental Protection Regulations









# Designer Range

**MASONRY BLOCKS AND BRICKS**



## Architectural Designer Range Overview

National Masonry's Designer Range has the leading range of decorative masonry blocks available. Blocks are available in Seven contemporary colours in either a smooth face, honed, polished or split face finishes. Whether large or small National Masonry's range of decorative blocks will give your next project the winning edge.

Designer Range is designed to be water resistant, reduce mould growth and lower the risk of staining.

### Value Added Finishes

Value added finished masonry is supplied as a single face product. When only one face is value added, the back side of the block may not be suitable as a face finish due to the value adding process. If both faces are value added, both faces will be suitable for a face work but care will be required when laying as there may be 2-5mm difference in the width of the individual blocks due to the honing / polishing process.

## Important Designer Range Information

### Lead Time

Lead times apply to all coloured blocks. Longer lead times apply to Honed, Polished, and Split Finishes as the product must be cured to harden sufficiently before processing.

### Colour and Texture Variation

Some variation in colour may occur due to natural variations in raw materials. Colour variation can also occur from batch to batch making it essential to order all product requirements at the same time. National Masonry® recommends part size blocks are cut on site to maintain colour consistency. Blocks can be cut to order.

### Blending

To obtain a consistent finish and mitigate colour variation, National Masonry® strongly recommends "blending" which is drawing product from multiple pallets on-site.

### Block Storage

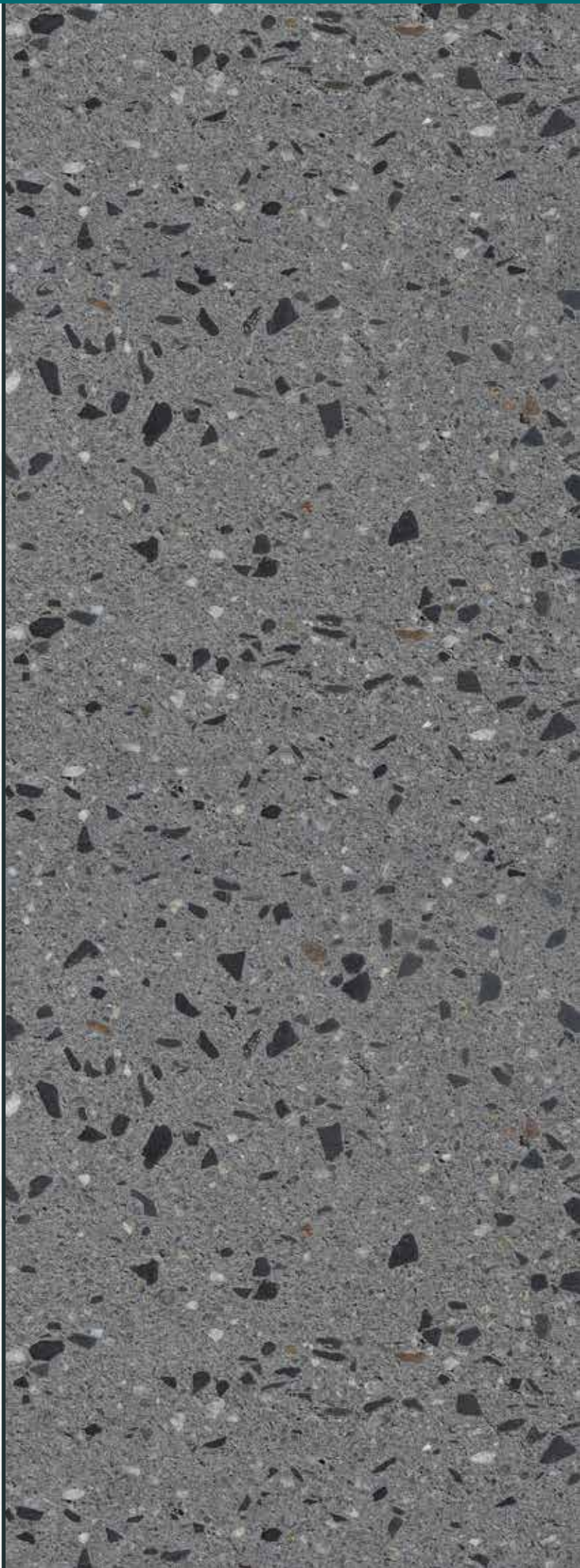
Blocks must be kept dry on site before use and when laid. Freshly laid walls must be covered overnight and when rain interrupts work in order to prevent moisture entering the cores of the blocks. Failing to do this will increase the likelihood of efflorescence.

### Mortar

Coloured Designer Range blocks contain an efflorescence inhibitor (Tech-Dry®). To complete the system, an additive must be used in mortar mix. National Masonry® supply and recommend TECH-DRYAD Mortar Additive. The consumption of additive varies significantly, 20 litres of mortar additive may lay approximately 1000-1500 Tech Dry Blocks.

### Sealing

All Designer Range blocks can be cleaned and then sealed with a quality penetrating sealer after installation.







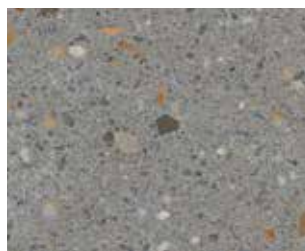
## Smooth Face

A finely textured finish created through the standard moulding process.



## Honed Face

The honed process grinds 2-3mm from the block surface, producing a matt exposed-aggregate finish.



## Polished Face

This involves taking a Honed Face and putting it through the additional polishing process. This enriches the colour of the aggregates.


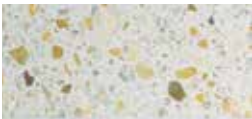










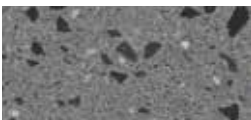










## Split Face

The splitting process produces a bold textured, exposed aggregate finish.

## Designer Range Block Colours

All colours and textures are made to order. Please contact National Masonry® for lead times.

	Smooth Face	Honed Face	Polished Face	Split Face
Alabaster				
Sandune		*	*	
Almond				
Charcoal				
Pearl Grey				
Sandstone Blend	*	*	*	
Jasper	*			*

Key: \* Not Available



### Designer Range Series 100, 150 and 200 Split Face, Smooth, Honed and Polished Face

#### Introduction

Series 100, Series 150 and Series 200 are suitable for internal and external walls in loadbearing and non-loadbearing applications.

#### Face textures

Series 100, 150, and 200 Designer Range blocks are available with the following face texture finishes:

- Split Face
- Smooth Face
- Honed Face
- Polished Face
- Ends - Honed or Polished finishes

#### Colours

Designer Range is available in 7 colours.

Customised colours and textures are also possible. Please note that extended lead times and minimum order quantities may apply.

### Designer Range Split Face

Designer Range Split Face is suitable for internal and external walls in loadbearing and non- loadbearing applications.

Designer Range Split Face is produced in the following block thicknesses, 100 (95mm thickness), Series 150 (145mm thickness) and Series 200 (195mm thickness).

#### Split Face

The splitting process produces a bold textured surface resulting in characteristics much like split natural stone.

#### Colours

Designer Range Split Face is available in 6 colours.

Customised colours are also possible. Please note that extended lead times and minimum order quantities may apply.

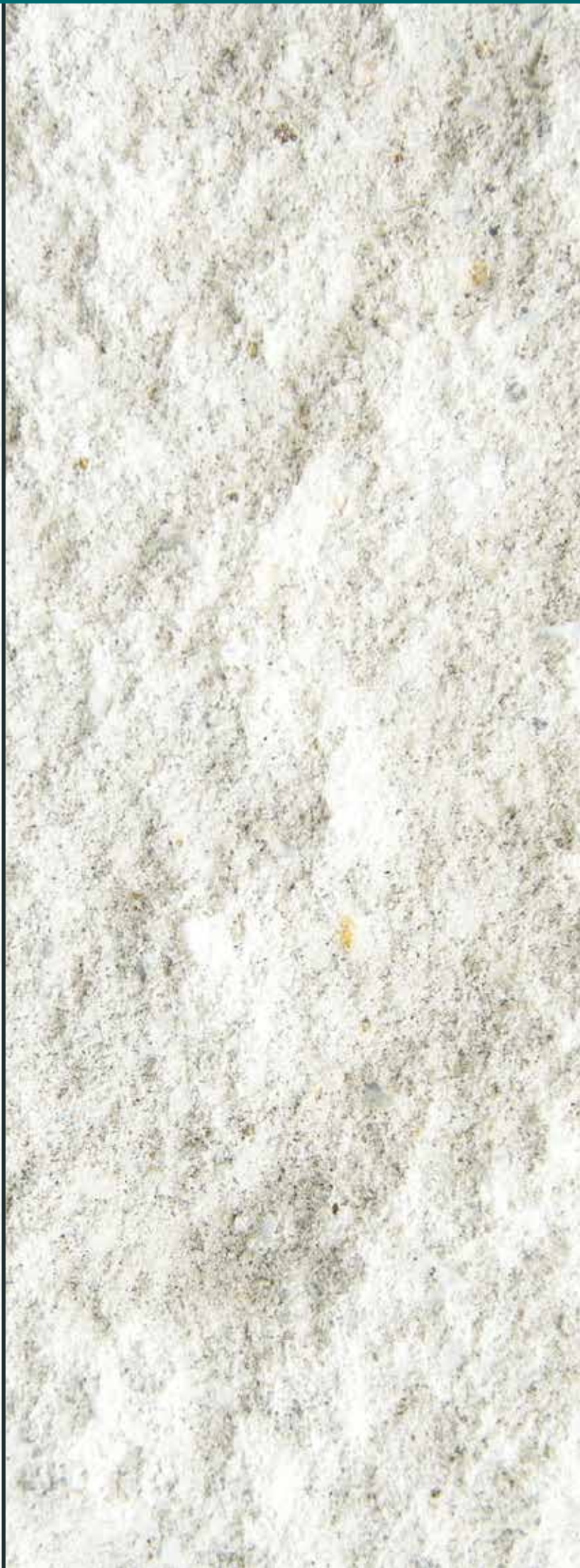
### Availability

#### Lead times apply to all coloured blocks.

Part size blocks are best cut/bolstered on-site to maintain colour consistency.

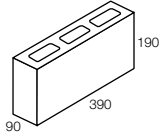
Part size blocks can be made-to-order.

Contact National Masonry® for further details.

