EXPERIMENT: 5

DRAWINGS OF BUILDING COMPONENTS

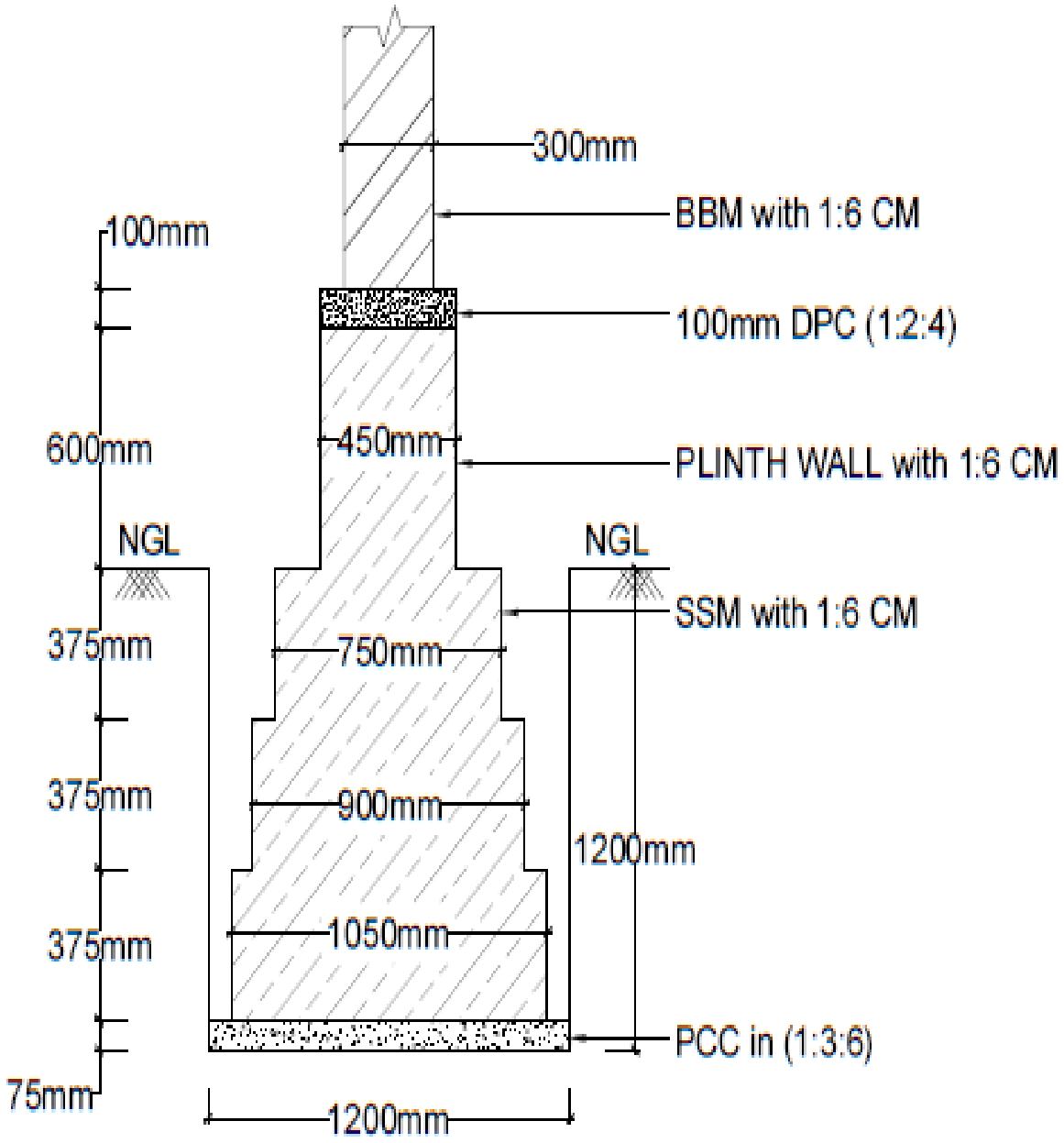
The drawings of different components of a building are to be prepared for the data given using AutoCAD software.

