INFORMATION BULLETIN: IB 47

Starter Bars – Concrete Masonry

CCANZ concrete answers

INTRODUCTION

Starter bar positions for concrete masonry are a vital part of the wall construction.

Errors in position can result in the wall being understrength and in many cases unable to be built without the replacing of the-starter bars by drilling and epoxy grouting steel in the correct position. This is time consuming and wasteful, since errors are often only discovered when the blocklayer lays out the first course.

This design note is applicable to 100, 150, 200 and 250 series walls built to modular pattern.

REQUIREMENTS

To be able to place the starter bars in the correct position, the contractor responsible for the foundation or floor construction must have the following information in addition to foundation dimensions:

1. Size and spacing of vertical bars.

Note: For non-specific design masonry buildings with solid filled walls:

Running bond: vertical bars will be D12 at 600 mm centres in earthquake zone A, and 800 mm centres in earthquake zones B and C.

Stack bond: vertical bars will be D12 to 600 mm centres in all zones. For partial filling, vertical bars will be D12 at 600 mm centres in earthquake zones B and C only, and constructed in running bond.

Bar size limited to D10 in 10 series walls.

2. Thickness of masonry walls to be built.
3. Edge support detail of masonry wall.
4. Positions of doorways.
5. Positions of windows.
6. Position for cut block on non-modular construction, if this is known.

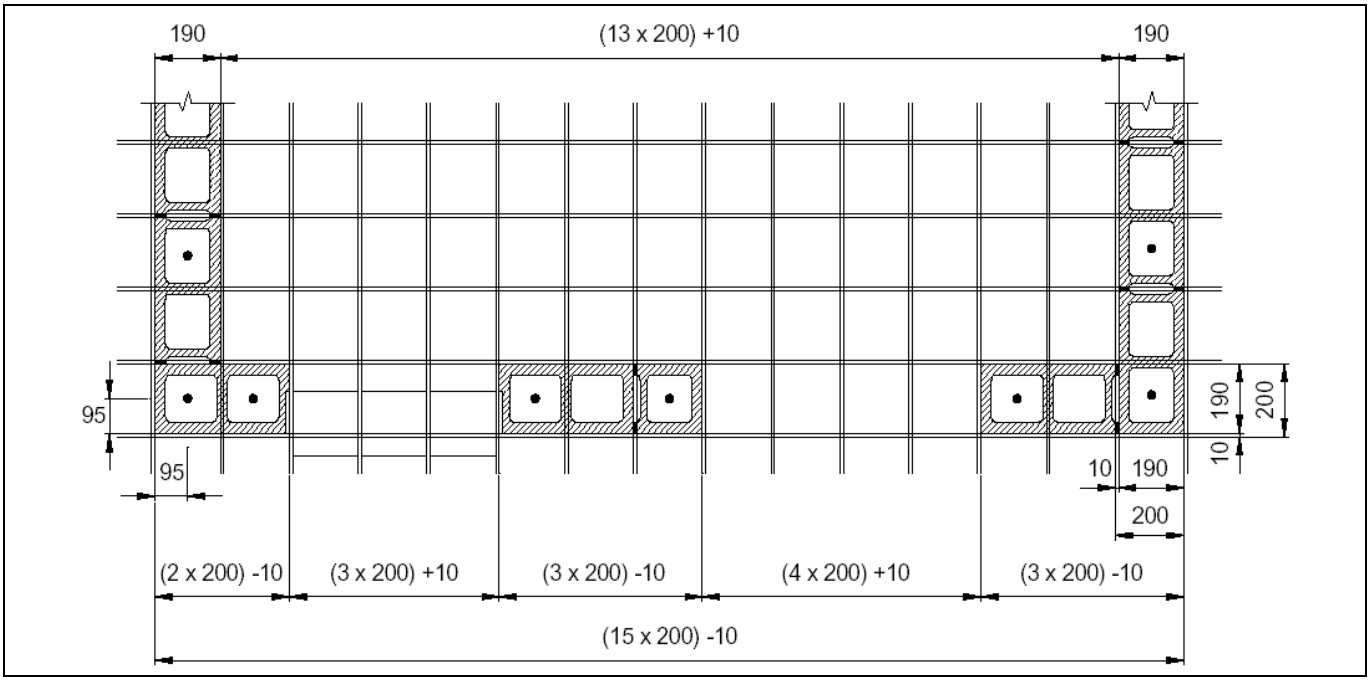


Figure 1: Planning on the standards concrete masonry grid.