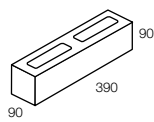




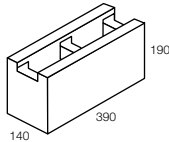
## Smooth, Split, Honed and Polished Face



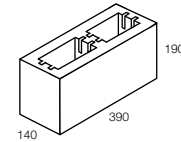
**10.01**  
Standard  
12.0 kg  
149 per pallet



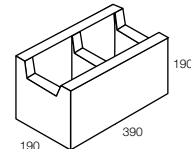
**10.71**  
Half Height Hollow  
5.6 kg  
300 per pallet



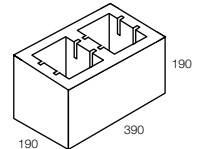
**15.20**  
Universal Hollow  
12.5 kg  
120 per pallet



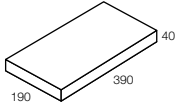
→ **Note:** Each pallet of 15.20 is packaged with 1 in 4 Universal 2 Closed Ends



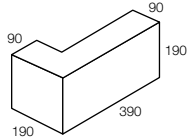
**20.20**  
Universal Hollow  
15.5 kg  
90 per pallet



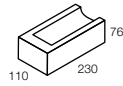
→ **Note:** Each pallet of 20.20 is packaged with 1 in 3 Universal 2 Closed Ends



**Arenapave 190x390**  
Capping  
6.9 kg  
216 per pallet

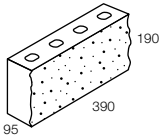


**10.26SM**  
Corner Return Solid  
17.8 kg  
96 per pallet

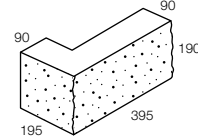


**Smooth Face**  
3.8 kg  
450 per pallet  
1 in every 7 bricks made is solid

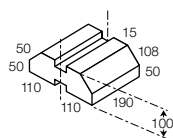
## Split Face



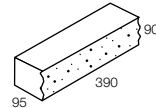
**10.101**  
Standard Split Face  
14.0 kg  
108 per pallet  
1 in 6 "universal" for ½ or ¾, to bolster on site.



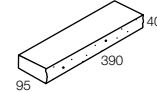
**10.26SP**  
Split Corner  
22.0 kg  
80 per pallet



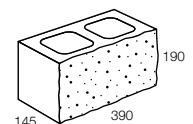
**10.39**  
Double Sill  
7.9 kg  
220 double units per pallet.  
Bolster on site.



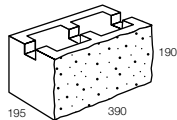
**10.109**  
Half Height  
7.3 kg  
216 per pallet



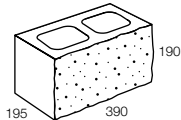
**10.117**  
Quarter Height  
3.5 kg  
432 per pallet



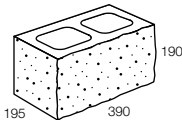
**15.101**  
Standard Split Face  
15.5 kg  
120 per pallet



**20.142**  
Channel  
17.0 kg  
90 per pallet

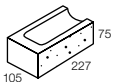


**20.101**  
Standard Split Face  
20.7 kg  
90 per pallet

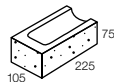


**20.192**  
Split Corner  
21.9 kg  
72 per pallet

## Aspect Range Polished Bricks

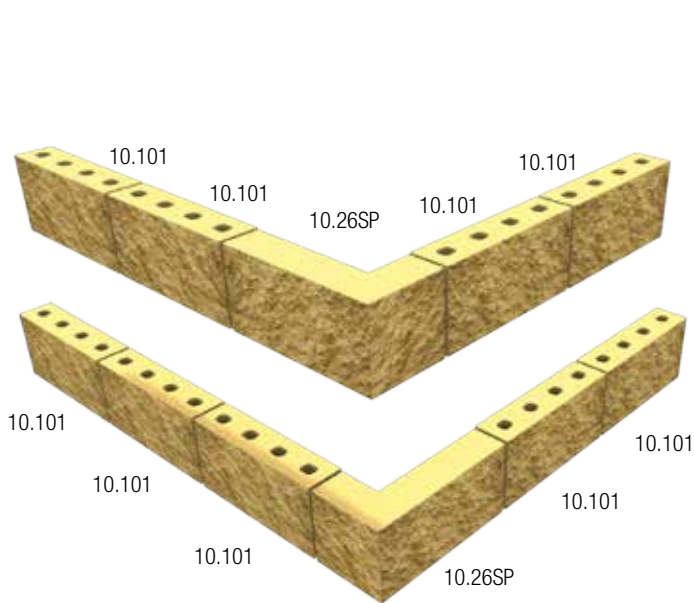


**Face Only**  
3.8 kg  
450 per pallet

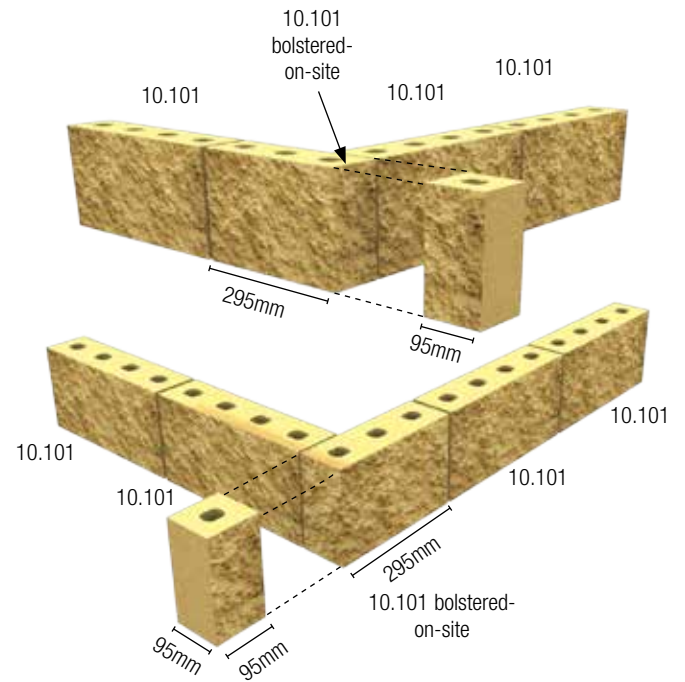


**Face and End**  
3.8 kg

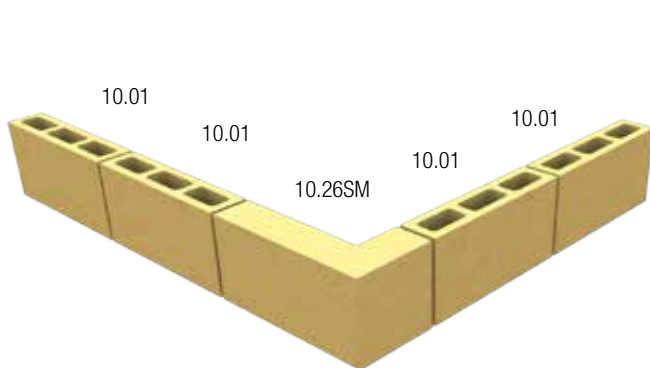
## Series 100 Installation Details



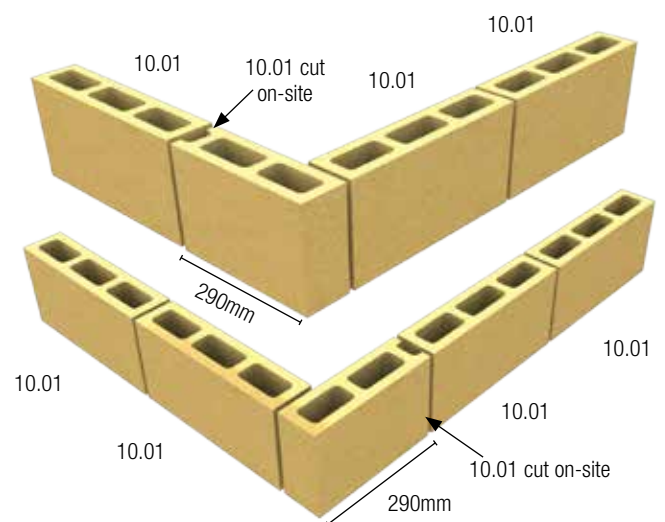
**Fig C1 – Corner Bonding Detail  
Utilising 10.26SP Split Face Corner Block**



**Fig C3 – Corner Bonding Detail  
Using Bolstered-On-Site Split Face Block**

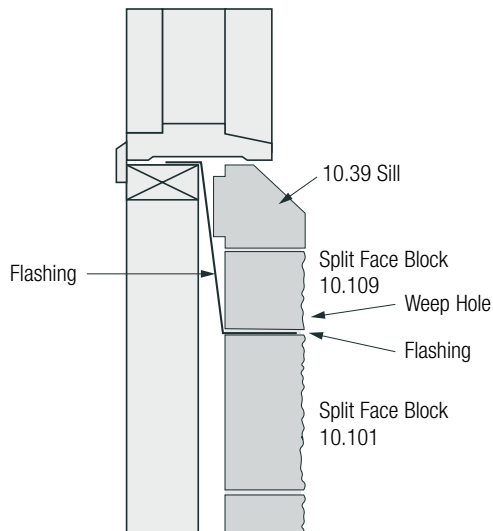


**Fig C2 – Corner Bonding Detail  
Utilising 10.26SM Smooth Face Corner Block**

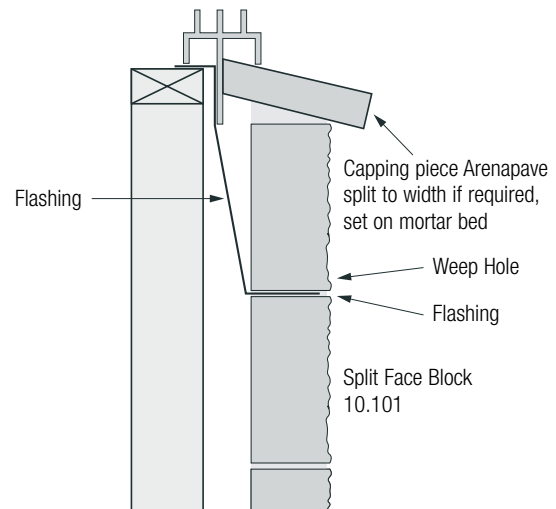


**Fig C4 – Corner Bonding Detail  
Using Cut-On-Site Corner Block**

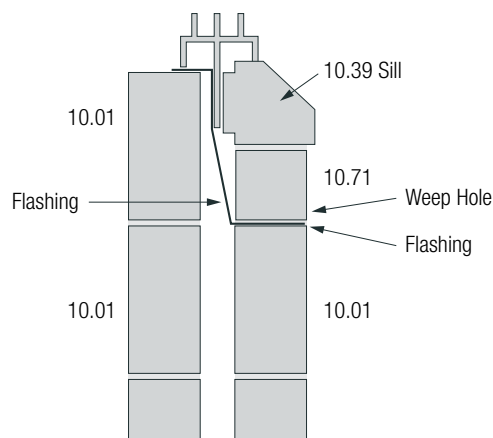
## Series 100 Installation Details



**Fig C5 — Sill Detail with Capping Piece  
Series 100 Split Face Designer Range**



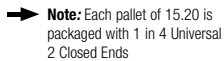
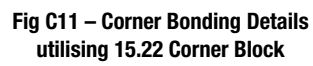
**Fig C6 — Sill Detail with Capping Piece  
Series 100 Split Face Designer Range**



