

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 $1,850 \text{ kg/m}^3$.
- **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 $1,850 \text{ kg/m}^3$.
- **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 m^2 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

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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.

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

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

Concrete Block Series

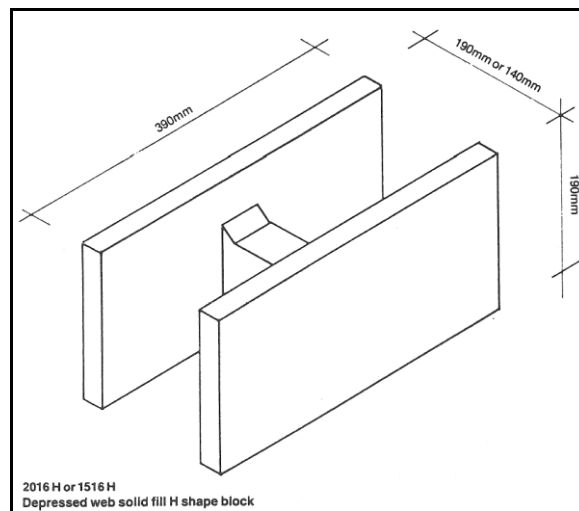
The full graphic descriptions of the block types listed in the block number system are set out in this section. Many of the block types in the full listing are not normally in standard production, since utilisation may be very infrequent.

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.



20 Series		
20.01	20.16	20.64*
20.02*	20.16H*#	
20.03*	20.17*	
20.04	20.20*	
20.05	20.23*	
20.08	20.24*	
20.09*	20.30	
20.10*	20.32*	
20.11*	20.33	
20.12	20.34	
20.13*	20.35	
20.14	20.44*	
20.15	20.45*	

15 Series	10 Series	25 Series
15.01	10.01	25.01*
15.02*	10.02	25.02*
15.03	10.03	25.04*
15.04	10.05	25.05*
15.05	10.08*	25.11*
15.12	10.14	25.12
15.14	10.17	25.14
15.15	10.30*	25.15*
15.16*		25.16*
15.16H*#		25.16H*#
15.19*		
15.30*		
15.35*		

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.

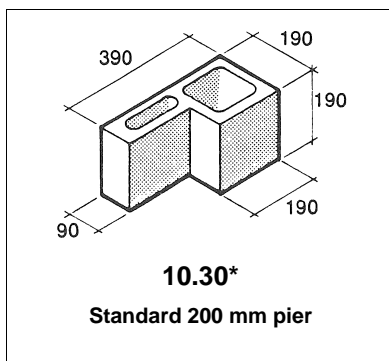
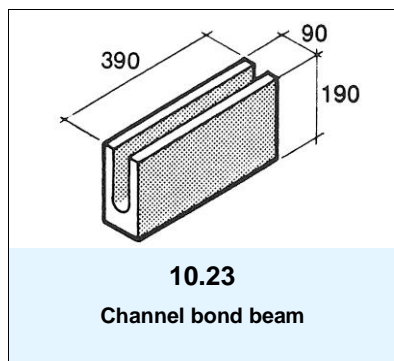
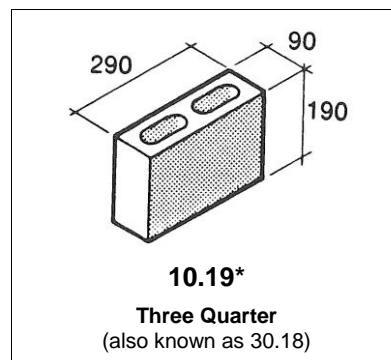
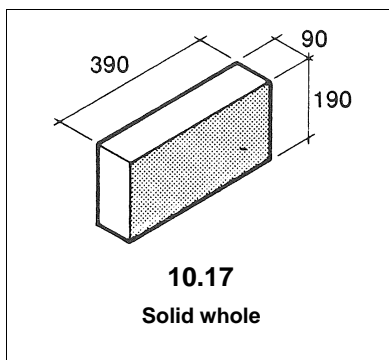
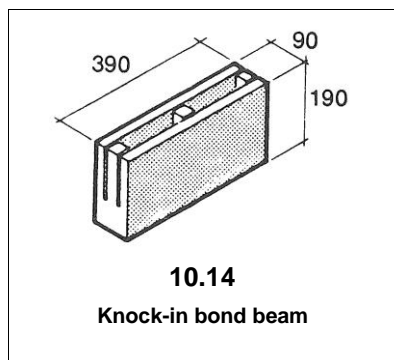
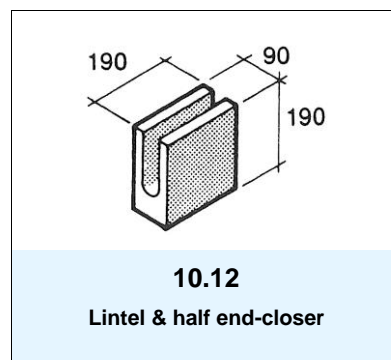
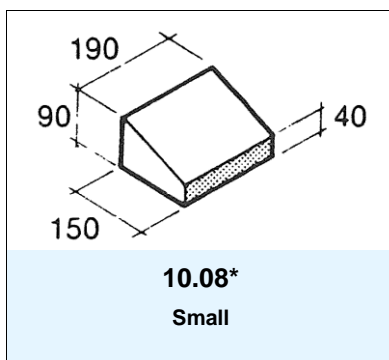
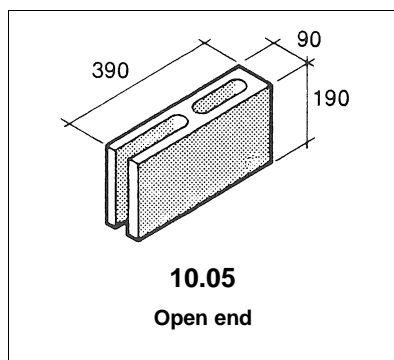
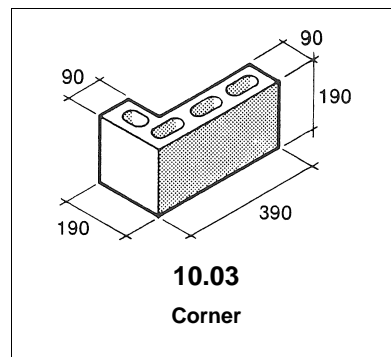
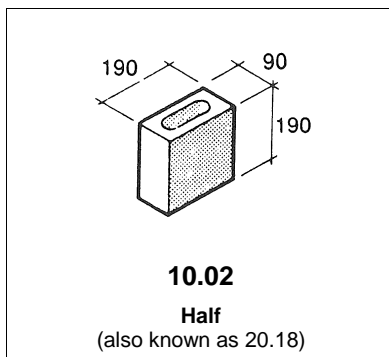
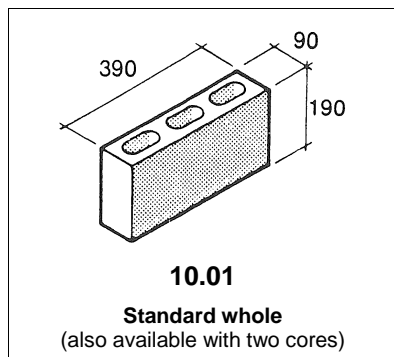
NZCMA Member Companies

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

Bowers Brothers Concrete Limited	Various Locations in Upper North Island	www.bowersbrothers.co.nz
Firth Industries	Various Locations	www.firth.co.nz
Mitchell Concrete Limited	Taranaki	www.mitchellconcrete.co.nz
The Block Shop New Zealand Ltd	Various Locations in the North Island	www.blockshop.co.nz
Viblock Limited	Christchurch and Alexandra	www.viblock.co.nz

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.

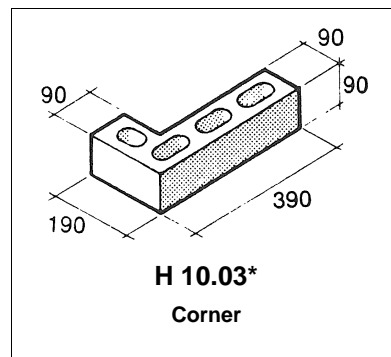
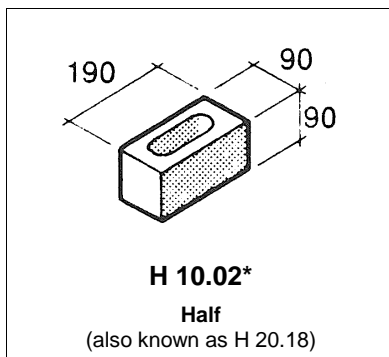
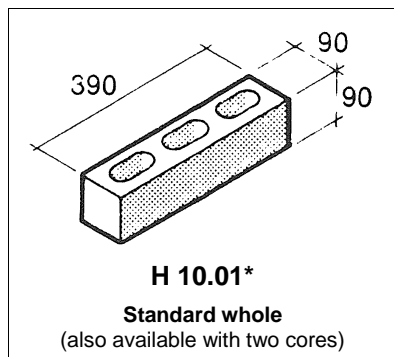


Shaded blocks are types not usually available ex-stock.

