1.2 Concrete Masonry Wall Units

Concrete Masonry Units are required to meet the requirements of Australian/New Zealand Standard AS/NZS 4455 Part 1 Masonry units, pavers, flags and segmental retaining wall units - Masonry units. The specification requirements of this document are contained in Section 1.7. Specification information for concrete bricks is presented in Section 5.3.

Definitions

The following definitions are in common usage.

- **Masonry** - any construction in units of concrete laid to a bond and joined together with mortar.
- **Face Shells** - walls of a masonry unit connected by a web and normally laid vertically.
- **Gross Cross-sectional Area** - total plan area parallel to the bedding surface including cells and re-entrant spaces.
- **Hollow Masonry Unit** – a unit with cores, intended to be laid with its faces vertical.
- **Lightweight Masonry Unit** – a unit with a dry density of less than 1,850 kg/m³.
- **Net Cross-sectional Area** - the gross plan area less the area of cells and re-entrant spaces.
- **Nominal Dimensions** – unit dimensions defining block size inclusive of the 10 mm mortar joint.
- **Normal Weight Masonry Unit** - a unit with a dry density greater than 1,850 kg/m³.
- **Solid Masonry Unit** – a unit with any recesses being not greater than 10% of gross volume.
- **Web** – a cross partition connecting face shells within a hollow masonry unit.

**Block Types**

- **Plain Face Blocks** - have a relatively smooth face texture and are typical of most standard masonry.
- **Split Face** – Veneer or structural units double moulded and mechanically split to form a rough textured face. Some structural units are available with split ends to form corners.
- **Rumbled Units** – veneers and some paving units with induced spalling at corners due to block to block contact in a rotating drum.
- **Screen Blocks** – units with large voids used as a wind break instead of a solid wall. They have decorative features arising from the pattern of voids.
- **Interlocking Paving** – units when laid provide a structural wearing surface for footpaths, residential driveways, patios, suburban roads and industrial applications. (See Section 7).
- **Flagstone Paving** – units with gross plan area greater than 0.08 m² laid to provide a wearing surface for footpaths and residential driveways. (See Section 7).
- **Turfed Paving** – units manufactured with voids to be filled with topsoil and grassed as an option for parking on a lawn. Also used as an option for permeable paving. (See Section 7).
- **Custom Masonry** – many masonry options are available offering alternative face shell effects with variations to texture and colour.
- **Pilaster and Column Blocks** – hollow units within a masonry wall which are filled with grout to form a vertical reinforced column.
- **Bondbeam** – a unit designed to include horizontal reinforcing and be grouted to form a beam.

**Block Numbering System**

Several different numbering or coding systems are used for concrete masonry units in many countries. The New Zealand Concrete Masonry Association has established the following national coding system for use by designers, specifiers, merchants, blocklayers and member companies of NZCMA.

The system is basically numerical with letters indicating variations of particular numerically coded units. Each code reference is in two numerical sections - the first refers to nominal unit width and the second to type of unit.

All units are nominal 200 mm height (190 mm actual) unless prefixed with T, H, or Q which respectively denote three-quarter height (150 nominal, 140 actual) or half height (100 nominal, 90...
actual) units. When a block is suffixed H it indicates the special plan shape of the block which represents an H form with two open ends.

The following code covers standard block types currently in production in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

### Coding Examples:

From the above code, unit reference 20.05 denotes 200 mm nominal width, open end unit.

Reference 15.15 Left denotes 150 mm nominal width left handed corner bond beam.