**Fig C8 — Sill Detail with Victorian Sill profile  
Series 100 Feature Face Cavity Wall**

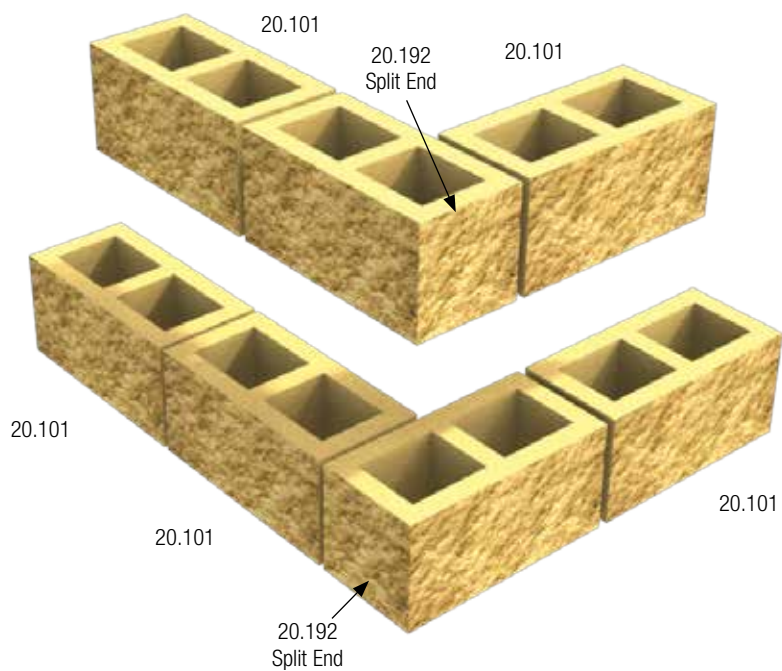
A **Weep Hole** is a small opening that allows ventilation and water to drain from a wall cavity. The Australian Building Code states: "Australian Standards 3700 – 2000 Section 4.7.2: Weep Holes shall be provided wherever it is necessary to drain moisture from or through masonry construction.

**Weep Holes** allow moisture that collects in the cavity to escape. Weep Holes should be spaced less than 1200mm centres wherever flashing is built into the masonry to shed water from the cavity. Weep Holes are usually empty perpend (10mm wide) but proprietary products are available to prevent the entry of insects.

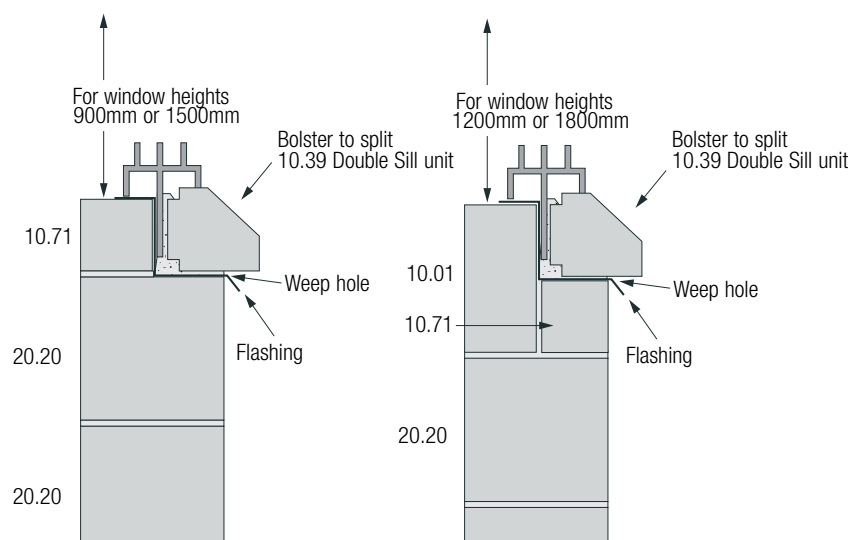




## Series 200 Installation Details



**Fig C11 – Corner Bonding Details**  
**Series 200 Split Face Designer Range**



**Fig C13 — Sill Detail - Single Skin Wall**  
**Series 200 Feature Face Designer Block**







The background is a solid teal color with a pattern of squares in various shades of teal and dark teal, some of which are slightly blurred or faded, creating a textured, grid-like effect.

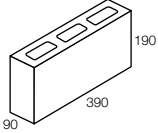
# Grey Blocks

**MASONRY BLOCKS AND BRICKS**

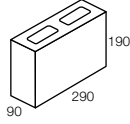
## Concrete Grey Blocks

Concrete Grey Blocks are manufactured utilising virgin raw materials to provide a high strength product. Concrete Grey Blocks are commonly used for construction on houses, schools, and various commercial projects. Choosing the right Concrete Grey Block is important. Before selecting, you should ensure this product meets your projects requirements. Certain Concrete Grey Blocks are lightweight, heavy duty and/or fire rated. Please check the Additional Information. Please consult National Masonry® if you are unsure on the best Concrete Grey Block for your construction needs.

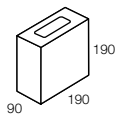
### 100mm Series - Hollow 60 minutes fire rating ( $f'_{uc} \geq 10\text{MPa}$ FRL = 60 Srf $\leq 22.5$ )



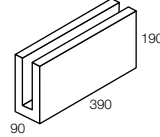
**10.01AG**  
Standard Hollow  
12.0 kg  
149 per pallet



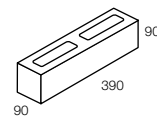
**10.02AG**  
Three Quarters  
8.7 kg  
192 per pallet



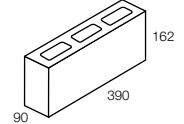
**10.03AG**  
Half  
5.7 kg  
252 per pallet



**10.12AG**  
Bond Beam  
10.1 kg  
108 per pallet

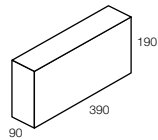


**10.71AG**  
Half Height Hollow  
5.6 kg  
300 per pallet

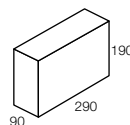


**10.201AG**  
Backup Hollow  
10.1 kg  
172 per pallet

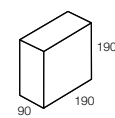
### 100mm Series - Fire Rated 180 minutes fire rating ( $f'_{uc} \geq 8\text{MPa}$ FRL = 180 Srf $\leq 21.5$ )



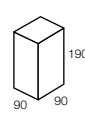
**10.331FR**  
Standard Solid  
13.3 kg  
139 per pallet



**10.332FR**  
Three Quarter  
10.5 kg  
192 per pallet

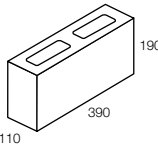


**10.333FR**  
Half  
6.8 kg  
252 per pallet



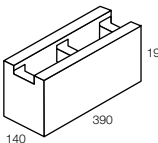
**10.334FR**  
Quarter  
3.5 kg  
504 per pallet

### 120mm Series - Reduced Core 240 minutes fire rating ( $f'_{uc} \geq 8\text{MPa}$ FRL = 240 Srf $\leq 19.7$ )



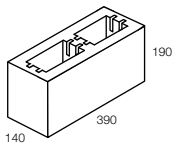
**12.401FR**  
Reduced Core  
13.1 kg  
120 per pallet

### 150mm Series - Hollow ( $f'_{uc} \geq 15\text{MPa}$ ) suitable for concrete filling

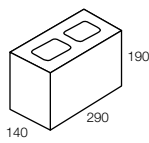


**15.42UNV**  
Universal Hollow  
12.8 kg  
120 per pallet

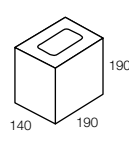
→ **Note:**  
Each pallet of 15.42UNV is packaged with 1 in 4 Universal 2 Closed Ends



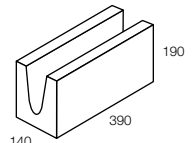
**15.02AG**  
Three Quarter  
10.3 kg  
128 per pallet



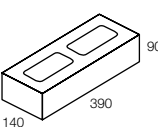
**15.03AG**  
Half  
7.2 kg  
192 per pallet



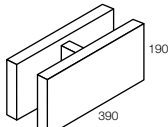
**15.22AG**  
Corner Block  
11.9 kg  
108 per pallet



**15.12AG**  
Bond Beam  
15.7 kg  
96 per pallet



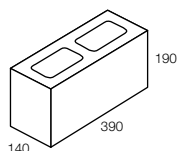
**15.71AG**  
Half Height Hollow  
7.5 kg  
216 per pallet



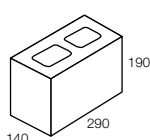
**15.48AG**  
'H' Block  
13.5 kg  
120 per pallet



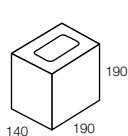
## 150mm Series - Fire Rated 120 minutes fire rating ( $f'_{uc} \geq 8\text{MPa}$ FRL = 120 Srf $\leq 22.6$ )



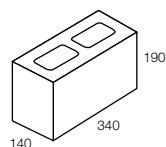
**15.01FR**  
Standard Hollow  
11.0 kg  
120 per pallet



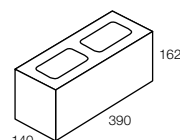
**15.02FR**  
Three Quarter  
9.1 kg  
128 per pallet