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H10 Series

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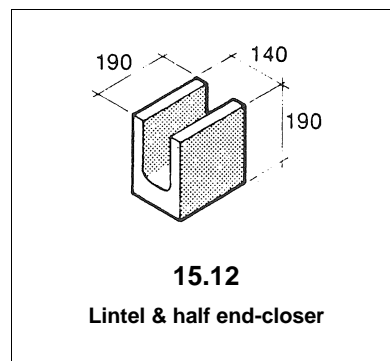
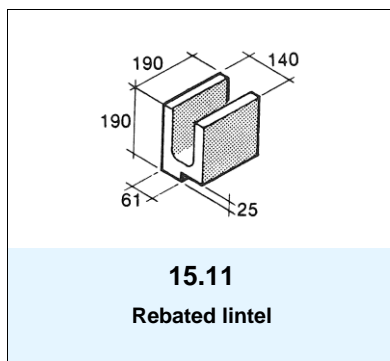
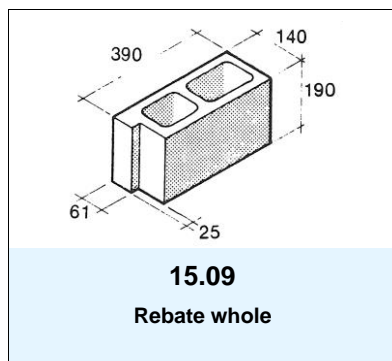
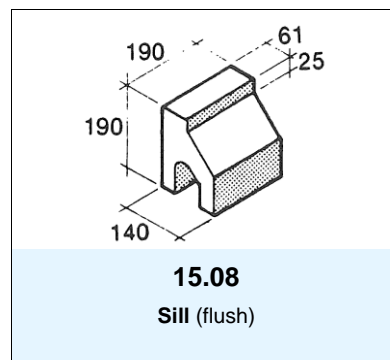
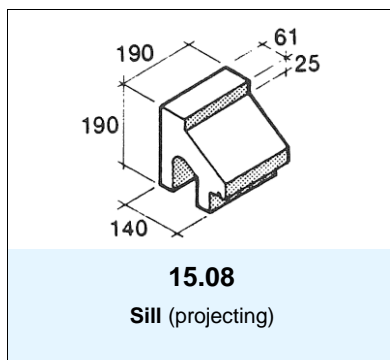
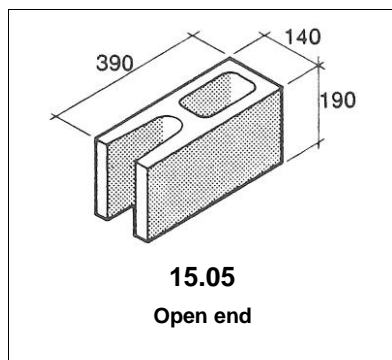
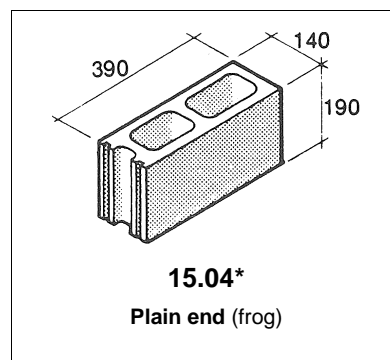
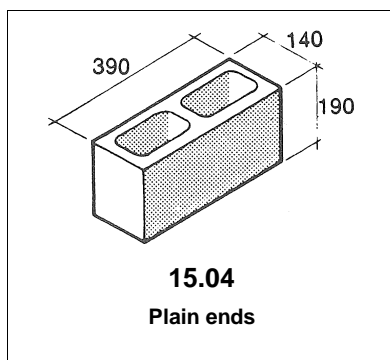
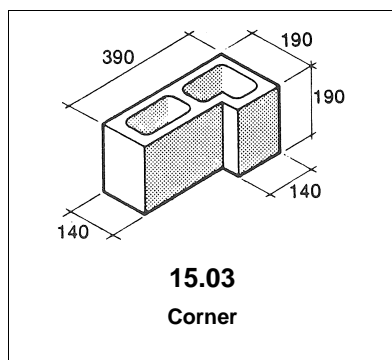
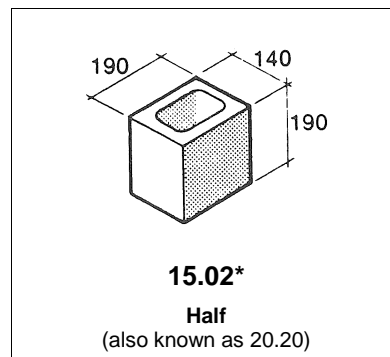
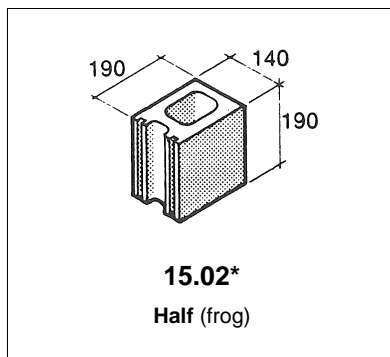
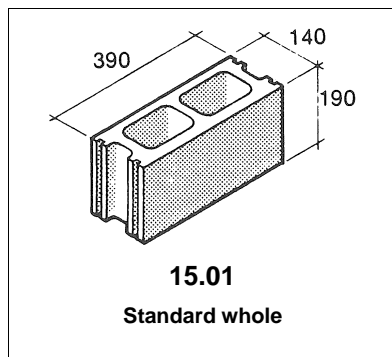


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15 Series

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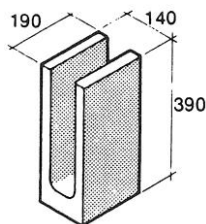


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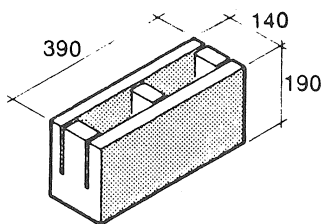
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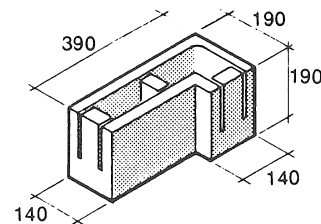
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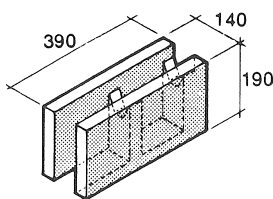
15.13
Deep lintel & full end-closer



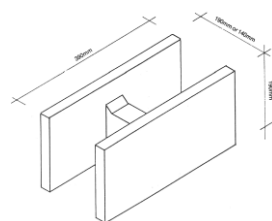
15.14
Knock-in bond beam
(also available with one open end)



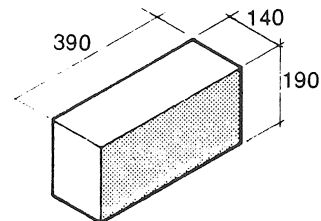
15.15
Corner bond beam, right hand
(left hand also available)



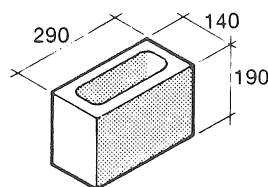
15.16*
Open end bond beam, depressed web



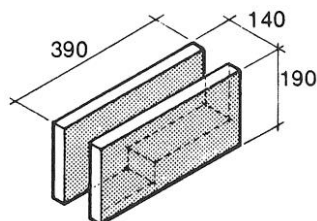
15.16H*
Depressed web solid fill H shape



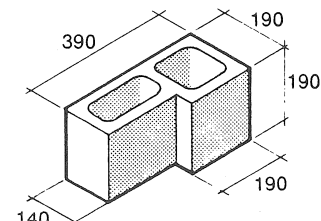
15.17
Solid whole



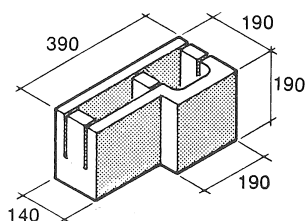
15.19*
Three quarter
(also known as 30.20)



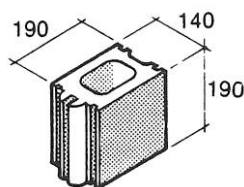
15.24
Channel open end bond beam



15.30*
Standard 200 mm pier



15.30*
Standard 200 mm pier, right hand
(left hand also available)



15.32
Control joint

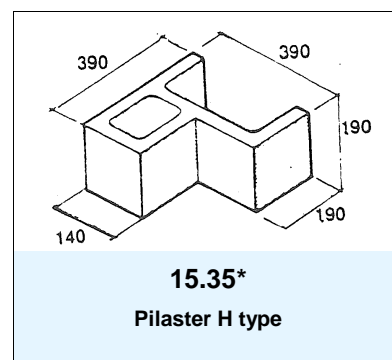
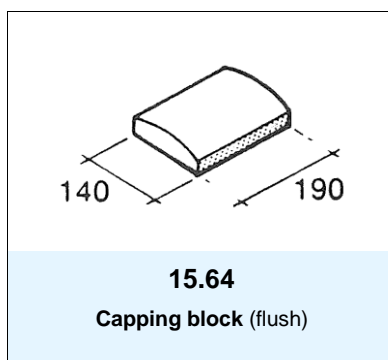
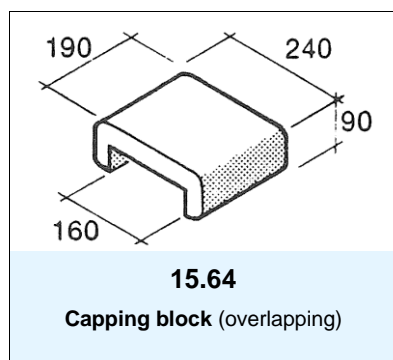
Shaded blocks are types not usually available ex-stock.

