TABLE 9.1(A)

MAXIMUM PANEL LENGTHS (mm)—SINGLE-LEAF UNREINFORCED WALLS 2400 mm IN HEIGHT

Edge conditions	Wall thickness	Wind class									
		N1	N2	N3	N4	N5	N6	C1	C2	C3	C4
Panel supported on 4 edges with no opening	90 solid/cored	7 750	5 850	4 100	3 050	2 150	1 650	3 250	2 350	1 650	1 350
	110 solid/cored	8 600	6 450	4 550	3 400	2 400	1 900	3 650	2 600	1 900	1 550
	140 solid/cored/hollow	11 500	8 600	5 900	4 300	3 300	2 500	4 650	3 500	2 500	2 000
	190 hollow	18 700	13 300	9 100	6 500	4 600	3 600	7 000	4 900	3 600	2 900
	230 solid	21 200	15 200	10 500	7 500	5 400	4 300	8 200	5 800	4 300	3 450
Panel supported on 4 edges with an opening (see Note 1)	90 solid/cored	3 250	2 200	1 425	400	*	*	500	*	*	*
	110 solid/cored	3 600	2 500	1 600	550	*	*	700	*	*	*
	140 solid/cored/hollow	5 050	3 500	2 350	1 350	550	*	1 700	625	*	*
	190 hollow	8 750	6 000	3 950	2 650	1 700	1 200	2 950	1 900	1 200	*
	230 solid	10 000	7 000	4 650	3 150	2 100	1 300	3 500	2 300	1 300	700
Panel supported on three edges with a free end or control joint	90 solid/cored	3 850	2 900	2 050	1 500	1 000	700	1 600	1 100	700	550
	110 solid/cored	4 300	3 200	2 250	1 700	1 100	800	1 800	1 200	800	600
	140 solid/cored/hollow	5 700	4 300	2 950	2 150	1 600	1 150	2 300	1 750	1 150	850
	190 hollow	9 400	6 700	4 500	3 300	2 300	1 800	3 500	2 500	1 800	1 450
	230 solid	10 600	7 600	5 250	3 750	2 700	2 100	4 050	2 900	2 150	1 750
Panel supported on the base and one vertical edge	90 solid/cored	2 400	1 600	1 100	800	550	*	850	600	*	*
	110 solid/cored	2 600	1 700	1 200	900	650	550	950	700	550	*
	140 solid/cored hollow	3 700	2 400	1 700	1 200	850	700	1 300	950	700	550
	190 hollow	5 300	3 900	2 900	2 100	1 300	1 000	2 300	1 400	1 000	750
	230 solid	6 100	4 600	3 450	2 300	1 600	1 300	2 500	1 700	1 300	1 000

LEGEND:
* = not applicable

NOTES:

1 For walls with openings, the panel length given is from the wall support to the edge of the opening (see Figure 1.3(b)).

2 The values in this table are based on the assumption that mortar bed joints are finished flush or tooled to a depth not exceeding 3 mm.

3 Where the length of a wall panel between a support and an opening exceeds the value in the Table, the edge at the opening shall be provided with a vertical support.

4 Linear interpolation is allowed for wall heights between 2400 mm and 3000 mm.

TABLE 9.1(B)