**15.03FR**  
Half  
6.1 kg  
192 per pallet

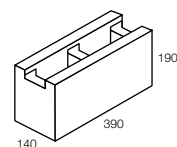


**15.22FR**  
Corner Block  
10.7 kg  
108 per pallet



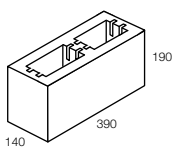
**15.321FR**  
Backup Cored  
13.0 kg  
120 per pallet

## 150mm Series - Light Weight Structural 120 minutes fire rating ( $f'_{uc} \geq 15\text{MPa}$ FRL = 120 Srf $\leq 22.6$ ) suitable for concrete filling

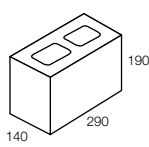


**15.20LWS**  
Light Weight  
11.3 kg  
144 per pallet

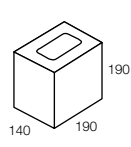
→ **Note:**  
Each pallet of 15.20LWS is packaged with 1 in 4 Universal 2 Closed Ends



**15.02LWS**  
Three Quarter  
9.4 kg  
128 per pallet

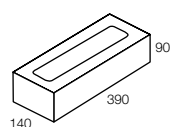


**15.03LWS**  
Half  
6.3 kg  
192 per pallet

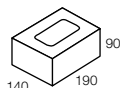


**15.22LWS**  
Corner Block  
11.6 kg  
108 per pallet

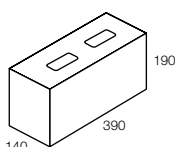
## 150mm Series - Fire Rated 240 minutes fire rating



**15.483FR**  
Half Height Solid  
9.8 kg  
192 per pallet

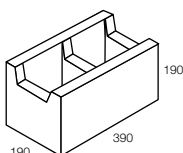


**15.485FR**  
Half  
4.9 kg  
384 per pallet



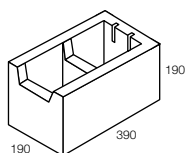
**15.401FR**  
Reduced Core  
15.3 kg  
120 per pallet

## 200mm Series - Hollow 60 minutes fire rating ( $f'_{uc} \geq 15\text{MPa}$ FRL = 60 Srf $\leq 22.5$ ) suitable for concrete filling

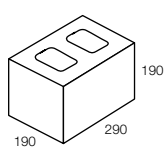


**20.42UNV**  
Channel/Notch Block  
13.9 kg  
108 per pallet

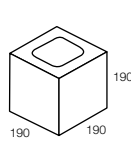
→ **Note:**  
Each pallet of 20.42UNV is packaged with 1 in 4 Universal 1 Closed End



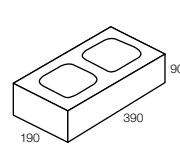
**20.02AG**  
Three Quarter  
13.7 kg  
96 per pallet



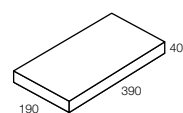
**20.03AG**  
Half  
8.9 kg  
144 per pallet



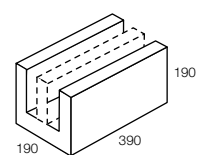
**20.01AG**  
Standard Hollow  
15.5 kg  
90 per pallet



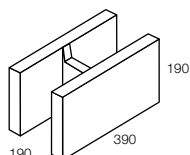
**20.71AG**  
Half Height Hollow  
7.0 kg  
162 per pallet



**Arenapave 190x390**  
Capping  
6.9 kg  
216 per pallet.

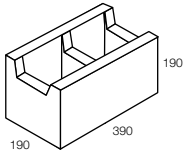


**20.12AG**  
Lintel Bond Beam  
18.0 kg  
72 per pallet



**20.48AG**  
'H' Block  
14.2 kg  
90 per pallet

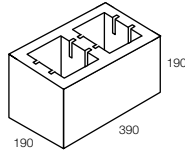
## 200mm Series - Light Weight Structural 120 minutes fire rating ( $f'_{uc} \geq 15\text{MPa}$ FRL = 120 Srf $\leq 22.6$ ) suitable for concrete filling



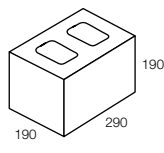
**20.20LWS**  
Light Weight  
12.8 kg  
108 per pallet



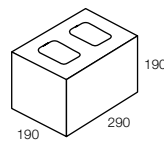
**Note:**  
Each pallet of 20.20LWS is packaged with 1 in 3 Universal 2 Closed Ends



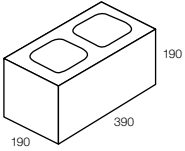
**20.02LWS**  
Three Quarter  
12.7 kg  
96 per pallet



**20.03LWS**  
Half  
8.3 kg  
144 per pallet

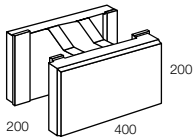


## 200mm Series - Hollow 240 minutes fire rating ( $f'_{uc} \geq 8\text{MPa}$ FRL = 240 Srf $\leq 19.7$ )

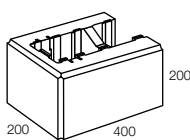


**20.401FR**  
Standard Hollow  
14.9 kg  
90 per pallet

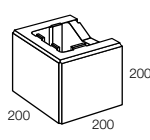
## 200mm Series - Mortarless Block System



**Stretcher Unit**  
17.5 kg  
60 per pallet

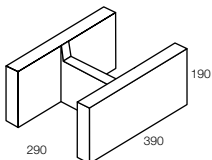


**End & Corner Unit**  
16.9 kg  
60 per pallet

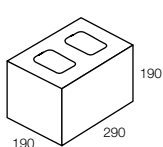


**Half Unit**  
Capping  
9.4 kg  
100 per pallet

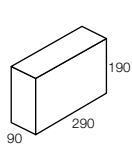
## 300mm Series



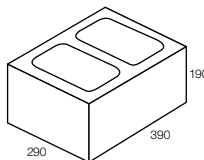
**30.48AG**  
'H' Block  
19.6 kg  
72 per pallet  
 $f'_{uc} \geq 15\text{MPa}$



**20.02AG**  
Half and End  
13.4 kg  
96 per pallet



**10.332FR**  
End Closer/Capping  
10.5 kg  
192 per pallet



**30.01AG**  
Standard  
20.5 kg  
72 per pallet

## Fire Rated and Lightweight Structural Blocks

Fire Rated (FR) and Light Weight Structural (LWS) blocks are manufactured using scoria which reduces the block weight and increases the fire performance characteristics.

### Fire Rated (FR)

- FR is ideal for non-loadbearing walls of commercial, industrial and high-rise buildings with concrete and portal framed structures.
- Also suitable for loadbearing walls, however the Srf values from Designer Block units apply. Refer to the National Masonry® Design Guide - Structural - Fire and Acoustic for more information.
- Manufactured in 90, 110, 140 and 190 mm thicknesses.
- 90, 140 and 190 mm fractions available.
- Suits most types of fire and/or acoustic wall construction.

### Light Weight Structural (LWS)

- LWS provides a 2 hour fire rating without core filling.
- Load bearing.
- Manufactured in 140mm and 190 mm including all fractions.
- Channel for horizontal re-inforcement.
- Suits most types of fire and/or acoustic wall construction.
- LWS Channel blocks are up to 11% lighter than basalt based Channel blocks.

## Fire Design Considerations

FR and LWS utilise scoria, which has been shown through fire testing to provide excellent fire insulation characteristics.

## Acoustic Design Considerations

FR and LWS provide sound resistance when incorporated with a wide variety of board-lining systems.

## Additional Information

Please refer to the National Masonry® Design Guide - Structural - Fire and Acoustic for additional structural, fire and acoustic performance information.



