MASONRY PRODUCTS

tcb mortarless

fast Up to **seven times faster** to lay than mortared masonry.

easy No mortar and no trowel means far **less skill required.**

clean No mortar means **no mess** – no sand, no cement bags, no mortar droppings, no site clean up.

all weather TCB Mortarless blocks can be laid when wet, and they **can be laid in the rain.**

code compliant TCB Mortarless blocks have been designed by engineers to provide proper cover to embedded reinforcement, meeting SAA Code requirements. This is an essential feature if long-term corrosion and spalling is to be avoided.

TCB Mortarless connectors have been designed to securely support all reinforcement in its correct location. Horizontal reinforcing bars are firmly held in position by the notches in the connectors. Vertical reinforcing bars are accurately held in position between the specially shaped base of the connectors and the horizontal bars.

better than the rest There are a number of mortarless block systems on the market in Australia, but none of them have all of the important features of TCB Mortarless.

TCB Mortarless provides an opportunity for builders, blocklayers, landscaping contractors and handymen to enjoy the numerous benefits of a mortarless block system without compromising structural adequacy, structural integrity or durability.

BUILDING BLOCKS FOR THE FUTURE

TCB Masonry Products
Web www.tcbmasonry.com Email email@tcbmasonry.com
Ph 07 4092 2086 Fax 07 4092 4361

MASONRY PRODUCTS

TCB Mortarless Blocks

Building Blocks for the Future

TCB Mortarless is an exciting new innovation in concrete block construction. With our specially-engineered mortarless block technology, load-bearing walls can be quickly and easily built, even by those without the skills and expertise of professional blocklayers.

TCB Mortarless offers the possibility of substantial savings in construction time and labour costs, and greatly reduces the waste associated with mixing mortar onsite. Unlike other similar systems, TCB Mortarless complies with SAA Codes and features significant new innovations to ensure maximum strength and reliability.

The strength and load bearing capacity of mortarless block walls is gained from the core filling grout, and all walls constructed with TCB Mortarless blocks must be fully grouted. All finished walls are therefore tantamount to reinforced concrete walls and are of far superior strength when compared to walls constructed with mortared hollow blocks or partially core filled blockwork.

Construction of walls using TCB Mortarless blocks is far quicker than construction of walls using traditional mortared blocks. Furthermore there is very little of the usual onsite mess (sand, cement bags, mortar droppings, etc) and the blocks can be laid wet or dry. In fact, TCB Mortarless blocks can even be laid in the rain if necessary!

Structural Features

There are a number of mortarless block systems available in Australia, but none have the full range of features of TCB Mortarless.

All load bearing walls constructed of mortarless blocks rely entirely on the core fill grout for their strength in resisting both axial and transverse loads. All walls constructed with TCB Mortarless blocks must therefore be core filled (grouted). Steel reinforcement is used to add strength both during and after construction, and as always it is essential to provide adequate concrete cover to reinforcement if long term corrosion is to be avoided in walls that are exposed to the elements. Most mortarless block systems do not provide adequate cover to the embedded reinforcement and hence walls constructed using the blocks do not comply with SAA Codes. TCB Mortarless blocks are the exception.

TCB Mortarless blocks have been designed by engineers to address this issue. The ends of the blocks have been especially shaped to ensure adequate grout cover, and the plastic connectors have been engineered to ensure that grout can readily and completely fill voids created by the shaped ends of the blocks. These are the predominant features that differentiate TCB Mortarless blocks from the rest of the mortarless blocks on the market and the importance of these features cannot be overstressed.

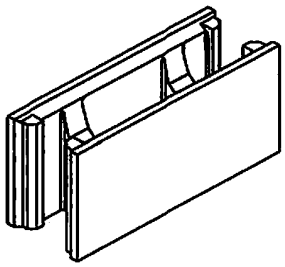
Another important feature of TCB Mortarless blocks is the large chamfer along the inside top edge of both side walls. These chamfers allow grout to fill under the bottom surface of the blocks in overlying courses and thereby maximise the effective load bearing width or thickness of walls constructed using the blocks.

TCB Masonry Products
Web www.tcbmasonry.com Email email@tcbmasonry.com
Ph 07 4092 2086 Fax 07 4092 4361

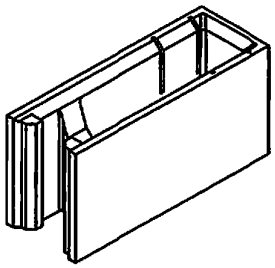
Product Range

TCB Mortarless blocks are presently available in 140 and 200 thicknesses. In both sizes the range of blocks is sufficient to construct straight walls, ends and corners for walls dimensioned in 200 increments both lengthwise and in height.