Reference H20.04 denotes 200 mm nominal width half-height plain end whole unit.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Reference Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td></td>
<td></td>
<td>Three-quarter height</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td>Half-height</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td>Thick wall-fire rated block</td>
</tr>
<tr>
<td></td>
<td>10.</td>
<td></td>
<td>100 mm nominal width</td>
</tr>
<tr>
<td></td>
<td>15.</td>
<td></td>
<td>150 mm nominal width</td>
</tr>
<tr>
<td></td>
<td>20.</td>
<td></td>
<td>200 mm nominal width</td>
</tr>
<tr>
<td></td>
<td>25.</td>
<td></td>
<td>250 mm nominal width</td>
</tr>
<tr>
<td></td>
<td>30.</td>
<td></td>
<td>300 mm nominal width</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td></td>
<td>Standard whole</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td></td>
<td>Half</td>
</tr>
<tr>
<td></td>
<td>03</td>
<td></td>
<td>Corner</td>
</tr>
<tr>
<td></td>
<td>04</td>
<td></td>
<td>Plain ends</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td></td>
<td>Open end</td>
</tr>
<tr>
<td></td>
<td>08</td>
<td></td>
<td>Sill</td>
</tr>
<tr>
<td></td>
<td>09</td>
<td></td>
<td>Rebate whole</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
<td>Rebate half</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td></td>
<td>Rebated lintel</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td></td>
<td>Lintel &amp; half end-closer</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td></td>
<td>Deep lintel &amp;full end-closer</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td></td>
<td>Knock in bond beam</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td></td>
<td>Corner bond beam</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
<td>One open end bond depressed web/clean out</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td></td>
<td>Solid whole</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td></td>
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<td></td>
<td>19</td>
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<tr>
<td></td>
<td>23</td>
<td></td>
<td>Channel bond beam</td>
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<tr>
<td></td>
<td>24</td>
<td></td>
<td>Channel open bond beam</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td></td>
<td>Half single bull nose</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td></td>
<td>Whole single bull nose</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td></td>
<td>Half double bull nose</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td></td>
<td>Whole double bull nose</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td></td>
<td>Standard 200 mm pier</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td></td>
<td>Control joint</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td></td>
<td>L pier square end</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td></td>
<td>Pilaster C type</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td></td>
<td>Pilaster H type</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td></td>
<td>Half knock-in bond beam</td>
</tr>
<tr>
<td></td>
<td>45</td>
<td></td>
<td>Header</td>
</tr>
<tr>
<td></td>
<td>64</td>
<td></td>
<td>Capping block</td>
</tr>
</tbody>
</table>

Units available in alternative forms, (e.g. left or right) are to be defined by a suffix note.
Concrete Block Series

The full graphic descriptions of the block types listed in the block number system are set out in this section. Many of the block types in the full listing are not normally in standard production, since utilisation may be very infrequent.

The blocks listed below are those which are predominantly in standard production. A restricted number of these types are available as half high units.

BEFORE SPECIFYING BLOCK TYPES, a check with potential supplies to the area of construction should be made. All manufacturers have a current production range publication.

Some manufacturers have introduced a block which is an H configuration for the construction which requires solid filling. It would be used as an alternative to 20.16. The advantages of these blocks relates to providing greater vertical cell areas and avoiding back to back problems when using the 20.16 units with reinforcement spaced at 600 mm centres. Solid fill structural masonry in the United States makes significant use of this block shape which is illustrated below.

<table>
<thead>
<tr>
<th>20 Series</th>
<th>15 Series</th>
<th>10 Series</th>
<th>25 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.01</td>
<td>15.01</td>
<td>10.01</td>
<td>25.01*</td>
</tr>
<tr>
<td>20.02*</td>
<td>15.02*</td>
<td>10.02</td>
<td>25.02*</td>
</tr>
<tr>
<td>20.03*</td>
<td>15.03</td>
<td>10.03</td>
<td>25.04*</td>
</tr>
<tr>
<td>20.04</td>
<td>15.04</td>
<td>10.05</td>
<td>25.05*</td>
</tr>
<tr>
<td>20.05</td>
<td>15.05</td>
<td>10.08*</td>
<td>25.11*</td>
</tr>
<tr>
<td>20.08</td>
<td>15.12</td>
<td>10.14</td>
<td>25.12</td>
</tr>
<tr>
<td>20.09*</td>
<td>15.14</td>
<td>10.17</td>
<td>25.14</td>
</tr>
<tr>
<td>20.10*</td>
<td>15.15</td>
<td>10.30*</td>
<td>25.15*</td>
</tr>
<tr>
<td>20.11*</td>
<td>15.16*</td>
<td></td>
<td>25.16*</td>
</tr>
<tr>
<td>20.12</td>
<td>15.16H*</td>
<td></td>
<td>25.16H*</td>
</tr>
<tr>
<td>20.13*</td>
<td>15.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.14</td>
<td>15.30*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.15</td>
<td>15.35*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * Not all NZCMA members produce this block or all the variations of rebate, end shape, etc.
# The 15.16H, 20.16H and 25.16H blocks are manufactured by Mitchell Concrete Limited. The 20.16H block is also manufactured by Holcim (New Zealand) Limited. Firth Industries will manufacture to order.