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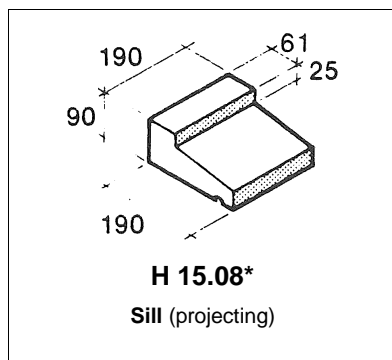
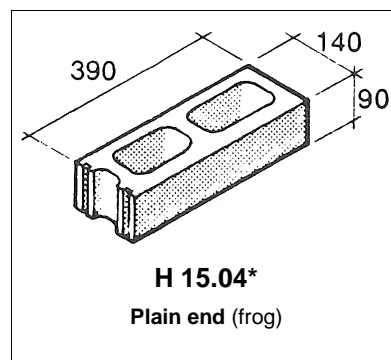
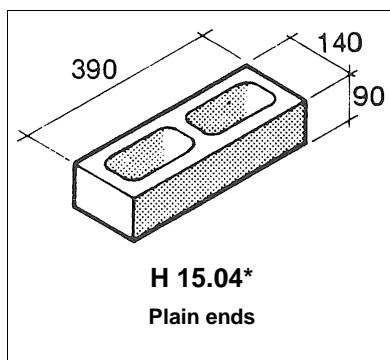
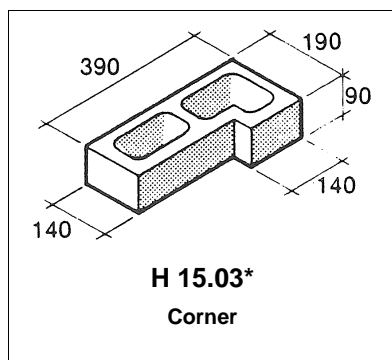
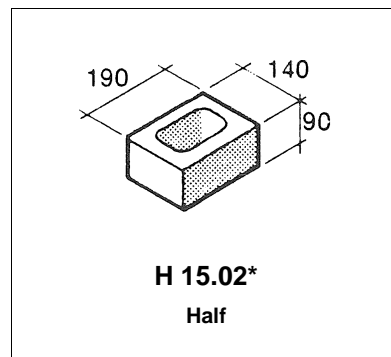
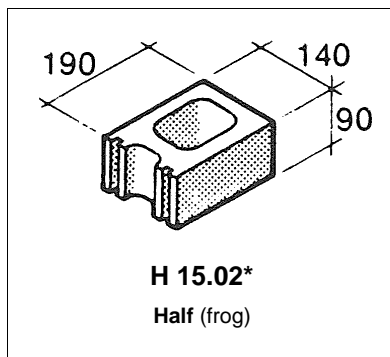
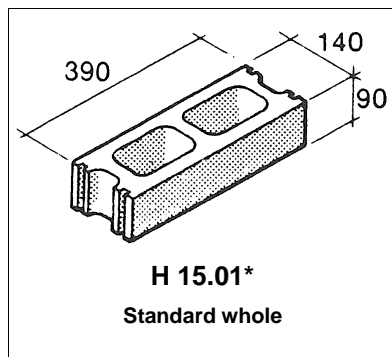


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H 15 Series

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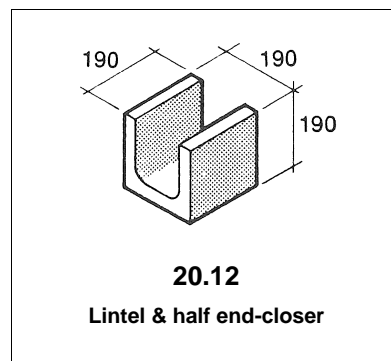
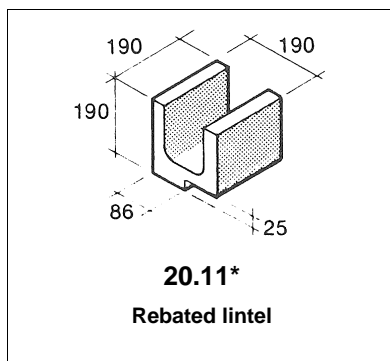
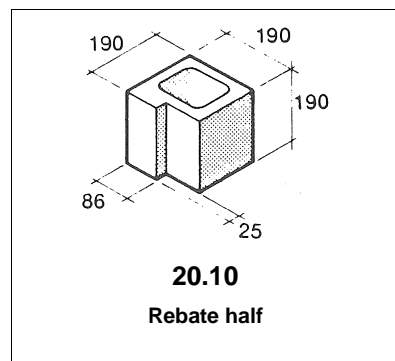
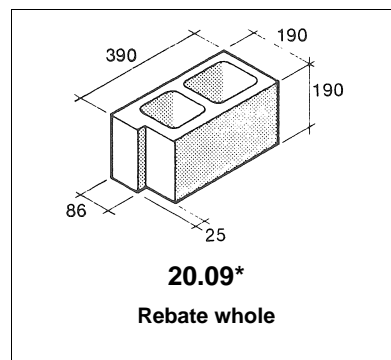
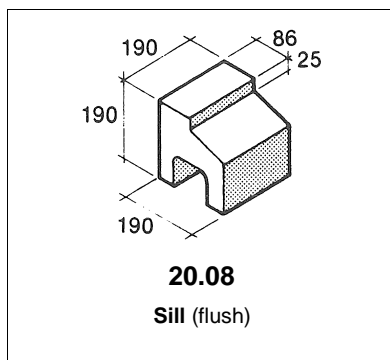
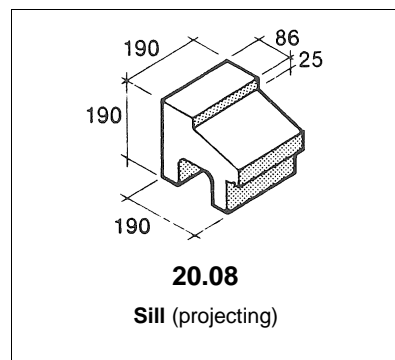
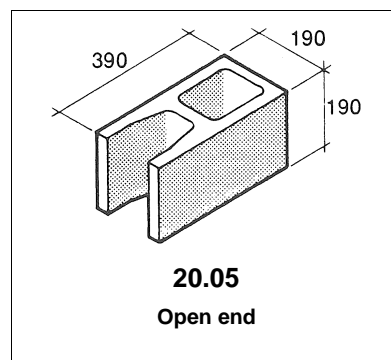
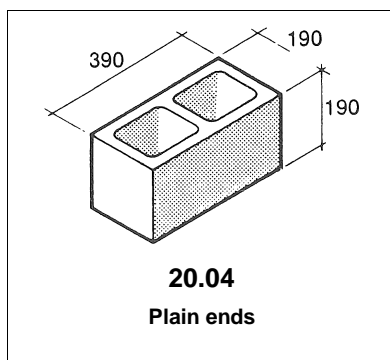
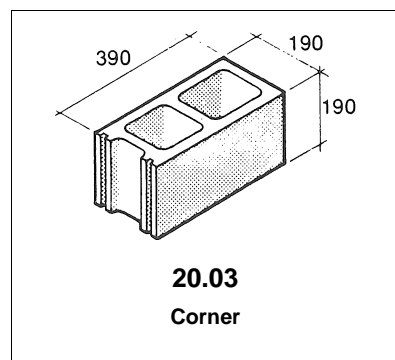
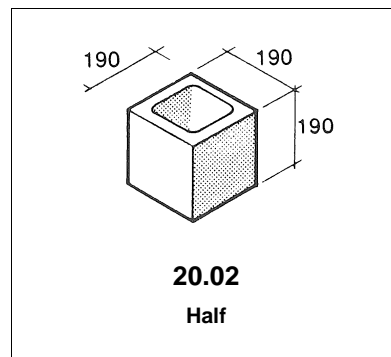
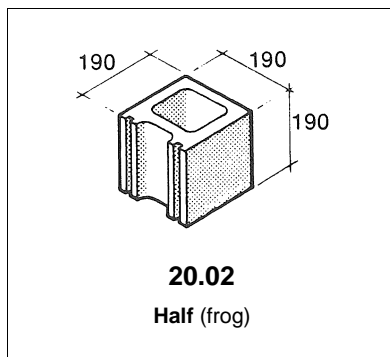
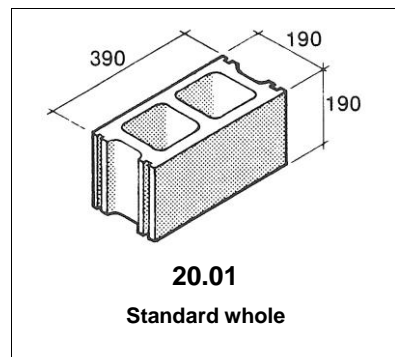


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20 Series

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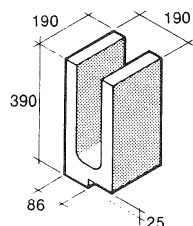


Shaded blocks are types not usually available ex-stock.