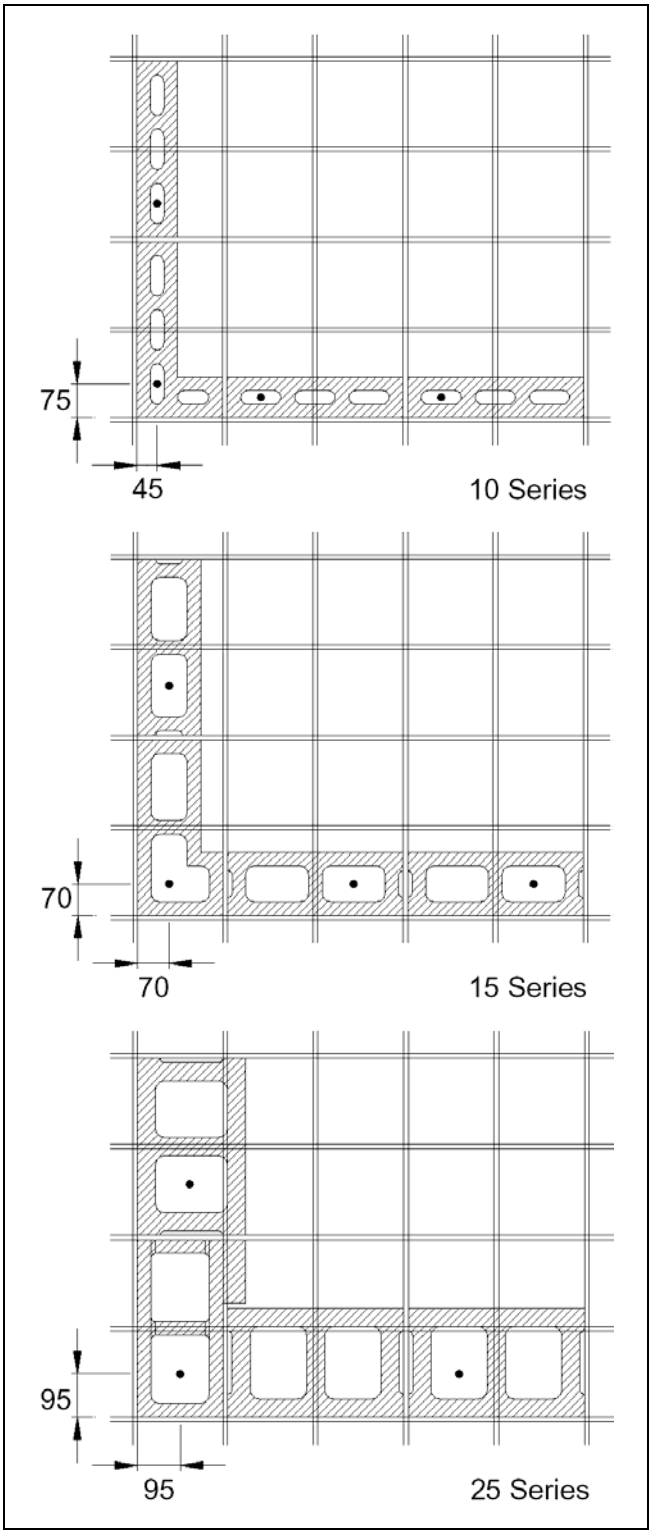


Figure 2: Modular corner constructions

SETTING OUT

The details in this document are based upon the modular concept of 200 mm at each corner and intersection. Masonry units are produced in different thicknesses, yet may be put together to meet the modular concept (Figures 1 and 2). There are a number of basic rules which will apply to ALL masonry construction.

1. Every corner will be solid filled with grout and will contain a vertical reinforcing bar.
2. Every bonded T intersection will have a solid filled core and will contain a vertical reinforcing bar.
3. Each masonry cell immediately adjoining a door opening will be solid filled and will contain a vertical reinforcing bar.
4. Each masonry cell adjoining a window will be solid filled and contain a vertical reinforcing bar.