## Typical Component Usage - Series 100 Block

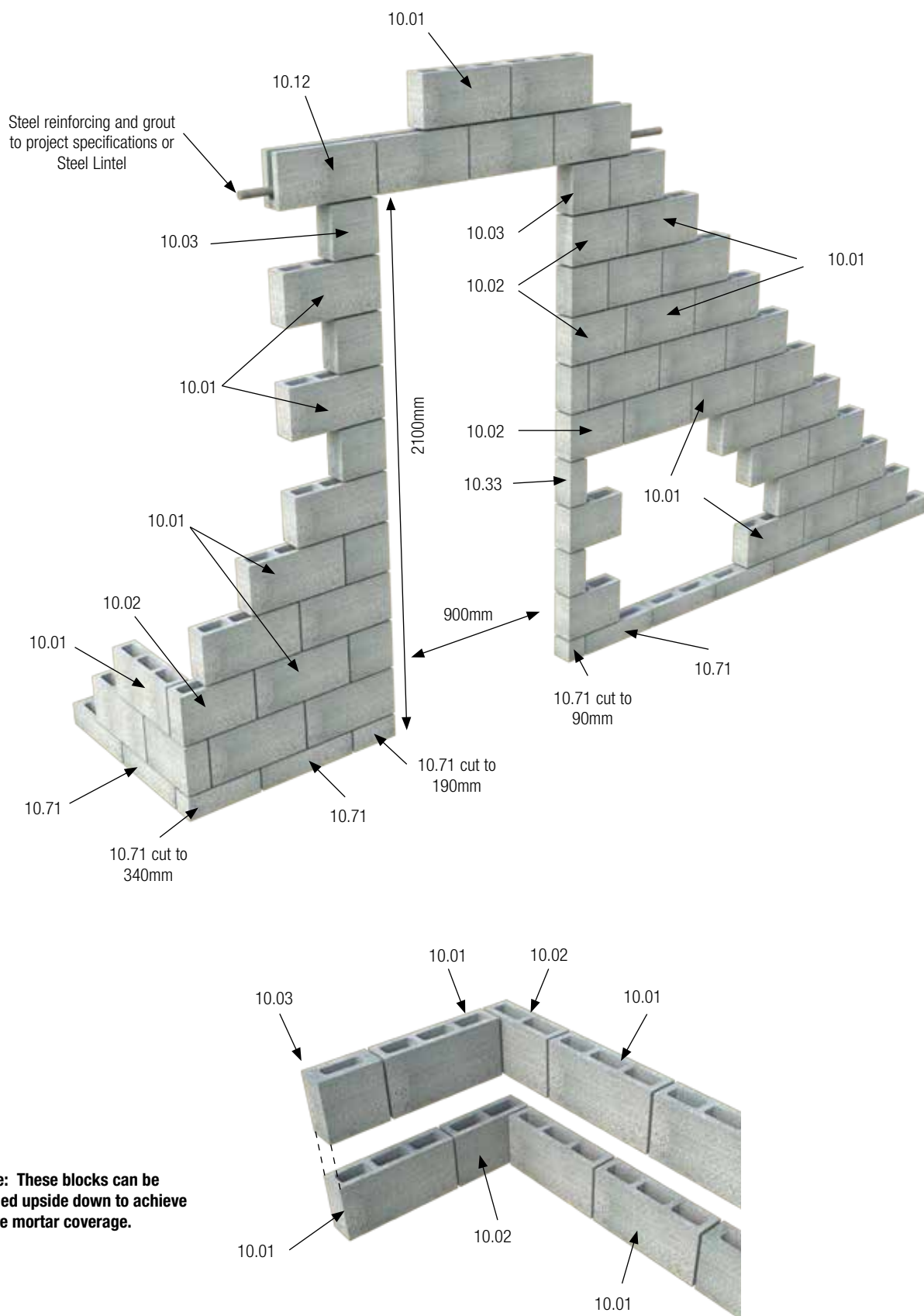
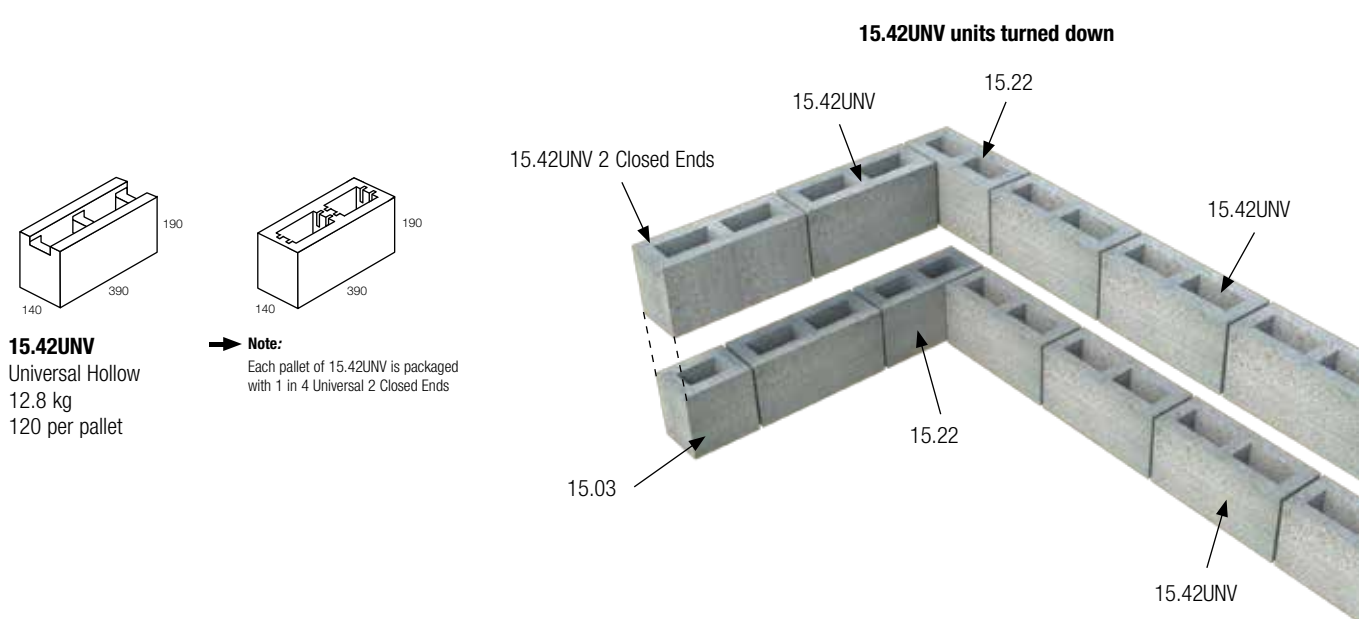


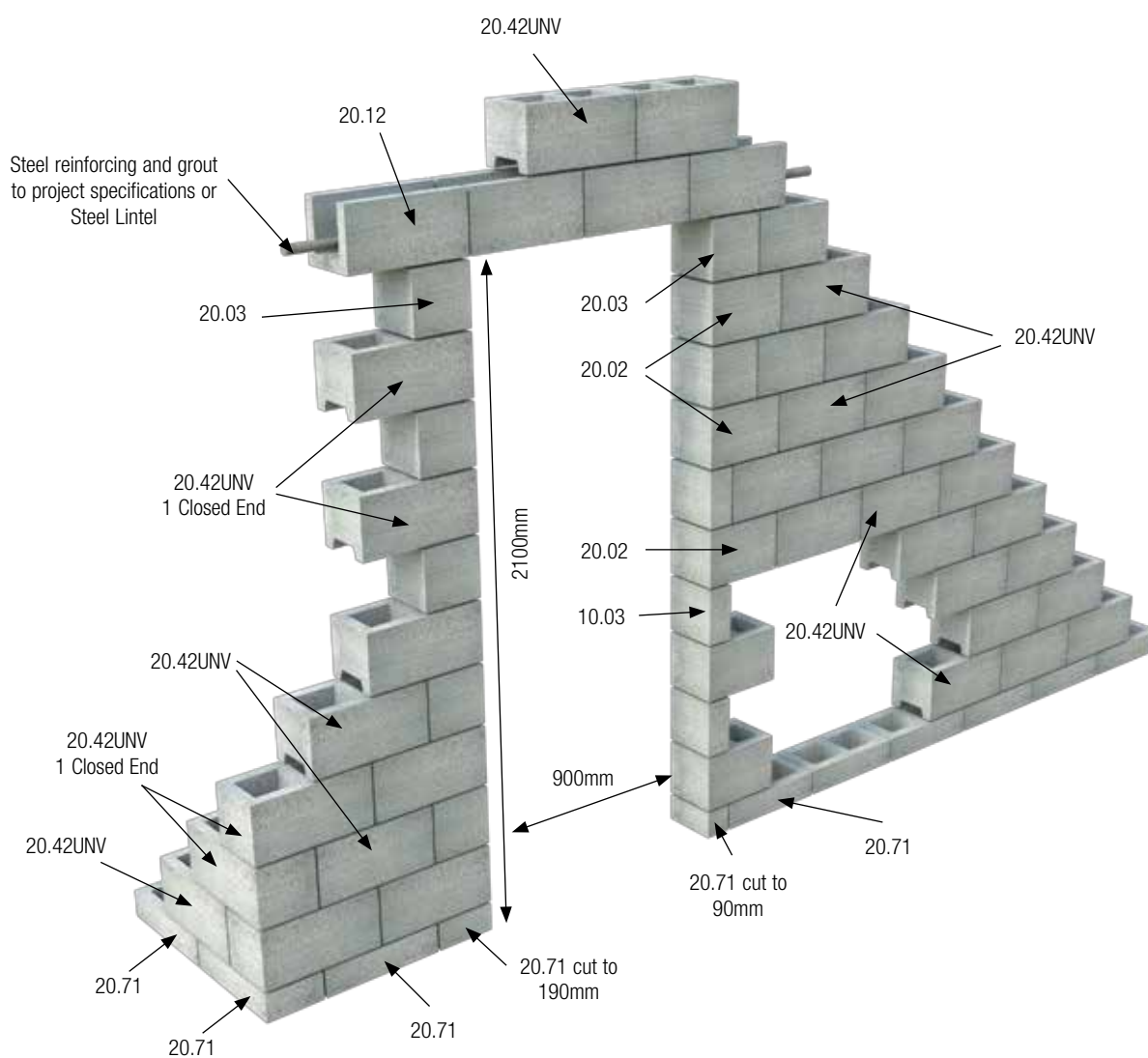
Fig D3 – Alternative Corner Bonding and Free End Detail for Series 100 Block

### Typical Component Usage - Series 150 Block

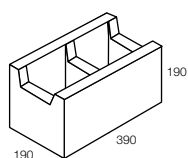


**Fig D4 – Corner Bonding and Free End Detail for Series 150 Block**

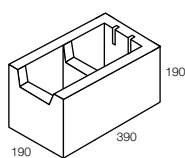
### Typical Component Usage - Series 200 Block



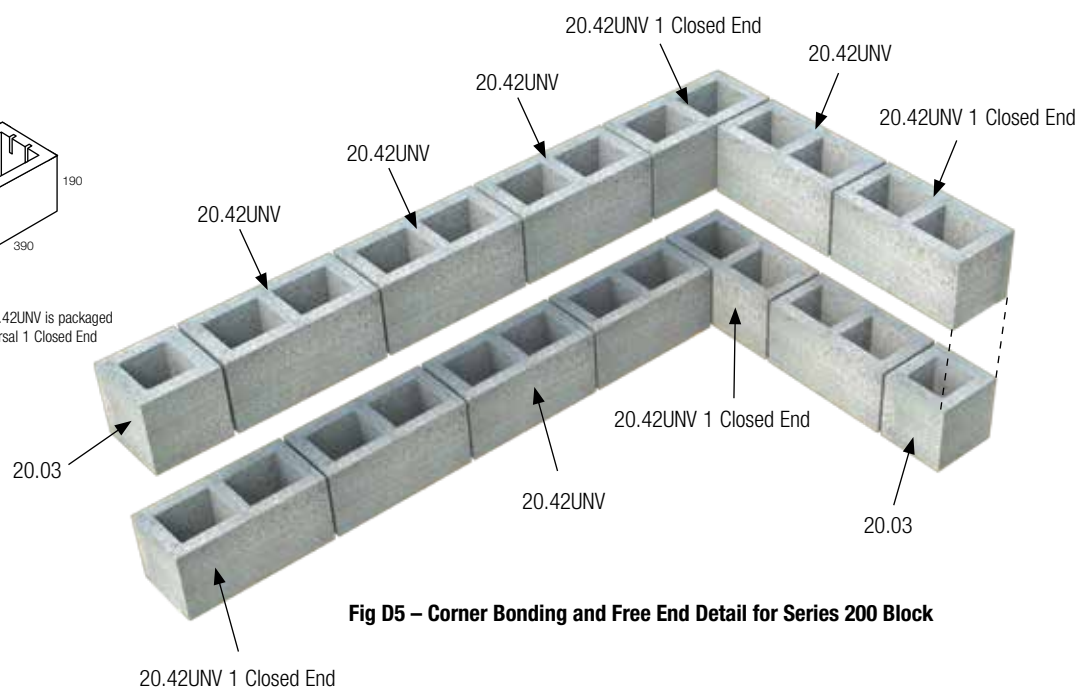
### 20.42UNV units turned down



**20.42UNV**  
Channel/Notch Block  
13.9 kg  
108 per pallet



➔ **Note:**  
Each pallet of 20.42UNV is packaged  
with 1 in 4 Universal 1 Closed End



**Fig D5 – Corner Bonding and Free End Detail for Series 200 Block**





# Core Filled Blocks

**MASONRY BLOCKS AND BRICKS**

## Core-Fill Block

For construction of reinforced masonry retaining walls and loadbearing walls requiring increased robustness characteristics. Available in standard grey or Designer Range colours. Available with smooth, honed, polished and split face textured finishes.