A. CROSS SECTION OF MASONRY WALL FOUNDATION, RCC COLUMNS WITH ISOLATED AND COMBINED FOOTINGS

Exercise 5.1

Draw a cross section of a S.S. Masonry foundation to be provided for a load bearing wall 300mm thick in Burnt Brick Masonry in superstructure of a residential building. Use following data:

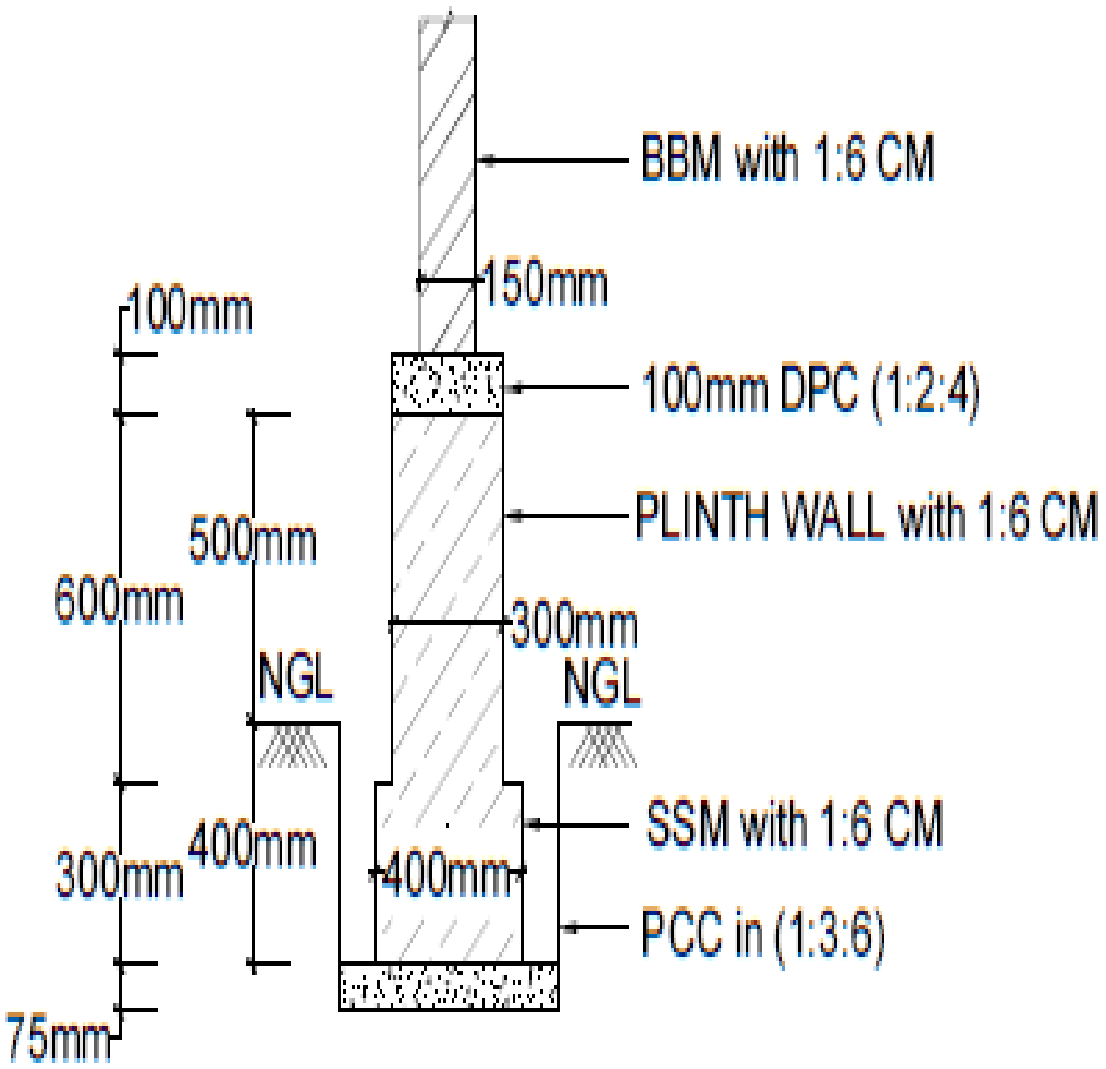
a. Width of foundation = 1.20m
b. Depth of foundation below GL = 1.20m
c. Width of PCC = 1.20m
d. Thickness of PCC in 1:3:6 = 75mm.
vii. Width of second footing = 0.90m
viii. Depth of second footing = 0.375m
ix. Width of third footing = 0.75m
x. Depth of third footing = 0.375m
e. Width of first footing above PCC = 1.05m
f. Depth of first footing above PCC = 0.375m
xi. Width of plinth wall = 0.45m
xii. Depth of plinth wall = 0.60m
xiii. Thickness of DPC in 1:2:4 = 100mm.



