
Carpentry joint

Objectives: At the end of this exercise you shall be able to

- draw the views of lengthening joints
 - draw the views of widening joints
 - draw the views of bearing joints
 - draw the views of angled or corner joints
 - draw the views of oblique shouldered joints
 - draw the views of through housing joint
 - draw the views of housing joint (Single dovetail)
 - draw the views of housing joint (stopped housing with shoulder)
 - draw the different varieties of panels
 - draw the different forms of moulding.
-

PROCEDURE

TASK 1: Draw the plan and elevation of different types of lengthening joints (Fig 1)

DATA: Width of the member - 300mm.

Thickness of the member - 200mm.

Length of the member - can be assumed.

- Draw the plan and elevation of lapped joints using member size 300x200mm.
- Draw the elevation of finished joints with single fish plates, double fish plates and intended fish plates.
- Draw the elevation of scarfed or spliced joints.
- Draw the elevation of table joints.

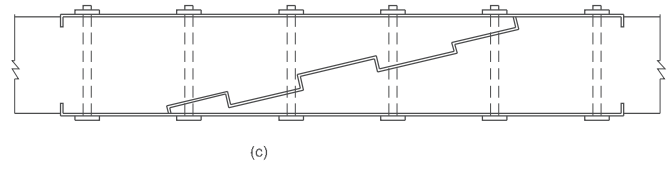
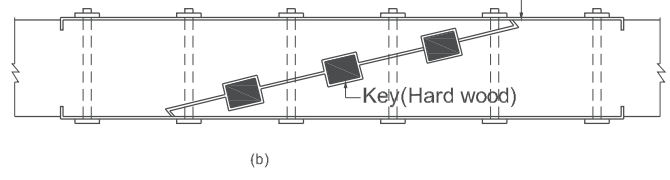
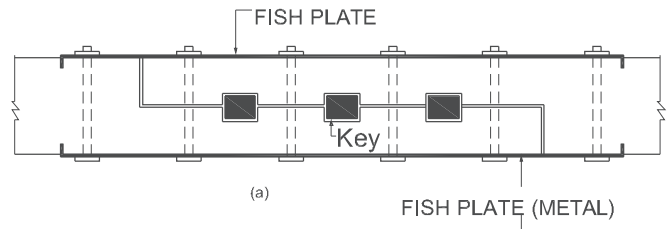
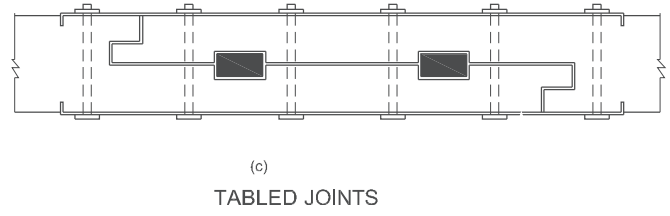
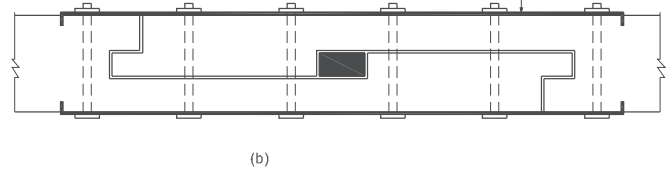
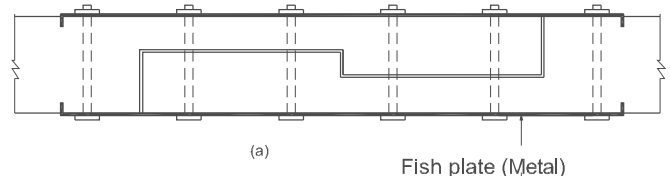
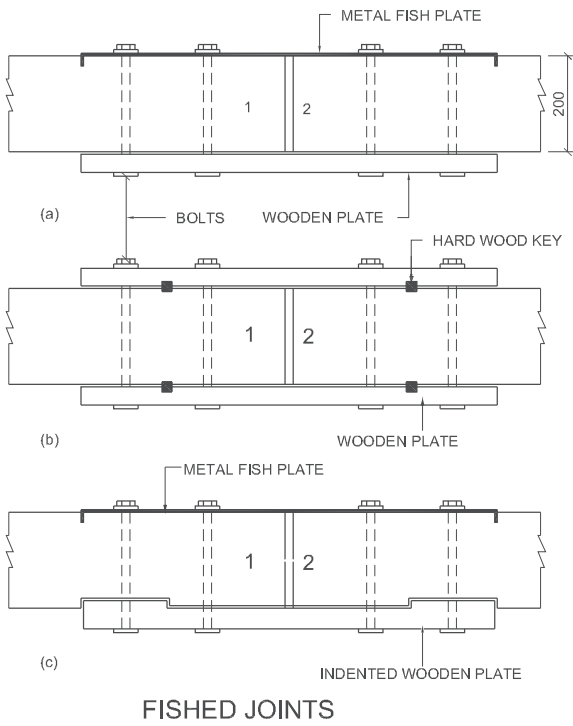
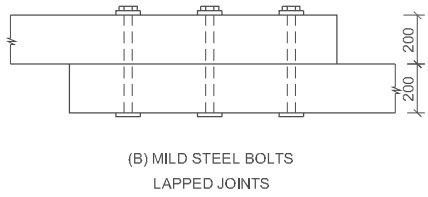
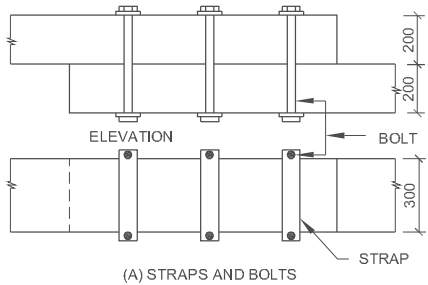
TASK 2: Draw the sectional elevation of widening joints (Fig 2)

DATA: Thickness of member - 200 mm.

Draw the sectional elevation of

- Butt joint.
- Rebated joint.
- Rebated and filleted joint.
- Ploughed and tongued joint.
- Tougued and grooved joint.
- Rebated, tougued and grooved joint.
- Splayed, dowelled, matched and beaded, matched nd V-joint and dovetailed joint.

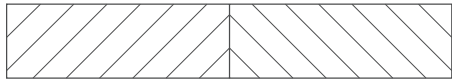
Fig 1



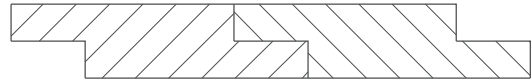
LENGTHENING JOINTS

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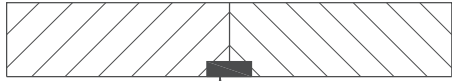
Fig 2



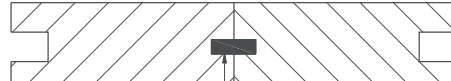
BUTT JOINT



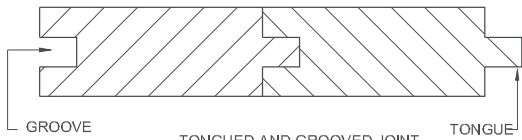
REBATED JOINT



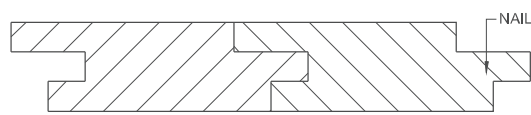
REBATED AND FILLETED JOINT



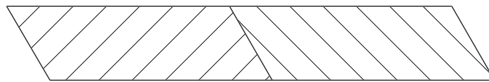
PLOUGHED AND TONGUED JOINT



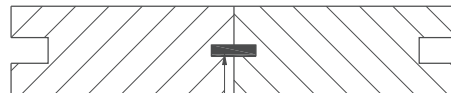
TONGUED AND GROOVED JOINT



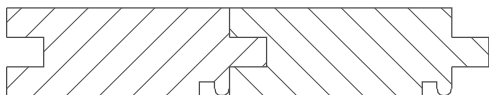
REBATED, TONGUED AND GROOVED JOINT



SPLAYED JOINT



Dowelled joint



MATCHED AND BEADED JOINT



MATCHED AND V-JOINTED JOINT

WIDENING JOINTS

DCN2678E2

TASK 3 : Draw the views of bearing joints, angle joints and oblique shouldered joints (Fig 3, Fig 4, Fig 5)

Width of the member - 300 mm.

Thickness of the member - 200 mm.

DATA

Size of the members can be assumed suitably.

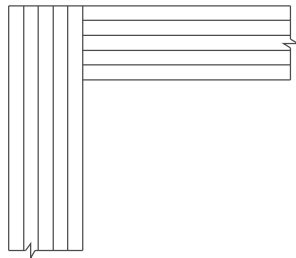
- 1 Draw the three dimensional views of halved joint, notched joint cogged joint, housed joint, chase - mortise joint, dovetailed joint mortise and tenon joint, joggled joint, bridled joint, tusk and tenon joints.

Draw the all types of bearing joints.

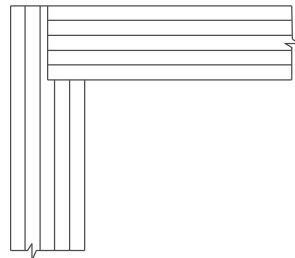
Draw the oblique shouldered joints.

- 2 Draw the sketches of Angled or corner joint and oblique shouldered joint.

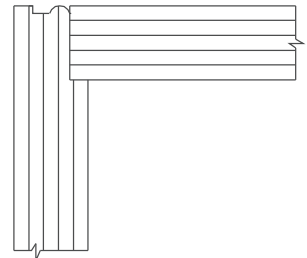
Fig 3



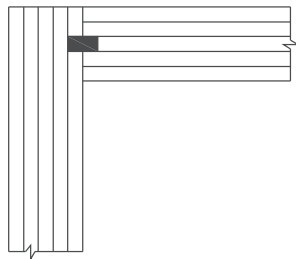
BUTT JOINT



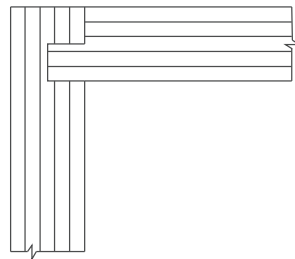
REBATED BUTT JOINT



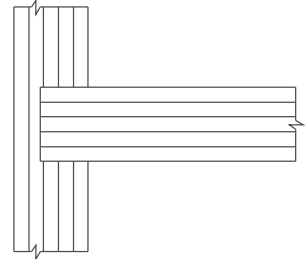
REBATED AND BEADED BUTT JOINT



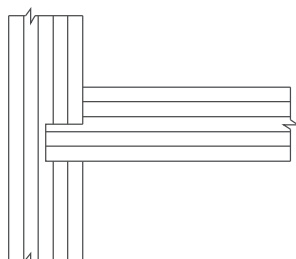
TONGUED AND BUTT JOINT



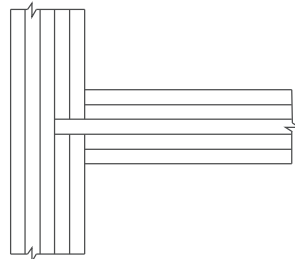
TONGUED AND GROVED JOINT



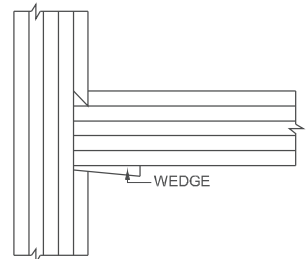
HOUSED JOINT



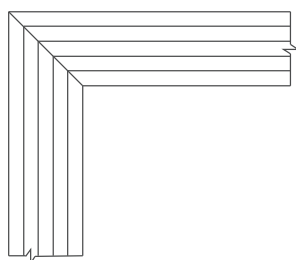
SHOULDERED AND HOUSED JOINT



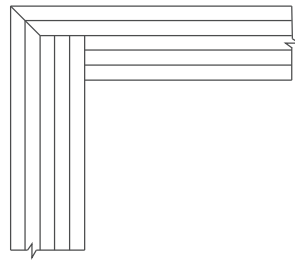
TONGUED AND HOUSED JOINT



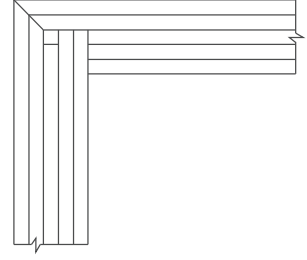
STOPPED DOVETAILED JOINT



PLAIN MITRE JOINT



MITRED AND REBATED JOINT

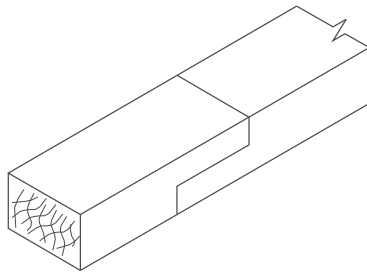


MITRED, GROOVED AND TONGUED JOINT

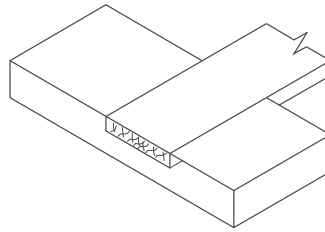
ANGLE JOINTS

DCN2678H3

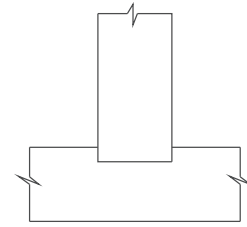
Fig 4



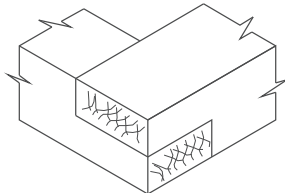
LONGITUDINAL HALVED JOINT



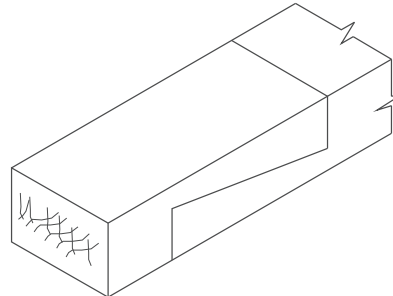
TEE HALVED JOINT



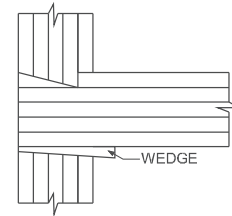
HOUSED JOINT



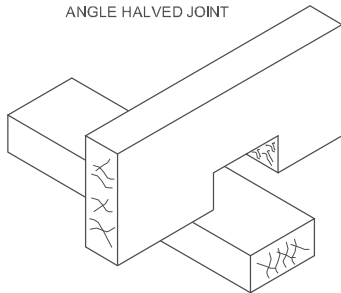
ANGLE HALVED JOINT



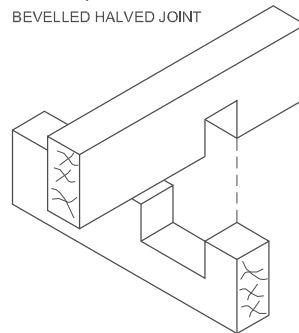
BEVELLED HALVED JOINT



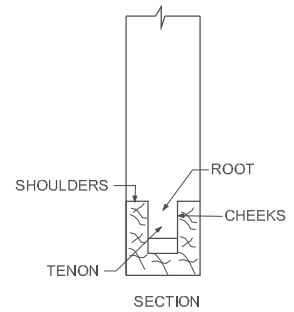
DOVETAIL JOINT



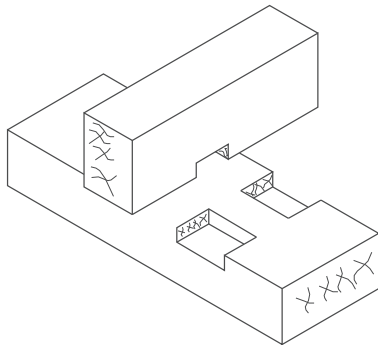
SINGLE NOTCHED JOINT



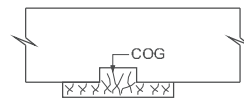
DOUBLE NOTCHED JOINT



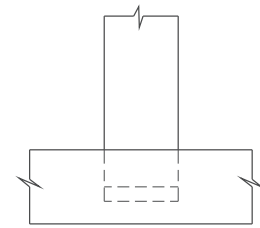
SECTION



COGGED JOINT

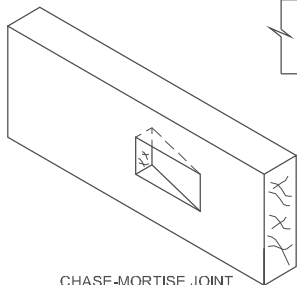


COGGED JOINT

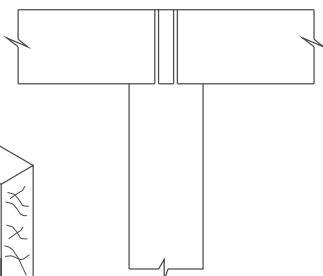


ELEVATION

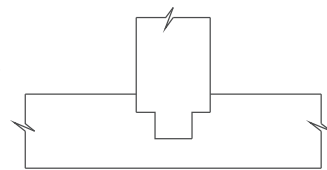
MORTISE AND TENON JOINT



CHASE-MORTISE JOINT



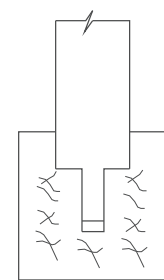
DOUBLE TENON JOINT



ELEVATION



PLAN
JOGGLE TENON JOINT

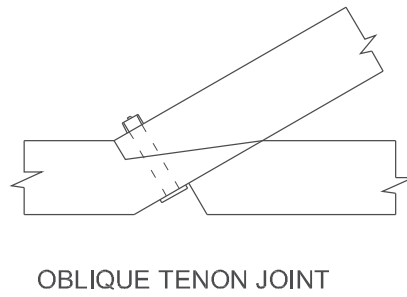
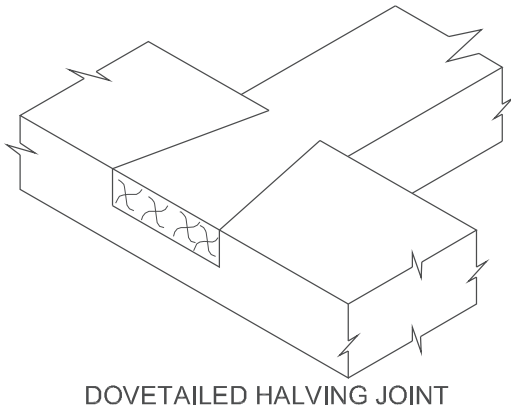
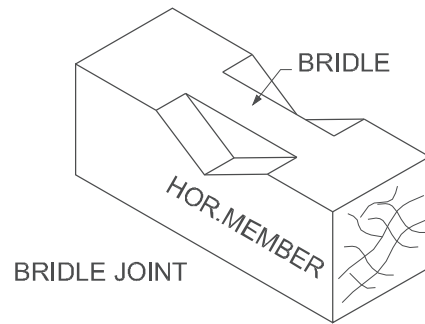
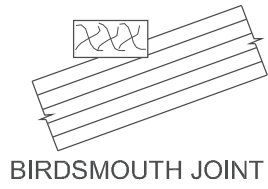