* 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.

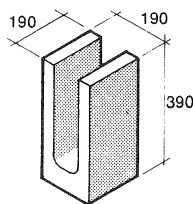
New Zealand Concrete Masonry Manual

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.



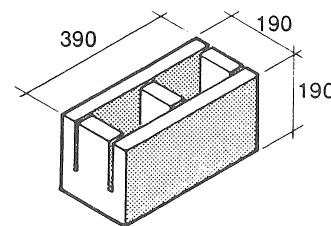
20.13*

Deep lintel & full end-closer
(rebated)



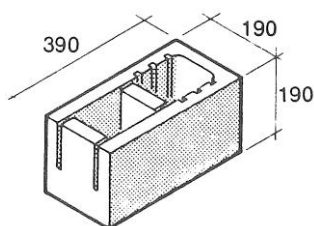
20.13

Deep lintel & full end-closer



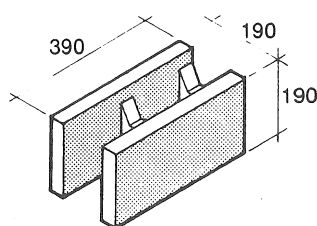
20.14

Knock-in bond beam



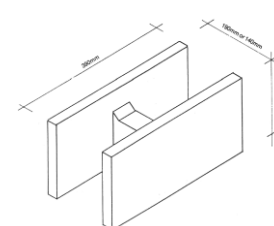
20.15

Corner bond beam



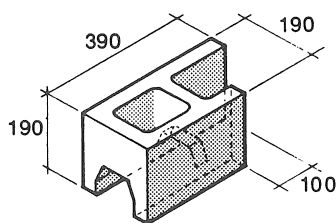
20.16*

Open end bond beam,
Depressed web



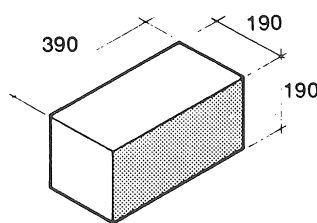
20.16H**

Depressed web solid fill H shape



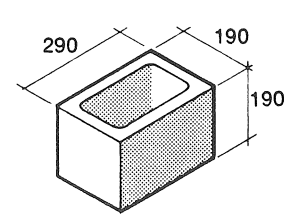
20.16

Right hand clean out
(left hand also available)



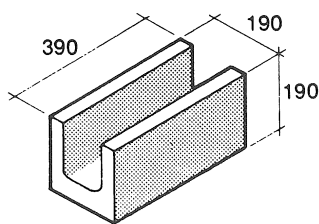
20.17*

Solid whole



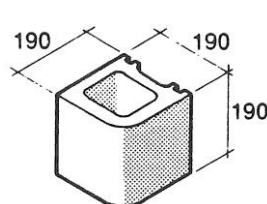
20.19

Three quarter
(also known as 30.02)



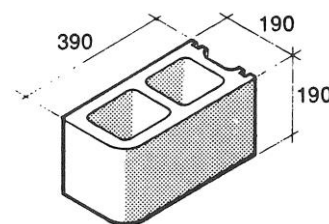
20.23*

Channel bond beam



20.26

Half single bull nose



20.27

Whole single bull nose

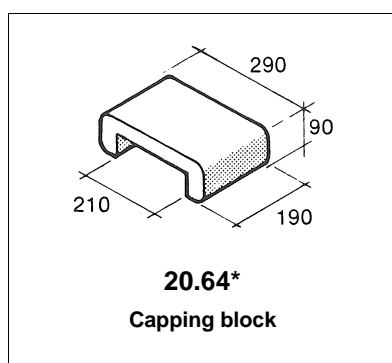
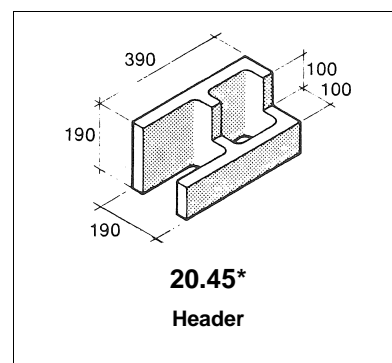
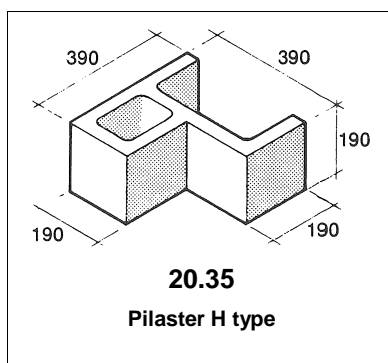
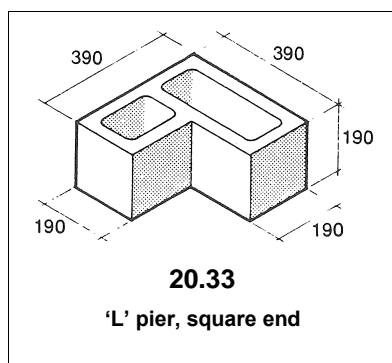
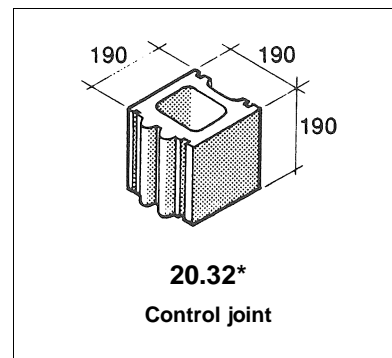
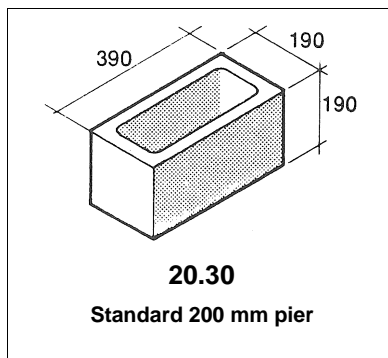
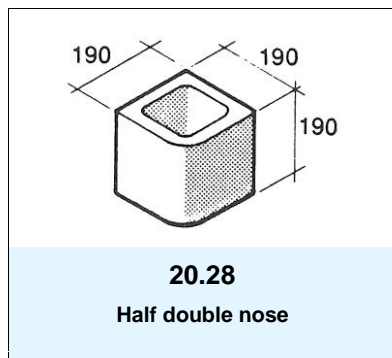
Shaded blocks are types not usually available ex-stock.

* 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.

New Zealand Concrete Masonry Manual

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.