CROSS SECTION OF SIZE STONE MASONRY FOUNDATION FOR MAIN WALL (Fig:2.1)

Exercise 5.2

Draw a cross section of a S.S. Masonry foundation to be provided for a partition wall 150mm thick in Burnt Brick Masonry in superstructure of a residential building



CROSS SECTION OF SIZE STONE MASONRY FOUNDATION FOR PARTITION WALL (Fig:2.2)

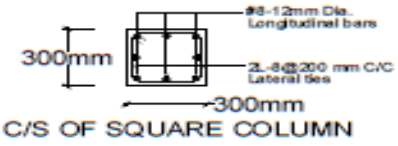
Exercise 5.3

Prepare a working drawing for an isolated column footing (RCC) for a column size 300mm x 300mm reinforced with #8 of 12mm HYSD- steel as main bars together with 2 legged 8ϕ stirrups at 200c/c.

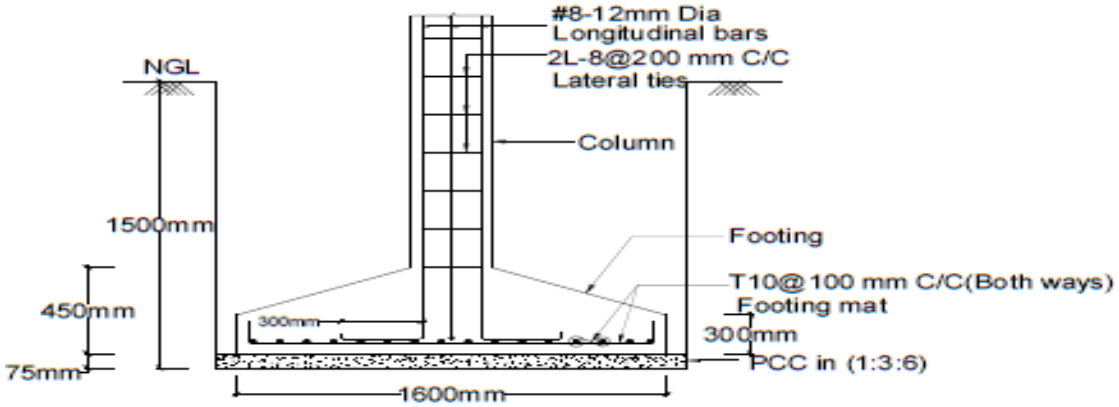
Details of footing: Size of footing is 1.6m x 1.6m and the thickness of the footing at the face of the column is 450mm which reduces to 300mm at the edge of footing. The mat comprises of 10ϕ TOR- steel at 100 c/c both ways. The footing is provided with PCC bed in 1:3:6 of thickness 75mm.Depth of foundation is1.5m from natural ground level.