## Core-Fill Reinforced Retaining Walls

National Masonry® feature face core-fill blocks are designed for the construction of reinforced masonry retaining walls and loadbearing walls requiring increased robustness characteristics and where a feature face is required.

## Designer Range

### Face textures

Core-fill block is available with the following face texture finishes:

- Smooth face
- Honed face
- Polished face
- Split face
- Ends — honed or polished finishes.

### Colours

Designer Range is available in 7 colours. Customised colours and textures are also possible. Please note that extended lead times and minimum order quantities may apply.

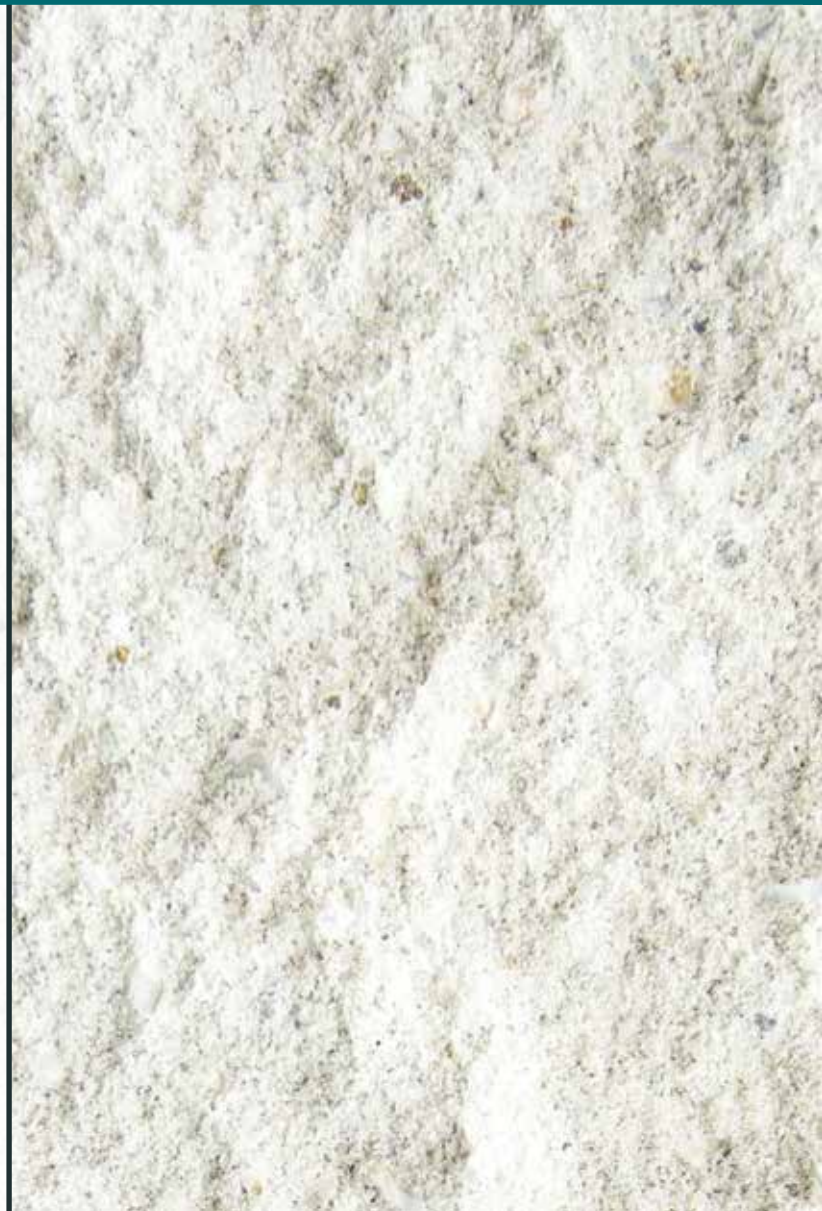
### Installation considerations

Hydrostatic pressure at the bottom of a freshly grouted core is very high, forcing water to seep out of the wall. This must be cleaned off. The admixture used with Designer Range will increase the time for the grout to firm and dry, therefore more care must be used inspecting and cleaning any seepage on the surface of these walls. Pours of 1.2m. maximum Lift (wall height) are recommended.

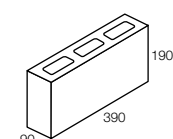
It is imperative that core-filled block work must be:

- a. poured when structure and mortar is dry.
- b. covered from rain during construction

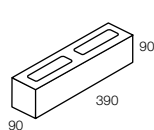
Failure to follow the above instructions highly increases the chance of efflorescence (Ref. Pages 14 & 15).



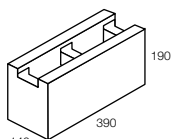
## Smooth, Split Face, Honed and Polished Face



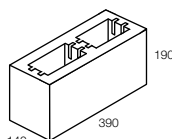
**10.01**  
Standard  
12.0 kg  
149 per pallet



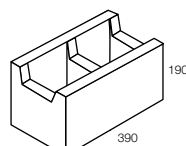
**10.71**  
Half Height Hollow  
5.6 kg  
300 per pallet



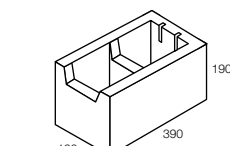
**15.20**  
Universal Hollow  
12.5 kg  
120 per pallet



**Note:** Each pallet of 15.20 is packaged with 1 in 4 Universal 2 Closed Ends

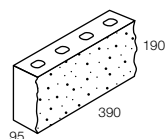


**20.20**  
Universal Hollow  
15.5 kg  
90 per pallet

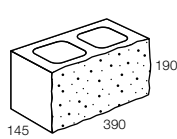


**Note:** Each pallet of 20.20 is packaged with 1 in 3 Universal 2 Closed Ends

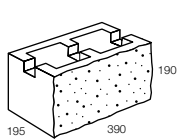
## Split Face



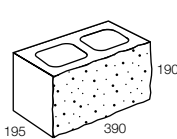
**10.101**  
Standard Split Face  
14.0 kg  
108 per pallet  
1 in 6 "universal" for ½ or ¾, to bolster on site.



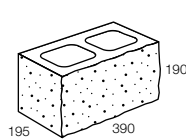
**15.101**  
Standard Split Face  
15.5 kg  
120 per pallet



**20.142**  
Channel  
17.0 kg  
90 per pallet



**20.101**  
Standard Split Face  
20.7 kg  
90 per pallet



**20.192**  
Split Corner  
21.9 kg  
72 per pallet







## Core-fill block - Standard Grey Block Series 150, 200 and 300

### Introduction

National Masonry® core-fill block is designed for the construction of reinforced masonry retaining walls and loadbearing basement walls requiring increased robustness characteristics.

### Construction considerations

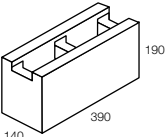
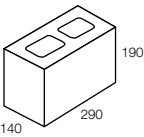
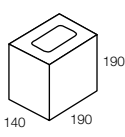
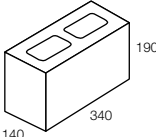
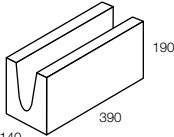
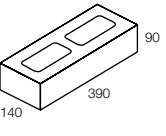
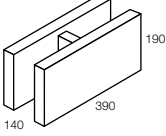
Before commencing placement of the grout, it is important that the cores should be clean and free of mortar 'dags' projecting into the core. A steel rod is pushed down the core to knock off these 'dags' and to break up any mortar that has dropped onto the footing. The cores are then hosed or swept out from the bottom of each core through the 'clean-out' space. The vertical steel rods are tied to the starter bars, and then the clean-out blocks are covered with formwork, ready for grouting (see 'retaining wall details' in book 1). An alternative method, which may be used in low height walls, is to leave a gap in the mortar bed at the bottom of each core and to hose out the dropped mortar and dags before the mortar has set.

When grouting series 150 blocks, lifts (block wall height) should be reduced to 800mm (4 courses) to ensure no voids are left in the wall.

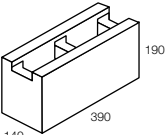
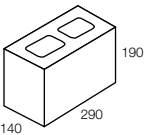
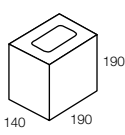
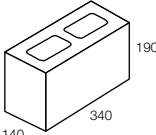
Due to the high hydrostatic pressure at the bottom of freshly grouted core, water will seep through the wall. This must be cleaned off. The admixture used with Designer Range will increase the time for the grout to firm and dry, therefore more care must be used inspecting and cleaning any seepage on the surface of these walls. Clean all grout spills before they set.