HOUSED TENON JOINT

BEARING JOINTS

DCN0678H4

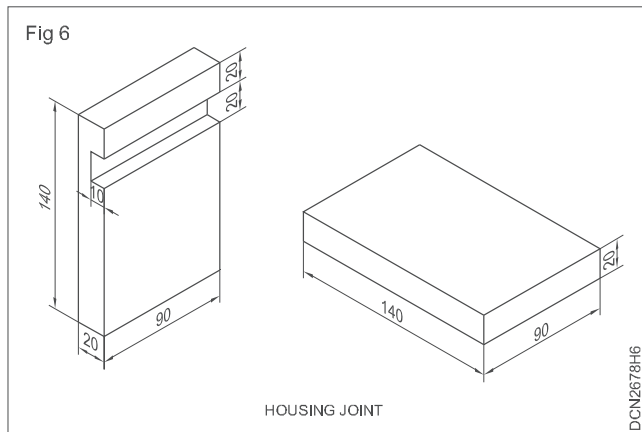
Fig 5



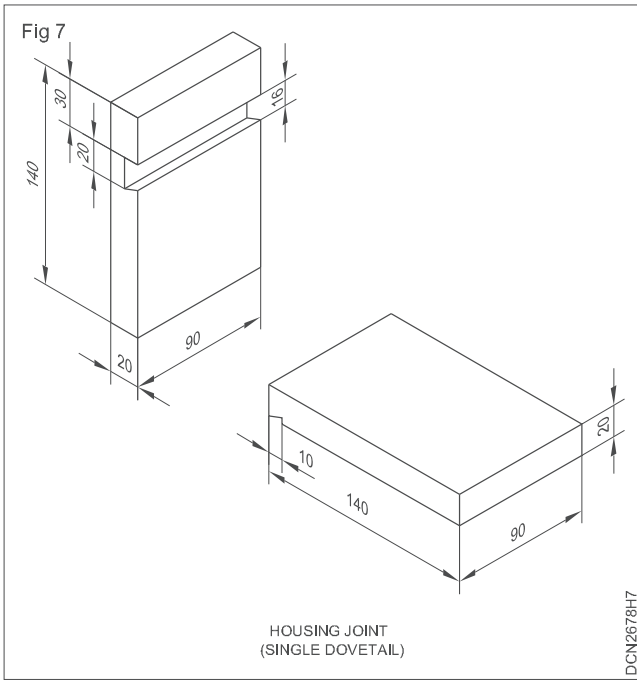
OBLIQUE SHOULDERED JOINTS

DCN2678H5

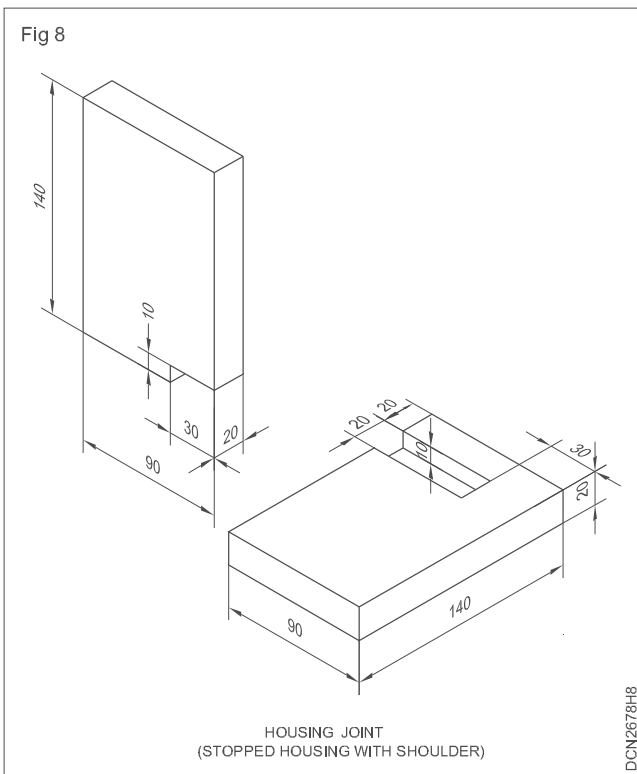
TASK 4: Draw the views of through housing joint (Fig 6)



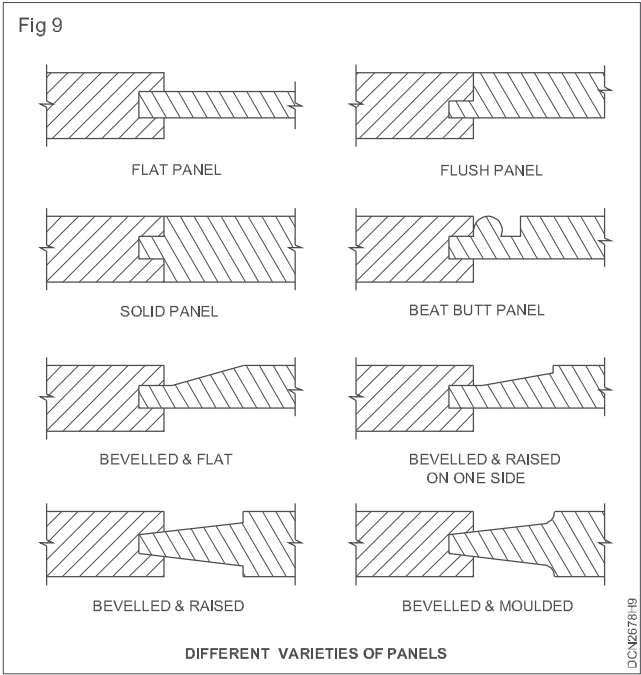
TASK 5: Draw the views of housing joint (Single dovetail) (Fig 7)



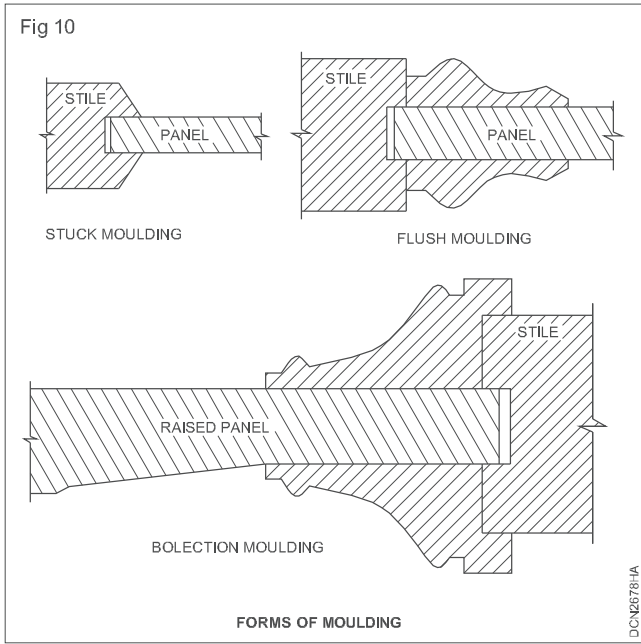
TASK 6: Draw the views of housing joint (stopped housing with shoulder) (Fig 8)



TASK 7: For the given different varieties of panels, prepare the drawing proportionately (Fig 9)



TASK 8: For the given different forms of moulding, prepare the drawing proportionately (Fig 10)



Types of doors - I

Objectives: At the end of this exercise you shall be able to

- draw the views of ledged and battened door
- draw the views of ledged, battened and braced door
- draw the views of ledged, battened, braced and framed door.

PROCEDURE

TASK 1; Draw the, elevation and vertical section of ledged and battened door (Fig 1)

DATA

Width of wall - 300 mm.
 Height of lintel - 150 mm.
 Size of door - 850 x 1950 mm.

Frame size

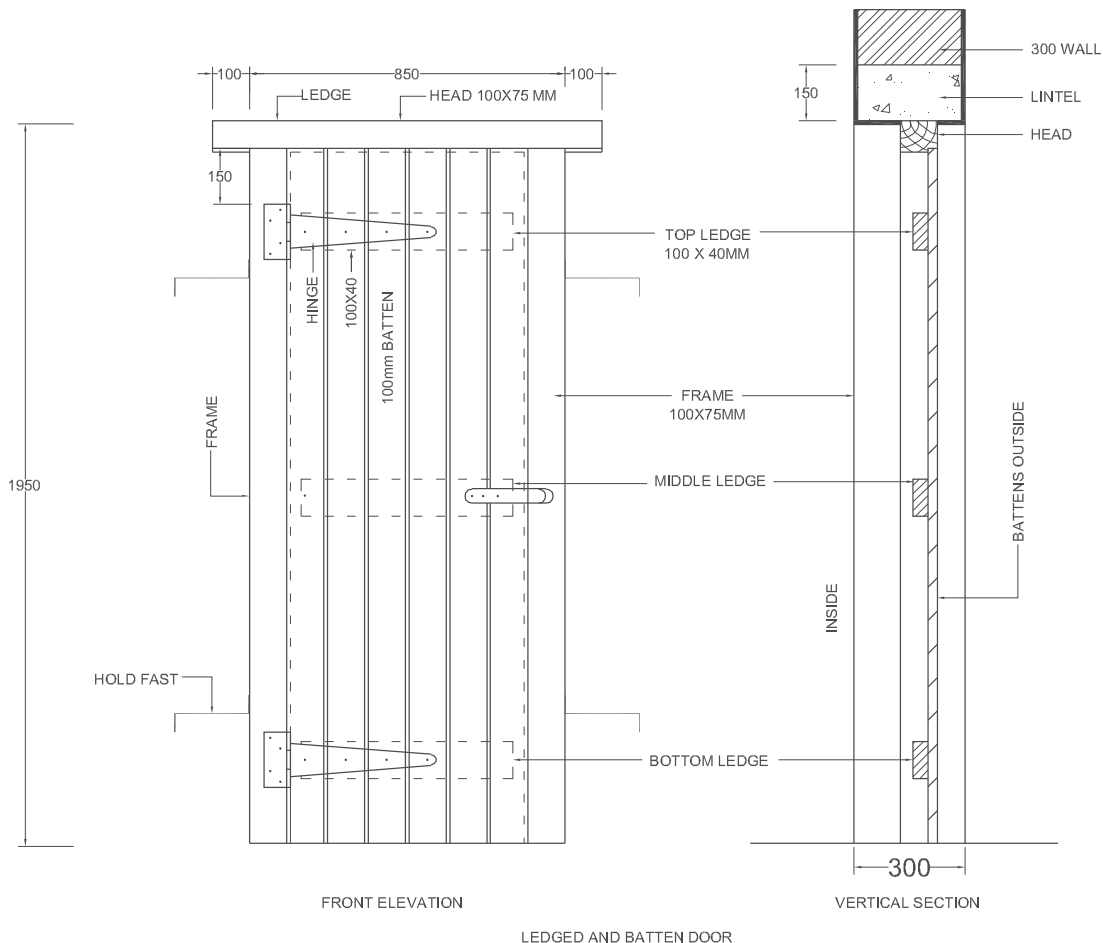
Head frame - 100 x 75 mm.
 Post - 100 x 75 mm.
 Ledge - 100 x 40 mm -3 Nos.

Batten - 32 mm thick - 6 Nos.

Length of hinges - 400 mm -2 Nos.

- Draw the door opening, size 850 x 1950 mm.
- Draw two door posts, thickness 75 mm and height 1875 mm, at a distance of 700 mm apart.
- Draw door head 75 mm thick and 1050 mm length.
- Draw batten 6 nos, 117 mm width between the posts.

Fig 1



DCN0679H1

- Draw top, middle and bottom ledges, of size 100 x 40 mm as shown in figure.
- Draw two hinges of length 400 mm at a suitable position.
- Develop the vertical section and fill the details as shown in figure.
- Complete the drawing.

TASK 2: Draw the vertical section, and elevation of ledged, battened and braced door (Fig 2)

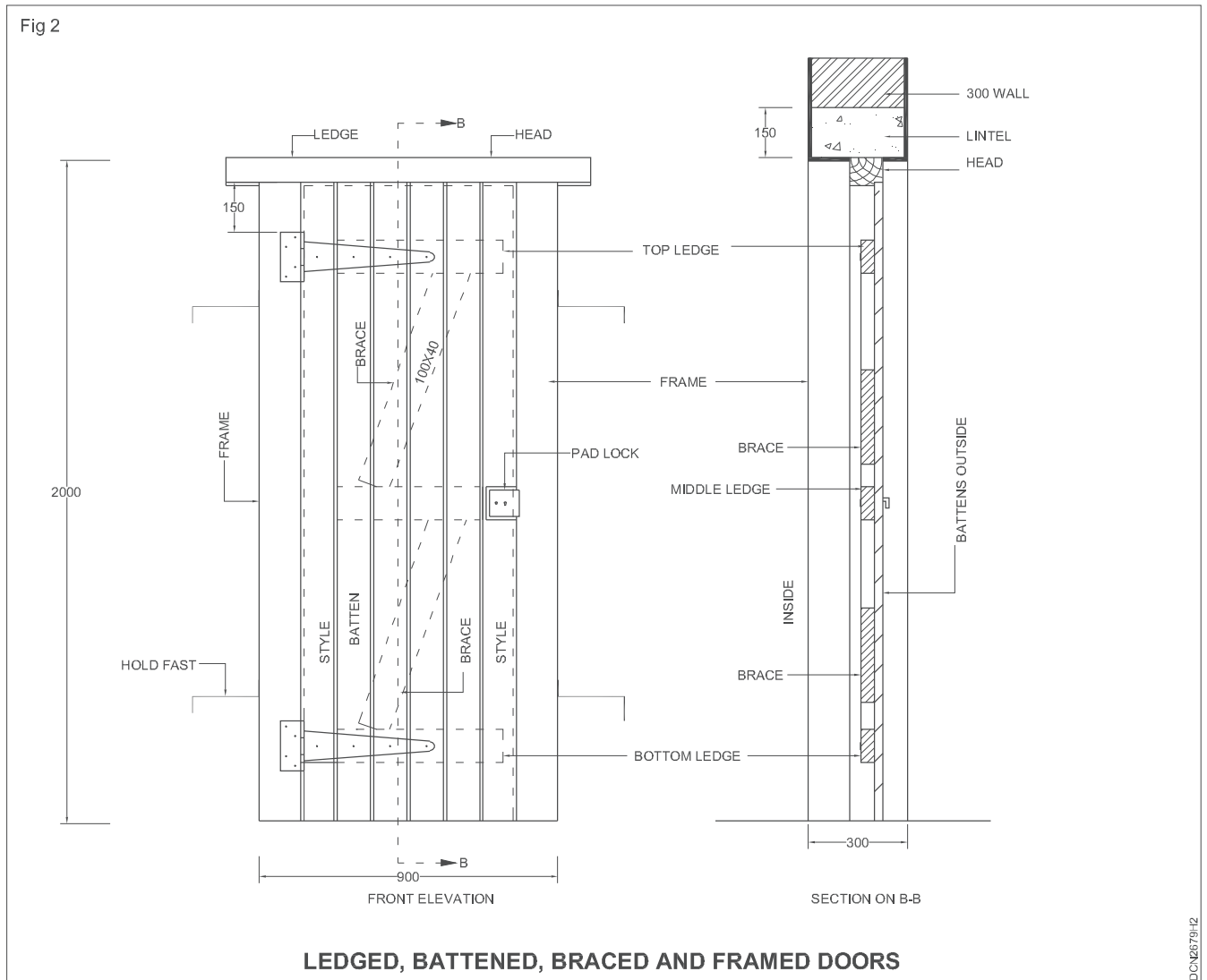
DATA

Width of wall - 300 mm.
 Height of lintel - 150 mm.
 Size of door - 750 x 1950 mm.

Frame size:

Head frame - 100 x 75
 Post - 100 x 75 mm.
 Ledge - 100 x 40 mm -3 Nos.
 Brace - 100 x 40 mm -2 Nos.
 Batten - 32 mm thick - 5 Nos.
 Length of hinges - 400 mm -3 Nos.

- Draw the door opening, size 850 x 1950 mm.
- Draw two door posts, thickness 75 mm height 1875 mm, at a distance of 700 mm apart.
- Draw door head 75 mm thick and 1050 mm length.
- Draw batten 6 nos, 117 mm width between the posts.
- Draw top, middle and bottom ledges, of size 100 x 40 mm as shown in figure.
- Draw two hinges of length 400 mm at a suitable position.
- Draw braces inclined between top and middle ledges and middle and bottom ledges.
- Develop the vertical section, fill the details and Complete the drawing.



TASK 3 Draw the vertical section, elevation of leged, framed and braced door.

DATA

Width of wall	- 300 mm.
Height of lintel	- 150 mm.
Size of door	- 900 x 2000 mm.

Frame size:

Head frame	- 100 x 75.
Post	- 100 x 75 mm.
Ledge	- 100 x 30 mm -3 Nos.
Batten	- 30 mm thick - 4 Nos.
Styles	- 125 x 40 mm thick, 2 Nos.
Length of hinges	- 400 mm -3 Nos.

- Draw the door opening, size 900 x 2000m.
- Draw two posts, thickness 75 mm and height 1925 mm, at a distance of 750 mm apart.
- Draw door head 75 mm thick and 1200 mm length.
- Draw styles 125 x 40 mm thick 2 Nos.
- Draw battens 4 Nos, 125 mm width between the styles.
- Draw top, middle and bottom ledges as shown in figure.
- Draw the hinges 400 mm - 2 Nos.
- Draw braces inclined between top and middle ledges and middle and bottom ledge.
- Develop the vertical section and mark the symbol and complete the drawing.

Types of doors - II

Objectives: At the end of this exercise, you shall be able to, draw the views of

- panelled door
- panelled and glazed door.

TASK 1: Draw the vertical section, elevation of panelled door (Fig 1)

DATA

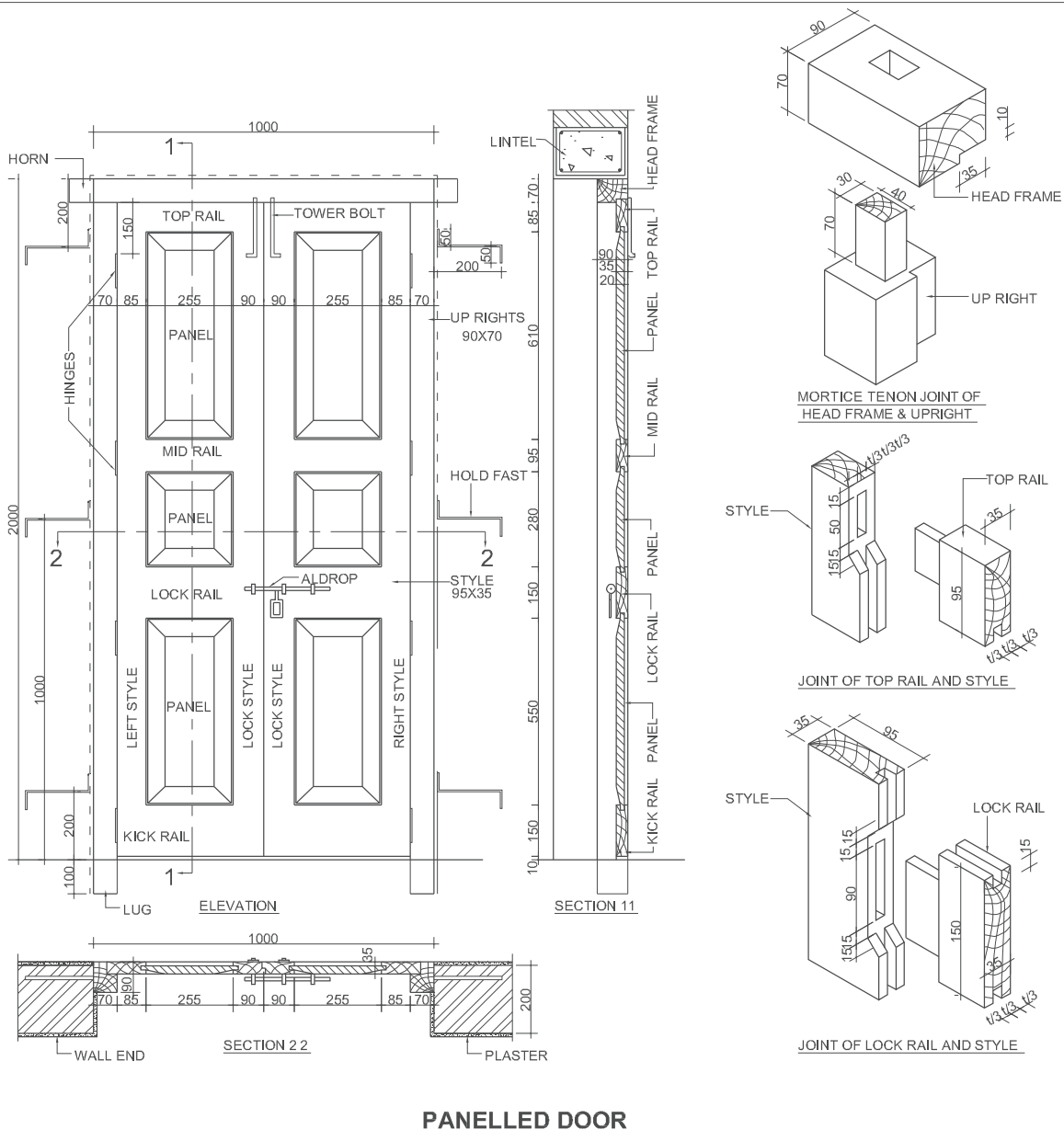
Width of wall	- 300 mm.
Height of lintel	- 150 mm.
Size of door	- 1000 x 2000 mm.