NZCMA Member Companies

To confirm availability of block types, NZCMA Members can be contacted at the following links:

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Email/Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aitkens Concrete Limited</td>
<td>Gisborne</td>
<td><a href="mailto:ailcon@xtra.co.nz">ailcon@xtra.co.nz</a></td>
</tr>
<tr>
<td>Bay of Plenty Cobble Company</td>
<td>Tauranga</td>
<td><a href="http://www.bopcobblecompany.co.nz">www.bopcobblecompany.co.nz</a></td>
</tr>
<tr>
<td>Firth Industries</td>
<td>Various Locations</td>
<td><a href="http://www.firth.co.nz">www.firth.co.nz</a></td>
</tr>
<tr>
<td>Holcim (New Zealand) Limited</td>
<td>Various Locations</td>
<td><a href="http://www.holcim.co.nz">www.holcim.co.nz</a></td>
</tr>
<tr>
<td>Horizon International Limited</td>
<td>Various Locations</td>
<td><a href="http://www.horizoninternational.co.nz">www.horizoninternational.co.nz</a></td>
</tr>
<tr>
<td>Mitchell Concrete Limited</td>
<td>Taranaki</td>
<td><a href="mailto:mitchellconrete@xtra.co.nz">mitchellconrete@xtra.co.nz</a></td>
</tr>
<tr>
<td>Oamaru Shingle Supplies</td>
<td>Oamaru</td>
<td><a href="http://www.oamarushingle.co.nz">www.oamarushingle.co.nz</a></td>
</tr>
<tr>
<td>Upper Hutt Masonry</td>
<td>Upper Hutt</td>
<td><a href="mailto:blocks@567.co.nz">blocks@567.co.nz</a></td>
</tr>
</tbody>
</table>
10 Series

These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

10.01 Standard whole
(also available with two cores)

10.02 Half
(also known as 20.18)

10.03 Corner

10.05 Open end

10.08* Small

10.12 Lintel & half end-closer

10.14 Knock-in bond beam

10.17 Solid whole

10.19* Three Quarter
(also known as 30.18)

10.23 Channel bond beam

10.30* Standard 200 mm pier

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.
H10 Series

These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **H 10.01* Standard whole** (also available with two cores)
- **H 10.02* Half** (also known as H 20.18)
- **H 10.03* Corner**

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see *NZCMA Member Companies* on page 3 of this section.
15 Series

These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **15.01** Standard whole
- **15.02** Half (frog)
- **15.02** Half (also known as 20.20)
- **15.03** Corner
- **15.04** Plain ends
- **15.04** Plain end (frog)
- **15.05** Open end
- **15.08** Sill (projecting)
- **15.08** Sill (flush)
- **15.09** Rebate whole
- **15.11** Rebated lintel
- **15.12** Lintel & half end-closer

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.
These diagrams cover standard block types currently in production in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **15.13** Deep lintel & full end-closer
- **15.14** Knock-in bond beam (also available with one open end)
- **15.15** Corner bond beam, right hand (left hand also available)
- **15.16** Open end bond beam, depressed web
- **15.16H** Depressed web solid fill H shape
- **15.17** Solid whole
- **15.19** Three quarter (also known as 30.20)
- **15.24** Channel open end bond beam
- **15.30** Standard 200 mm pier, right hand (left hand also available)
- **15.32** Control joint

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.

* The 15.16H Block is manufactured by Mitchell Concrete Limited and Holcim (New Zealand) Limited. Firth Industries will manufacture to order.
These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

15.64
Capping block (overlapping)

15.64
Capping block (flush)

15.35*
Pilaster H type

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.
H 15 Series

These diagrams cover standard block types currently in production in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **H 15.01***: Standard whole
- **H 15.02***: Half (frog)
- **H 15.02***: Half
- **H 15.03***: Corner
- **H 15.04***: Plain ends
- **H 15.04***: Plain end (frog)
- **H 15.08***: Sill (projecting)

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see *NZCMA Member Companies* on page 3 of this section.
20 Series

These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.
These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **20.13**
  Deep lintel & full end-closer (rebated)

- **20.13**
  Deep lintel & full end-closer

- **20.14**
  Knock-in bond beam

- **20.15**
  Corner bond beam

- **20.16**
  Right hand clean out (left hand also available)

- **20.16**
  Open end bond beam, Depressed web

- **20.16H**
  Depressed web solid fill H shape

- **20.17**
  Solid whole

- **20.19**
  Three quarter (also known as 30.02)

- **20.23**
  Channel bond beam

- **20.26**
  Half single bull nose

- **20.27**
  Whole single bull nose

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.