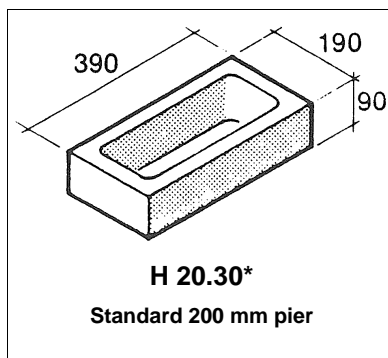
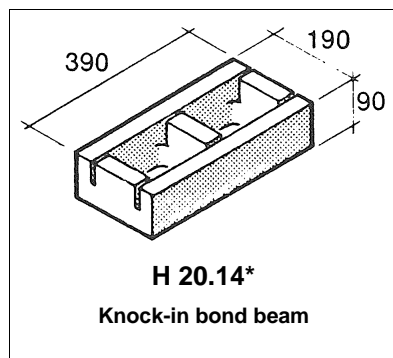
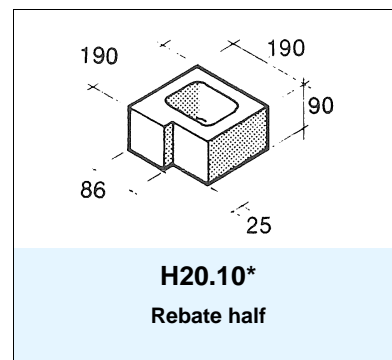
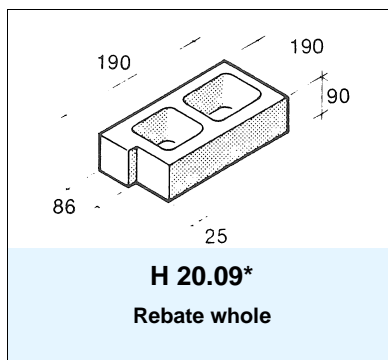
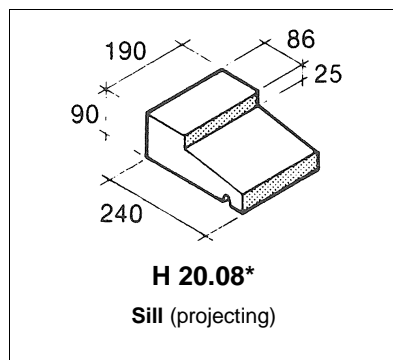
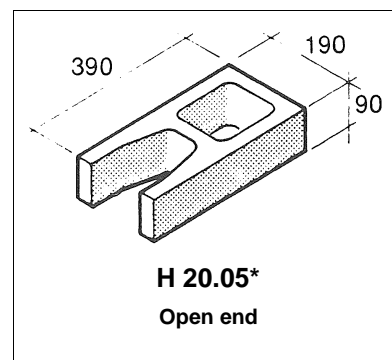
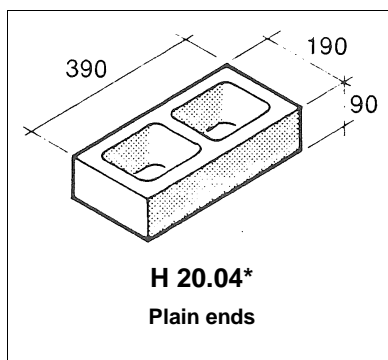
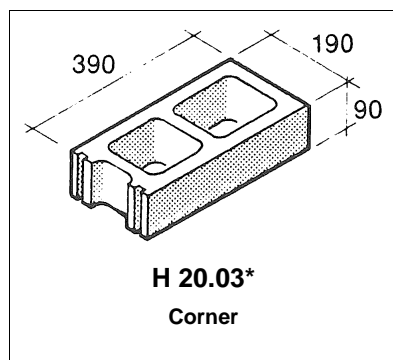
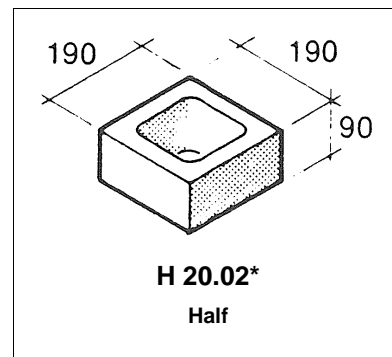
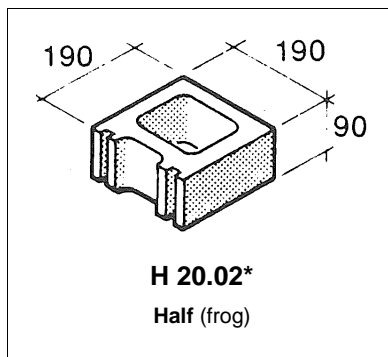
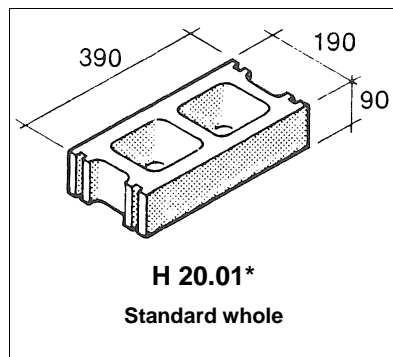


Shaded blocks are types not usually available ex-stock.

* 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.

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.

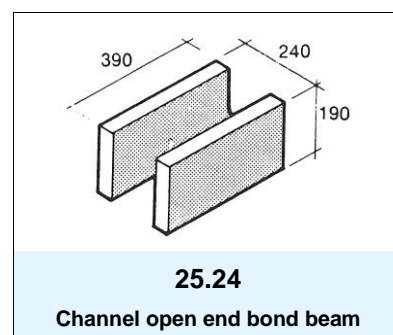
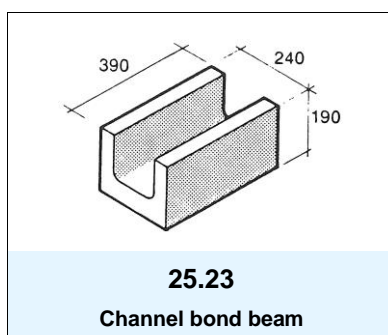
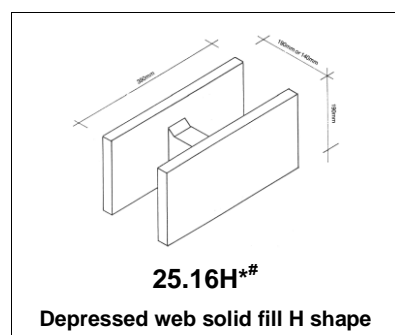
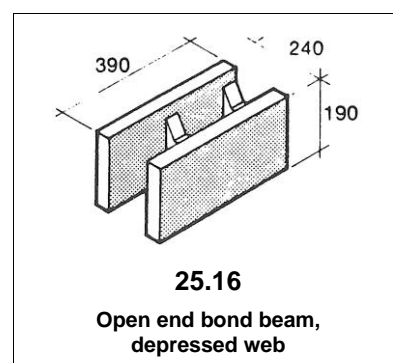
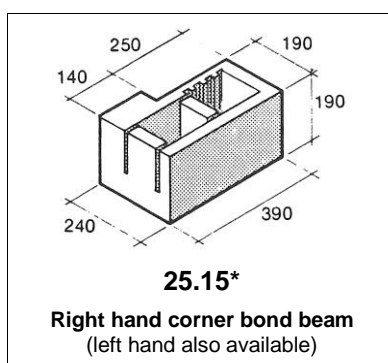
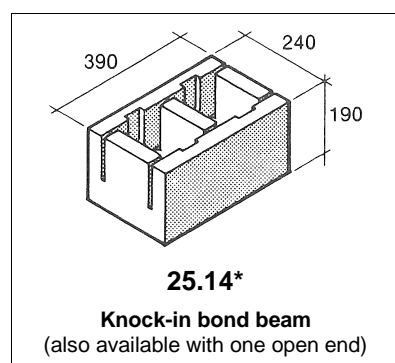
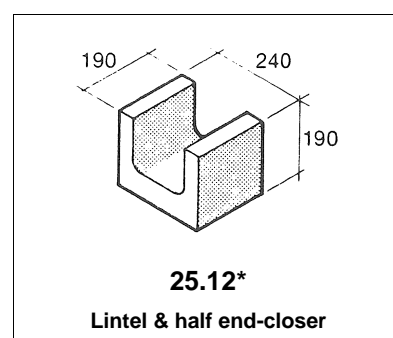
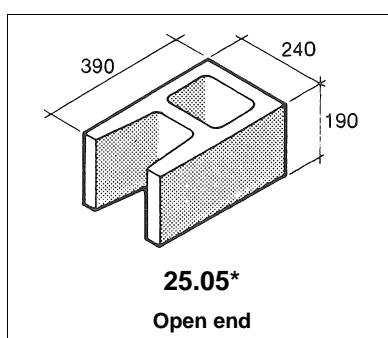
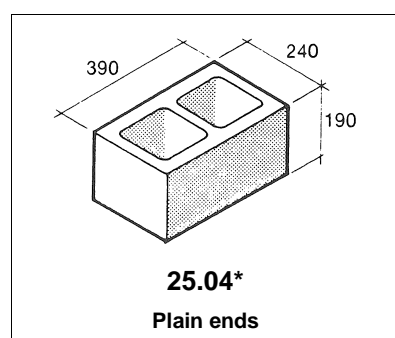
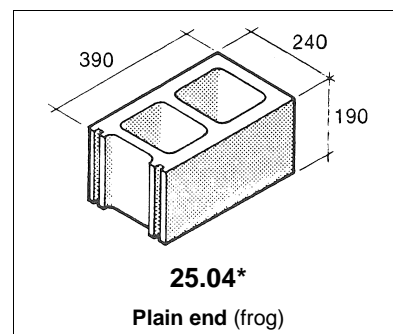
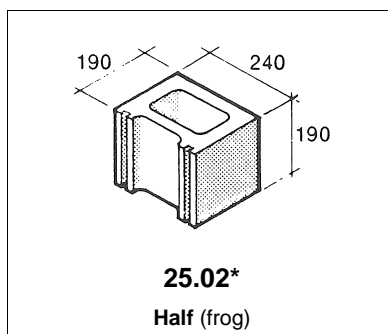
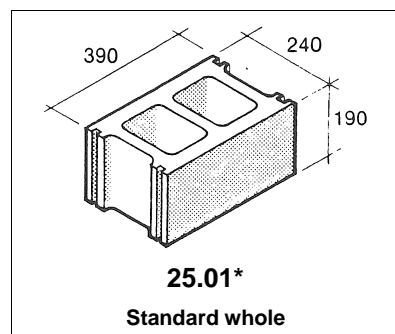


Shaded blocks are types not usually available ex-stock.