Frame size:

Head frame	- 90 x 70 mm.
Post	- 90 x 70 mm.
Vertical styles	- 95 x 35 mm -4 Nos.
Top rail	- 95 x 35 mm.
Lock rail	- 150 x 35 mm.
Mid rail	- 95 x 35 mm.
Butt hinges	- 100 mm 4 Nos.
Pannel	- 6 Nos. of equal size, 20 mm thick.

- Draw door opening, size 1000 x 2000 mm.
- Draw two post 70 mm thick, height 1930 mm at a distance of 860 mm apart.
- Draw door head 70 mm thick 1300 mm length inclined the horn.
- Draw style of size 95 x 35 mm near the two post.
- Draw top rail 95 x 35 mm.
- Draw panel size 20 mm thick.
- Draw widrail 95 x 35 mm.
- Draw lock rail 150 x 35 mm.
- Draw the bottom rail 150 x 35 mm.
- Draw panels and butt hinges as shown in figure.
- Mark the aldrop in lock rail and complete the drawing.
- Draw the vertical section and mark the symbols and complete the drawing.

Fig 1



PANELLED DOOR

TASK 2: Draw the elevation and vertical section of panalled and glazed door (Fig 2)

DATA

Width of wall - 300.

Height of lintel - 150 mm.

Size of door - 1000 x 2000 mm.

Frame size -

Head frame - 90 x 70 mm.

Post - 90 x 70 mm.

Vertical styles - 95 x 35 mm thick 4 Nos.

Top rail - 95 x 35 mm.

Lock rail - 195 x 35 mm.

Bottom - 195 x 35 mm.

Butt hinges - 100 mm 4 Nos.

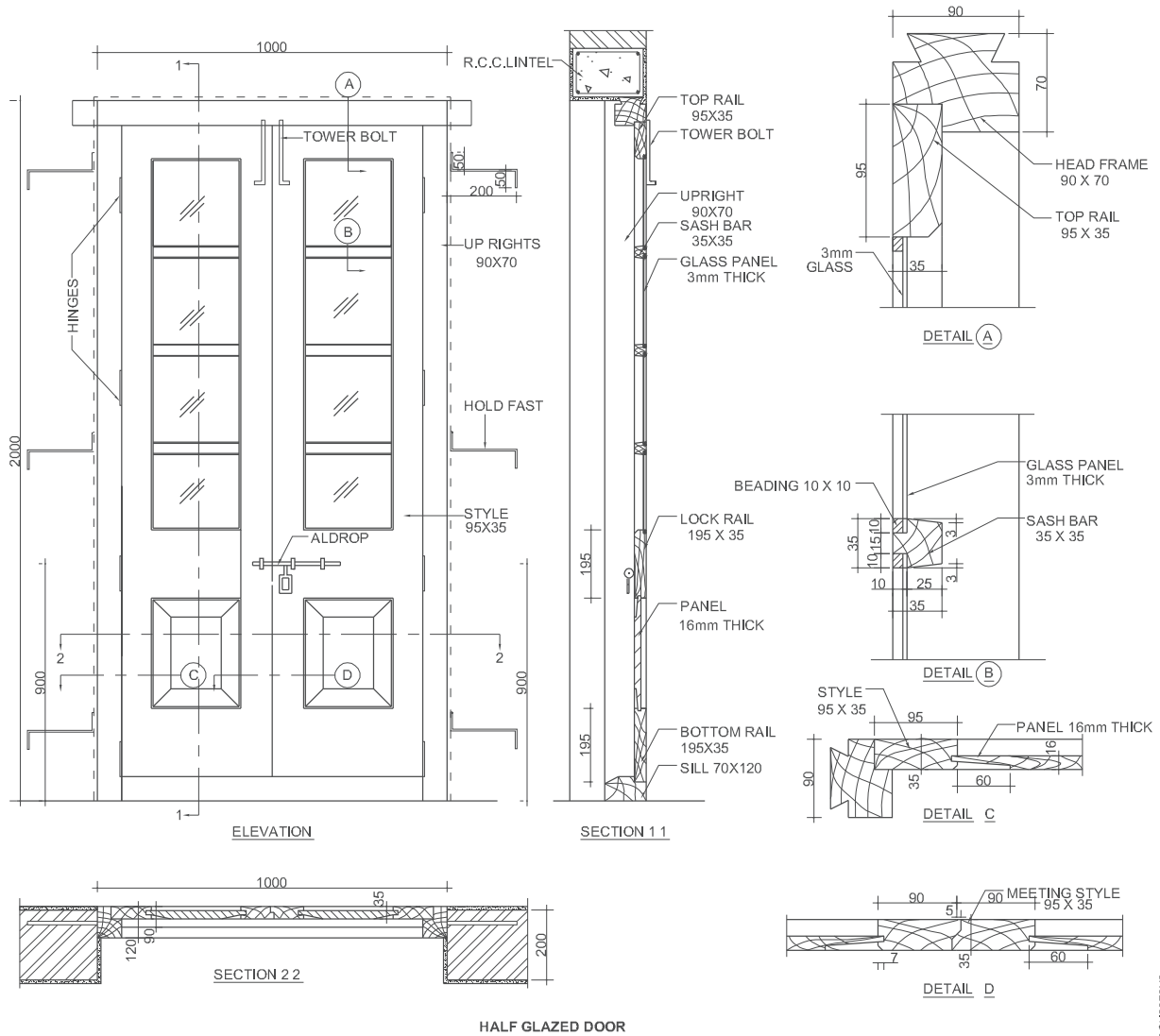
Panel - 6 Nos. of equal size, 20 mm thick.

Glass = 3 mm thick 8 Nos.

Sash = 35 x 35 mm.

- Draw door opening 1000 x 2000 mm.
- Draw two posts 70 mm thick, height 1930 mm at a distance of 860 mm apart.
- Draw door head 70 mm thick.
- Draw style of size 95 x 35 mm near the two post.
- Draw top rail 95 x 35 mm.
- Draw sash bar and glass panel as shown in figure.
- Draw the lock rail and mark the aldrop.
- Develop the vertical section mark the symbols and complete the drawing.

Fig 2



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Types of doors - III

Objectives : At the end of this exercise, you shall be able to

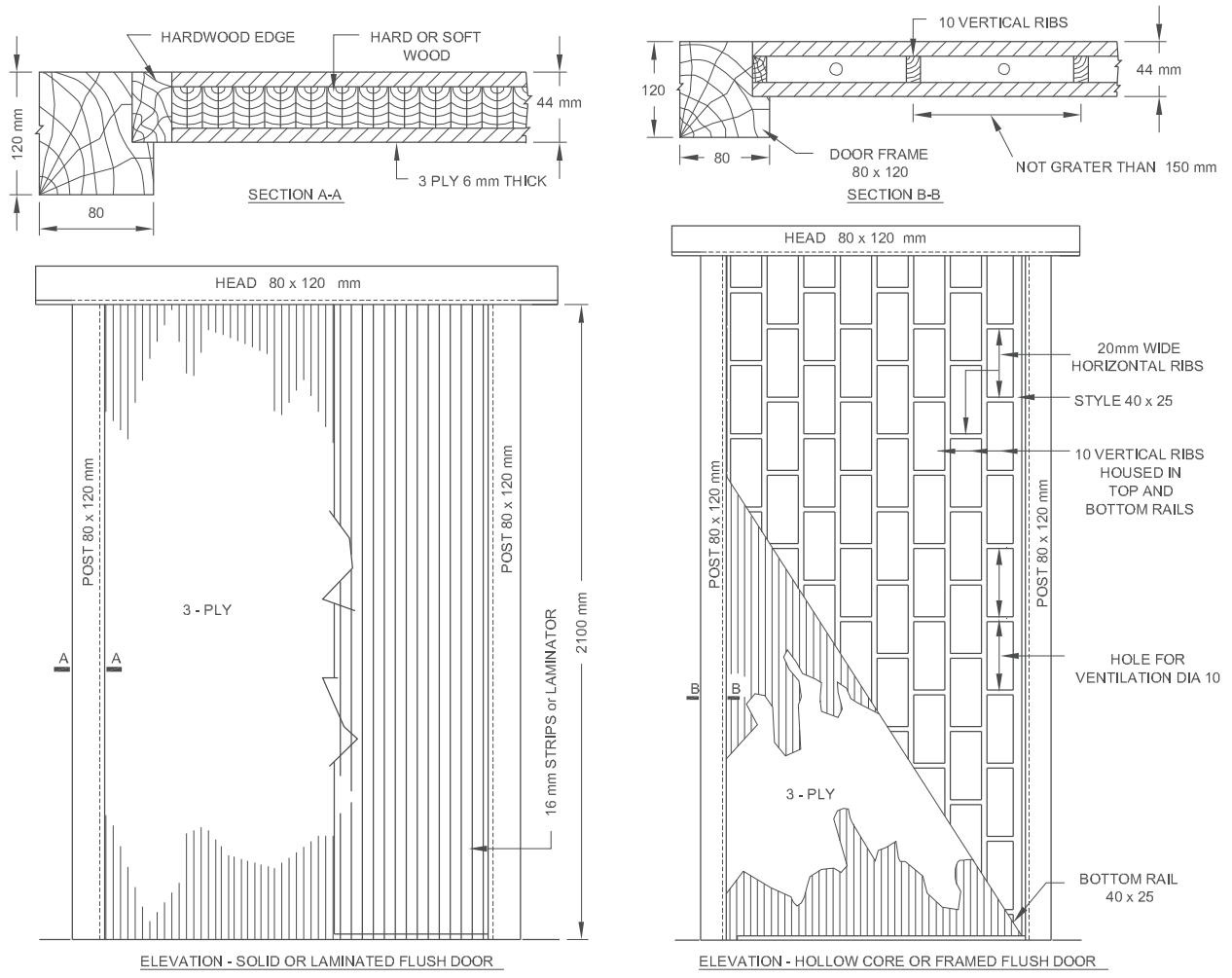
- draw the section and elevation of the flush doors
- draw the elevation of collapsible door.

TASK 1: Draw the elevation and section of solid or laminated flush door (Fig 1a)

DATA

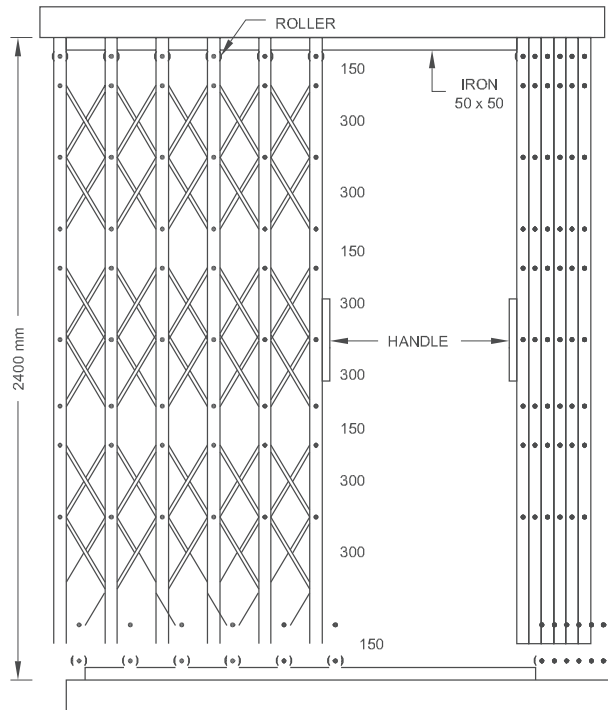
- | | | |
|----------------------|------------------------|---|
| Size of door | - 1000 x 2000. | <ul style="list-style-type: none"> • Draw two posts of thickness 80 mm, and height 1920 mm at a distance of 840 mm apart. • Draw a head 80 mm thickness over the post. • Draw parallel strips 16 mm each as shown in fig 1. • Draw the details of section as shown in fig 1. • Complete the drawing. |
| Post | - 80 x 120 mm - 2 Nos. | |
| Head | - 80 x 120 mm. | |
| 3 ply | - 6 mm thick. | |
| Thickness of shutter | 44 mm. | |
- Draw the door opening, size of 1000 x 2100 mm.

Fig 1



(a)

(b)



(c) COLLAPSIBLE DOOR DOORS

DCN2679Y1

TASK 2: Draw the elevation and section of framed flush door (Fig 1b)

DATA

- | | | |
|------------------|---------------|---|
| Horizontal ribs | - 20 mm wide. | • Draw a head 80 mm thickness over the post. |
| Vertical ribs | - 10 mm. | • Draw horizontal & vertical ribs of 20 mm width as shown in fig 1. |
| Ventilating hole | - 10 mm. | • Draw bottom rail of size 40 x 25 mm. |
| Bottom rail | - 40 x 25. | • Draw the details of section as shown in figure. |
- Draw the door opening, 1000 x 2100 mm.
 - Draw two points of thickness 80 mm, and height 1920 mm at a distance of 840 mm apart.
 - Complete the drawing.

— — — — —

TASK 3: Draw the elevation of collapsible door (Fig 1c)

DATA

- | | |
|---|--|
| Size of door = 2400 x 3000 mm. | • Draw 10 vertical channels in open condition of left side and vertical channels in closed condition on right side. |
| Double channels 20 x 10 x 2 mm. | • Draw the flats diagonally between the channels as shown in the figure. Mark the rivet heads at the junction of channels and flats. |
| Spacing of vertical channels 100 to 120 mm. | • Complete the drawing. |
| Flat iron 20 mm wide, 5 mm thick. | |
- Draw the door opening size 2400 x 3000 mm.

— — — — —

Types of windows & ventilator

Objectives: At the end of this exercise, you shall be able to

- draw the elevation and vertical section of panelled windows
- draw the elevation and vertical section of steel windows
- draw the elevation and cross section of ventilators.

PROCEDURE

TASK 1: Draw elevation and vertical section of paneled window (Fig 1a)

DATA

- | | | |
|--------------------|------------------------------|--|
| Window opening | = 750 x 1200 mm. | • Draw two posts of 75 mm thick and 1050 mm height at distance of 600 mm apart. |
| Frame size | = 110 x 75 mm. | • Draw a sill of 75 mm thick and 900 mm length below the post. |
| Head | = 75 x 110 mm. | • Draw the head of 75 mm thick and 900 mm length over the post. |
| Post | = 75 x 110 mm - 2 Nos. | • Draw the hanging style of width 75 mm near the posts. |
| Hanging style | = 75 x 32 mm - Nos. | • Draw the two meeting styles of width 75 mm in the middle. |
| Meeting style | = 75 x 32 mm - Nos. | • Draw top rail and bottom rail of height 75 mm between the styles. |
| Top rail | = 75 x 32 mm. | • Draw three panels of height of 258 mm and two frieze rail of 75 mm height between the top and bottom rail. |
| Frieze rail | = 75 x 32 mm. | • Draw the vertical section as shown in fig 1. |
| Bottom rail | = 75 x 32 mm. | |
| Panel | = 348 x 162 x 20 mm - 6 Nos. | |
| Projection of horn | = 150 mm on both sides. | |
- Draw the window opening of size 750 x 1200 mm.

TASK 2: Draw the elevation and details of steel window (Fig 1b)

DATA

- | | | |
|--------------------|-------------------|--|
| Size of window | = 900 x 1200 mm. | • Draw head, sill, posts of size 24 x 35 x 3 mm as shown in fig. |
| No of glazed panel | = 8 Nos. | • Draw mullion in the middle of frame. |
| Sash bar | = 20 x 20 x 3 mm. | • Draw eight glass panels of same size in each shutter. |
| Mullion | = 45 x 25 x 3 mm. | • Draw sash bar of 20 mm width between the panels. |
| Head, silk, post | = 24 x 35 x 3 mm. | • Complete the drawing. |
- Draw the window opening of size 900 x 1200 mm.