MAXIMUM PANEL LENGTHS (mm)—SINGLE-LEAF UNREINFORCED WALLS 3000 mm IN HEIGHT

Edge conditions	Wall thickness	Wind class									
		N1	N2	N3	N4	N5	N6	C1	C2	C3	C4
Panel supported on 4 edges with no opening	90 solid/cored	6 600	5 100	3 700	2 550	1 850	1 500	2 750	2 000	1 500	1 250
	110 solid/cored	7 350	5 650	4 100	2 900	2 150	1 750	3 100	2 300	1 750	1 450
	140 solid/cored/hollow	9 700	7 300	5 200	3 850	2 800	2 300	4 200	3 000	2 300	1 850
	190 hollow	15 300	11 000	7 700	5 500	4 000	3 300	6 000	4 300	3 300	2 500
	230 solid	17 500	12 600	8 900	6 500	4 800	3 900	7 000	5 100	3 900	3 100
Panel supported on 4 edges with an opening (see Note 1)	90 solid/cored	2 700	1 850	650	*	*	*	*	*	*	*
	110 solid/cored	3 100	2 150	850	425	*	*	500	*	*	*
	140 solid/cored/hollow	4 200	2 950	1 800	800	425	*	950	475	*	*
	190 hollow	7 050	4 900	3 250	2 150	1 100	550	2 400	1 550	550	*
	230 solid	8 100	5 700	3 850	2 650	1 450	850	2 900	1 750	850	550
Panel supported on three edges with a free end or control joint	90 solid/cored	3 300	2 550	1 850	1 150	800	600	1 300	850	600	450
	110 solid/cored	3 650	2 850	2 050	1 250	900	700	1 400	950	700	550
	140 solid/cored/hollow	4 850	3 700	2 600	1 900	1 200	950	2 100	1 350	900	700
	190 hollow	7 700	5 500	3 800	2 800	2 000	1 600	3 000	2 200	1 600	1 200
	230 solid	8 700	6 300	4 400	3 200	2 400	1 900	3 500	2 600	1 900	1 300
Panel supported on the base and one vertical edge	90 solid/cored	2 000	1 400	1 000	700	500	*	750	500	*	*
	110 solid/cored	2 000	1 400	1 100	800	600	500	850	650	500	*
	140 solid/cored hollow	2 900	2 000	1 400	1 050	800	650	1 150	850	650	550
	190 hollow	4 600	3 500	2 350	1 600	1 100	850	1 700	1 200	850	650
	230 solid	5 400	4 200	2 700	1 900	1 400	1 150	2 100	1 500	1 150	900

LEGEND:
* = not applicable

NOTES:

1 For walls with openings, the panel length given is from the wall support to the edge of the opening (see Figure 1.3(b)).

2 The values in this table are based on the assumption that mortar bed joints are finished flush or tooled to a depth not exceeding 3 mm.

3 Where the length of a wall panel between a support and an opening exceeds the value in the Table, the edge at the opening shall be provided with a vertical support.

4 Linear interpolation is allowed for wall heights between 2400 mm and 3000 mm.

9.2.2 External walls with engaged piers

External unreinforced single-leaf masonry walls with engaged piers complying with Figure 9.1 and Table 9.2 are deemed to satisfy the requirements of this Standard.

TABLE 9.2

PIER SPACINGS FOR ONE-WAY SPANNING WALLS

Wall thickness (*T*) mm	Pier thickness (*A*) mm	Pier width (*B*) mm	Spacing (*S*) mm for wind class			
			N1	N2	N2 with tie-down (see Note 1)	N3 with tie-down (see Note 1)
Wall height 2400 mm						
90	190	290	1 000	600	1 900	*
90	290	190	1 700	1 200	8 000	3 300
90	290	290	2 600	1 800	12 300	5 000
110	230	230	1 320	840	4 200	1 200
110	230	350	2 040	1 320	6 360	1 920
110	350	230	3 240	2 160	23 640	8 400
110	350	350	4 920	3 360	36 000	9 600
Wall height 2700 mm						
90	190	290	700	500	1 000	*
90	290	190	1 300	900	5 100	2 000
90	290	290	2 000	1 400	7 800	3 100
110	230	230	960	600	2 160	720
110	230	350	1 440	960	3 360	1 080
110	350	230	2 520	1 680	13 440	5 400
110	350	350	3 840	2 520	20 640	8 160
Wall height 3000 mm						
90	190	290	600	400	600	*
90	290	190	1 000	700	3 400	1 200
90	290	290	1 600	1 100	5 200	1 900
110	230	230	720	480	1 320	*
110	230	350	1 080	720	2 040	*
110	350	230	1 920	1 320	8 760	3 600
110	350	350	3 000	2 040	13 320	5 520

LEGEND:
* = not applicable

NOTES:

1 Piers with tie-downs shall include one full-height N10, N12 or M10 reinforcing bar tied to the footing and positively attached to the top plate (in accordance with Clause 6.7.2).

