

Brick Technical Bulletin - Coursing Brick Application

BTB 10

This Marshalls Technical Bulletin is intended to clarify the type of concrete bricks that should be used as coursing units when combined with blockwork.

A number of issues have been raised, predominantly by housebuilders and inspectors from the National House Builders Federation (NHBC), on the use of concrete common bricks in conjunction with other masonry materials, eg. blocks, when combined together in a wall.

The NHBC Guidance Notes state in Clause 6.1 – S2(g):

“Where a different size of masonry unit is needed to ensure correct coursing, small units of the same material should be used to reduce cracking and problems due to different thermal insulation properties”.

The NHBC Guidance Notes are intended to prevent problems created by mixing clay products, which expand, with concrete materials, which contract, within the same wall, and where thermal bridging may be a problem, to prevent the mixing of aggregate and aerated concrete products.

The table below can be used as an indicative guide to the acceptability of coursing bricks with different block backgrounds.

BLOCK BACKGROUND	COURSING BRICK
Dense Concrete Blocks	Solid Concrete Brick, textured for rendering if required
Medium Density Blocks	Lightweight/Medium Density Coursing Bricks

DENSE CONCRETE BLOCKWORK

Definition: Aggregate blocks with a solid density range of 1850 - 2300kg/m³ which meet the Robust Details Specification.

Solid dense concrete bricks are recommended for use as coursing units in conjunction with dense aggregate blocks. The densities of blocks and concrete bricks are compatible, as are their drying shrinkage, thermal conductivity and water absorption. If required, the external face texture of solid common bricks can be manufactured with a ‘keyed’ or textured face to maximise adhesion properties where necessary for render application. NHBC Standards Extra No. 40, December 07, gives further details. Dense coursing bricks are available to suit 100mm and 140mm widths at 65mm and 73mm high.

LIGHTWEIGHT/MEDIUM DENSITY BLOCKWORK

Definition: Medium density blocks with a density range of 1300 - 1550kg/m³.

In this application bricks of medium/lightweight density should be used. These are available in both 100mm and 140mm widths at 65mm high.

SOLID CONCRETE BRICKS

Definition: Solid bricks, not frogged or perforated, with a density range of 1900 - 2200kg/m³.

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LIGHTWEIGHT/MEDIUM DENSITY COURSING BRICKS

Definition: Solid bricks with an average density of <math><1400\text{kg/m}^3</math>.

Note: By virtue of their production method, frogged and perforated concrete common bricks tend to have smoother faces and may not offer the same degree of adhesion as a textured solid coursing brick. They are, however, suitable for use in general construction, but care should be taken that they are laid frog up, and the frog filled with mortar. Frogged bricks are **NOT** recommended for use either as soldier courses or as padstones, regardless of whether the frog is filled with mortar.

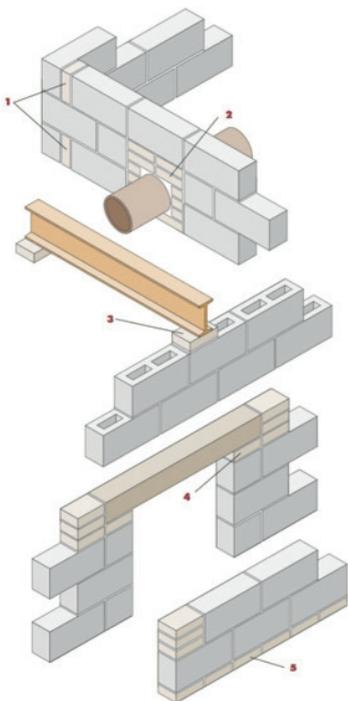
Clay bricks SHOULD NOT be used in conjunction with aggregate based or aerated blocks due to their potential differential movement but dense or lightweight coursing bricks may be combined with the appropriate aggregate blockwork.

Marshalls coursing bricks are NOT suitable for use in conjunction with autoclaved aerated blocks.

The use of bespoke coursing bricks offers the advantages of:

- Manufactured by the same basic material as dense and lightweight aggregate blocks.
- Similar performance characteristics in relation to density, drying shrinkage, thermal properties and water absorption.
- Available in different widths to accommodate 100mm to 140mm block widths.
- Eliminates the need for cutting blocks on site.
- Approved by the NHBC
- Available, if required with a specific keyed face to assist adhesion.

Concrete coursing bricks are available from most Builders Merchants. They should be specifically ordered as coursing bricks, either lightweight or dense, depending on their compatibility with the block background.



Notes: Although the illustrations show the use of 140mm bed width coursing bricks, the standard 100mm size can be used in similar applications.

1. Coursing bricks of both sizes and densities can be used to bond in block walls.
2. They are easily used to fill in the voids in walls formed by such items as pipes, etc. where cutting of blocks may be difficult.
3. With the increasing use of hollow blocks due to weight restrictions, coursing bricks can be used to form padstones to cover the voids within the block and to spread any load.
4. The most popular use is in the makeup of courses in and around window and door openings. Because both the dense and lightweight coursing bricks have similar properties to that of the base blockwork, the overall wall construction can be assumed to be a homogenous mass.
5. Standard storey heights within floor levels frequently co-ordinate to sizes which are less than multiples of full-height blocks. The coursing bricks are ideal for making up courses either as kicker units or by closing off at roof level. Similarly coursing bricks can be used to make up half-length modules instead of the expense of cutting blocks to size.

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	DENSE	LIGHTWEIGHT
Form	Solid	Solid
Sizes	215mm x 100mm x 65mm	215mm x 100mm x 65mm
	215mm x 140mm x 65mm	215mm x 140mm x 65mm
	215mm x 100mm x 73mm (Frogged)	
Composition	Dense Aggregate and Portland Cement	Blended Lightweight Aggregate and Portland Cement
Density	<2100±50 kg/m ³	Average <1400 ±50 kg/m ³
Strength	22.5N/mm ² min.	10N/mm ² min
Drying Shrinkage	<0.45mm/m	<0.9mm/m
Thermal Conductivity	Protected: 1.24W/mK	Protected: 0.47W/mK
	Exposed: 1.33W/mK	Exposed: N/A