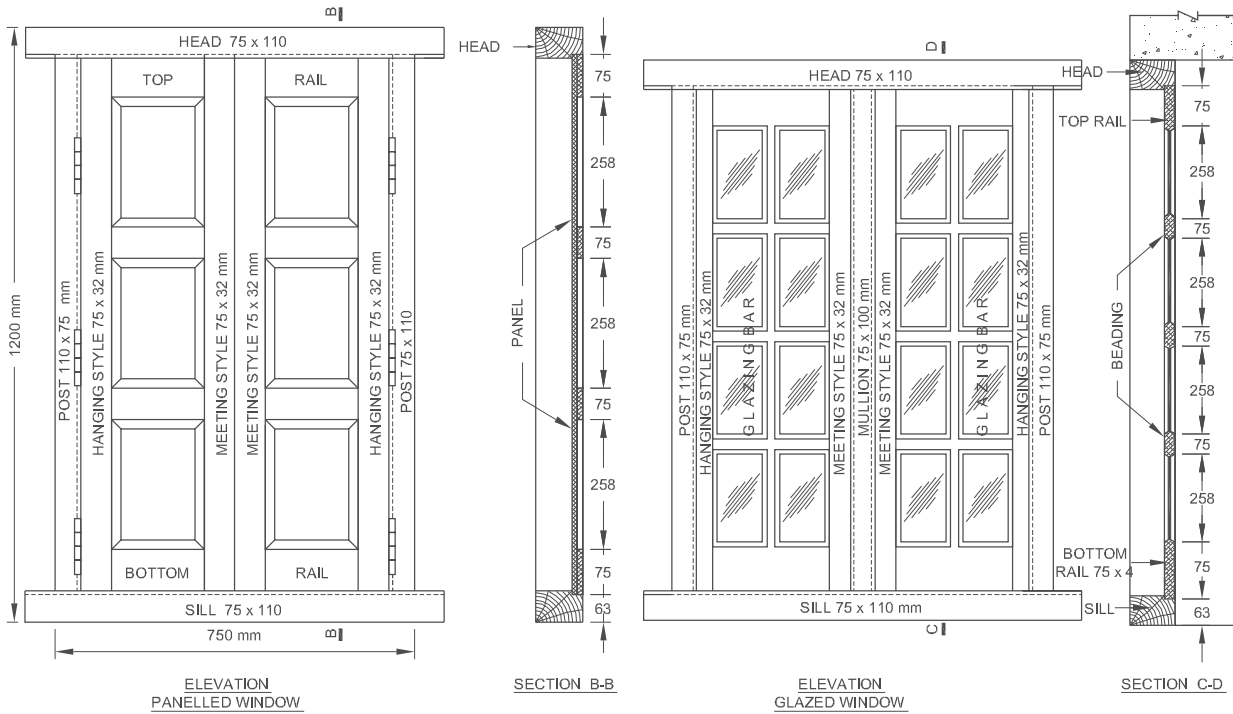
TASK 3: Draw the elevation and cross section of ventilators (Fig 1c)

DATA

- | | | |
|--------------------|-----------------|---|
| Size of ventilator | - 1000 x 600 m. | • Draw the an opening of size 1000 x 600 mm. |
| Head | - 80 x 100 mm. | • Draw the posts of thickness 80 mm at a distance of 840 mm apart. |
| Sill | - 80 x 40 mm. | • Draw a sill of thickness 80 mm and length 1300 mm below the post. |
| Top rail | - 80 x 40 mm. | • Draw a head of thickness 80 mm and length 1300 mm over the post. |
| Bottom rail | - 80 x 40 mm. | • Draw two styles of 80 mm width near the post. |
| Style | - 80 x 40 mm. | |

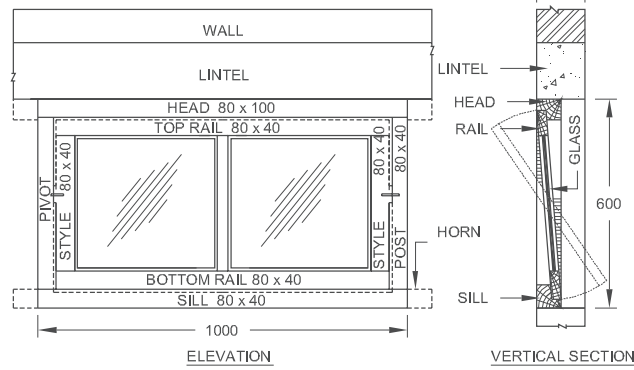
- Draw top and bottom rails of 80 mm width.
- Draw two glass panels.
- Complete the elevation as shown in fig.
- Draw the section of ventilator as shown in fig 1.
- Complete the drawing.

Fig 1



(a)

(b)



(c)

VENTILATOR

WINDOWS AND VENTILATORS

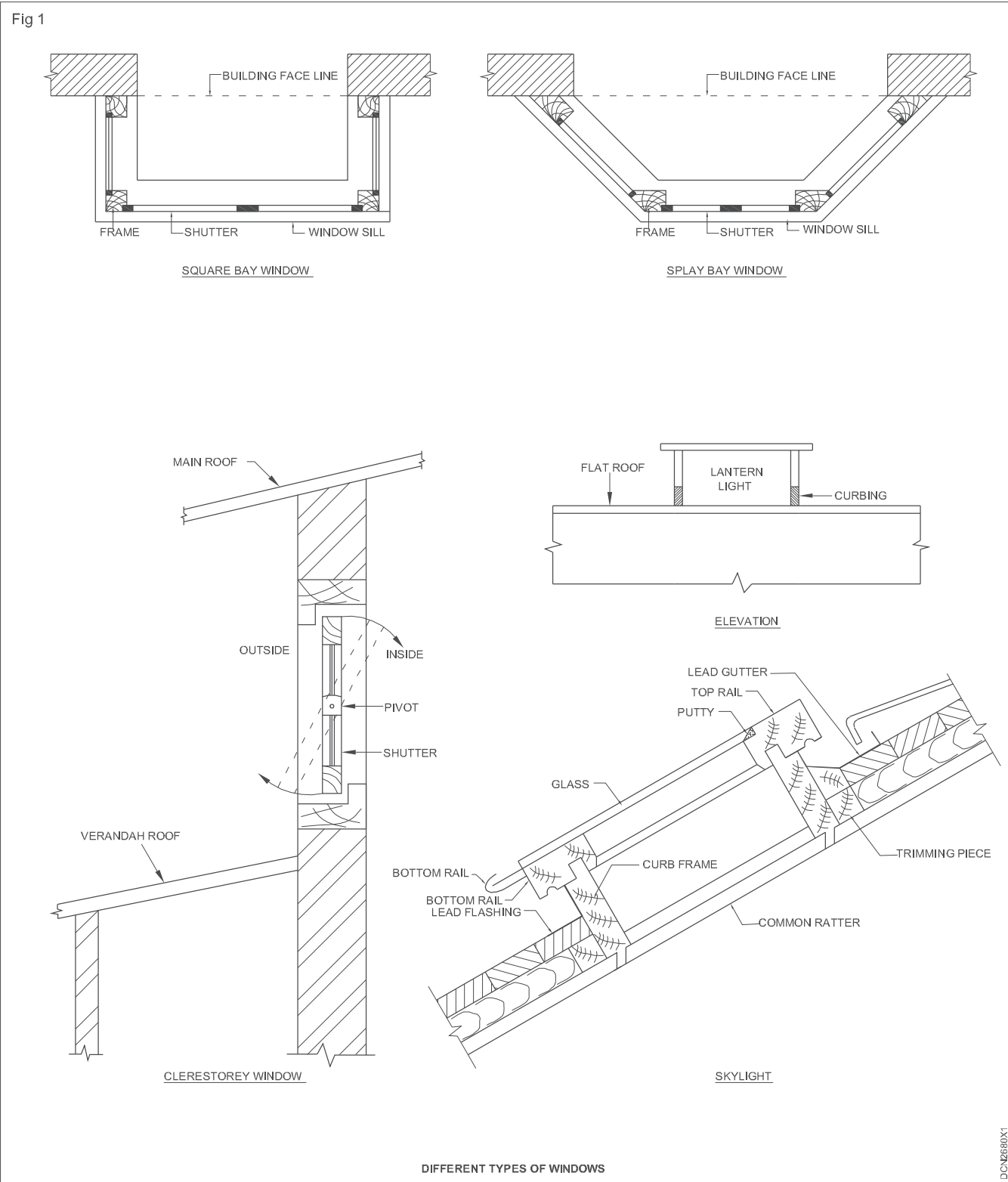
DC2680H1

Different types of windows

Objectives : At the end of this exercise, you shall be able to

- draw the different types of windows
- identify the location of windows.

1. Draw bay window.
2. Draw corner window.
3. Draw clerestorey window.
4. Draw lantern light window.
5. Sky light window.



Types of ground & upper floors

Objectives: At the end of this exercise, you shall be able to

- draw section of a timber ground floor
- draw isometric view of brick floor
- draw isometric view of flag stone
- draw the section of concrete floor
- draw the section of terrazzo floor
- draw the section of mosaic floor.

PROCEDURE

TASK 1: Draw the section of a timber ground floor (Fig 1a)

DATA

Wall	200 mm thick.
Base concrete	- 150 mm thick.
Sleeper walls	- 100 mm thick, at 1500 mm/c.
Wallplate	- 100 mm thick.
D.P.C	- 25 mm thick.
Bridging joint	- 50 x 180 mm.
Floor boards	- 32 mm thick.

- Draw the section of wall above and below ground floor.

- Draw the base concrete, 150 mm depth.
- Draw the sleeper wall of height 1000 mm at 1500 mm c/c.
- Draw the section of wall plate 100 mm x 100 mm, over 300 mm thick D.P.C on end wall and centre of sleeper wall.
- Draw the elevation of bridging joint 180 mm depth over these wall plates.
- Draw the section of floor boards, 32 mm thick over joint.
- Finish the drawing with proper conventional symbols.



TASK 2: Draw the isometric view of brick floors (Fig 1b)

- Draw the sub-grade with 100 mm thick lean concrete as shown in figure.
- Draw 12 mm thick lime/ cement mortar over this subgrade.

- Draw the isometric view of bricks laid on edges as shown in figure.



TASK 3: Draw the isometric view of flag stone floor (Fig 1c)

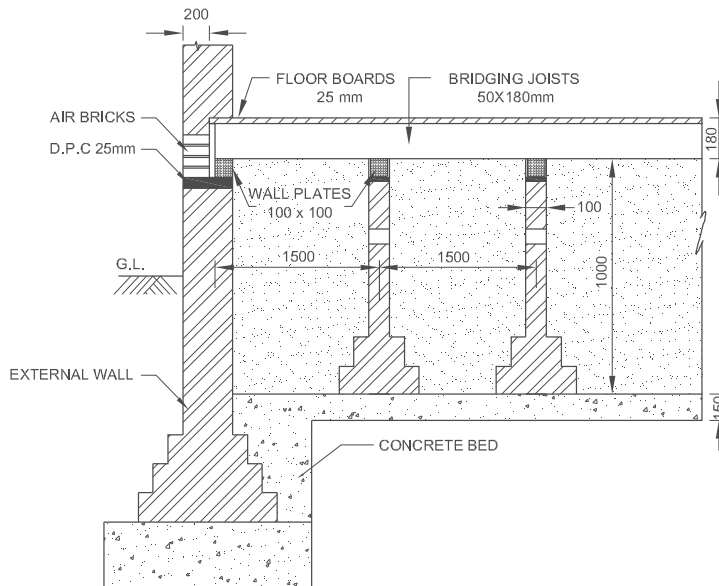
DATA

Stone size	- 60 x 45 x 20 mm.
Depth of concrete for subgrade	- 100 mm.
Mortar bed	- 20 mm thick.

- Draw the sub grade with 100 mm thick lean concrete as shown in figure.
- Draw 20 mm thick lime / cement mortar over this sub grade.

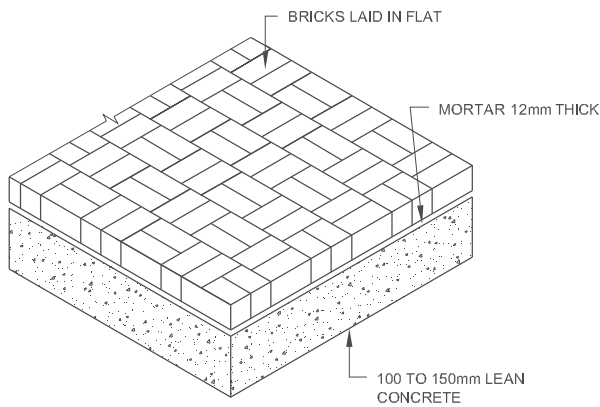
- Draw the stone slabs over this mortar bed as shown in figure.

Fig 1



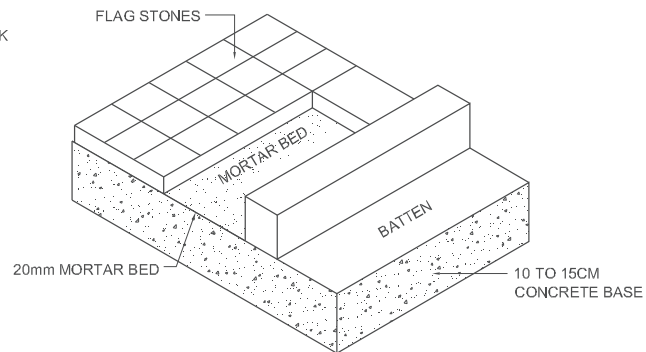
BASEMENT OR GROUND FLOOR OF TIMBER

(a)



BRICKS FLOOR

(b)



FLAGSTONES FLOOR

(c)

FLOORS (GROUND)

DCN2883H1

TASK 4: Draw the section of cement concrete floor (Dimensions are given in) (Fig 2a)

- Draw section of a wall, with basement.
- Draw 100 mm thick base concrete above earth fill.
- Draw a line to mark to ground level.
- Draw 25mm thick floor finish with cement plastering.
- Show hard earth filling, of suitable (it may varies) thickness above ground level.

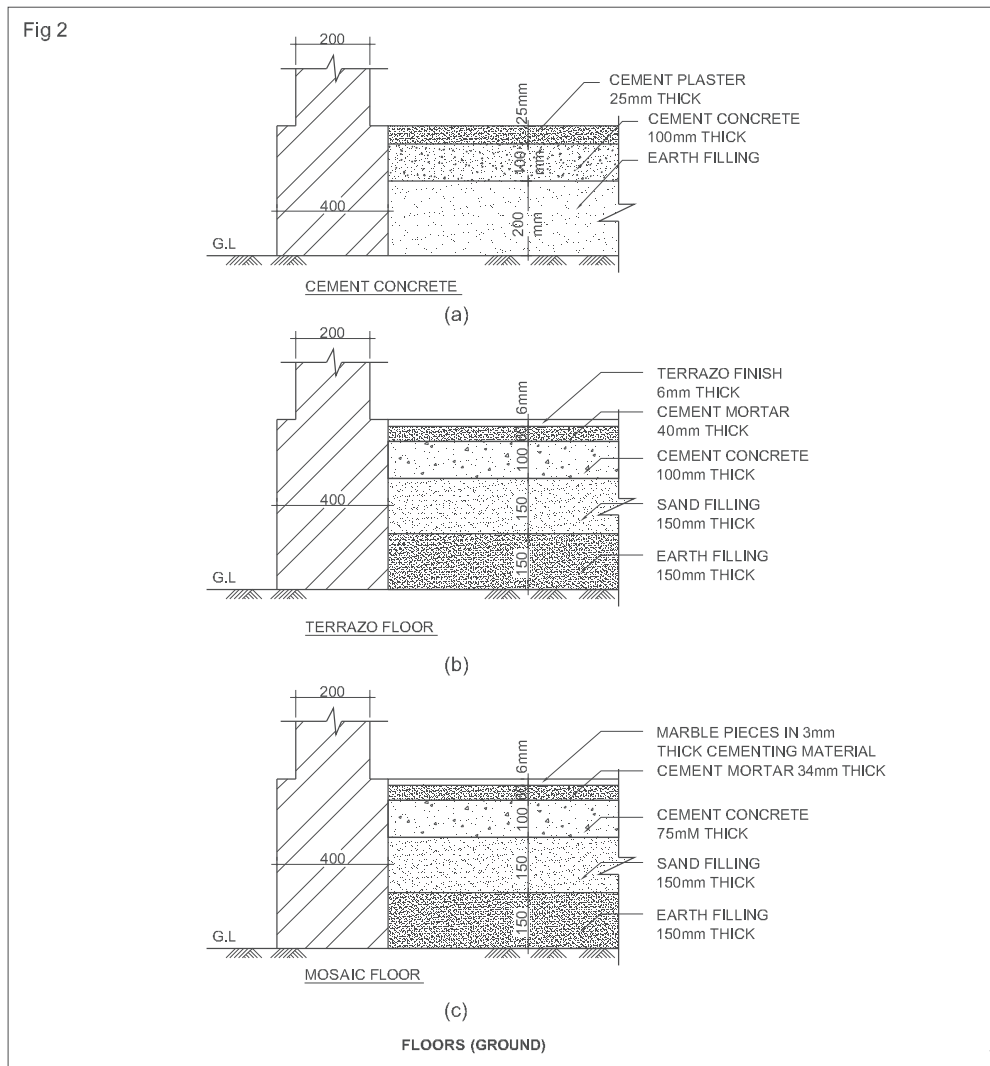
TASK 5: Draw the section of terrazzon floor (Fig 2b)

- Draw section of a wall with basement.
- Show well consolidated earth fill above ground level.
- Draw a line to mark ground level.
- Draw 150 mm thick sand filling above earth fill.

- Draw 75 mm thick cement concrete over sand filling.
- Draw 34 mm thick cement mortar.
- Draw 6 mm thick terrazzo flooring.

TASK 6: Draw the section of mosaic floor (Fig 2c)

- Draw section of a wall with basement.
- Draw a line to mark ground level.
- Show well consolidated earth fill above ground level.
- Draw 150 mm thick sand filling above earth fill.
- Draw 75 mm thick cement concrete over sand filling.
- Draw 34 mm thick cement mortar.
- Show 6 mm thick marble chips is cementing materials, as mosaic flooring.



Draw the types of upper floors

Objectives: At the end of this exercise, you shall be able to

- draw plan and section of single joist timber floor
- draw plan and section of double joist timber floor
- draw plan and section of triple of framed timer floor
- draw the section of brick jack arch floor
- draw the section of concrete jack arch floor.

PROCEDURE

TASK 1 : Draw plan and detailed section of a single joist timber floor (Fig 1a)

DATA

- | | | |
|------------------------|------------------------------|---|
| Room size | - 300 x 4900 mm. | • Draw wall plate 100 mm wide on longer side, in dashed line. |
| Wall | - 300 mm thick. | • Draw 75 mm thick wedges on shorter walls. |
| Bridging joist | - 50 x 100 mm at 350 mm c/c. | • Draw the bridging joists, 50mm width at 350 mm c/c in shorter span. |
| Herring bone strutting | - 32 x 50 mm. | • Draw 32 mm wide strut in the middle of shorter span and between the bridging joists. |
| Floor board | - 32 mm. | • Show the boarding of 32 mm thick at one corner and complete the drawing as shown in figure. |
| Wall plate | - 100 x 75 mm. | |
| Wedge | - 75 x 100 mm. | |
- Draw the plan of the room 3000 x 1900 mm, width wall thickness 300 mm.

— — — — —

TASK 2: To draw the section along long span (Section AA) (Fig 1b)

- Draw the section of wall.
- Draw the wedge 75 mm wide and 100 mm height, attached to the wall.
- Draw bridging joists 50 mm wide, 100 mm depth, first one attached to the wedge and others, 350 mm c/c.
- Draw the struts 32 x 50 mm diagonally between the joists
- Draw the floor board 32 mm thick on the bridging joist.
- Draw the ceiling joining the bridging joist at bottom and complete the drawing.