* The 20.16H Block is manufactured by Mitchell Concrete Limited and Holcim (New Zealand) Limited. Firth Industries will manufacture to order.
These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **20.28**
  Half double nose

- **20.30**
  Standard 200 mm pier

- **20.32**
  Control joint

- **20.33**
  ‘L’ pier, square end

- **20.35**
  Pilaster H type

- **20.45**
  Header

- **20.64**
  Capping block

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see *NZCMA Member Companies* on page 3 of this section.
H 20 Series

These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **H 20.01***
  - Standard whole

- **H 20.02***
  - Half (frog)

- **H 20.02***
  - Half

- **H 20.03***
  - Corner

- **H 20.04***
  - Plain ends

- **H 20.05***
  - Open end

- **H 20.08***
  - Sill (projecting)

- **H 20.09***
  - Rebate whole

- **H20.10***
  - Rebate half

- **H 20.14***
  - Knock-in bond beam

- **H 20.30***
  - Standard 200 mm pier

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see *NZCMA Member Companies* on page 3 of this section.
25 Series

These diagrams cover standard block types in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **25.01*** Standard whole
- **25.02*** Half (frog)
- **25.04*** Plain end (frog)
- **25.05*** Plain ends
- **25.07*** Open end
- **25.12*** Lintel & half end-closer
- **25.14*** Knock-in bond beam (also available with one open end)
- **25.15*** Right hand corner bond beam (left hand also available)
- **25.16*** Open end bond beam, depressed web
- **25.16H*** Depressed web solid fill H shape
- **25.23*** Channel bond beam
- **25.24*** Channel open end bond beam

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see NZCMA Member Companies on page 3 of this section.

* The 25.16H Block is manufactured by Mitchell Concrete Limited and Holcim (New Zealand) Limited. Firth Industries will manufacture to order.
30 Series

These diagrams cover standard block types currently in production in New Zealand but not necessarily available from all plants. Specifiers are therefore recommended to contact respective manufacturers to check the types of blocks available in the district of the job in hand.

- **30.02***
  Half
  (also known as 20.19)

- **30.04***
  Plain ends

- **30.14***
  Knock-in bond beam

Shaded blocks are types not usually available ex-stock.

* Blocks are not available from all plants and direct reference should be sought from manufacturers, see *NZCMA Member Companies* on page 3 of this section.
Split Blocks

A wide range of uses including facings, veneers, screens, planter boxes, feature walls and fences can be made of solid concrete masonry split blocks.

Most manufacturers produce a wide range of split units in quarter, half, three-quarter and full course heights. Some plants produce units with bolstered or pitched faces, and blocks from a wide range of aggregate textures and colours are also available.

Specifiers should therefore check with respective manufacturers to ensure that the chosen units are available in the district of the job in hand.

Split units are usually referred to by name rather than by code number. However, they are serialised in terms of course height. This is different to the coding of standard blocks by width. Unless otherwise specified, all split blocks are 90 mm wide.

Figure 1: Veneer Split Block

Figure 2: Structural Split Block

Figure 3: Split Block Wall
(Image Source: http://www.blockwall.org)
50 Series

(40 mm Actual Height)

Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.
100 Series

(90 mm Actual Height)

Not all the blocks shown in these diagrams are manufactured by all plants so specifiers should check with respective manufacturers to ascertain the full range of units are available in the district of the job in hand.
150 Series

(140 mm Actual Height)

Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.

![Split full](image1)

![Split three-quarter](image2)

![Split half](image3)

200 Series

(190 mm Actual Height)

Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.

![Split full](image4)

![Split three-quarter](image5)

![Split half](image6)
Special Finished Screen Blocks

Concrete blocks are also available in a wide range of screen patterns, special finishes and textures, some of which are shown in the following diagrams.

Not all blocks shown in the diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of special or textured units available in the district of the job in hand.

In some cases manufacturers produce special or textured units other than those shown, and some plants produce range of supplementary textured units such as bond beam units, rebated units, fractional units and so on, all with matching faces.

Again, specifiers should check the availability of such units with respective manufacturers.

Typical Screen Blocks

Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.
Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.
Textured blocks

Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.