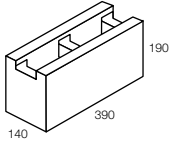


## 150mm Series - Hollow ( $f'_{uc} \geq 15\text{MPa}$ ) suitable for concrete filling

 <p><b>15.42UNV</b> Universal Hollow 12.8 kg 120 per pallet</p>	<p>➔ <b>Note:</b> Each pallet of 15.42UNV is packaged with 1 in 4 Universal 2 Closed Ends</p>	 <p><b>15.02AG</b> Three Quarter 10.3 kg 128 per pallet</p>	 <p><b>15.03AG</b> Half 7.2 kg 192 per pallet</p>	 <p><b>15.22AG</b> Corner Block 11.9 kg 108 per pallet</p>	 <p><b>15.12AG</b> Bond Beam 15.7 kg 96 per pallet</p>
 <p><b>15.71AG</b> Half Height Hollow 7.5 kg 216 per pallet</p>	 <p><b>15.48AG</b> 'H' Block 13.5 kg 120 per pallet</p>				

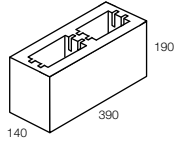
## 150mm Series - Light Weight Structural 120 minutes fire rating ( $f'_{uc} \geq 15\text{MPa}$ FRL = 120 $S_{rf} \leq 22.6$ ) suitable for concrete filling

 <p><b>15.20LWS</b> Light Weight 11.3 kg 144 per pallet</p>	<p>➔ <b>Note:</b> Each pallet of 15.20LWS is packaged with 1 in 4 Universal 2 Closed Ends</p>	 <p><b>15.02LWS</b> Three Quarter 9.4 kg 128 per pallet</p>	 <p><b>15.03LWS</b> Half 6.3 kg 192 per pallet</p>	 <p><b>15.22LWS</b> Corner Block 11.6 kg 108 per pallet</p>
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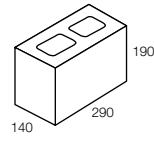
**200mm Series - Hollow** 60 minutes fire rating ( $f'_{uc} \geq 15\text{MPa}$  FRL = 60 Srf  $\leq 22.5$ ) suitable for concrete filling

**15.42UNV**  
Universal Hollow  
12.8 kg  
120 per pallet

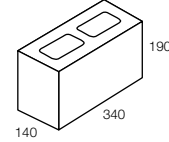
→ **Note:**  
Each pallet of 15.20LWS is packaged  
with 1 in 4 Universal 2 Closed Ends



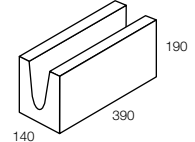
**15.02AG**  
Three Quarter  
10.3 kg  
128 per pallet



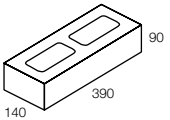
**15.03AG**  
Half  
7.2 kg  
192 per pallet



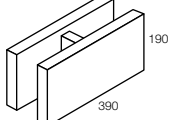
**15.22AG**  
Corner Block  
11.9 kg  
108 per pallet



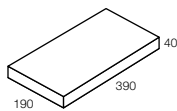
**15.12AG**  
Bond Beam  
15.7 kg  
96 per pallet



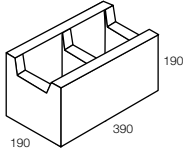
**15.71AG**  
Half Height Hollow  
7.5 kg  
216 per pallet



**15.48AG**  
'H' Block  
13.5 kg  
120 per pallet

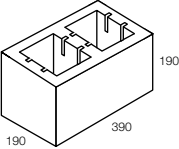


**Arenapave 190x390**  
Capping  
6.9 kg  
216 per pallet.

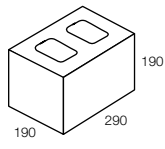
**200mm Series - Light Weight Structural** 120 minutes fire rating ( $f'_{uc} \geq 15\text{MPa}$  FRL = 120 Srf  $\leq 22.6$ ) suitable for concrete filling

**20.20LWS**  
Light Weight  
12.8 kg  
108 per pallet

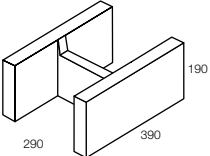
→ **Note:**  
Each pallet of 20.20LWS is packaged  
with 1 in 3 Universal 2 Closed Ends



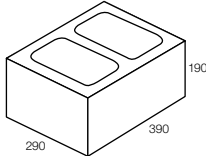
**20.02LWS**  
Three Quarter  
12.7 kg  
96 per pallet



**20.03LWS**  
Half  
8.3 kg  
144 per pallet

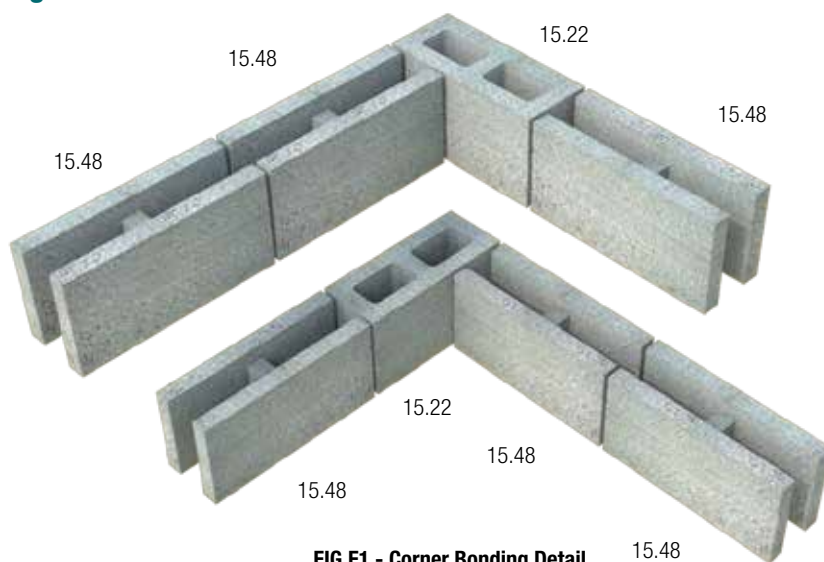
**300mm Series** ( $f'_{uc} \geq 15\text{MPa}$ )

**30.48AG**  
'H' Block  
19.6 kg  
72 per pallet

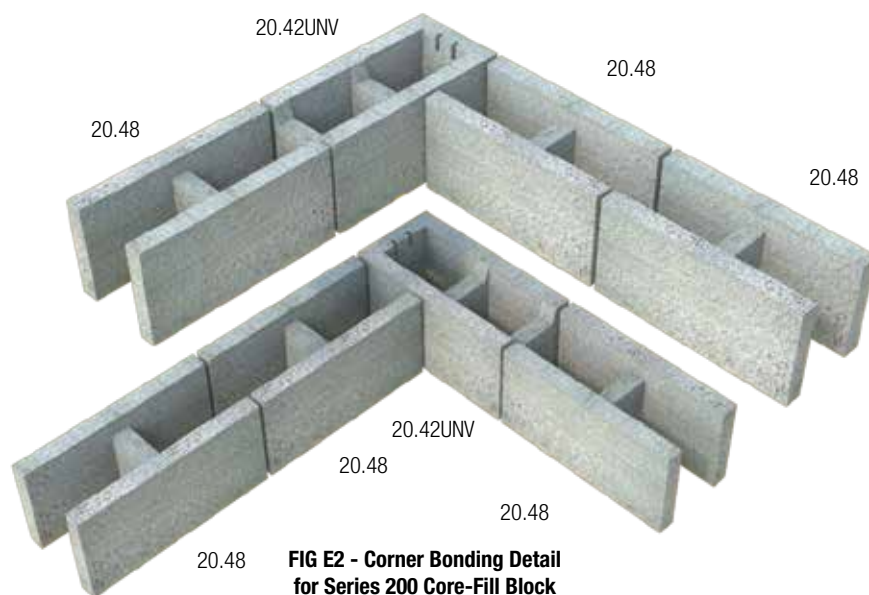


**30.01AG**  
Standard  
20.5 kg  
72 per pallet

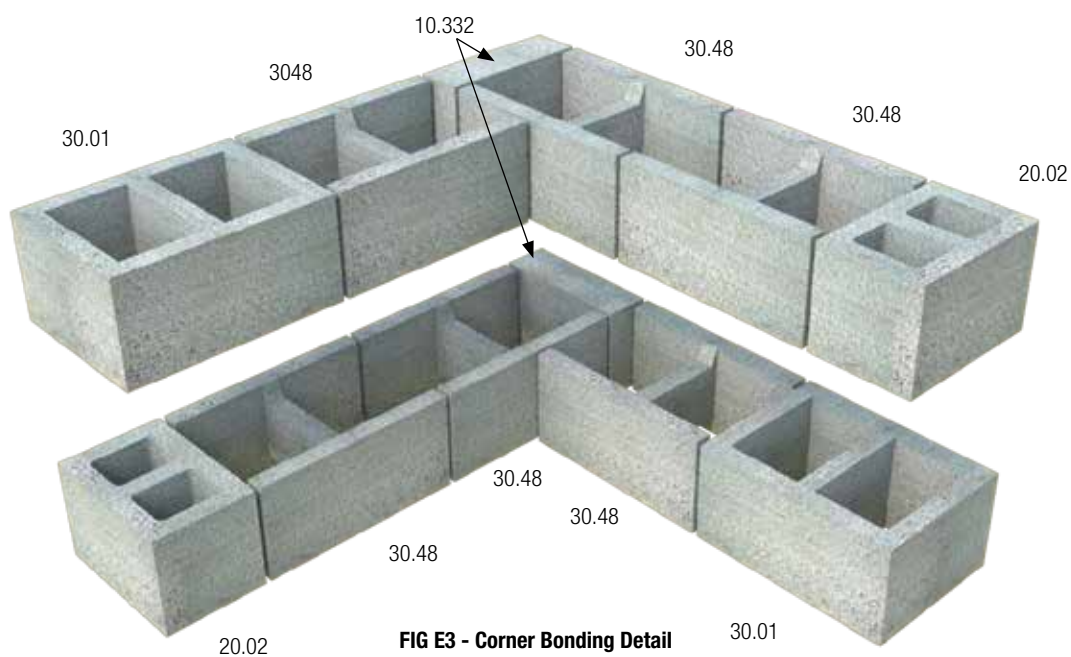
## Typical Component Usage - Core Filled



**FIG E1 - Corner Bonding Detail  
for Series 150 Core-Fill Block**



**FIG E2 - Corner Bonding Detail  
for Series 200 Core-Fill Block**



**FIG E3 - Corner Bonding Detail  
for Series 300 Core-Fill Block**

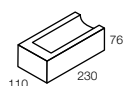




# Concrete Bricks

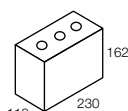
**MASONRY BLOCKS AND BRICKS**

## Render Bricks



### Standard Brick

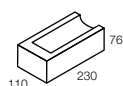
3.8 kg  
450 per pallet  
 $f'_{uc} \geq 10$  MPa Ash Grey  
1 in every 7 bricks  
made is solid



### Quick Brick

6.8 kg  
250 per pallet  
 $f'_{uc} \geq 4$  MPa

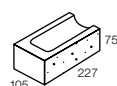
## Designer Range Brick



### Smooth Face

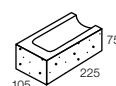
3.8 kg  
450 per pallet  
1 in every 7 bricks  
made is solid

## Aspect Range Polished & Honed Bricks



### Face Only

3.8 kg  
450 per pallet



### Face and End

3.8 kg

## Render Bricks

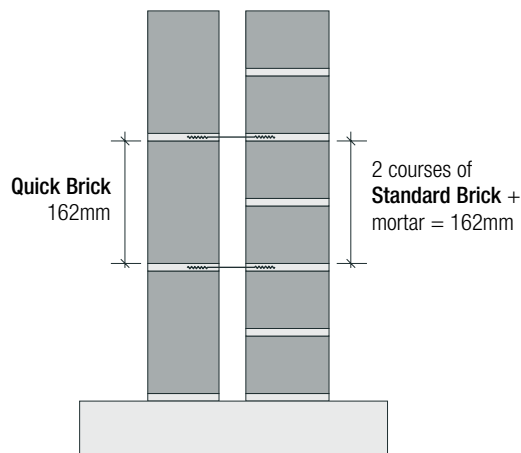
Standard Bricks (Ash Grey) provide good fire performance where minimising weight is not a primary consideration.