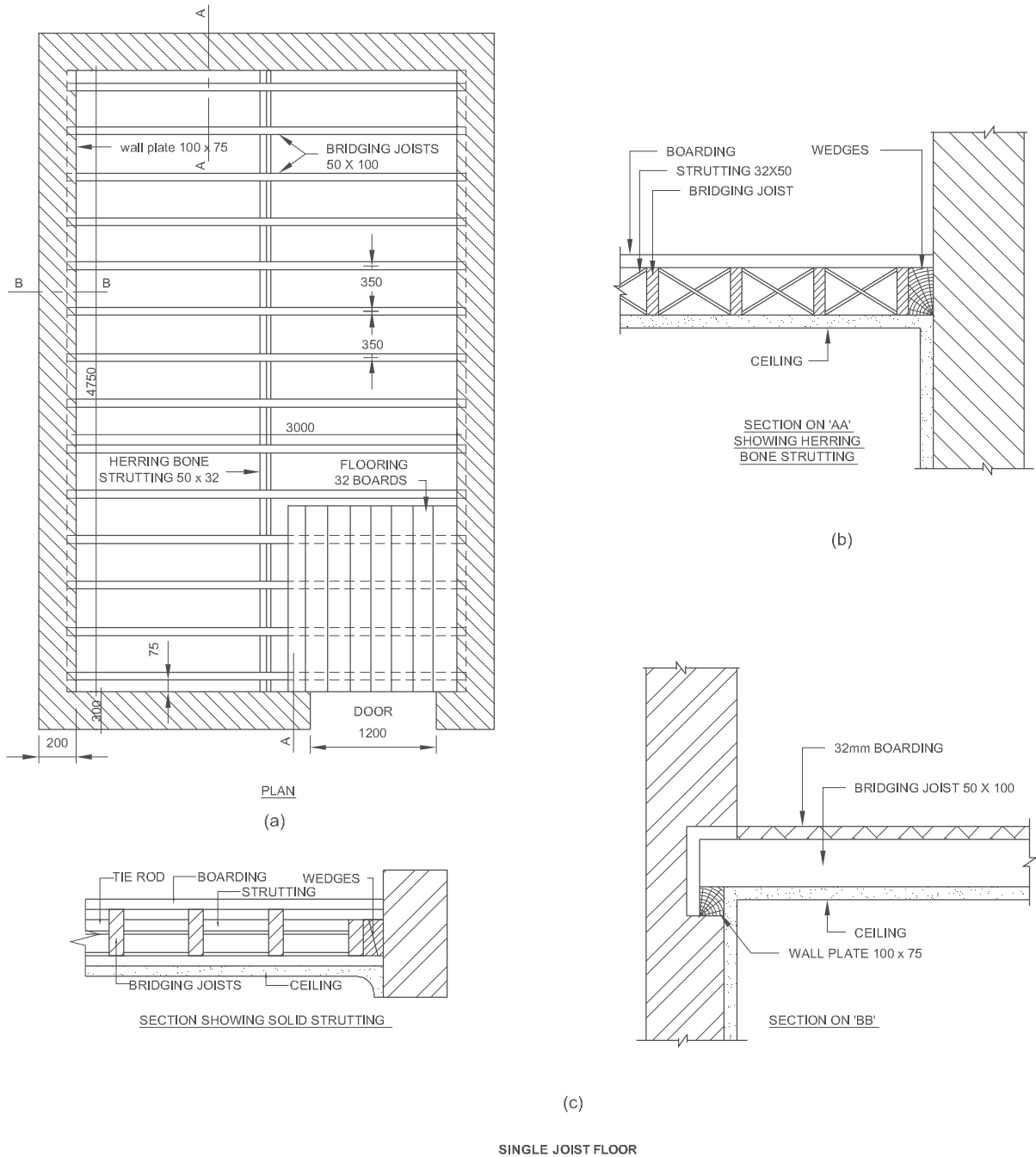
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TASK 3: To draw the section along shorter span (Section BB) (Fig 1c)

- Draw the section of wall.
- Draw wall plate 75 mm wide, 100 mm height, inside the wall.
- Draw bridging joist 100 mm height over this wall plate.
- Draw a 32 mm thick borad over the joist, starting from the side of wall.
- Show air space as shown in figure.
- Draw ceiling under the bridging joist, and complete the drawing.

— — — — —

Fig 1



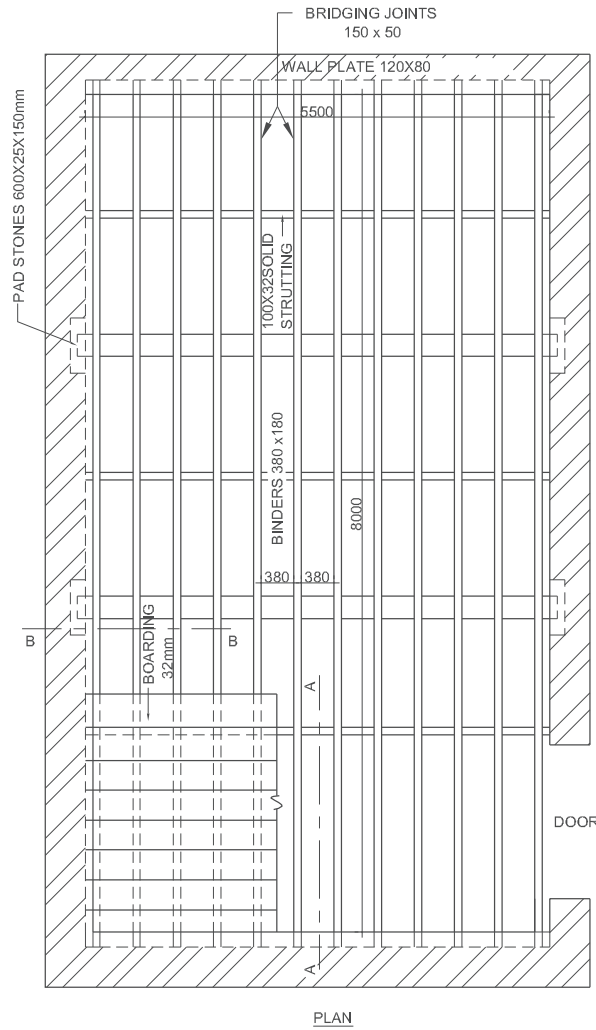
TASK 4: Draw the plan and detailed section of a double joist timber floor (Fig 2a)

DATA

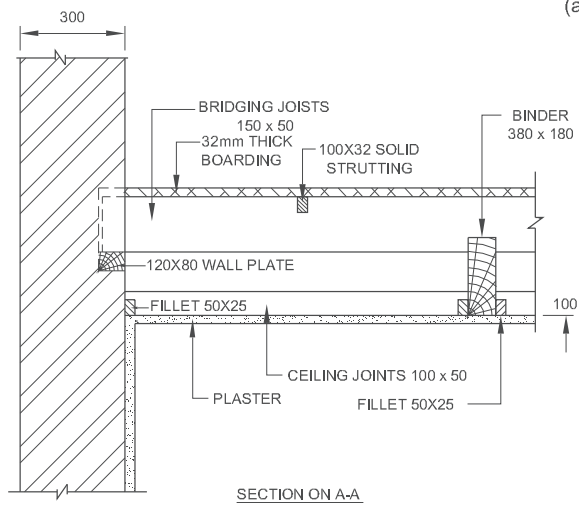
- | | | | |
|----------------|--------------------------------|---------------|----------------|
| Wall thickness | - 300 mm. | Ceiling joist | - 50 x 100 mm. |
| Room size | - 5500 x 8000 mm. | Fillet | - 50 x 25 mm. |
| Binders | - 180 x 380 mm at 2000 mm c/c. | | |
| Bed stone | - 250 x 120 x 600 mm. | | |
| Bridging joist | - 150 x 50 mm. | | |
| Struts | - 100 x 32 mm. | | |
| Boarding | - 32 mm thick. | | |
| Wall plate | - 120 x 80 mm. | | |
- To draw sectional plan.
 - Draw sectional plan of room with all thickness 300 mm.
 - Draw binders in shorter span, 2000 mm c/c.
 - Draw bed stone 250 x 600 in the wall below the binders.
 - Draw wall plate 75 mm inside the wall, in shorter span.

- Draw bridging joist 50 x 150 mm, 380 mm c/c along longer span.
- Draw the struts in between the bridging joist, in each span.
- Draw 32 mm thick boarding in one corner as shown in figure.

Fig 2

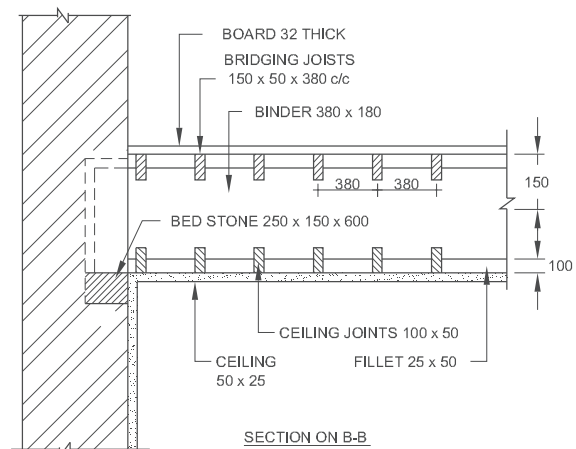


PLAN
(a)



SECTION ON A-A

(b) (b)



SECTION ON B-B

(c)

DOUBLE JOIST TIMBER FLOOR

DCNZ883X2

TASK 5 : To draw the section near the wall along long span (Section AA) (Fig 2b)

- Draw the section of wall.
- Draw the ceiling joist, binders, bridging joist, board etc. as shown in figure.

— — — — —

TASK 6: To draw the section near the wall along short span (Section BB) (Fig 2c)

- Draw the section of the wall.
- Draw the section of floor as shown in figure.

— — — — —

TASK 7 : To draw plan and section of triple joist timber floor (Fig 3)

DATA

- | | | |
|----------------|-----------------|--|
| Bridging joist | - 7.5 x 15 cm. | • Draw M.S girder of size 38 x 10.5 cm at 3 m c/c. |
| Bider | - 28 x 15 cm. | • Draw pad stone of size 25 x 15 x 60 cm on left side wall with equal spacing. |
| Pad stone | - 25 x 12 x 60. | • Draw binders of size 28 x 15 cm laid over the pad stone block. |
| Struting | - 10 x 3.2 cm. | • Draw wooden boarding 32 mm at left side corner. |
| M.S Gider | - 38 x 10.5 cm. | • Draw wooden lines AA and BB as shown in figure. |
| Wall plate | - 12 x 8 cm. | • Draw section AA and BB as shown in figure. |
- Draw a room of width 8 m. and suitable length with wall thickness of 300 mm.
 - Draw wall plates size 12 x 8 cm on two sides as shown.
 - Draw bridging joist of size 7.5 x 15 cm connecting the wall plate at 38 cm c/c.

— — — — —

TASK 8: Draw the section of brick jack arch floor (Fig 4a)

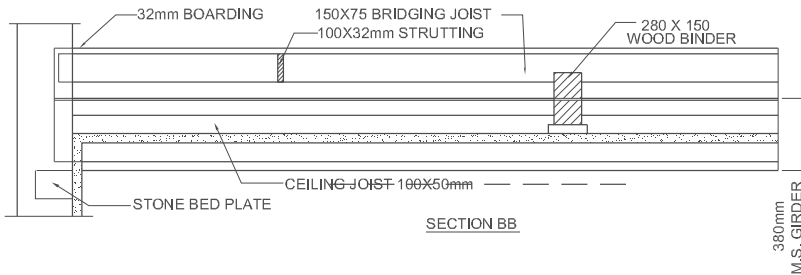
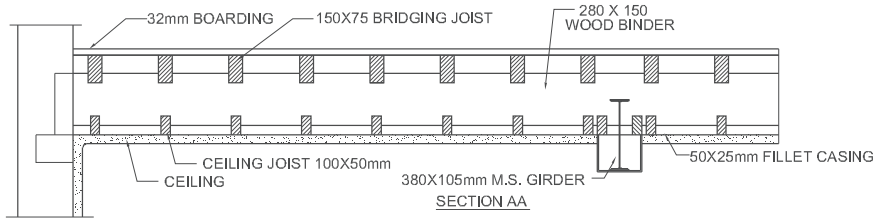
DATA

- | | | |
|---------|-----------------|--|
| Span | - 1500 mm. | • Draw the arch joining the two bottom flangers as shown in figure 4a. |
| R.S.J | - 400 x 165 mm. | • Draw the brick on edge forming arch shape. |
| Tie rod | - 20 mm. | • Draw a tie rod connecting the two R.S.J. |
- Draw the section of wall 300 mm thick.
 - Draw the R.S.J of size 400 x 165 mm in to the wall.
 - Draw the second R.S.J at a distance of 1500 mm from the first R.S.J.
 - Draw a horizontalk line 100 mm above the crown.
 - Draw the title flooring showing 25 mm thick.
 - Name and dimension the drawing.

Fig 3



PLAN



FRAMED TIMBER FLOOR

DCN2883X3

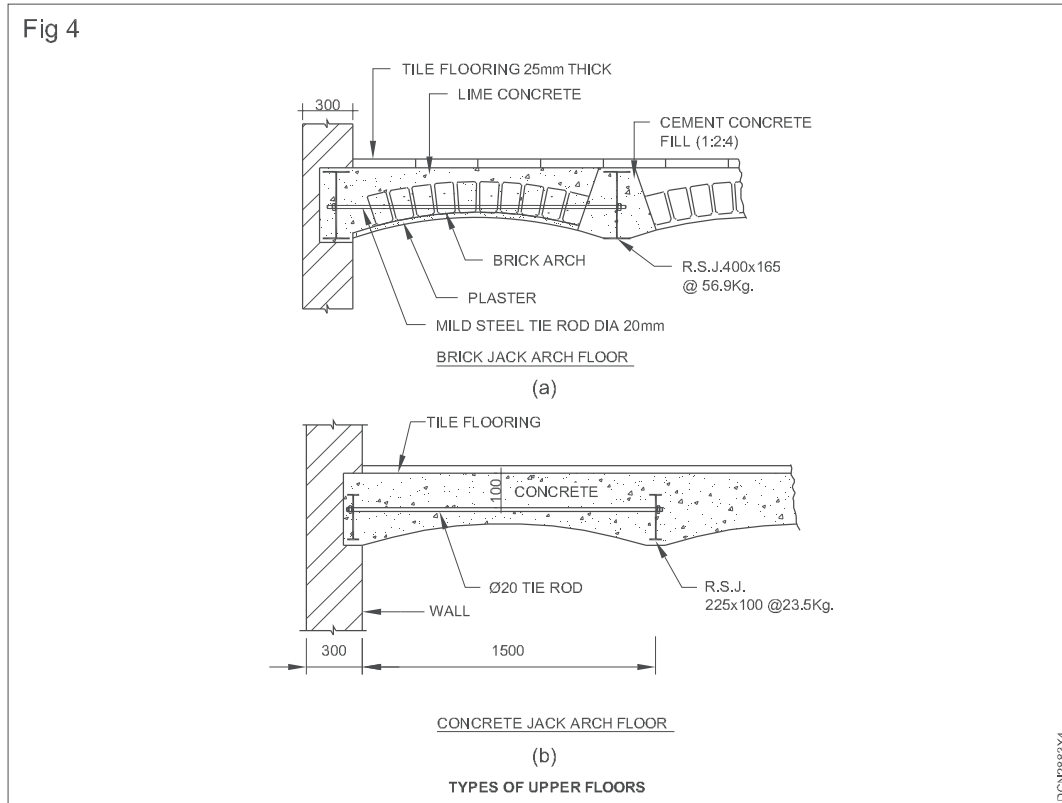
TASK 9 : Draw the section of concrete jack arch floor (Fig 4b)

DATA

- Span - 1500 mm.
- R.S.J - 225 x 100 mm.
- Tie rod - 20 mm.

- Arrange the position, in the layout for drawing details of concrete jack arch floor.
- Select the scale and draw the section of wall 300 mm thick.
- Draw the R.S.J of size 225 x 100 mm in to wall.

- Draw the second R.S.J at a distance of 1500 mm from the first R.S.J.
- Draw the arch joining the two bottom flanges as shown in figure.
- Show the concrete forming arch shape.
- Draw a tie rod connecting the two R.S.J.
- Draw a horizontal line 100 mm above the crown.
- Draw the tile flooring showing 25 mm thick.
- Name and dimension the drawing.



Stairs (as per shape)

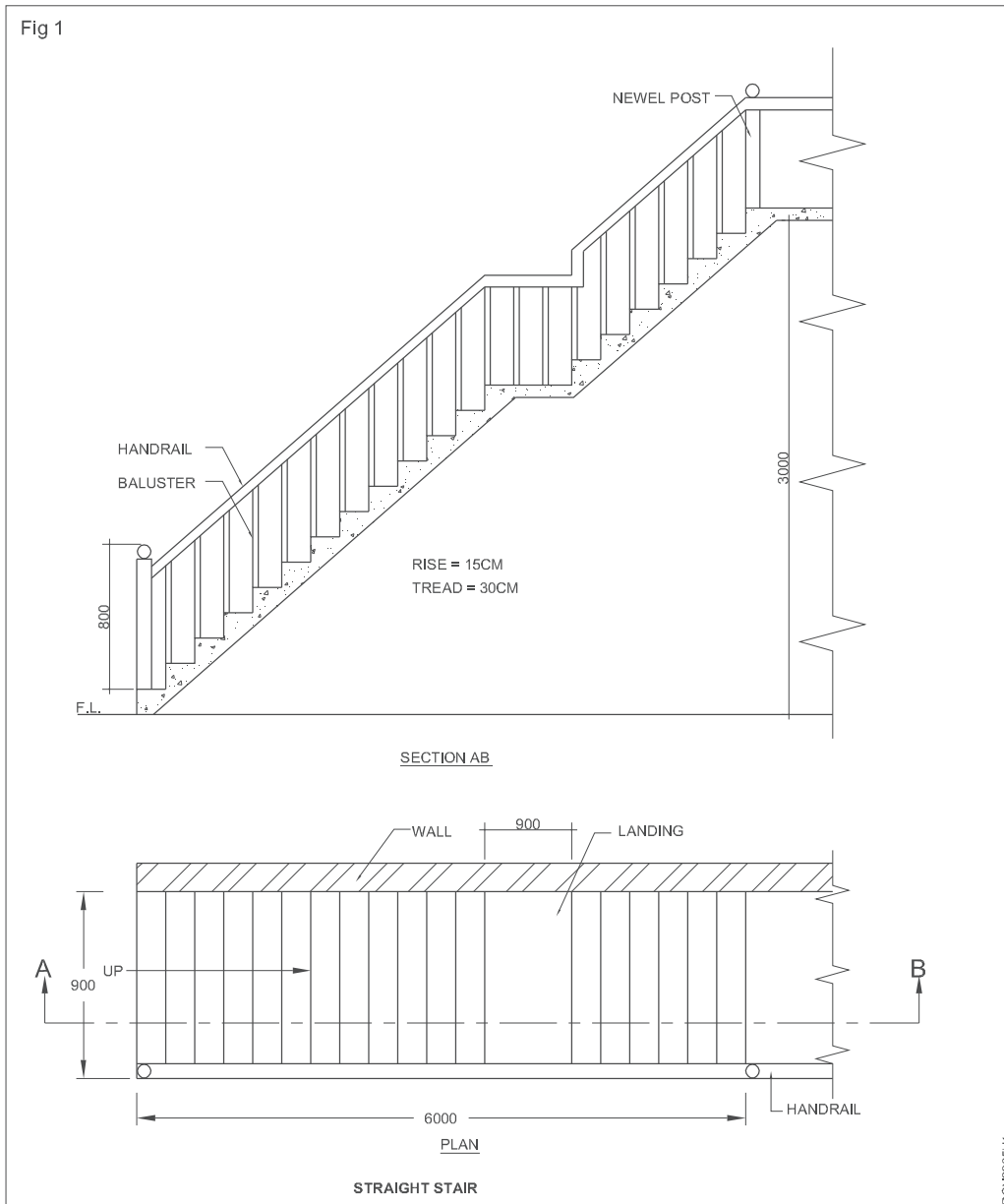
Objective : At the end of this exercise you shall be able to
 • draw the plan and section of straight stair.

PROCEDURE

TASK 1: Draw the plan and section of straight stair (Fig 1)

DATA

Height of upper floor	3m.	The Tread	30cm.
The total runs of straight stair	6m.	No.of Steps in the flight	= 20 Nos.
R.C.C waist	10cm thick.	Width of stair	0.90m.
The rise	15cm.	The handrail G.I pipe	50mm Dia.
		Newel post G.I pipe	75mm 80cm height.



DCN298511

The baluster 25mm G.I pipe and missing data may be assumed.

I PLAN

- Select scale 1:50.
- Draw plan of the straight stair with proper number of treads.
- Draw the landing after twelve risers.
- Draw the treads (6 Nos) after the landing.

- Dimension the drawing properly.

II Sectional Elevation

- Draw upward projector lines to mark the risers from each tread and complete the section as indicated in figures.
- Draw hand rail details.
- Fully dimension the drawing.

