Recommendations for construction of Earthquake Safer Buildings

For Load Bearing Wall System Buildings up to three stories

1. Construction of Foundations

» For one storied building, the recommended size of foundations are as follows:
- ➲ Width 750 mm and depth 800 mm for brick masonry with cement mortar.
- ➲ Width 750 mm and depth 800 mm for stone masonry in cement mortar.
- ➲ Width 850 mm and depth 800 mm for brick masonry with mud mortar.

» For building up to three stories, the recommended size of foundations are as follows:
- ➲ Width 900 mm and depth 900 mm for brick masonry with cement mortar
- ➲ Width 900 mm and depth 900 mm for stone masonry in cement mortar.
- ➲ Width 1050 mm and depth 1050 mm for brick masonry with mud mortar. The buildings with brick masonry in mud mortar should not be constructed more than two stories.

» 75 mm thick Plain Cement Concrete (P.C.C.) in 1:2:4 ratio of cement sand aggregate should be laid over one layer Brick flat soling for constructing brick masonry in foundation.

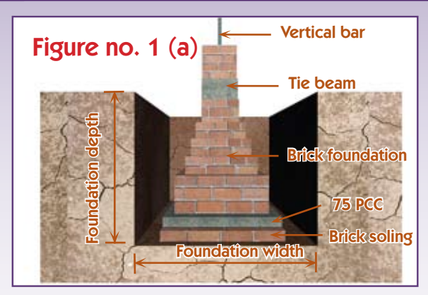

Figure no. 1 (a)

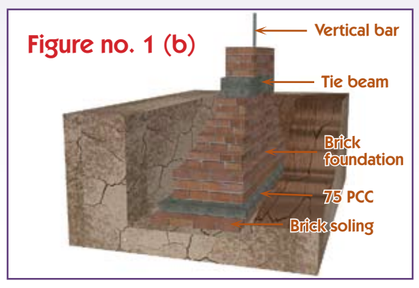

Figure no. 1 (b)

2. Construction of Tie Beams

» Tie beams should be provided for tying up the walls with each other and preventing dampness coming up from ground to superstructure.

» The level of tie beam should be usually 450 mm to 750 mm from ground level.

» Tie beam should be constructed with concrete in 1:2:4 ratio of cement, sand and aggregate.

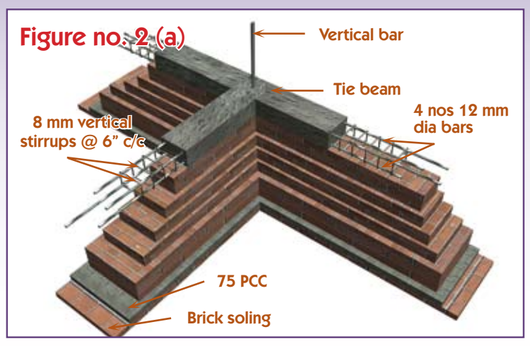

Figure no. 2 (a)

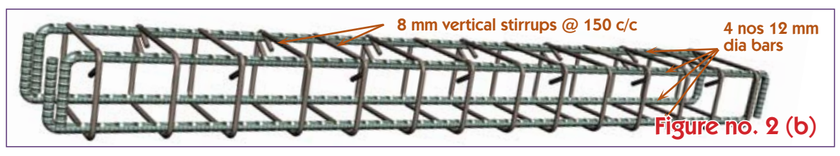

Figure no. 2 (b)

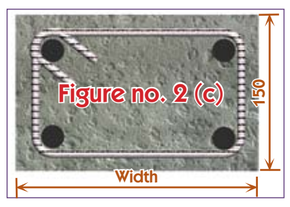

Figure no. 2 (c)

3. Thickness of Wall

» For brick masonry in cement sand mortar (1:6) the thickness of wall should be 350 mm at ground floor and 230 mm at first and second floors. The width of room should not exceed 3.5 m.

» For stone masonry wall in cement sand mortar (1:6) the thickness of wall should be 450 mm for ground floor and 350 mm for first floor. It is safe to construct maximum two floors with stone masonry and the width of room should not exceed 3.5 m.

» For brick masonry with mud mortar the thickness of wall should be 350 mm at ground floor and 230 mm at first floor. It is recommended to construct maximum two floors only with brick masonry in mud mortar.

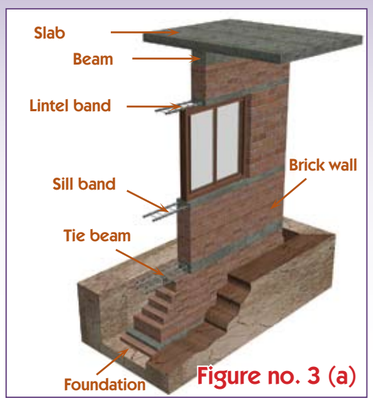

Figure no. 3 (a)

4. Locations of doors and windows in wall

» The doors and windows should be placed at minimum 600 mm distance away from corner of walls.

» Door and windows in a wall should be placed at 600 mm apart from each other.

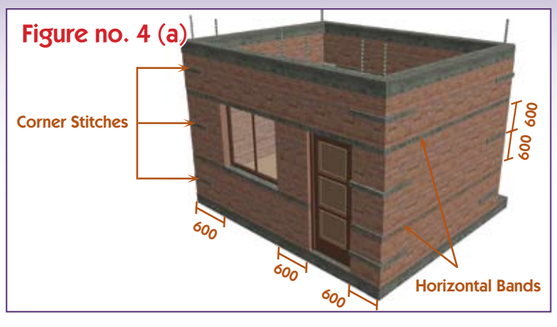

Figure no. 4 (a)

5. Concrete Stitches at Corners

» Concrete stitches should be provided at junctions and corners of walls.