2 This Table applies to walls with no openings. For piers at the edge of major openings, such as garage doors, see Clause 6.7.2.

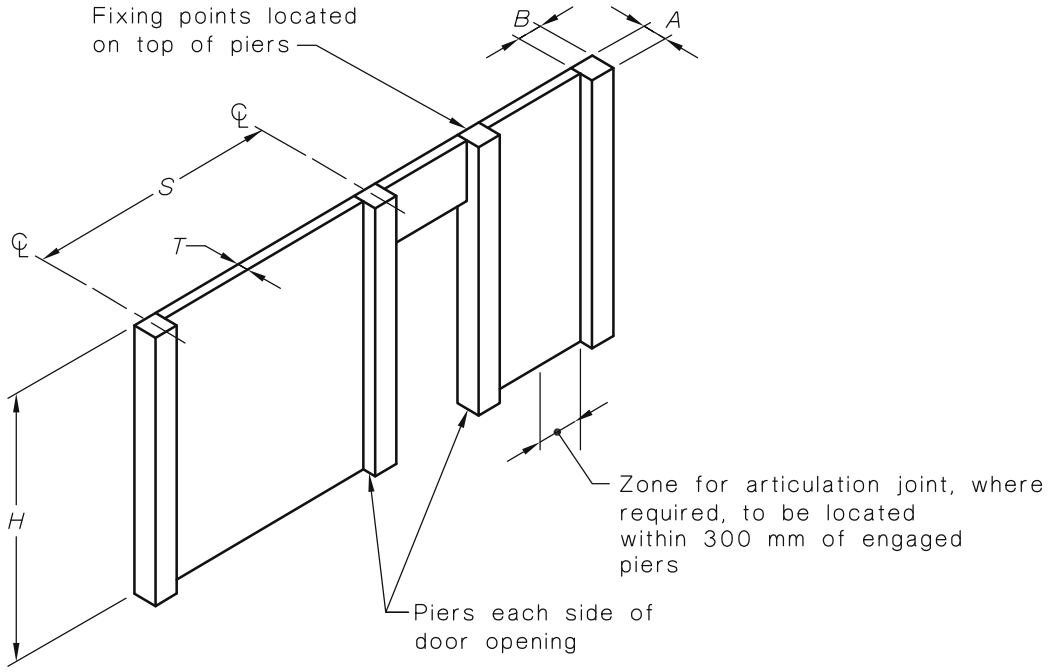


FIGURE 9.1 ENGAGED PIERS IN EXTERNAL SINGLE-LEAF WALLS

9.3 INTERNAL WALLS

Internal single-leaf masonry walls shall be at least supported at the top in accordance with Clause 6.4 and shall be dimensioned in accordance with Table 9.3.

TABLE 9.3

MAXIMUM WALL HEIGHTS FOR SINGLE-LEAF INTERNAL WALLS

millimetres

Wall thickness	Height
90	2400
110	3000
140	3800
190	5200

SECTION 10 REINFORCED MASONRY WALLS

10.1 SCOPE OF SECTION

This Section sets out specific requirements for masonry walls reinforced to resist wind actions.

NOTE: Additional requirements for resistance to water penetration might apply for single-leaf reinforced masonry walls (see Clause 14.8.1).

10.2 GENERAL CRITERIA

A1

Masonry walls reinforced to resist wind actions shall have a thickness of 140 mm or 190 mm and shall be reinforced with N12 or N16 bars in grouted cores in accordance with Clauses 10.3 to 10.5.

NOTE: A typical arrangement of reinforcement is shown in Figure 10.1.

Steel reinforcement shall be detailed in accordance with the relevant requirements of AS 3600.

NOTE: Where an N16 bar is required, 2 N12 bars may be substituted.