Quarter turn newelstair

Objective : At the end of this exercise you shall be able to

- **draw the plan and section of quarter turn newelstair.**
-

TASK 1: Draw the plan and section of quarter turn newelstair. (Fig 1)

DATA

Stair room size	= 2.4 x 4.6m.
Height between floors	= 315 cm.
Tread	= 30cm.
Rise	= 15 cm.
Width of landing	= 1m.
Width of stair	= 1m.
Wall thickness	= 20cm.
R.C.C slab thickness	= 12 cm.
No.of risers 1st flight	= 12 Nos.
No.of risers 2nd flight	= 9 Nos.
Hand rail, newel post, baluster	= 25 mm.

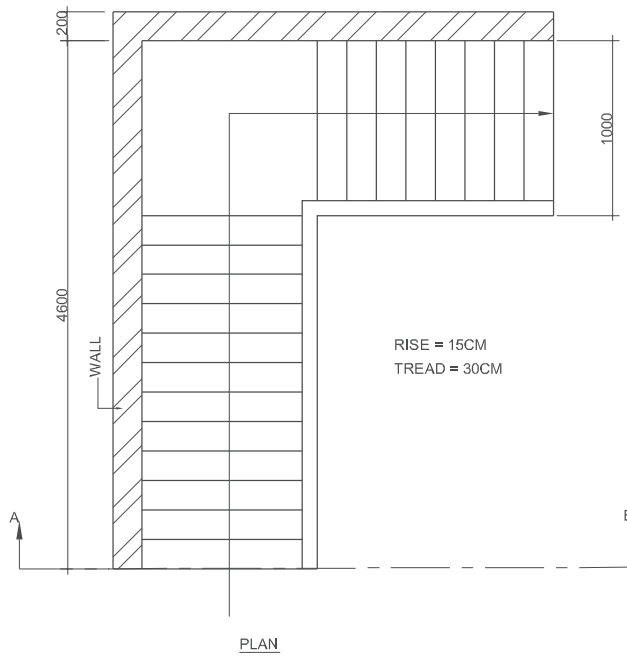
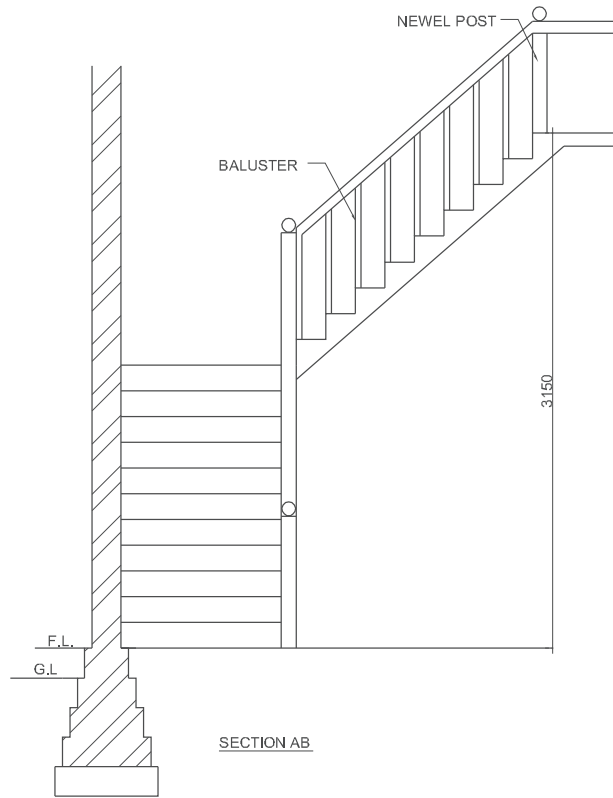
I PLAN

- Draw the plan of quarter turn newel stair as per given data with proper number of treads.
- Draw the landing after 12 risers.
- Draw the treads (8 Nos) after the landing on rightside.
- Draw the Hand rail in plan.

II Draw the elevation

- Draw the projectors up ward from each tread to mark the risers.
- Draw the hand rail details as per the drawing.
- Dimension the drawing properly.

Fig 1



STRAIGHT STAIR

DCN2985T1

Half turn stair (geometrical)

Objective : At the end of this exercise, you shall be able to,

- draw the plan and section of half turn stair geometrical.

TASK 1: Draw the plan and section of half turn stair (geometrical) (Fig 1)

DATA

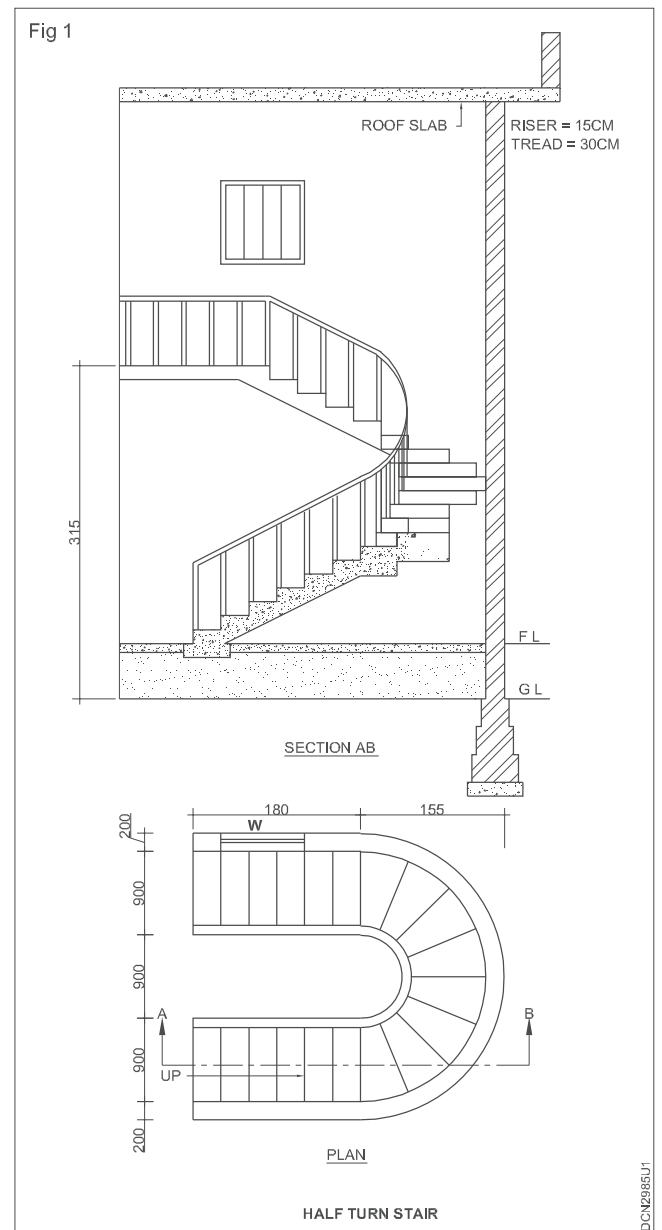
Height between floors	= 3m.
Tread	= 30cm.
Rise	= 15cm.
Width of stair	= 0.90m.
Open space	= 0.90m.
Wall thickness	= 20cm.
R.C.C slab thickness	= 12cm.
No.of steps	= 20 Nos.
Hand rail, newel post, baluster	= 25 mm,
balustrade height	= 80cm.
Window style	= 1350 mm x 1450 mm.

PLAN

- Draw the plan of the stair room and treads as per given data.
- Draw the radiating treads from the centre.
- Draw handrail and window in plan.
- Complete the drawing with necessary dimensions.

ELEVATION

- Draw the upward projector lines from end of each tread to show the risers.
- Complete the drawing as per given data as shown in figure.
- Draw hand rail details as per data given.
- Draw elevation of the window.
- Dimension the drawing properly.



Bifurcated stair

Objective : At the end of this exercise, you shall be able to,

- draw the plan and section of bifurcated stair.

TASK 1: Draw the plan and section of bifurcated stair (Fig 1)

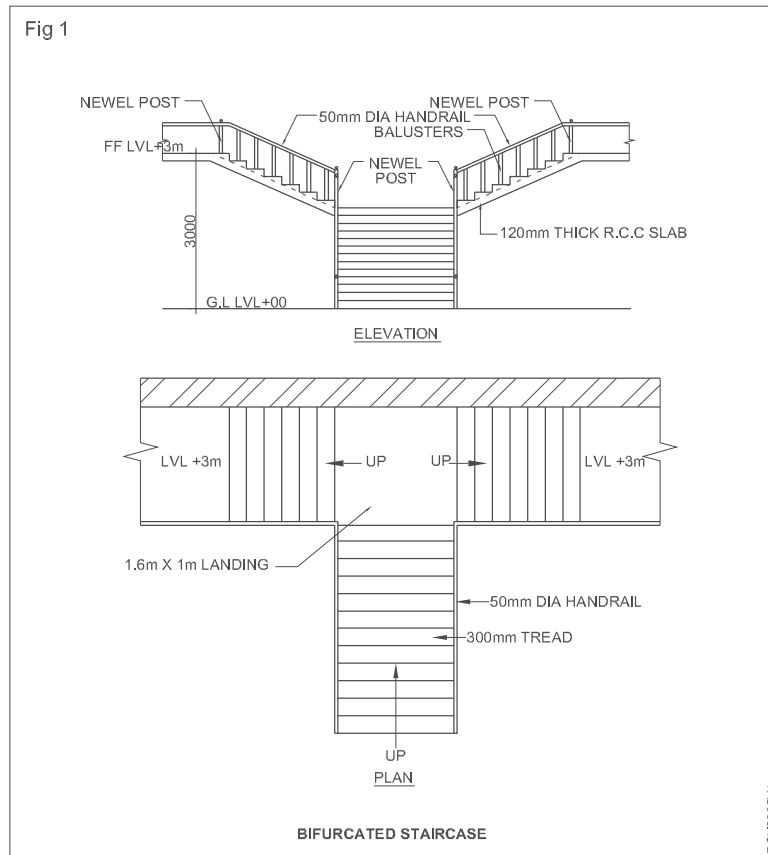
DATA

Height between floors	= 3m.	Tread	= 30cm.
		Rise	= 15cm.

Middle landing = 1m (width).
 Width of stair = 1m.
 Wall thickness = 20 cm.
 R.C.C slab thickness = 12 cm.
 No. of risers in 1st flight = 12 Nos.
 No. of risers in 2nd flight = 8 Nos.

Hand rail, newel post, baluster = 25 mm.

- Draw the plan of differential stair in 1:50 scale as per given data.
- To develop the elements, draw projections upwards from each tread.
- Complete the elevation as indicated in fig 1.



Three quarter turn stairs

Objective : At the end of this exercise, you shall be able to

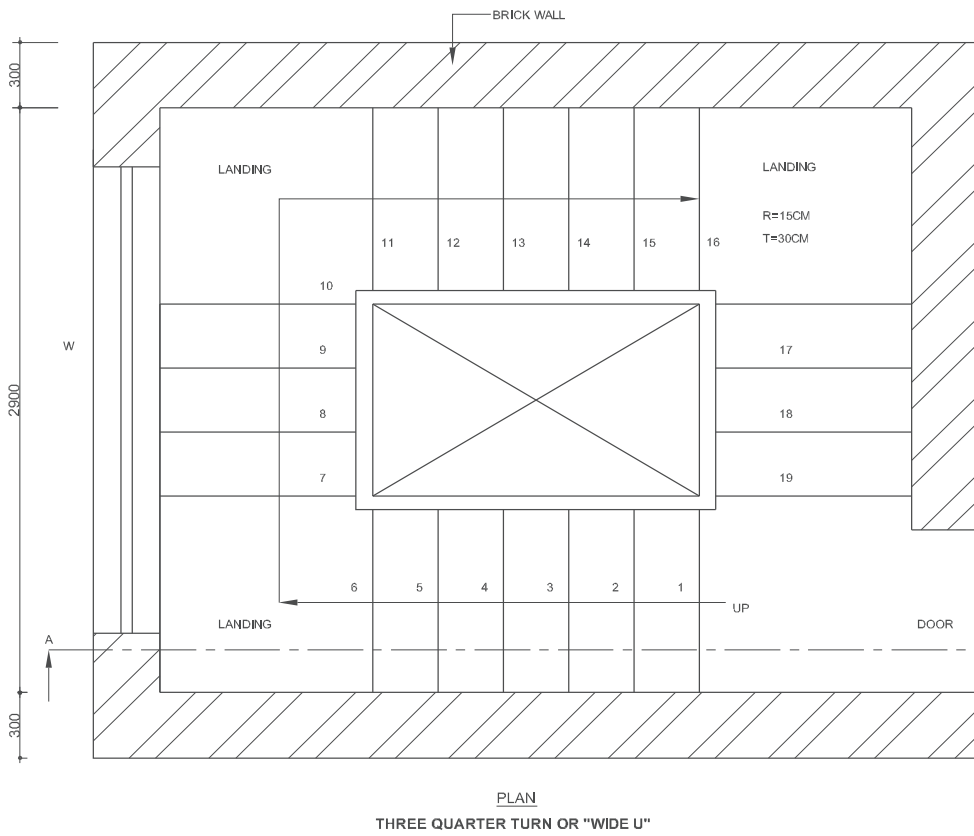
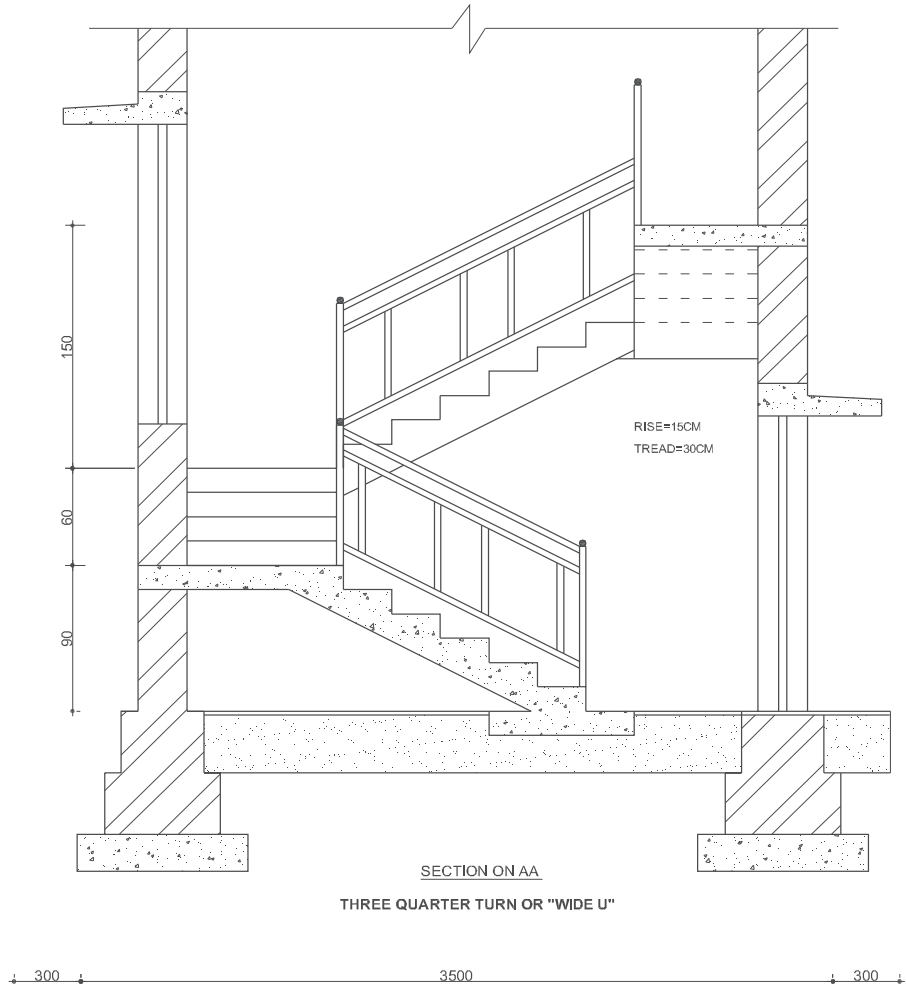
- draw the plan and section of three quarter turn stairs.

TASK 1: Draw the plan and section of turn stairs. (Fig 1)

DATA

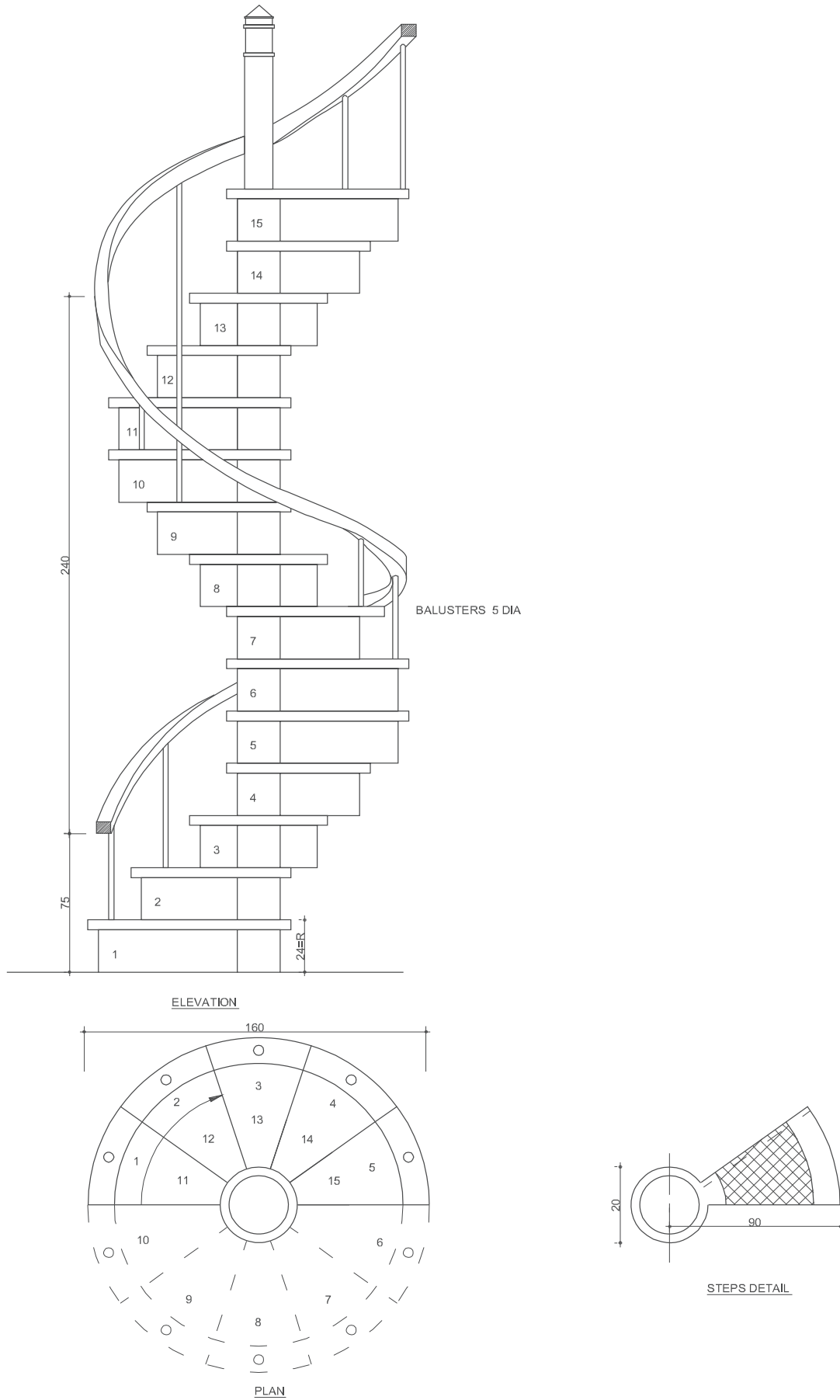
Room size	= 3.50 x 2.90m.	R.C.C. waist	= 12.5 cm.
Wall	= 30cm.	R.C.C. Beam	= 20 x 25cm.
Height between floor	= 3.00m.	Nosing	= 2.5 cm.
Tread	= 30 cm.	Hand rail	= 50 mm.
Rise	= 15 cm.	Baluster	= 25mm, 80cm height.
Width of stair	= 1.00m.	Balustrade	= with glass and wooden combination.
Width of stair	= 1.00m.		
Open well rectangle	= 150 x 90 cm.	Same as previous exercise considering given data.	