Standard bricks are a popular choice for walls in domestic and high-rise units with a rendered finish. They are also commonly used for loadbearing walls in 3-storey unit construction with plasterboard or render finish.

Quick bricks utilise a low-density blended concrete material which provides high fire rated performance together with medium weight.

Quick Brick is ideal for non-loadbearing applications such as walls in concrete framed office buildings and high-rise home units.

Quick Brick is 230mm long by 162mm high, equal to 2 courses of standard brick with mortar, making them a highly efficient and cost-effective construction component.



## Designer Range

Finely textured finish through the standard mould process.

Available in 5 standard colours.

## Aspect Range Polished & Honed

Polished and Honed bricks will give any modern project an innovative, stylish and distinctive look. Combining a colour palette to blend and highlight with many other building materials with subtle, yet distinctive hues of the polished/honed aggregate, the Aspect Range will be a highlight in any residential or commercial application.

Available in 4 colours.

## Designer Range Brick Colours

Alabaster



Sandune



Almond



Charcoal

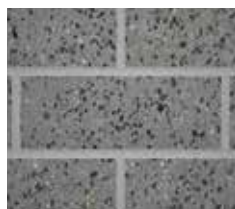


Pearl Grey

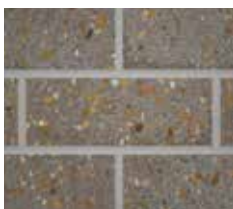


## Aspect Range Brick Colours

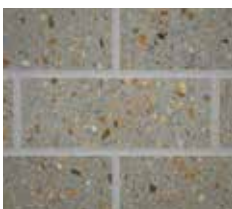
Carbon



Copper



Platinum

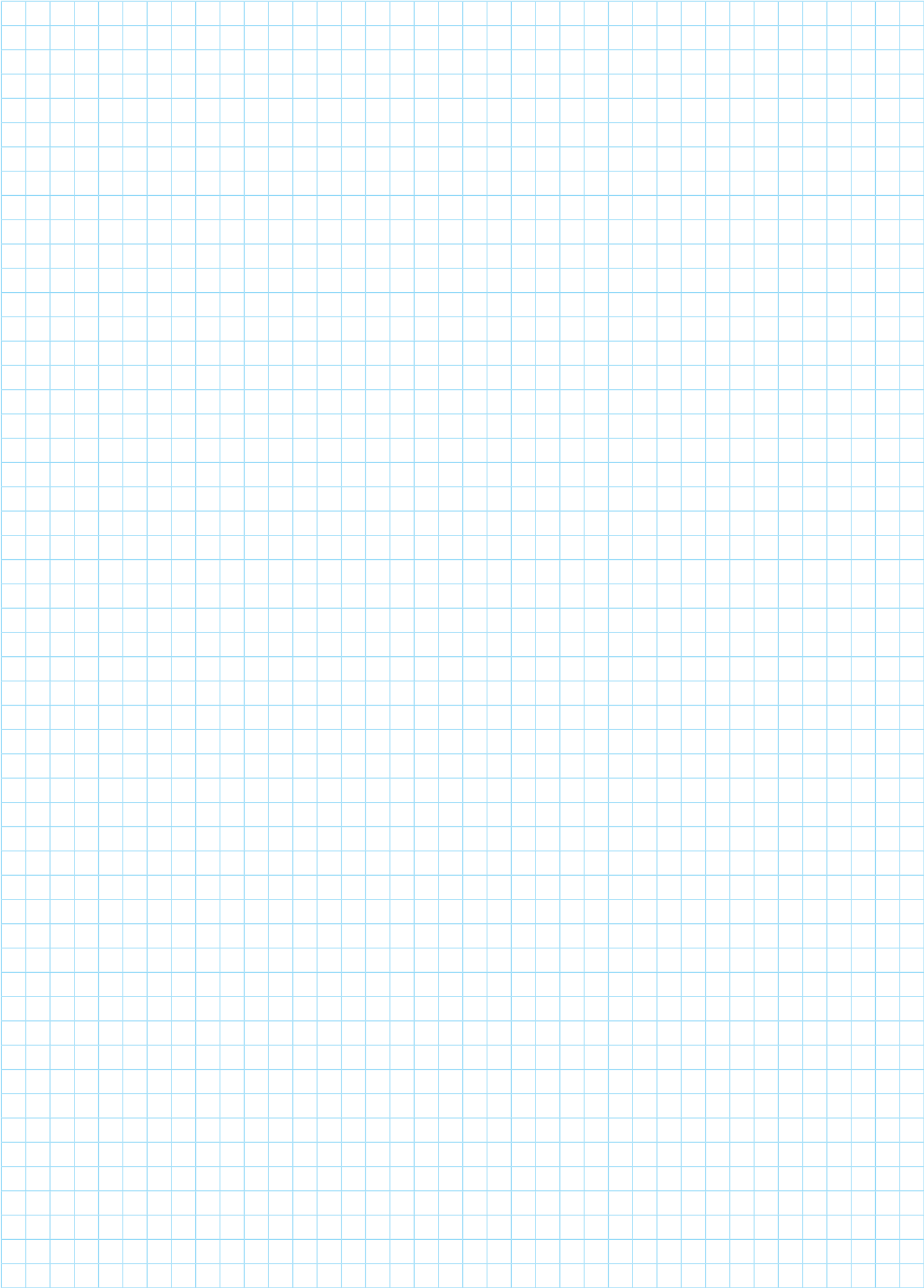


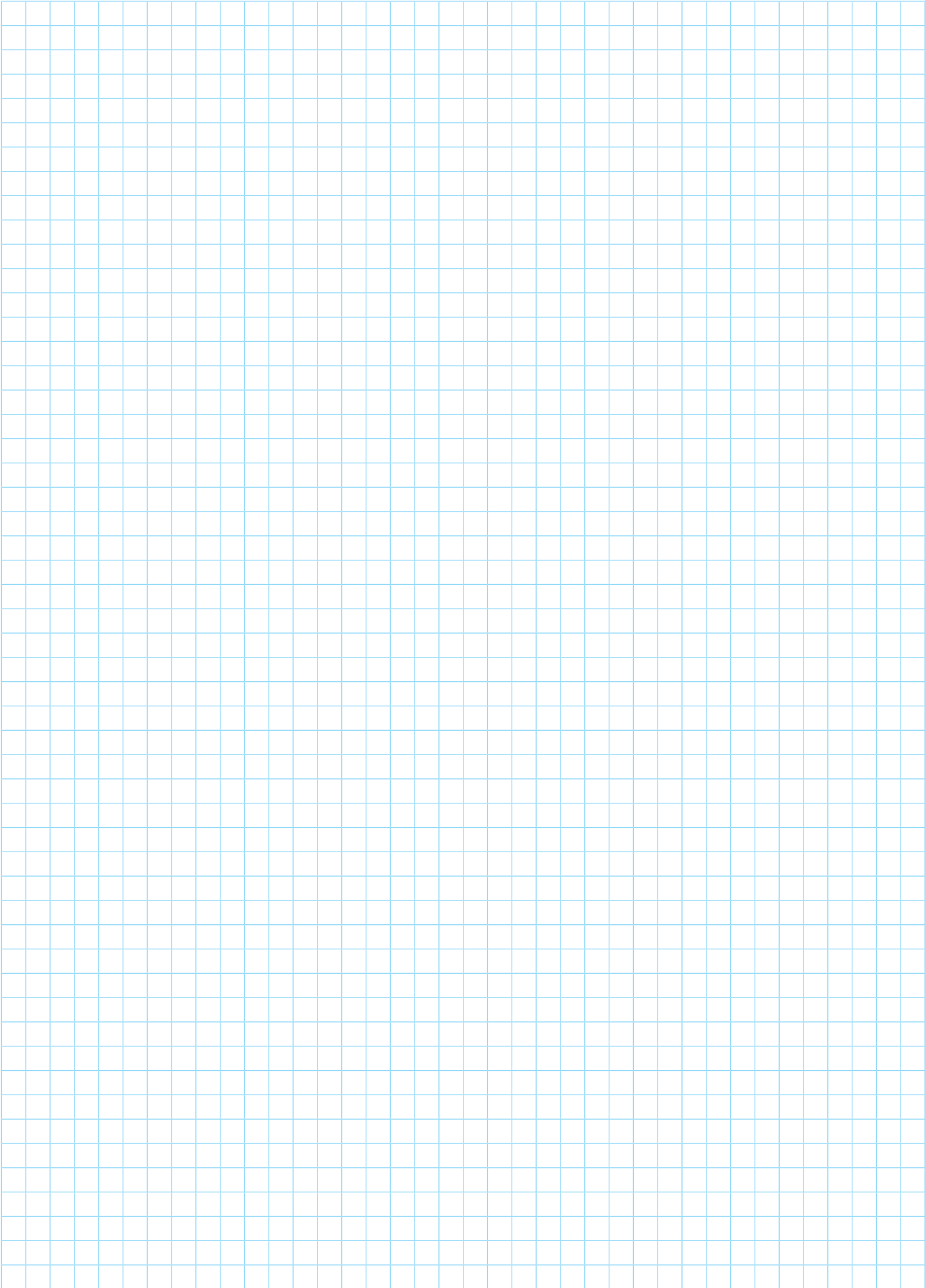
Titanium



Lined area for notes.









**All pallets remain the property of National Masonry®**

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Call the Victoria branch during office hours.

**(03) 9361 6443 or (03) 9361 6400**

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