Solution:

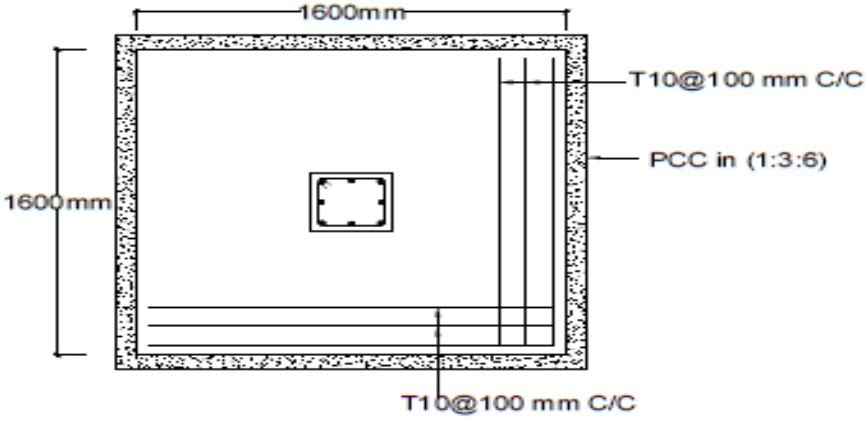
SQUARE ISOLATED COLUMN FOOTING(Fig:2.3)



C/S OF SQUARE COLUMN



L/S OF SQUARE ISOLATED COLUMN FOOTING



C/S OF SQUARE ISOLATED COLUMN FOOTING

Exercise 5.4

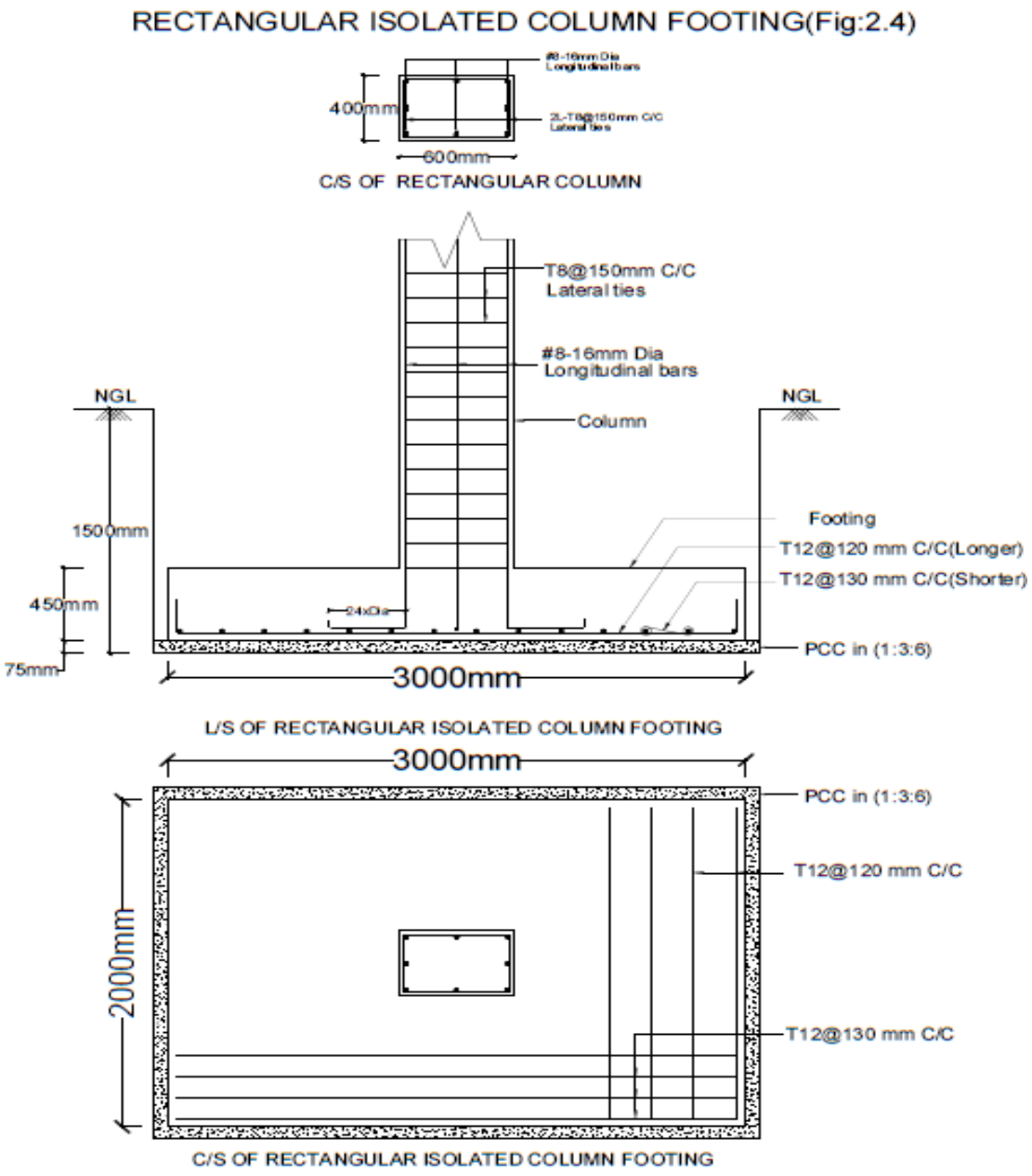
Prepare a working drawing for an isolated rectangular RCC column and footing has the following details:

Column size: (400 x 600) mm. Size of footing: 2m x 3m of uniform thickness 450mm. Depth of foundation below GL = 1.5m, Height of column to be shown above GL = 1.0m, Thickness of PCC bed in 1:3:6 = 75mm,

Details of reinforcement:

Column: #8 - 16ϕ as main bars with 2L - 8ϕ @ 150 c/c lateral ties, Footing: Longer direction steel - 12ϕ @ 130 c/c, Shorter direction steel - 12ϕ @ 220 c/c.

Solution:



Exercise 5.5

Draw plan, sectional elevation and cross section of a slab type combined footing with the given details:

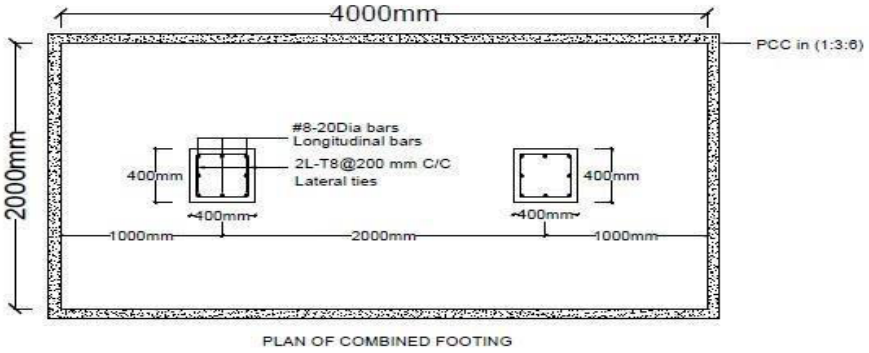
Size of columns = (400 x 400) mm, Depth of footing = 600mm, Size of footing =2m x 4m

Centre to centre distance between the columns = 2m, Thickness of PCC bed in 1:3:6 = 100mm, Column reinforcement details – longitudinal steel of #8 - 20ϕ with lateral ties of 2L - 8ϕ @ 200 c/c

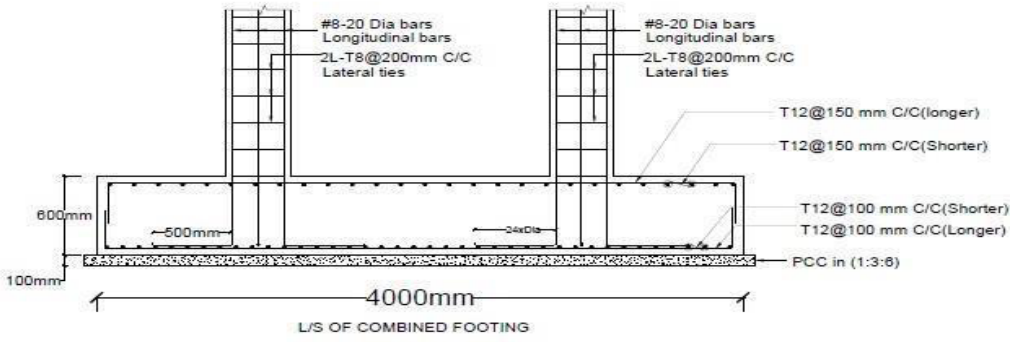
Footing reinforcement details – bottom reinforcement of 12ϕ @ 100 c/c both ways and top reinforcement of 12ϕ @ 150 c/c both ways