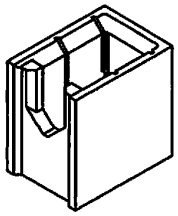
140 Series Mortarless



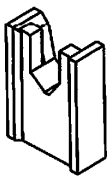
15.01M Stretcher
140W X 200H X 400L



15.02M Full End Block
140W X 200H X 400L



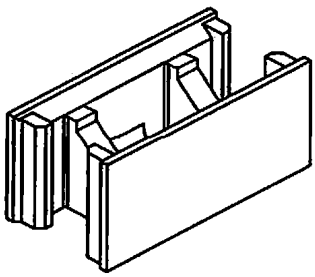
15.03M Half End
140W X 200H X 200L



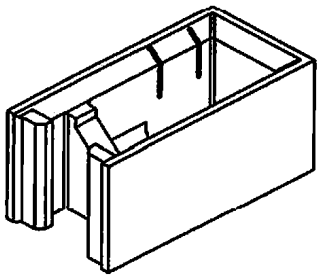
15.04M Corner Biscuit
140W X 200H X 60L

MLC Connector

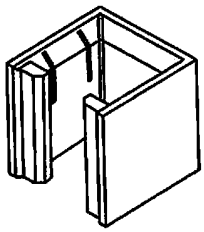
200 Series Mortarless



20.01M Stretcher
200W X 200H X 400L



20.02M Full End Block
200W X 200H X 400L



20.03M Half End
200W X 200H X 200L

MLC Connector

The full end blocks are used at all corners, and both the full end blocks and the half end blocks are used to construct ends of walls.

Planning and Construction Procedure

1. Dimensioning

Dimension wall lengths in 200mm increments.

Dimension wall heights in 200mm increments. This can be manipulated to some extent by laying the first course in a bed of mortar of a particular thickness, e.g. a 10mm mortar bed for the first course will add 10mm to the height of a wall. This can be very helpful for walls with door openings.

Be aware that the 200 mortarless block is in fact 200mm wide and not 190, and this will not suit the commonly available metal door frames. The 140 mortarless block is however 140mm wide and this will suit commonly available metal door frames.

The positioning of openings and the dimensions of opening widths should suit the 200mm module of the blocks. To a certain extent however blocks can be cut to length to suit an opening width, provided the structural integrity of the blocks is not impaired and provided the sides of the opening are shuttered up prior to grouting.

2. Starter Bars

Set out starter bars to coincide with the perpends in the wall. (Note: perpends are the joints between the ends of two adjacent blocks.)

The perpends always occur at multiples of 200mm and therefore in any wall the starter bars should be set out at multiples of 200mm starting at the end of the wall. There is one exception however: if the end of the wall is a corner then the first starter bar should NOT be positioned 200 from the end. It should be re-positioned to just 100 from the end or it should be omitted.

As a check, all starter bars, except corner bars, should pass through a plastic connector in either the first course or the second course of blockwork.

Accurate positioning of the starter bars is required to satisfy the engineer's requirements. The vertical bars in many walls will be centrally positioned in the wall thickness and this means that the starter bars should also be centrally positioned. However, in walls designed for flexure, such as cantilever retaining walls, the structural engineer will require the vertical reinforcement to located towards one face of the wall with a specified cover, and it is important that the starter bars be accurately installed accordingly.

In many cases it will be permissible to drill in starter bars after the footing or slab has been poured, and to set them in epoxy resin. This is definitely the easiest way to ensure they are in the correct location to suit the wall as they can be drilled in after the walls have been set out, and in fact they can be drilled in after the first course has been laid.

When the vertical bars are in walls designed for flexure however, such as cantilever retaining walls, then it is recommended that the starter bars be cast into the base slab or footing with a suitable cog at the embedded end for anchorage. Such starter bars should be accurately and firmly tied in position prior to placing concrete, and the concrete should be fully compacted around them using mechanical vibration.

Note however that if the structure being built could alternatively be built in mortared masonry without vertical reinforcement, then there is no requirement for starter bars in the TCB Mortarless block walls. Vertical bars in the grouted cores can simply sit on top of the footing or slab.

3. Laying Blocks

It will generally be necessary to set the first course of blocks in a mortar bed, but if the footing or base slab is precisely finished to an accurate level then this is not essential. Be aware however that if there is any unevenness or variation in level whatsoever it will be reflected throughout the entire height of the wall.

When laying the first course in mortar ensure that there is no mortar in the perpends as any mortar in the perpends will cause the length of the wall to grow and this will cause a problem in subsequent courses.

Prior to commencing laying of the first course, accurately set out all of the walls and mark all ends and corners. Whenever possible mark the line of the face of the wall using a chalk line.

Lay the blocks from both ends meeting somewhere at about mid length. If the set-out is accurately marked and the blocks are laid as described above, then the last block will slip snugly into place without the need for being forcefully installed.

The end blocks and half blocks contain slots for knock-outs. When constructing a corner, knock out the appropriate side of each end block so that a plastic connector can be installed to tie it to the end stretcher block in the intersecting wall. This applies to the first course and all subsequent courses. Failure to install connectors at corners could result in blocks becoming displaced during grouting.

When the first course is fully laid, install the plastic connectors at all perpends.