The starting point for setting out will be the corners of the building.

Step 1:

Determine measuring position at a corner.

With modular construction for masonry walls of nominal 100 (2 holes), 150, 200 and 250, the position from the corner will be 95 mm.

If the block wall is to overhang the foundation then the overhang dimension must be subtracted from the 95 mm (see figure 3).

Put nail in timber shutter or mark steel shutter. The 100 series which has 3 holes per unit will have a starting dimension of 75 mm.

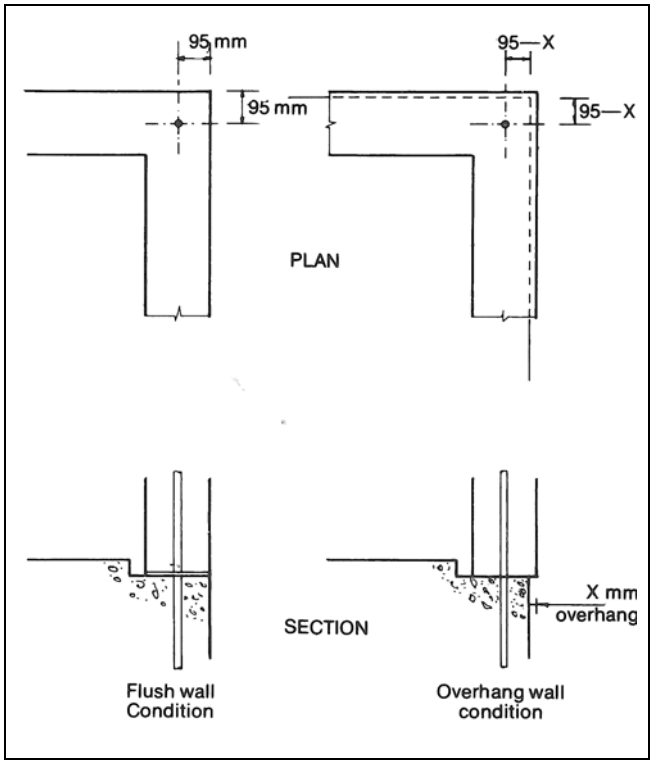
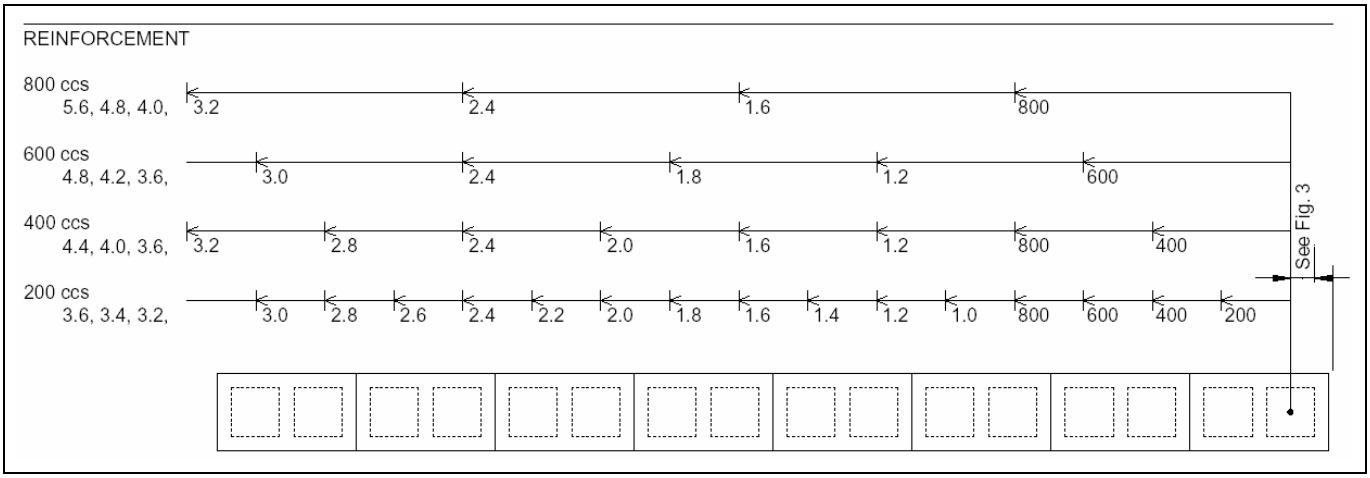


Figure 3: Foundation corner detail 200 series

Table 1:
Cumulative dimensions for start bar positions



Step 2:

From this comer position, using Table 1, mark the running dimension positions on the shutter, depending upon the nominal centres of steel required. If the wall length is non-modular (i.e. not a multiple of 200 mm), it is recommended that bar positions be marked out from each corner (see step 3). A tape hooked on a nail or a special long gauge rod are the simplest ways of measuring out.