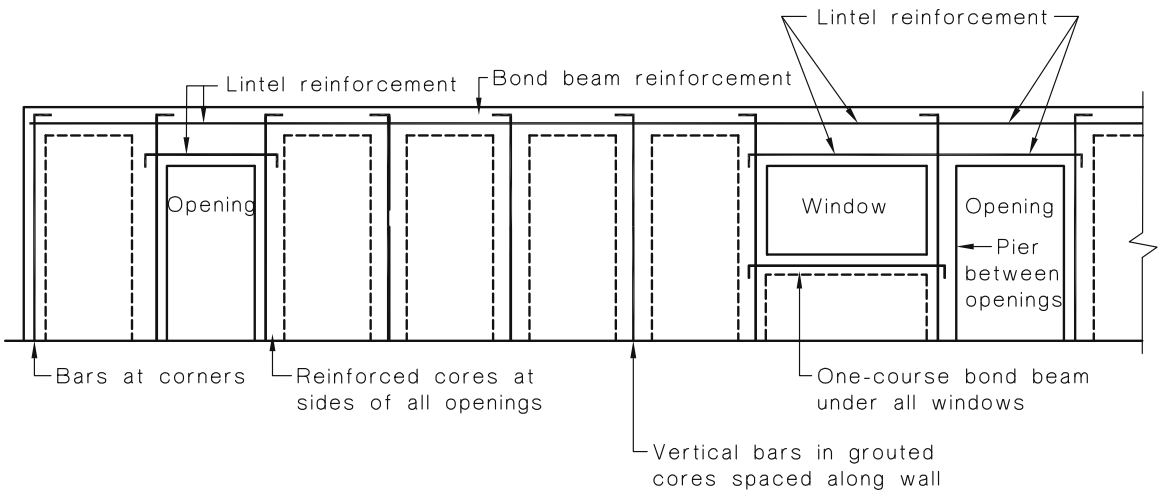
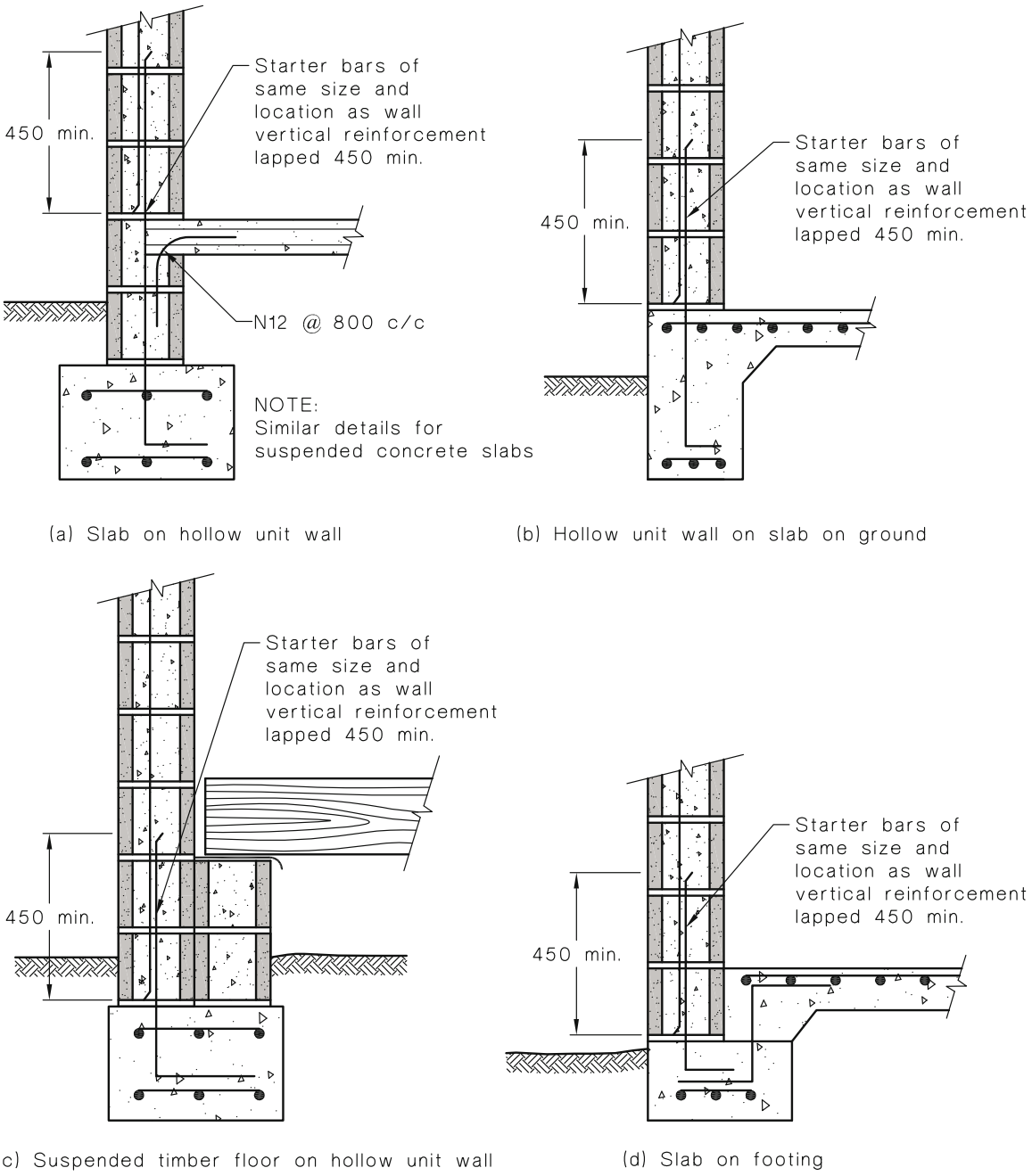