Build up the ends and corners of the walls true to a plumb line on all faces, ensuring all blocks are laid with tight perpends and ensuring all perpends are tied with plastic connectors. Install horizontal reinforcement as required by the engineer. Do not neglect to install corner bars and lap bars when building up ends and corners.

Note that when constructing an end to a straight length of wall, the last block in each course will alternately be a full end block or a half end block.

When constructing a corner in a 200 block wall, one full end block will be required in each course. A stretcher block will always butt against the side of the full end block to complete the corner, and the side of the full end block will need to be knocked out so that a connector can be installed to connect it to the stretcher block.

When constructing a corner in a 140 block wall, one full end block and one biscuit will be required on each course. The side of the full end block should be knocked out even though the plastic connector will only connect the end of the stretcher block to the biscuit. The knock out is required for the continuity of grout and the installation of L bars that lap with the horizontal reinforcement.

Use a string line stretched between the ends or corners of each length of wall to align the top corner of each block, and fill in each course of blocks maintaining tight perpends between all blocks. After the course is laid, install a connector at each perpend. Repeat this procedure on subsequent courses ensuring always that the perpends are tight and that the horizontal reinforcing bars are installed at the specified intervals.

If the gap for the final block on any course is too tight, starting at one end and then the other move each block in the course away from the gap to take up any slack in the perpends and then install the final block. Do not use a hammer to knock the final block into position.

When placing each block use the wedge provided with each connector if necessary to adjust its plumb line or its level. These can be used to lift the block on one side or to lift it at one end as and if required.

Sometimes it will be necessary to tap a block sideways to align it with the block below or with the block at one or both ends. DO NOT USE A HAMMER for this as it can fracture the block. Be aware that any fractured blocks that go undetected may blow out during grouting. When it is necessary to tap the block sideways, use an open palm of the hand or use the edge of a clenched fist to move the block.

Make all necessary adjustments to the blocks in one course prior to laying blocks in the next course.

Follow the above procedure for laying blocks in each course until the wall has reached grouting height.

Plug any voids created by chips to prevent grout spilling out of the wall. Use 1:6 (cement:sand) mortar for plugging the gaps.

4. Reinforcement

Refer to the engineer's drawings for reinforcement requirements, and see above for set-out and installation of starter bars.

All reinforcement bars for mortarless block walls should be straight or there will be serious issues when it comes to installation. Reject any bent bars.

All vertical bars with the exception of any corner bars should be aligned with perpends and should therefore pass through the plastic connectors. All vertical bars should also lap with starter bars, therefore it is necessary to mark the positions of starter bars for future reference when installing vertical bars in subsequent lifts of the wall.

Horizontal reinforcement should be installed to the engineer's specification, but in any case it is recommended that horizontal reinforcement be installed at maximum 600mm centres. The plastic connectors are castellated to firmly hold N12 bars in position and it is recommended that all horizontal reinforcement consist of N12 bars.

Push horizontal bars into a notch in the connector to secure it in a position; this will help support the vertical reinforcement in its specified position.

Install 1000 x 1000L bars in corners and lap minimum 600mm with horizontal bars beyond the corner.

Install 1000 x 400L bars at T intersections and lap the 1000mm leg 600 with the horizontal bars in the wall that terminates at the intersection.

After the wall is completed to the required height for grouting, install the vertical bars in the specified position with respect to the outside face of the blockwork. If the wall has been properly constructed, the vertical bars should be firmly held in their correct position by the horizontal bars and the plastic connectors.

When vertical bars are to be located centrally, they should be held in position by alternating rows of horizontal bars.

When vertical bars are to be located on one side or the other, they should be held in position by a horizontal bar on one side and the connector on the other side.

Note that vertical bars should extend at least 600mm beyond the top of the blockwork in a section of the wall for lapping with vertical bars in the subsequent section of wall.

5. Core Filling (Grouting)

Always use specially formulated grout. This should have a maximum 7mm aggregate and it should have about 230mm slump. A minimum 20MPa compressive strength (f'_c) is recommended but always comply with the structural engineer's specification.

It is recommended that walls be grouted in maximum lifts of 1.4m (7 courses). As with any block wall, the higher the wall being grouted the greater the pressure of the wet grout and the greater the risk of a blow out during grouting.

Anyone constructing a wall must also be very mindful of the need to maintain a safe workplace. Stability becomes an increasingly greater concern as the wall height increases, and tall walls will generally require temporary support during construction.

Always rod the grout to ensure proper compaction. Do not use mechanical vibration as this could fracture the blocks and result in blow outs during grouting.

Always be prepared for an unexpected blow out or two. Keep materials on hand so that blow outs can be remedied quickly without unduly delaying the grouting procedure.

Upon completion of each grouting operation always clean off the top edges of the block to ensure there will be no issues when the subsequent course of blocks is laid. Also check that none of the blocks in the top course have been displaced laterally, that all of the connectors are pushed down onto their seating, and that the four projecting posts of each connector are free of grout.

Further Enquiries to:

TCB Masonry Products
Web www.tcbmasonry.com Email email@tcbmasonry.com
Ph **07 4092 2086** Fax **07 4092 4361**