Step 3:

From the opposite corner bar position, mark the running dimensions positions on the shutter until reaching the original set, Step 1. These may not match, so include an additional bar (figure 4).

Step 4:

Mark positions of windows and doorways and ensure there is a reinforcing bar in the adjoining cell. Extra bars may be needed to cover this case (figure 5).

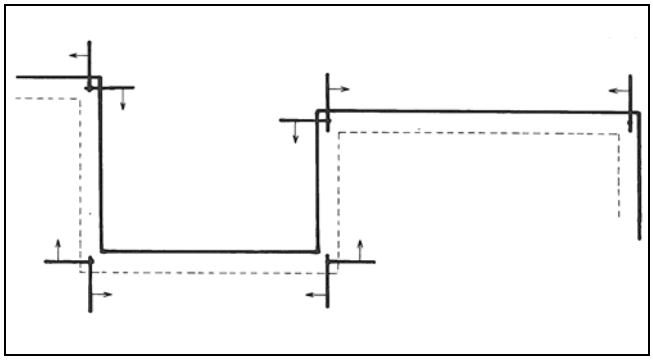


Figure 4: Work dimensions from each corner

Step 5:

Positions of starter bars in the opening of doorways can be omitted (figure 5).

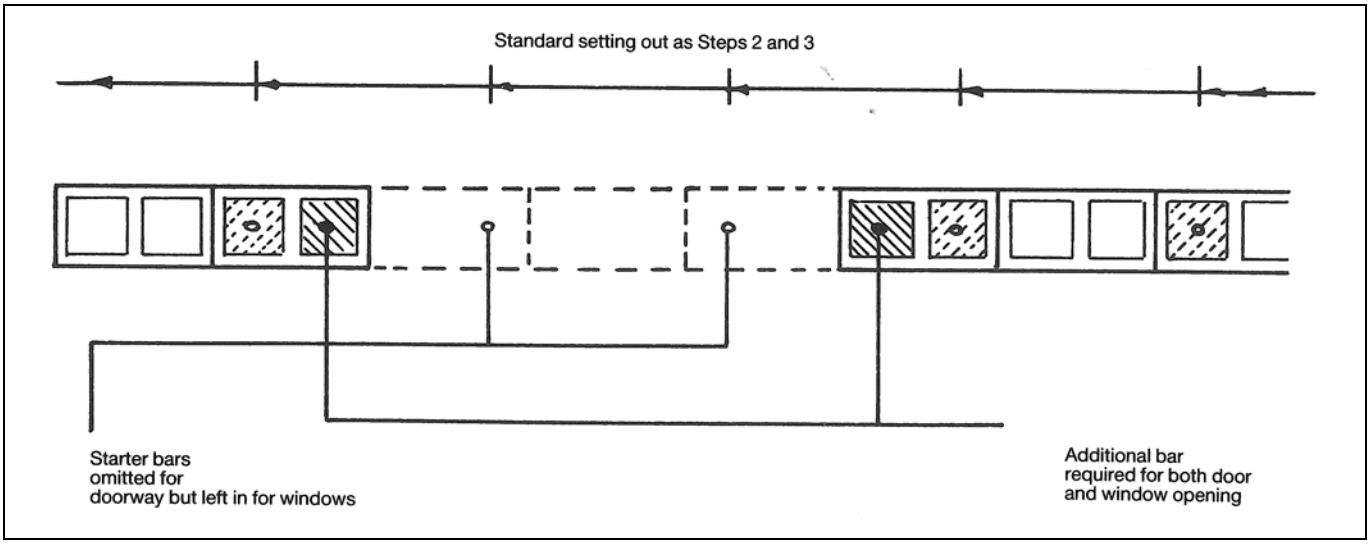


Figure 5: Example of Steps 4 and 5

Step 6:

The position of the bar from the face of the block depends upon the wall thickness and bar size.