FIGURE 10.1 TYPICAL REINFORCEMENT LAYOUT

10.3 STARTER BARS

Starter bars shall be provided and shall extend from the footing or slab 450 mm into the wall and shall be of the same size and location as the main vertical reinforcement (see Figure 10.2).



DIMENSIONS IN MILLIMETRES

FIGURE 10.2 STARTER BAR DETAILS

10.4 BOND BEAMS

Bond beams shall be provided in the following locations:

(a) At the tops of all reinforced walls (see Figure 10.3(A)).

(b) Where the wall supports a floor, at an intermediate level (see Figure 10.3(B)).

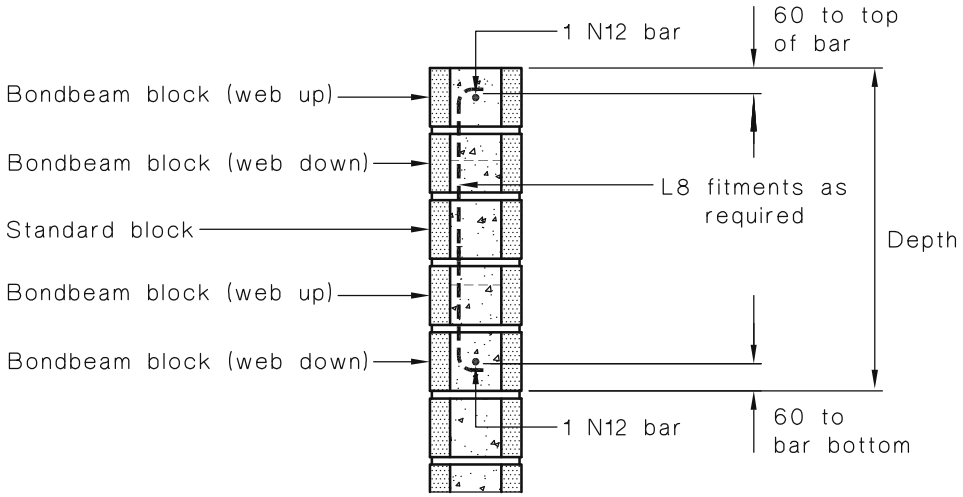
(c) Under all windows with a width of 1500 mm or greater.

Bond beams shall have a minimum depth and reinforcement in accordance with Table 10.1.