Solution:

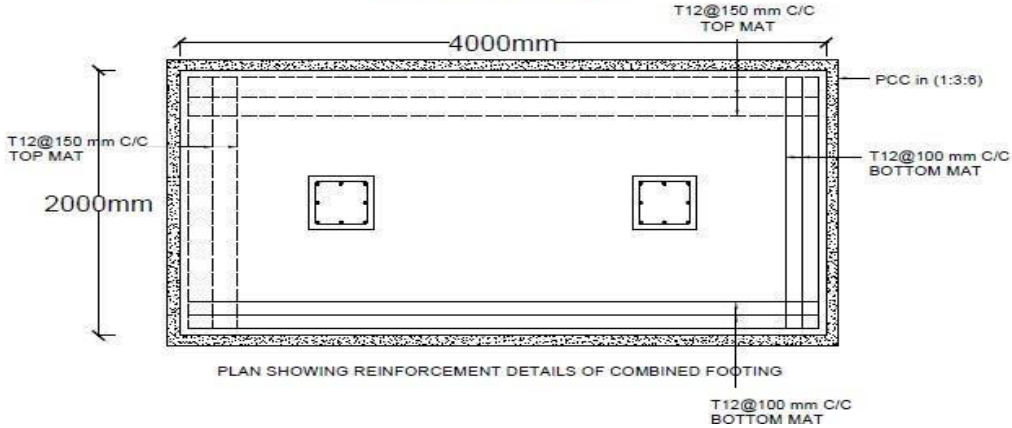
SLAB TYPE COMBINED FOOTING(Fig:2.5)



PLAN OF COMBINED FOOTING



L/S OF COMBINED FOOTING



PLAN SHOWING REINFORCEMENT DETAILS OF COMBINED FOOTING

B. DIFFERENT TYPES OF BONDS IN BRICK MASONRY

Exercise 5.6

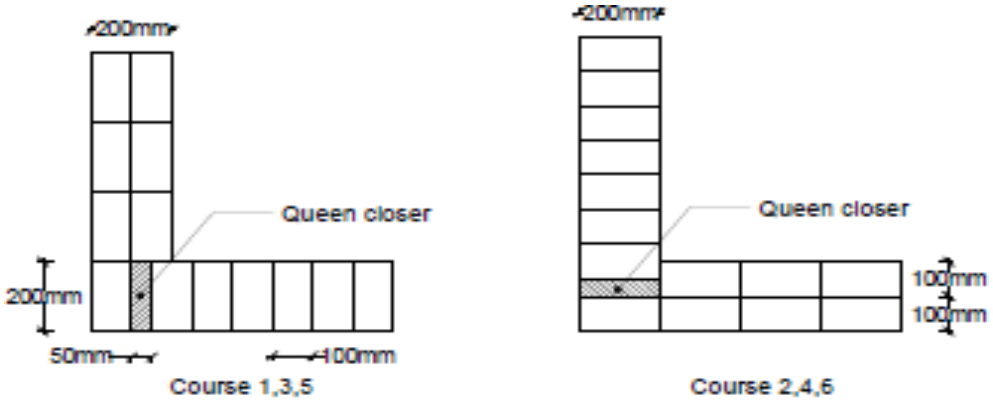
Draw two consecutive courses for corner joints of the following walls in English bond.