* 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.



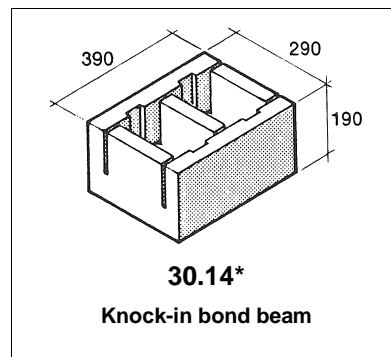
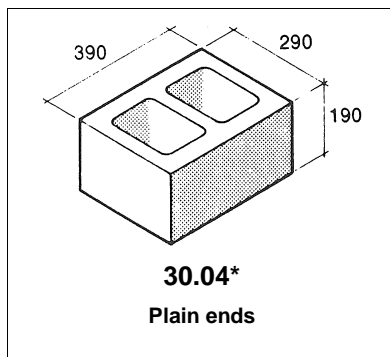
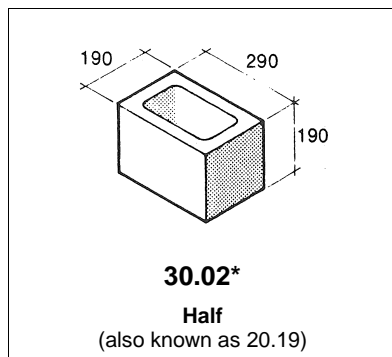
Shaded blocks are types not usually available ex-stock.

* 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.



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

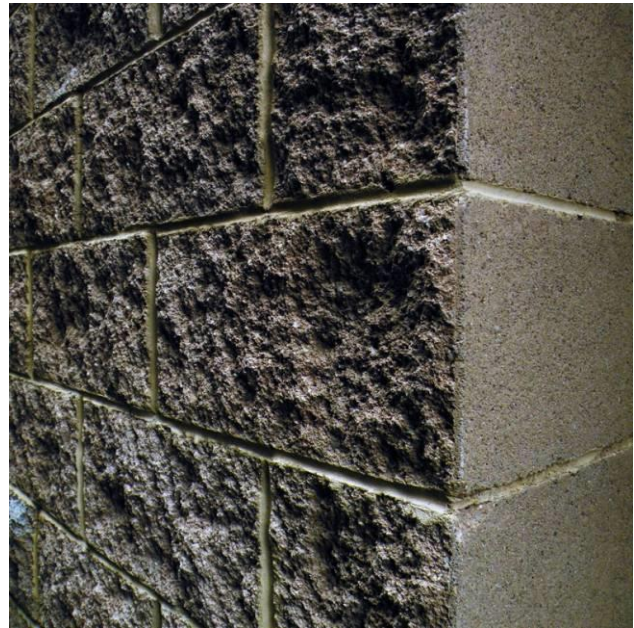


Figure 2: Structural Split Block

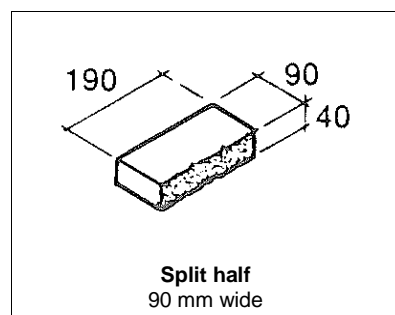
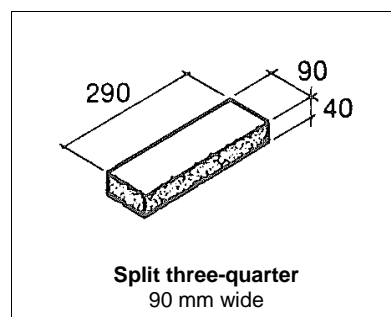
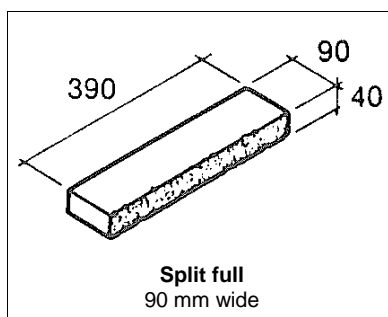
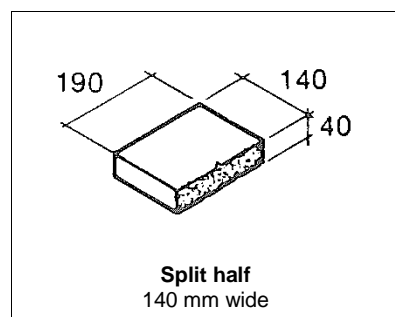
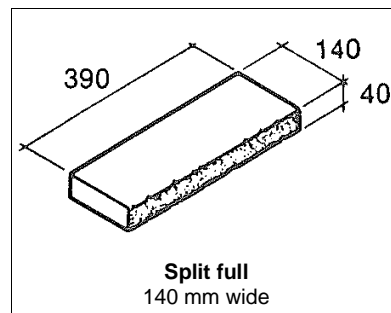
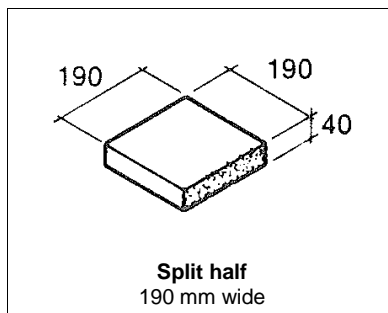
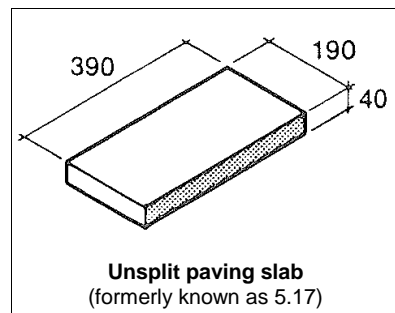


*Figure 3: Split Block Wall
(Image Source: <http://www.blockwall.org/>)*

50 Series

(40 mm Actual Height)

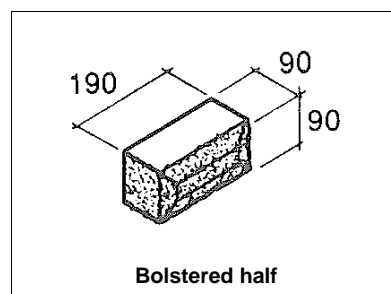
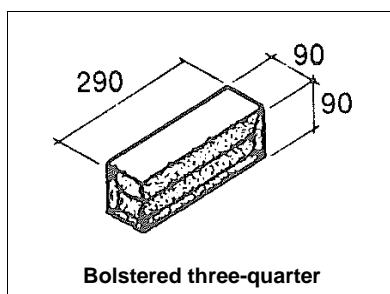
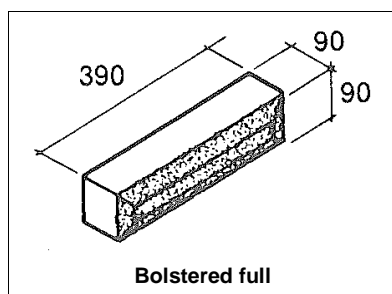
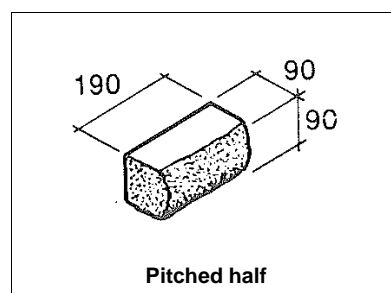
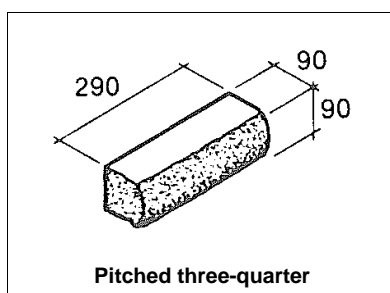
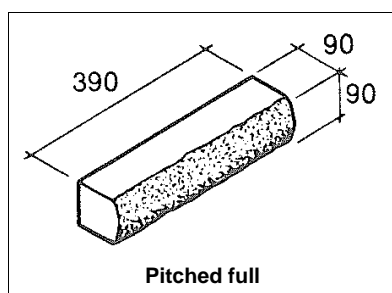
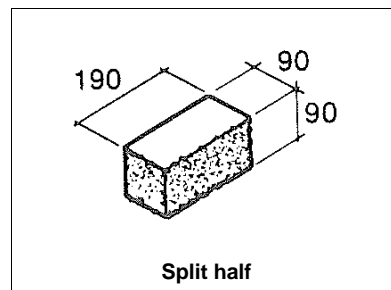
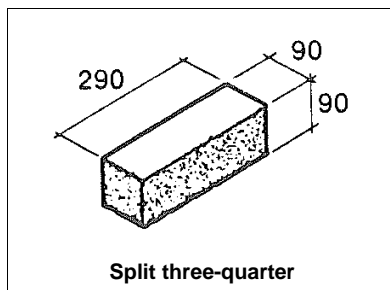
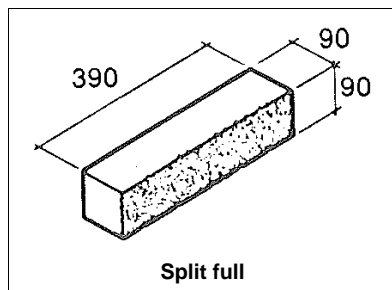
Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.