TABLE 10.1

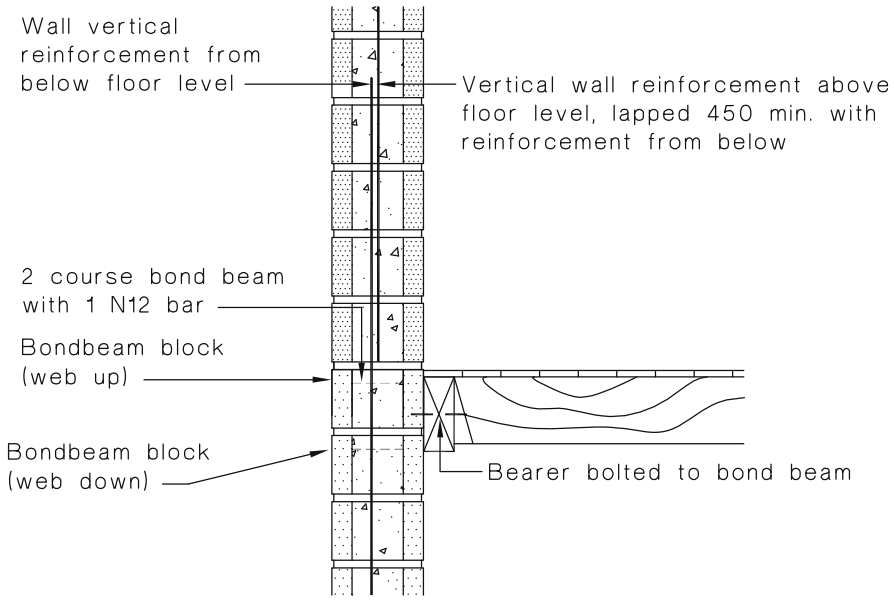
MINIMUM DEPTH AND REINFORCEMENT REQUIREMENTS FOR BOND BEAMS

Wind category	Reinforcement	Depth, mm (see Figure 10.3(A))	Maximum load width (*A*) mm (see Figure 6.2)
N1, N2	1-N16 or 2-N12	190	9000
	2-N12	390	9000
	2-N12	590	9000
N3	2-N12	190	9000
	2-N12	390	9000
	2-N12	590	9000
N4, C1	2-N12	190	5000
	2-N12	390	9000
	2-N12	590	9000
N5	2-N12	190	—
	2-N12	390	7000
	2-N12	590	9000
N6	2-N12	190	—
	2-N12	390	5000
	2-N12	590	9000
C2	2-N12	190	3500
	2-N12	390	9000
	2-N12	590	9000
C3	2-N12	190	—
	2-N12	390	5000
	2-N12	590	9000
C4	2-N12	190	—
	2-N12	390	—
	2-N12	590	7000