(a) One brick thick wall i.e., 200 x 200

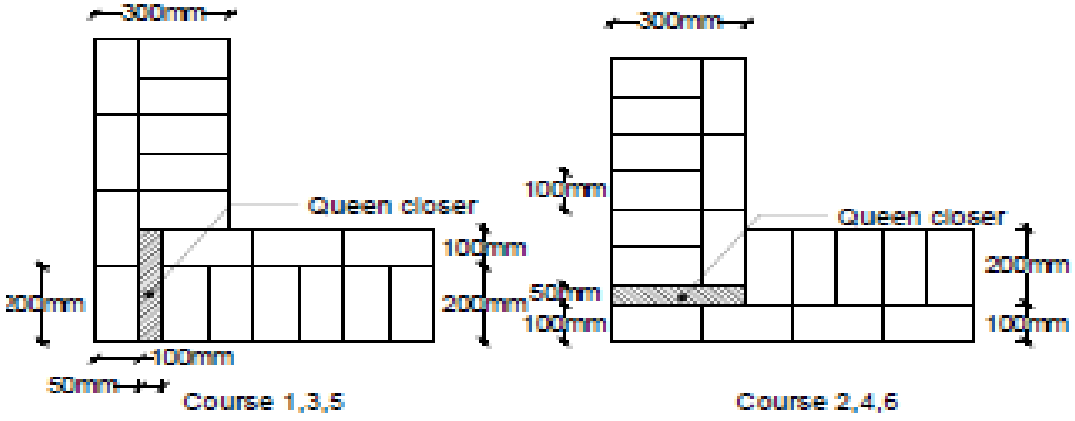
(b) One and half thick wall i.e., 300 x 300.

Solution: i) For one brick thick wall

ii) For one and half brick thick wall



ENGLISH BOND
ONE BRICK WALL 200X200(Fig:2.6a)



ENGLISH BOND
ONE AND HALF BRICK WALL 300X300(Fig:2.6b)

Exercise 5.7

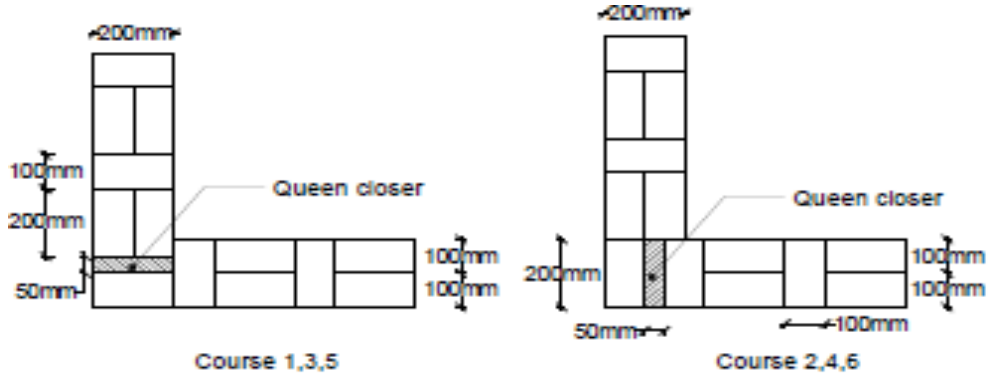
Draw plan of two consecutive courses for corner joints of the following walls in Double Flemish bond.

(a) One brick thick wall i.e., 200 x 200

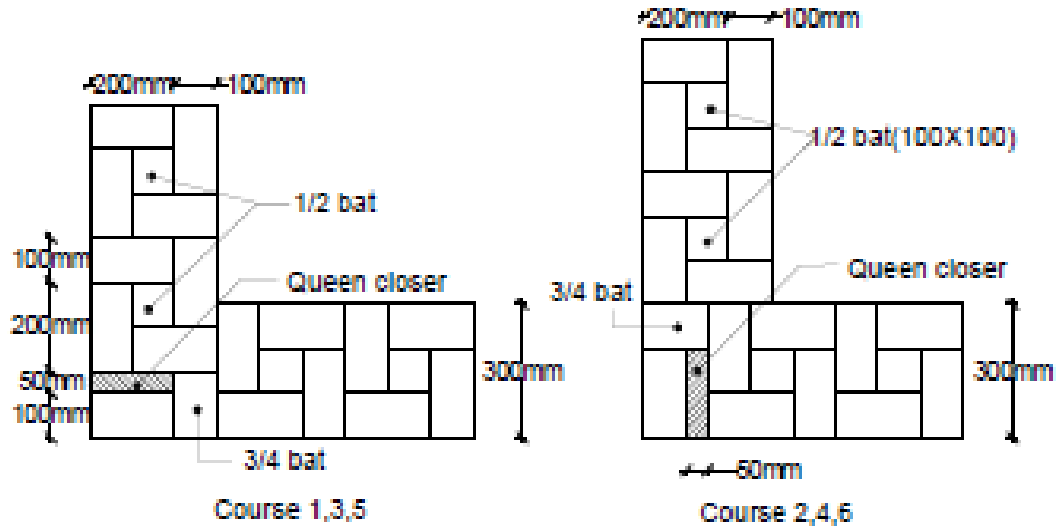
(b) One and half thick wall i.e., 300 x 300.