100 Series

(90 mm Actual Height)

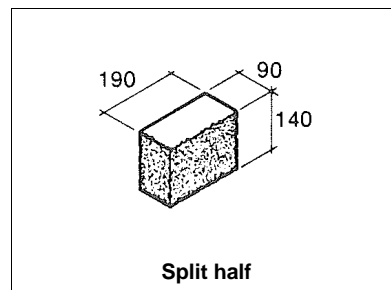
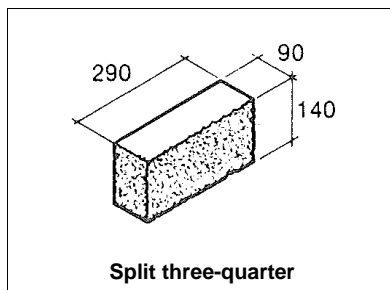
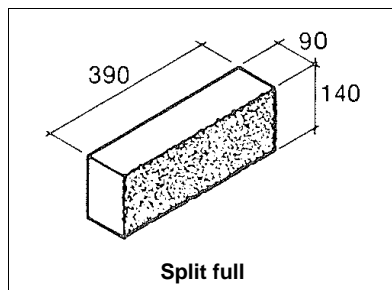
Not all the blocks shown in these diagrams are manufactured by all plants so specifiers should check with respective manufacturers to ascertain the full range of units are available in the district of the job in hand.



150 Series

(140 mm Actual Height)

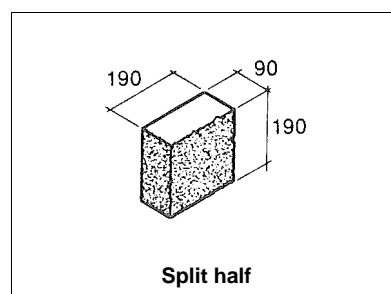
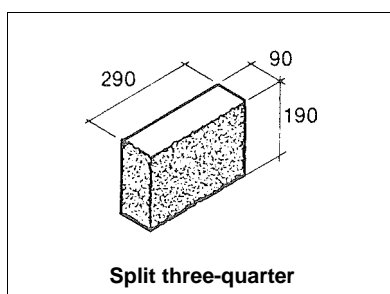
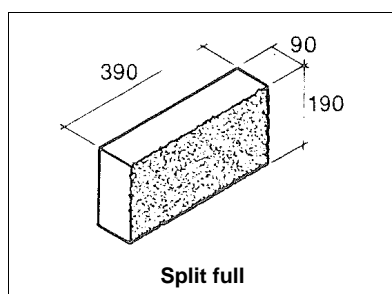
Not all the blocks shown in these diagrams are manufactured by all plants, so specifiers should check with respective manufacturers to ascertain the full range of units available in the district of the job in hand.



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.



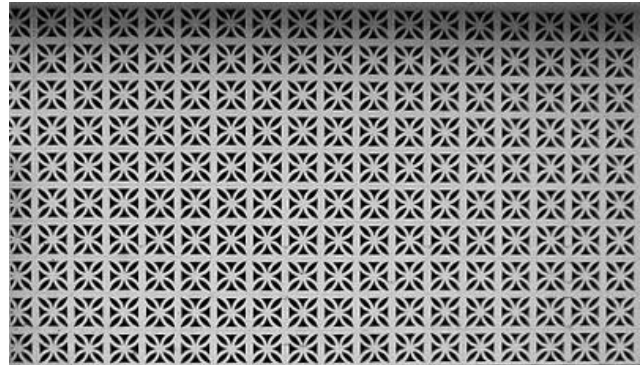
Special Finished Screen Blocks

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.

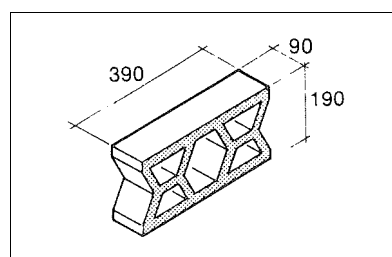
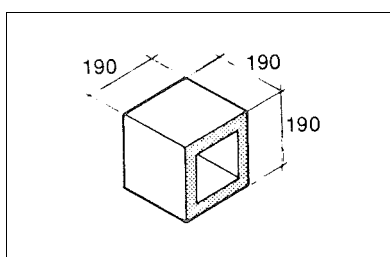
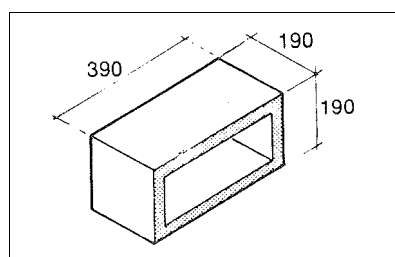
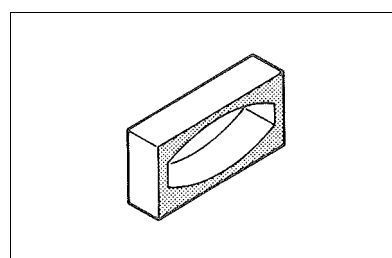
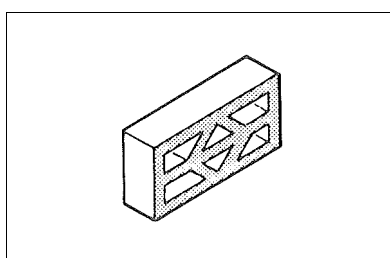
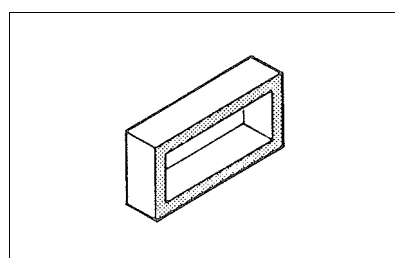
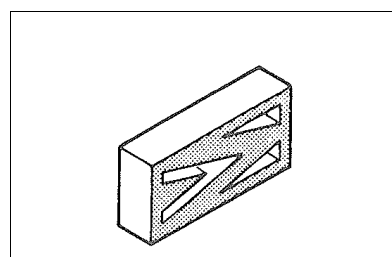
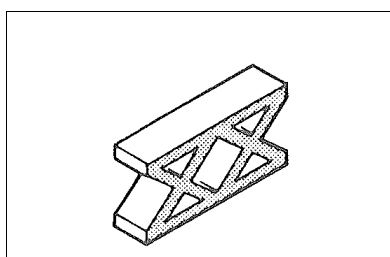
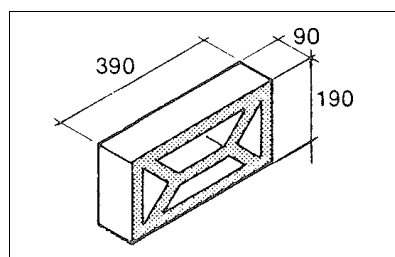
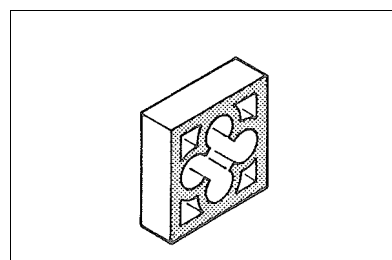
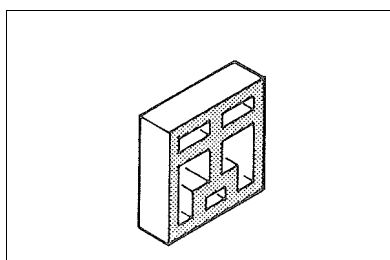
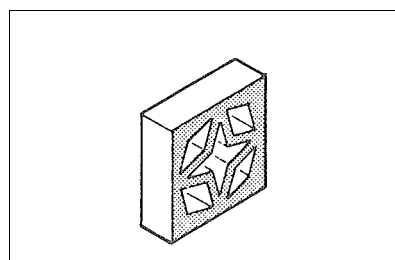
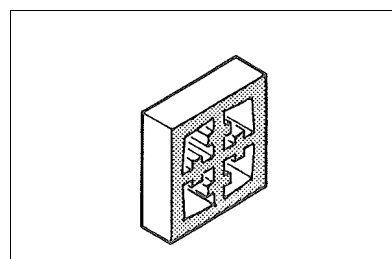
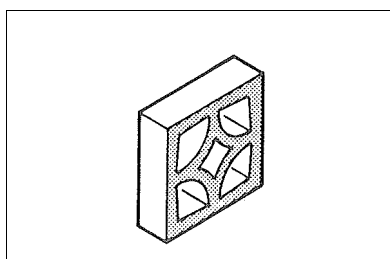
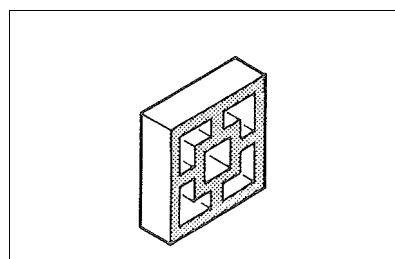
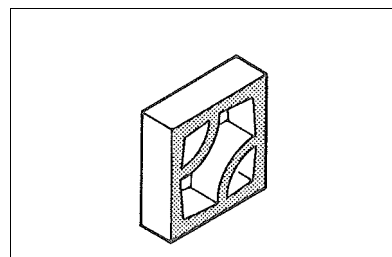
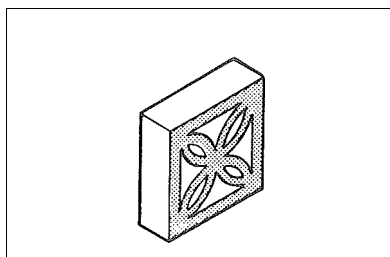
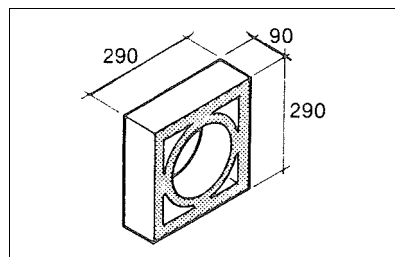
Again, specifiers should check the availability of such units with respective manufacturers.