Fig 1



DCN2885W1

Fig 2



STEEL SPIRAL STAIR

DCN2935M2

Spiral stair

Objective : At the end of this exercise, you shall be able to,
• draw the plan and section of spiral stairs.

TASK 1: Draw the plan and section of spiral stairs (Fig 1)

DATA

Height of floor	= 3m.
Wall	= 30cm.
Tread	= 19cm inner circle and 56cm outer circle.
Rise	= 21.80cm.
Width of stair	= 0.80cm.
R.C.C Waist	= 12.5cm.
R.C.C Pilar	= 20cm.
Hand rail	= 50mm.
Baluster	= 25mm.

- Draw the column dia 20cm.
- Draw the outer circle of 0.9m radius.
- Divide the circle in to 10 Equal parts.
- Draw the 10 Winders.
- Draw the outer circumference of handrail of 50mm.
- Draw the complete plan.
- Develop the elevation by projecting each and very points form plan as shown.
- Draw the balusters and handrail and complete the elevation.
- Complete the plan and elevation of spiral stair.

Half turn stair R.C.C open well

Objective : At the end of this exercise, you shall be able to,
• draw the plan and section of halfturn stair RCC open well.

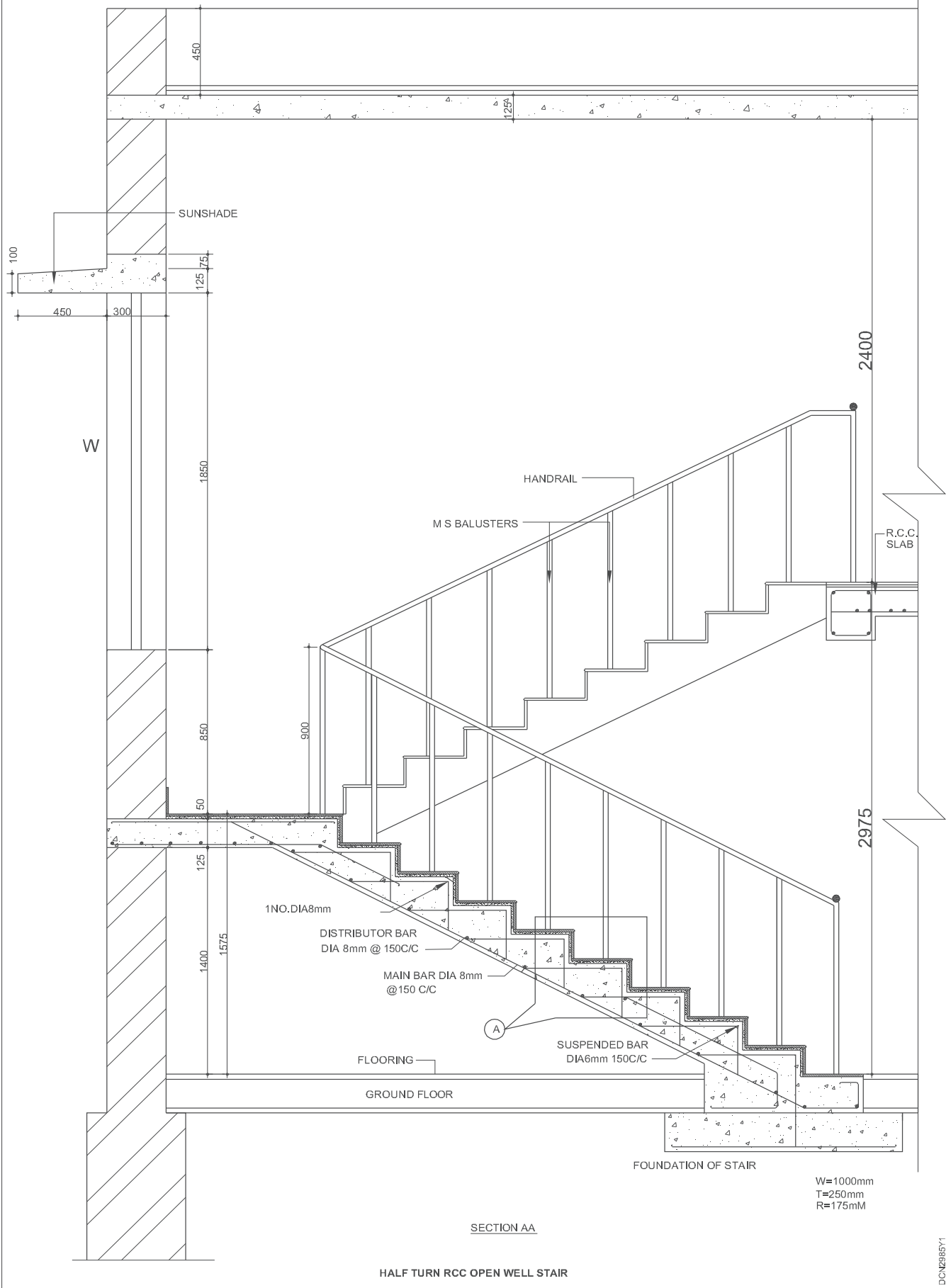
TASK 1: Draw the plan and section of halfturn stair RCC open well (Fig 1, Fig 2, & Fig 3)

DATA

Room size	= 6 x 2.50m.
Wall	= 30 cm.
Height of floor	= 2.975 m.
Tread	= 25 cm.
Rise	= 17.5 cm.
Width of stair	= 1.00 m.
Width of landing	= 1.00 m.
Open well rectangle	= 50 cm width.
R.C.C waist	= 12.5 cm.
R.C.C Beam	= 20 x 25 cm.
Nosing	= 2.5cm.
Hand rail	= 50 mm.
Baluster	= 25 mm.

- Draw the plan of room with size 6 x 2.5m.
- Draw the width of stair as 1 m.
- Draw the treads 25 cm wide and complete the plan as shown in figure.
- To develop the section, draw projectors upwards from each tread.
- Complete the section as indicated in the figure.

Fig 3



DCN2985Y1

Fig 2

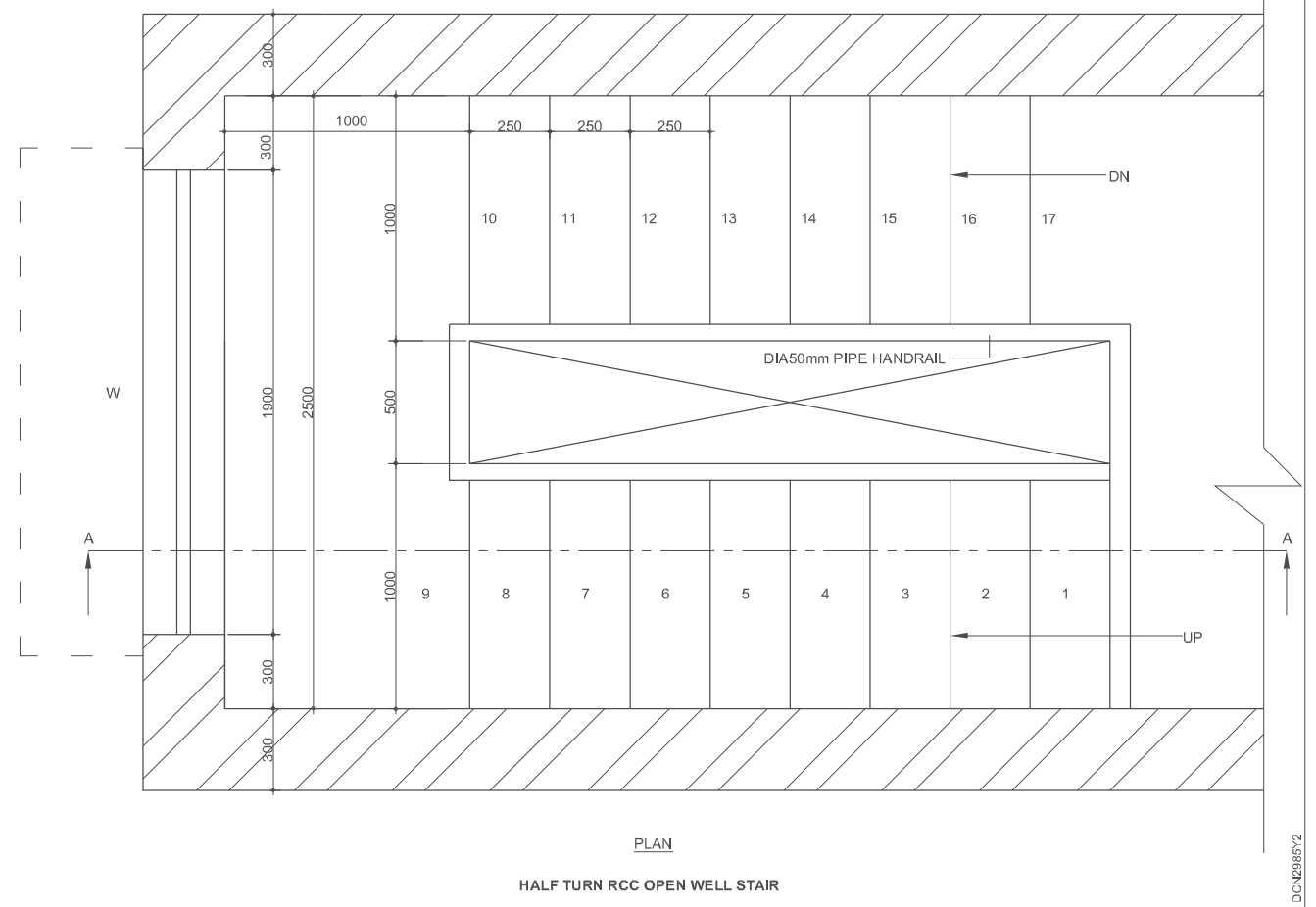
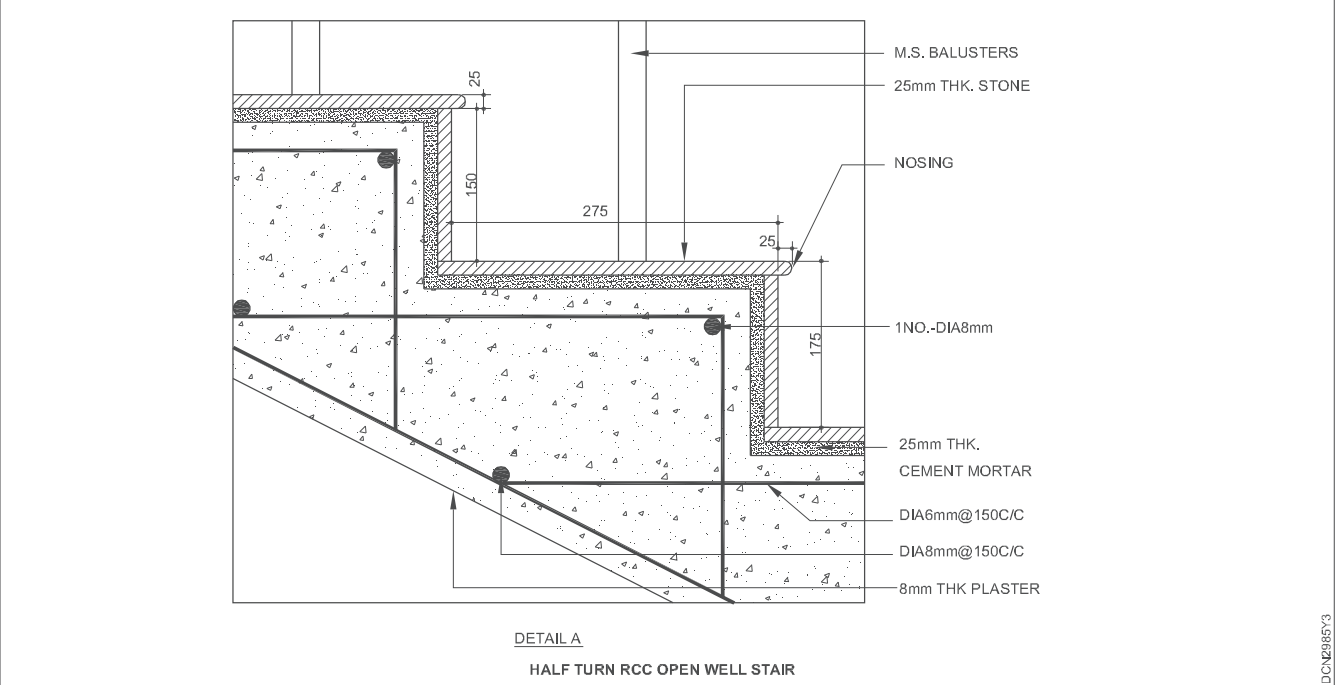


Fig 3



Brick stair

Objective : At the end of this exercise you shall be able to
 • draw the plain and section of brick stair.

PROCEDURE

TASK 1: Draw the plan and section of brick stair (Fig 1)

Data

Tread = 0.30m.

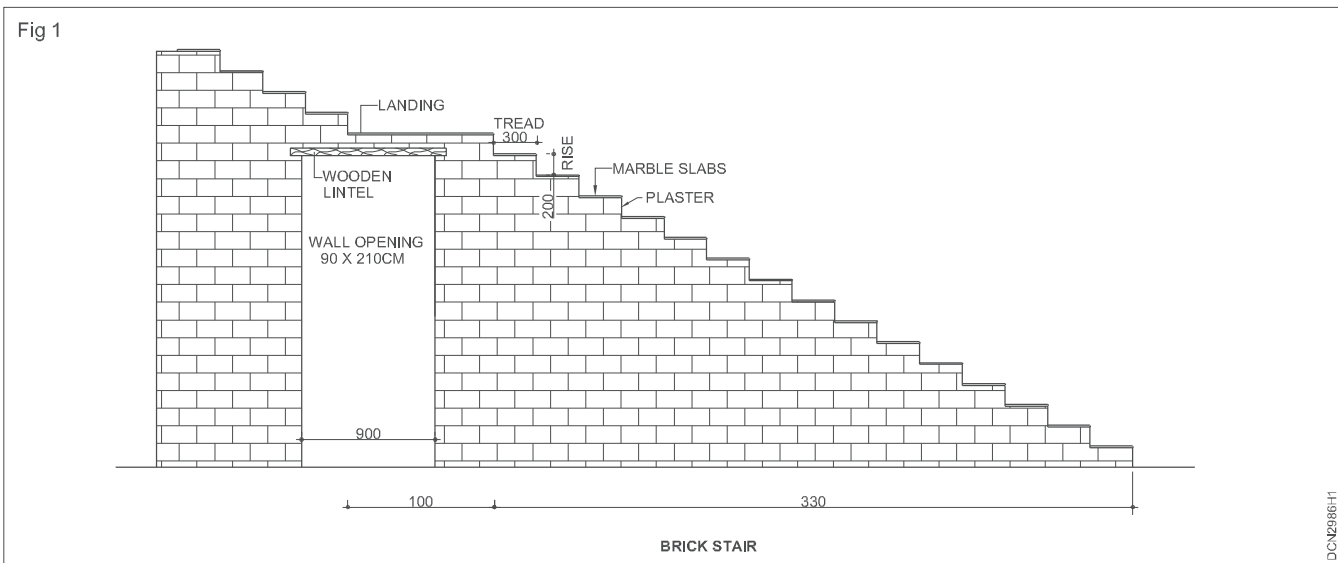
Wall = 30cm.

No.of steps 1st flight = 1 nos.

Size of opening below the landing = 0.90 x 2.10m.

Wooden lintel = 0.30 x 0.10 cm.

- Draw the elevation of stretcher course of a solid wall as shown.
- Draw an opening as shown.
- Draw a lintel over opening as shown and complete the drawing as shown.



Stone Stair

Objective : At the end of this exercise, you shall be able to,
 • draw the plan and section of stone stair.

TASK 1: Draw the section of staright flight stone stair composed of rectangular steps both ends resting on walls

DATA

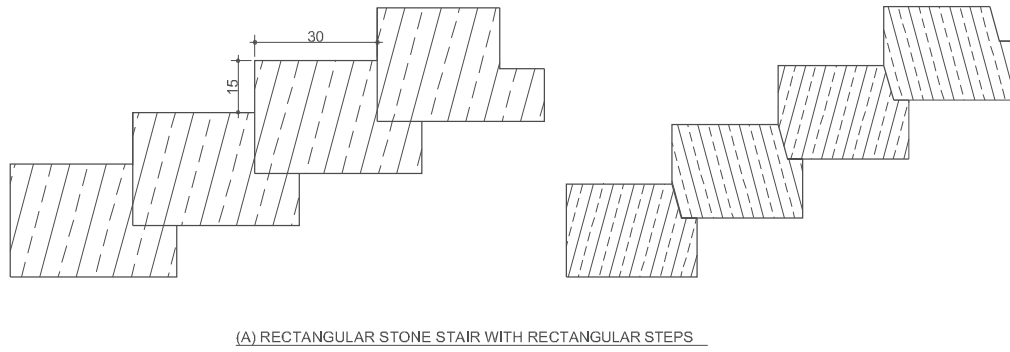
Rise = 15 cm.

Going = 30 cm.

- Draw tread 30 cm wide.
- Draw rise 15 cm.

- Draw the stone stairs with rectangular steps and complete the figure as shown in figure. (Fig 1)

Fig 1



DCN2986V1

TASK 2 : Draw the section of staright flight stone stair composed of spandril steps both ends resting on walls.

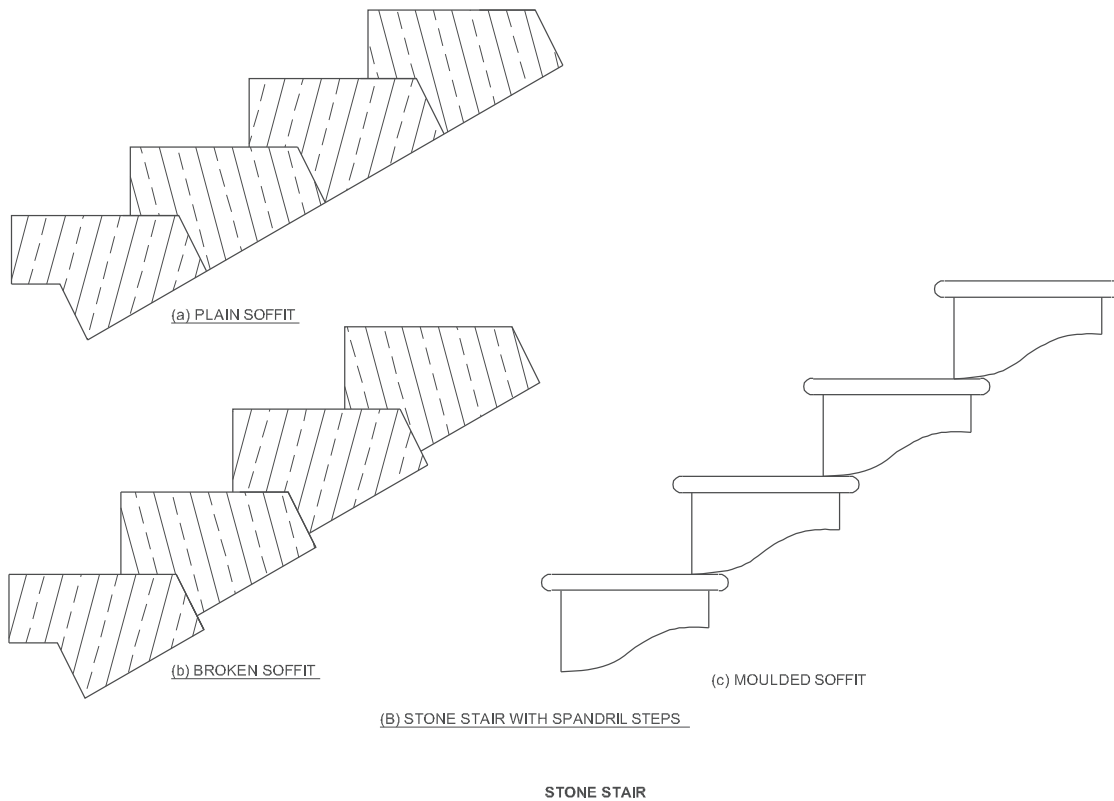
DATA

Rise = 15 cm.