Solution: i) For one brick thick wall

ii)For one and half brick thick wall



DOUBLE FLEMISH BOND
ONE BRICK WALL 200X200(Fig:2.7a)

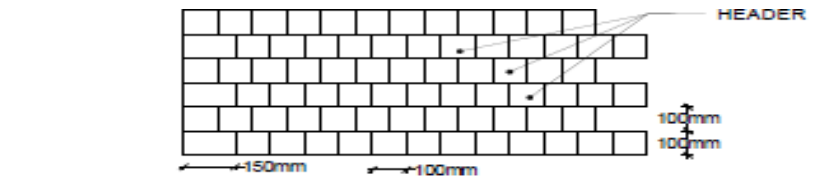


DOUBLE FLEMISH BOND
ONE AND HALF BRICK WALL 300X300(Fig:2.7b

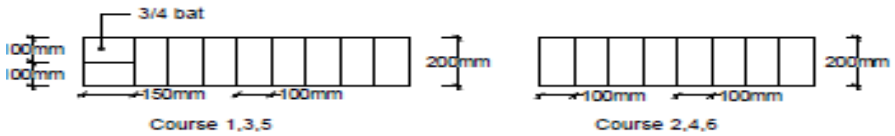
Exercise 5.8

Draw plan and elevation of two alternate courses of a one brick thick wall in Header bond.

Solution:



ELEVATION OF HEADER BOND

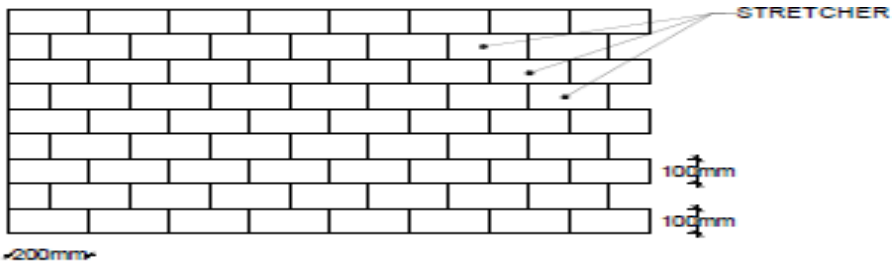


HEADER BOND
ONE BRICK WALL 200X200(Fig:2.8)

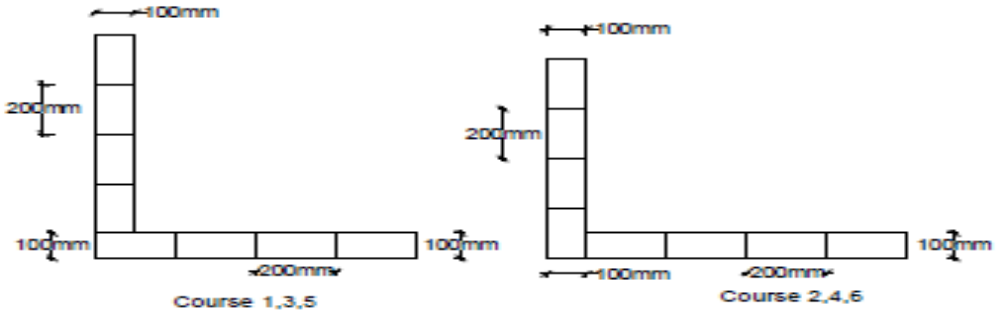
Exercise 5.9

Draw plan and elevation two alternate courses and elevation of a half brick thick wall in Stretcher bond.

Solution:



ELEVATION OF STRETCHER BOND



STRETCHER BOND
ONE BRICK WALL 200X200(Fig:2.9)