Images Source: <http://www.moderndesigninterior.com/2011/01/mid-century-decorative-concrete-screen.html>

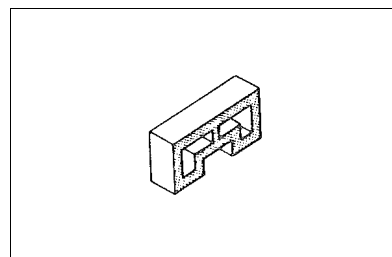
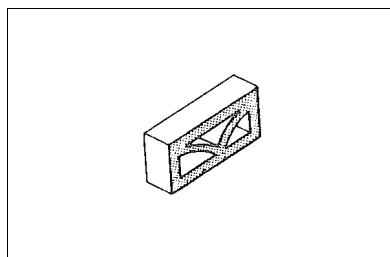
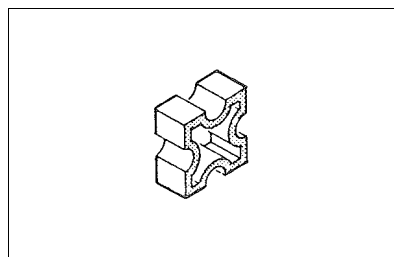
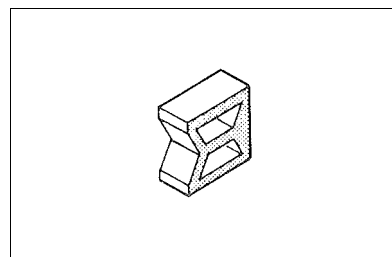
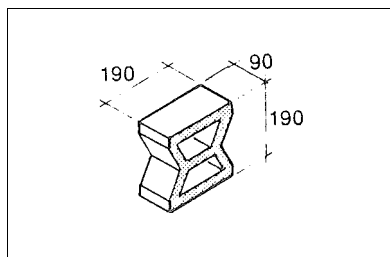
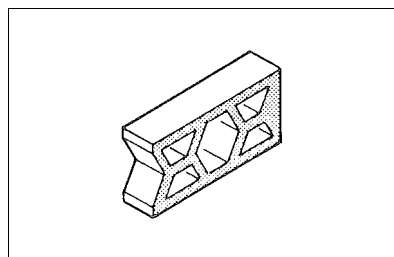
Typical Screen Blocks

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.



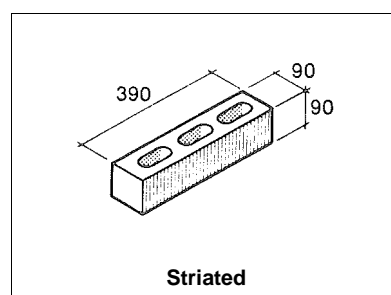
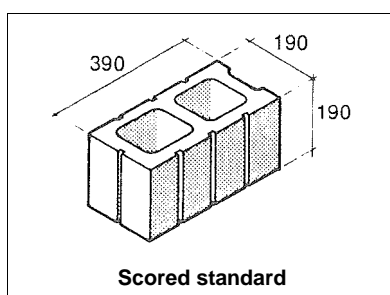
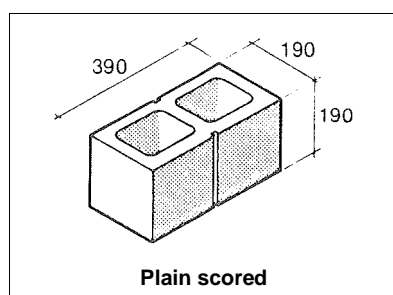
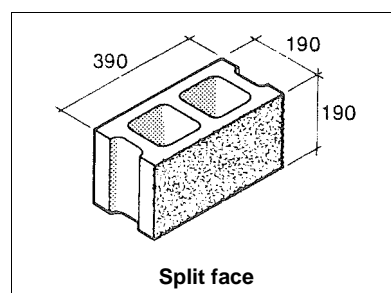
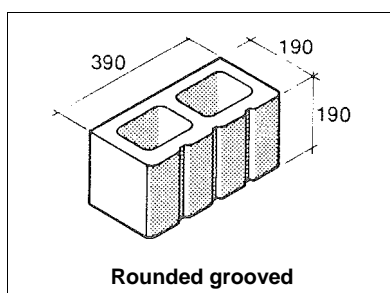
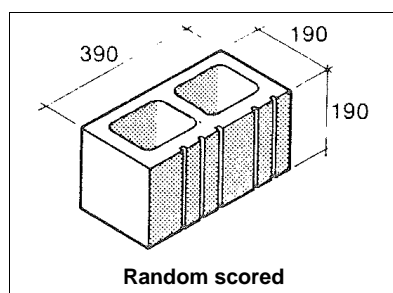
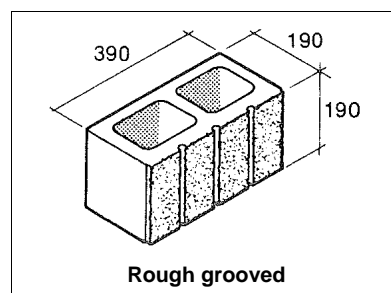
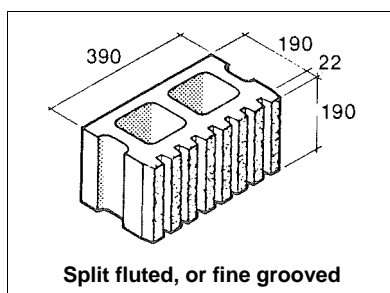
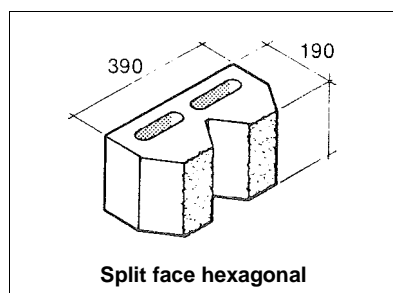
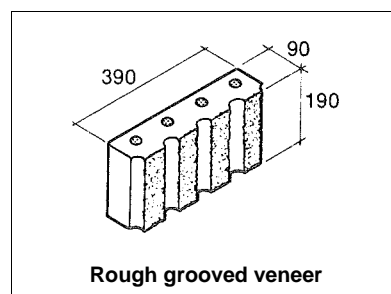
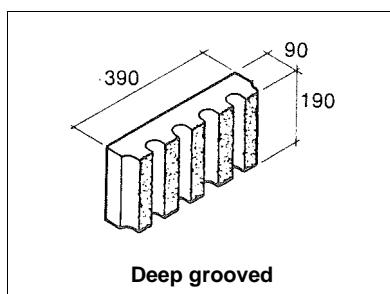
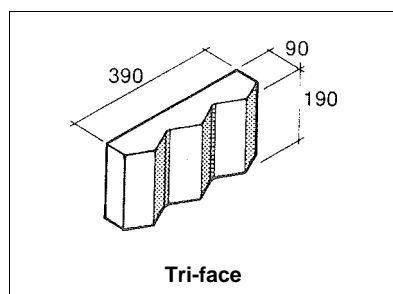
New Zealand Concrete Masonry Manual

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.



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