» The width of the stitches should be equal to the width of the wall and its thickness equal to that of the masonry unit or 75 mm, whichever is larger. The length of the stitch should be 900 mm, measured from the corner or junction of the walls.

» 2 numbers 10 mm diameter bars with 8mm diameter U-hooks at 150 mm c/c should be provided for stitches.

» The concrete stitches should be provided at every 600 mm height of wall.

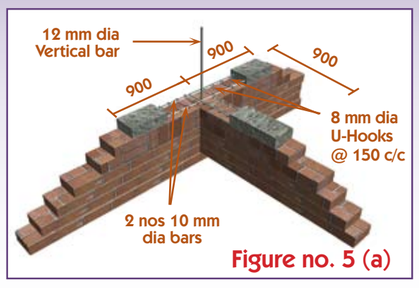

Figure no. 5 (a)

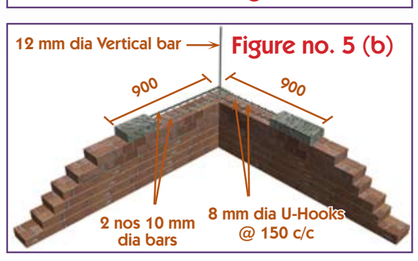

Figure no. 5 (b)

6. Floor Beams

» Floor beams should be provided through the whole length of wall togther with floor slabs.

» The width of the beams should be equal to the width of the wall and hight should be equal to minimum 325 mm.

» Reinforcement bars should be provided as shown in figure no. 6 (a).

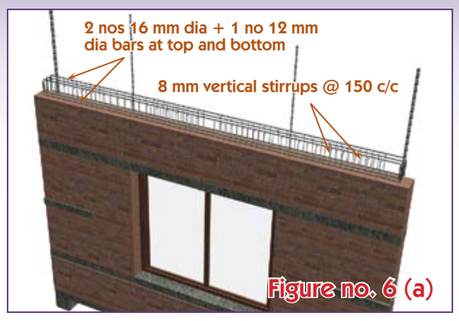

Figure no. 6 (a)

7. Sill and Lintel Bands

» Sill and Lintel bands should be provided at sill and lintel level of openings.

» The width of bands should be equal to the thickness of wall and thickness of bands should be 75 mm. At openings of more than 1.2 m. width, the thickness of lintel bands should be equal to 150 mm at opening with 450 mm bearing on either side.

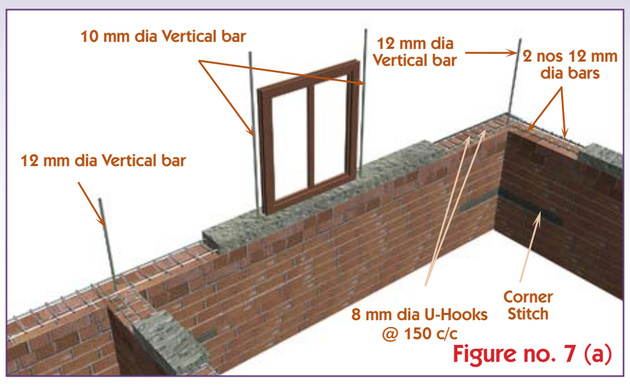

Figure no. 7 (a)

» 2 numbers 12mm diameter reinforcement bars with 8mm diameter U-hooks at 150 mm c/c should be provided for sill and lintel bands.

» For lintel bands of 150 mm Thickness, 4 numbers 12 mm diameter with 8 mm diameter vertical stirrups should be provided.

8. Vertical Bars

» Vertical bars of 12 mm diameter should be provided at every corners and junctions of the walls from foundations to the slab.

» Vertical bars of 10 mm diameter should be provided at each side of openings from tie beams to slab.

» Concreting (1:2:4) should be provided around the voids of vertical bars for making 100 x 100 mm reinforcement cement concrete (R.C.C.) Core.

» Usually construction of masonry walls should be carried gradually in a level. Walls should be left in steps for continuation part as shown in figure no. 8 (a, b).

» Walls should be constructed not more that 1.0 m. height in a day.

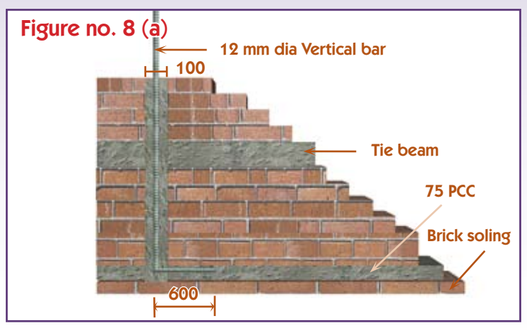

Figure no. 8 (a)

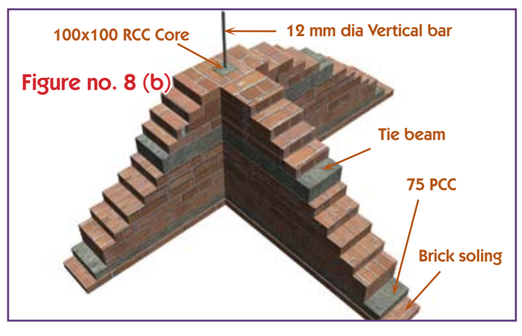

Figure no. 8 (b)

Based on Nepal National Building Code

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Earthquake Risk Reduction and Recovery Preparedness Programme for Nepal
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