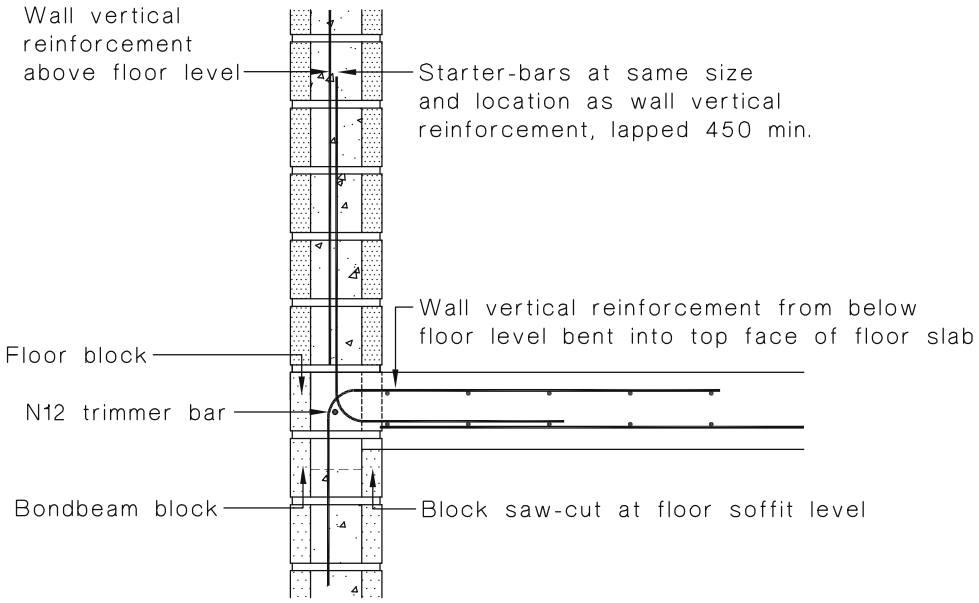


DIMENSIONS IN MILLIMETRES

FIGURE 10.3(A) DETAILS—BOND BEAM



TIMBER FLOOR



CONCRETE FLOOR

DIMENSIONS IN MILLIMETRES

FIGURE 10.3(B) DETAILS—BOND BEAM

10.5 VERTICAL REINFORCEMENT

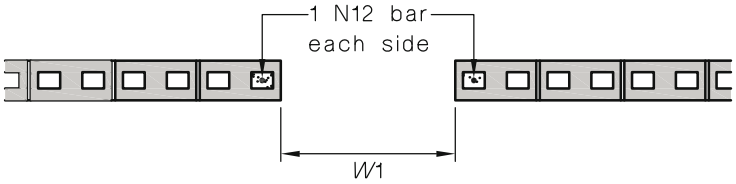
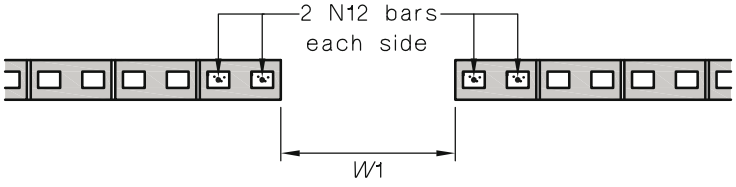
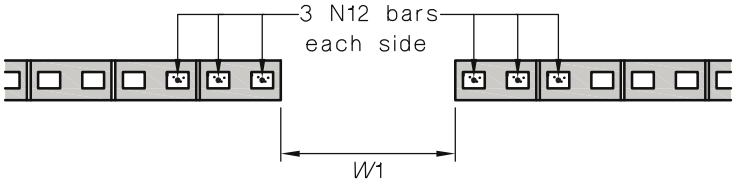
Vertical reinforcement shall be placed centrally in the vertical cores and located at corners, at both sides of openings and spaced along the wall between these locations in accordance with Tables 10.2 to 10.5.

The main wall reinforcement, inserted after laying of units is completed, shall be long enough to fully overlap the starter bars. The wall reinforcement shall also be hooked or cogged at the top end and engaged with the bond beam reinforcement.

NOTE: Tables 10.2 to 10.5 have been generated for 140 mm walls. The Tables give practical values but are considered conservative for 190 mm walls.

TABLE 10.2

MAXIMUM WIDTH OF OPENINGS

Edge reinforcement details mm	Wind category	Maximum width of opening, $W1$, m Wall height, m				
		2.4	2.5	2.7	3.0	3.6
	N1 and N2	5.5	5.5	5.5	5.3	3.6
	N3	5.2	4.9	4.2	3.4	2.3
	N4 and C1	3.5	3.2	2.7	2.2	1.4
	N5 and C2	2.4	2.2	1.6	1.4	—
	N6 and C3	1.7	1.5	1.3	1.0	—
	N1 and N2	5.5	5.5	5.5	5.5	5.5
	N3	5.5	5.5	5.5	5.5	4.2
	N4 and C1	5.5	5.5	5.2	4.1	2.7
	N5 and C2	4.5	4.1	3.4	2.7	1.5
	N6 and C3	3.2	2.9	2.4	1.9	1.1
	N1 and N2	5.5	5.5	5.5	5.5	5.5
	N3	5.5	5.5	5.5	5.5	5.5
	N4 and C1	5.5	5.5	5.5	5.1	3.5
	N5 and C2	5.5	5.5	4.5	3.2	2.2
	N6 and C3	4.2	3.8	3.1	2.4	1.5