The dimension from the shutter face will therefore be figures from Table 2 if the block is to be placed flush with the foundation (see figure 6). If an overhang detail is used, the overhang dimension must be subtracted from the figures in Table 2 (figure 6). Note that the corner starter bar lies on centre line of wall (figure 7). This only corresponds with the setting out reference position on the 200 series.

Table 2:
Position of reinforcement from block face

Nominal Wall Thickness (mm)	Face of block to	
	Centreline of bar (mm)	Face of 10/12 mm bar (mm)*
100	45	40
150	70	65
200	95	90
250	120	115

D12 bars are used in the non-specific design code NZS 4229.

D10 bars maximum size in 100 mm (10 series).

* Dimensions have been rounded to nearest 5 mm

Step 7:

Fix starter steel to shape and dimensions required. Typical details for D12 bars are shown in figure 6.

Step 8:

Immediately after concreting, make a running dimension check to see that steel is in correct position. Adjust as necessary, but make sure concrete around the starter is recompacted.

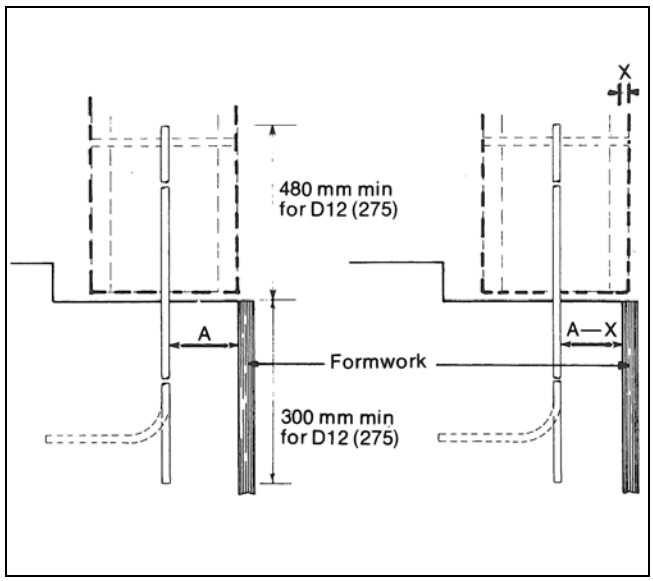


Figure 6: Position of bar from face of foundation

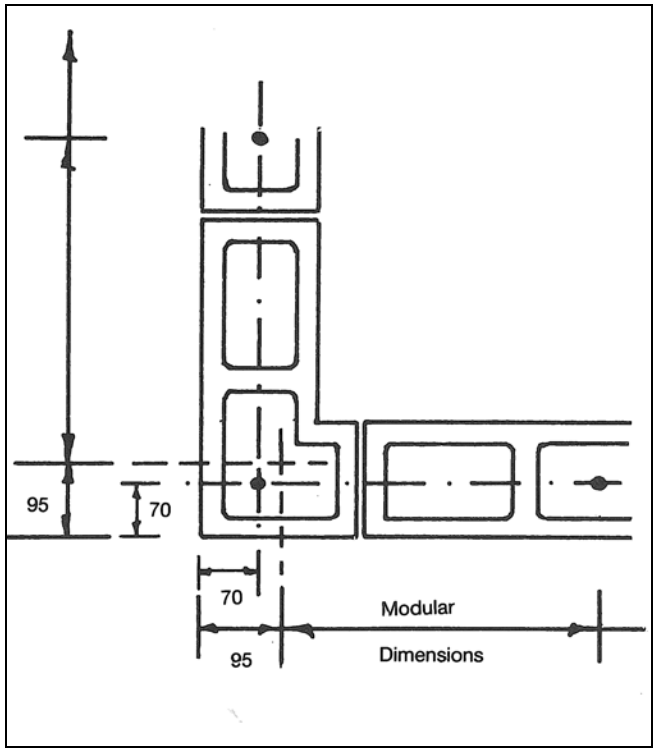


Figure 7: Positioning corner bar on 150 series

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