Going = 30 cm.

- Draw the stair with spandril steps with plan soffit, broken soffit and moulded soffit.
- Complete the drawing as in figure. (Fig 2)

Fig 2



DCN2986V2

Wooden stair

Objective : At the end of this exercise, you shall be able to,
 • draw the plain and section of wooden stair.

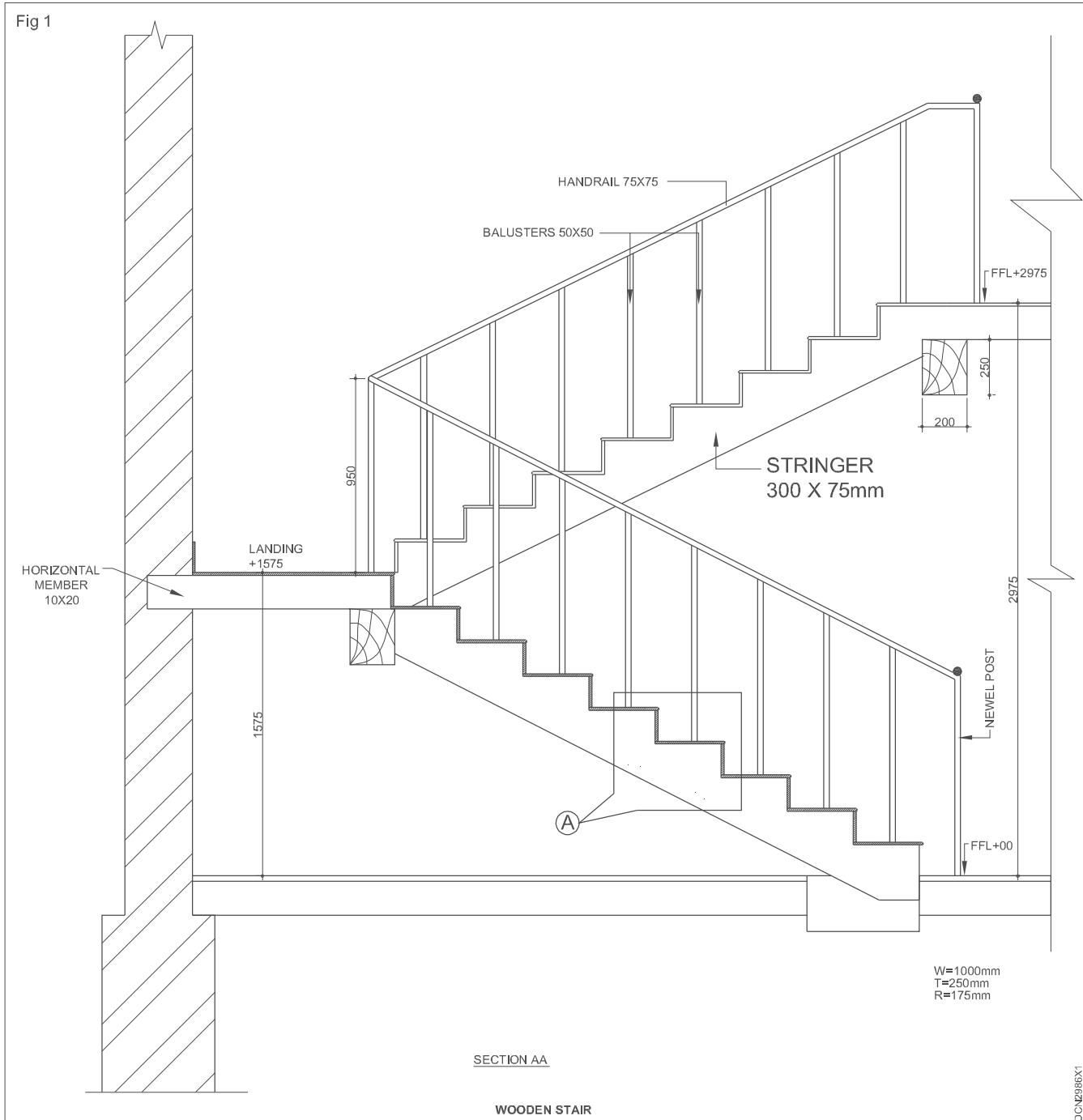
TASK 1 : Draw the plan and section of moving stairs (esclators)

DRAW THE PLAN AND SECTION OF WOODEN STAIRS (Fig 1, 2 & 3)

DATA

Room Size = 6 x 2.50m.
 Wall = 30 cm.
 Height of floor = 1.50m.

Tread = 25cm.
 Rise = 17.5cm.
 Width of stair = 1.00m.
 Plank = 12.5cm.
 Nosing = 2.5cm.



Hand rail = 50mm.
 Baluster = 25mm.
 Width of landing = 1m.
 Open well space = 50cm. (rectangle)
 Stringer beam = 10 x 20cm.

Horizontal member = 10 x 20cm.
 Wooden beam = 20 x 25cm.
 Complete the drawing showing all details as shown in figures.

Fig 2

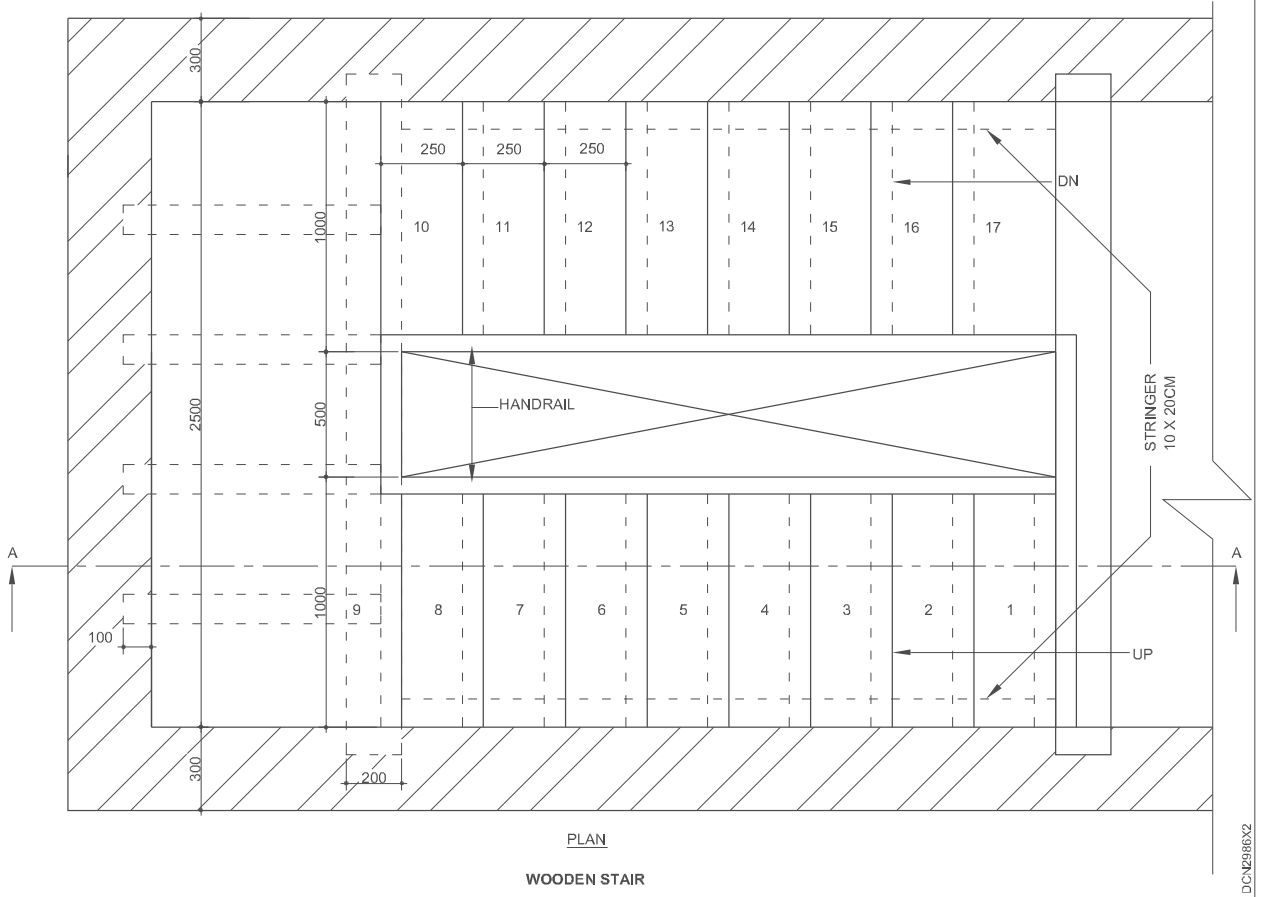
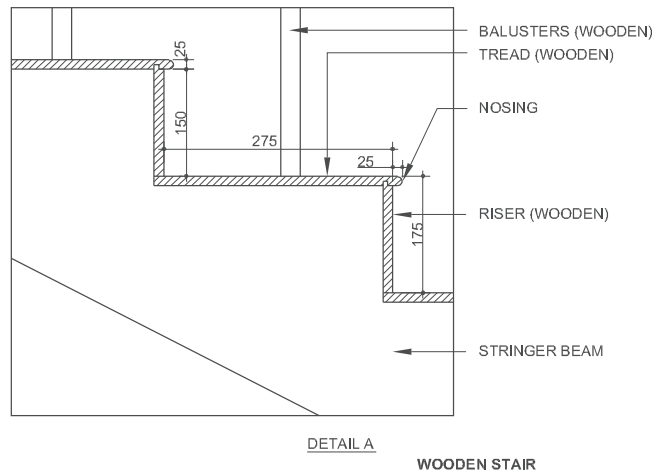


Fig 3



Metal stair

Objective : At the end of this exercise, you shall be able to,

- draw the section of metal stair.

TASK 1 : Draw the section of metal stairs (Fig 1)

Rise = 15cm.

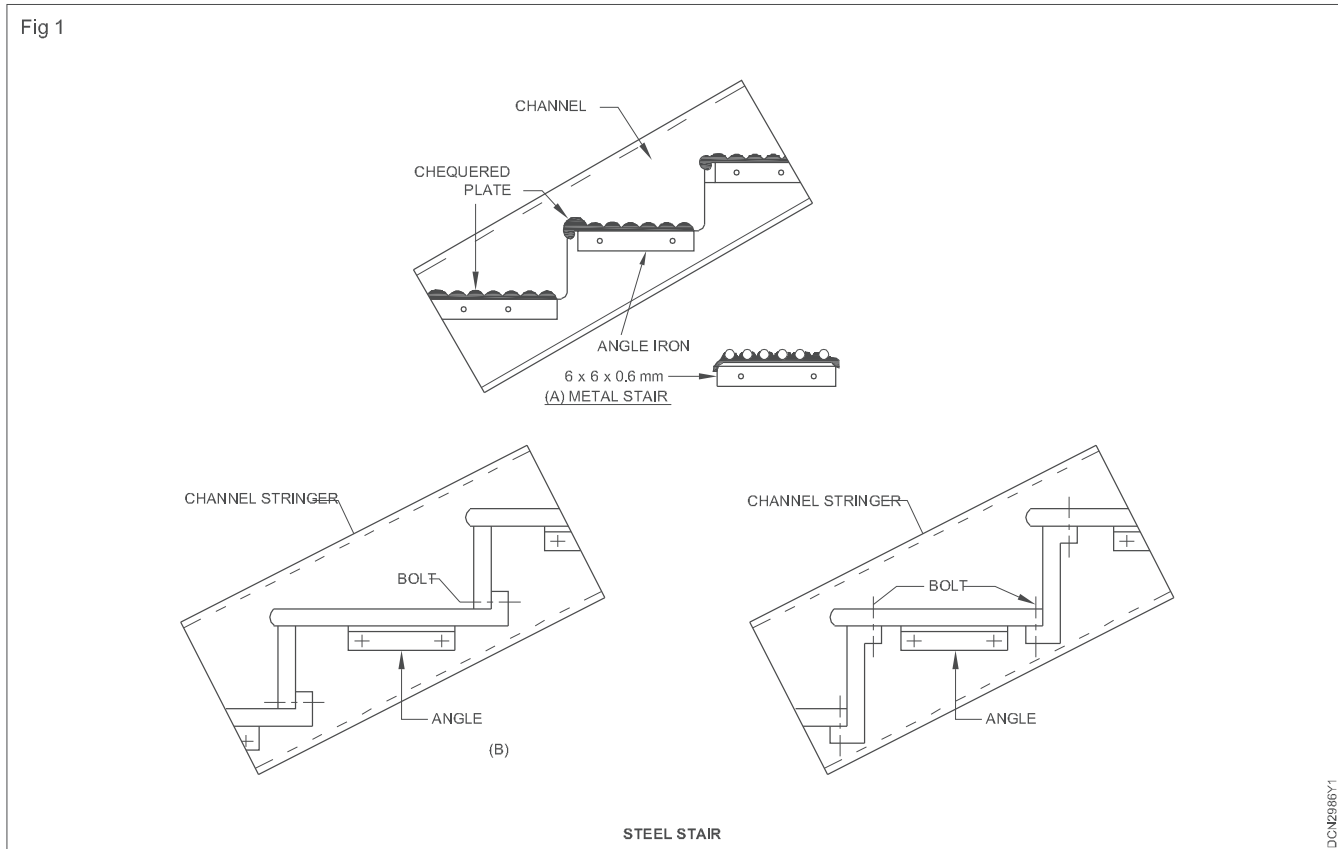
Tread = 30cm.

Two side channel stringer ISA = 150 x 150 x 12mm.

Angle iron = 6 x 6 x 0.6mm.

Chequered plate = 6 x 6 x 0.4mm.

- Draw two side channel stringer.
- Draw tread and rise angle plate and fittings fastening nut, bolt, weld, etc.
- Complete the plan and section as given in figure.



Half turn stair R.C.C dog legged

Objective : At the end of this exercise, you shall be able to,

- draw the plan and section of halfturn stair R.C.C dog legged.

TASK 1 : Draw the plan and section of halfturn stair RCC dog legged (Fig 1)

DATA

Room sizes = 5 x 2m.

Wall = 30 cm.

Height of floor = 2.975m.

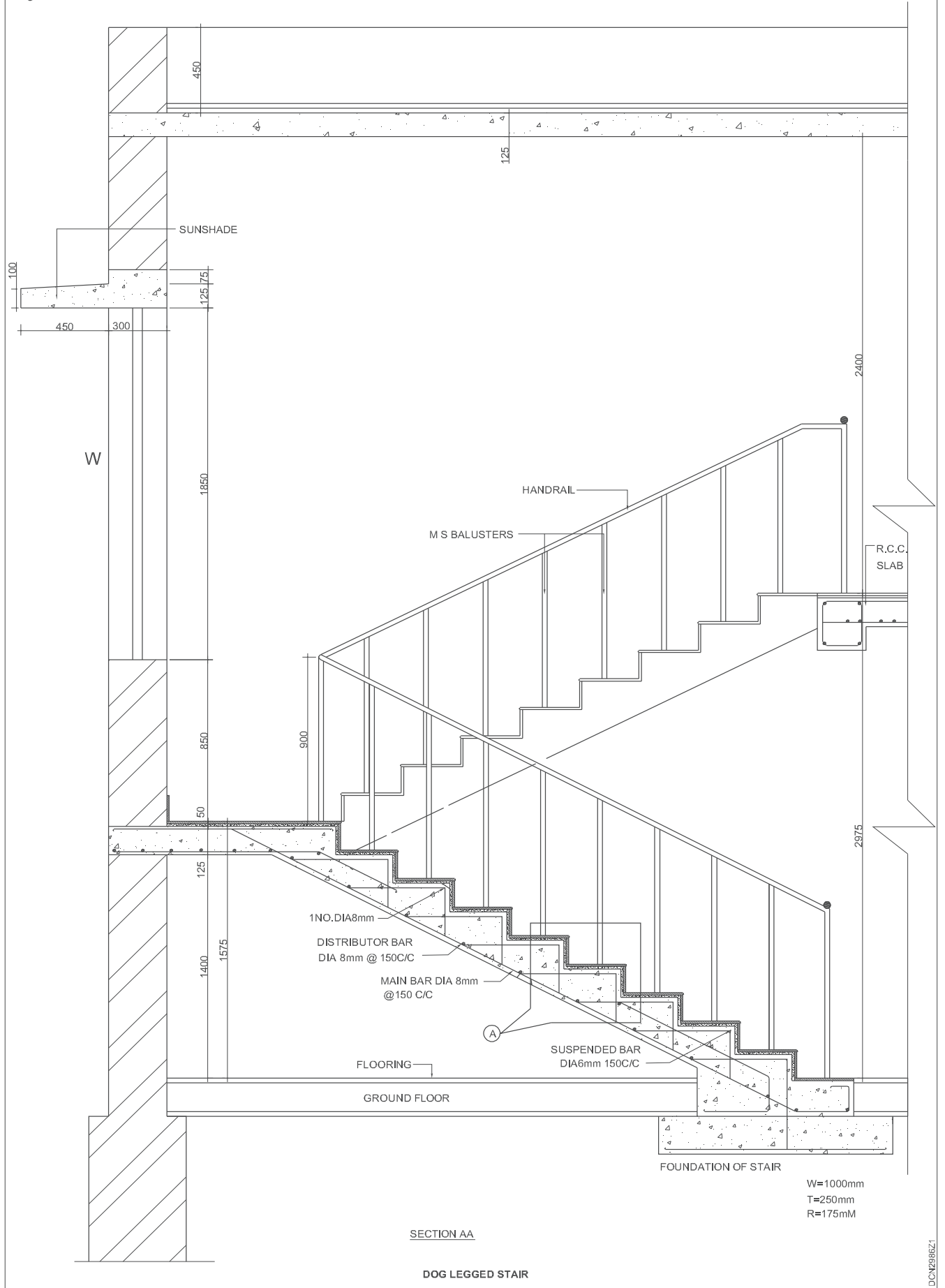
Tread = 25cm.

Rise = 17.5cm.

Width of stair = 1m.

Width of landing = 1m.

Fig 1



- R.C.C Slab = 12cm.
- R.C.C Beam = 20 x 30 cm.
- Hand Rail = 25 mm.
- Baluster = 25mm.

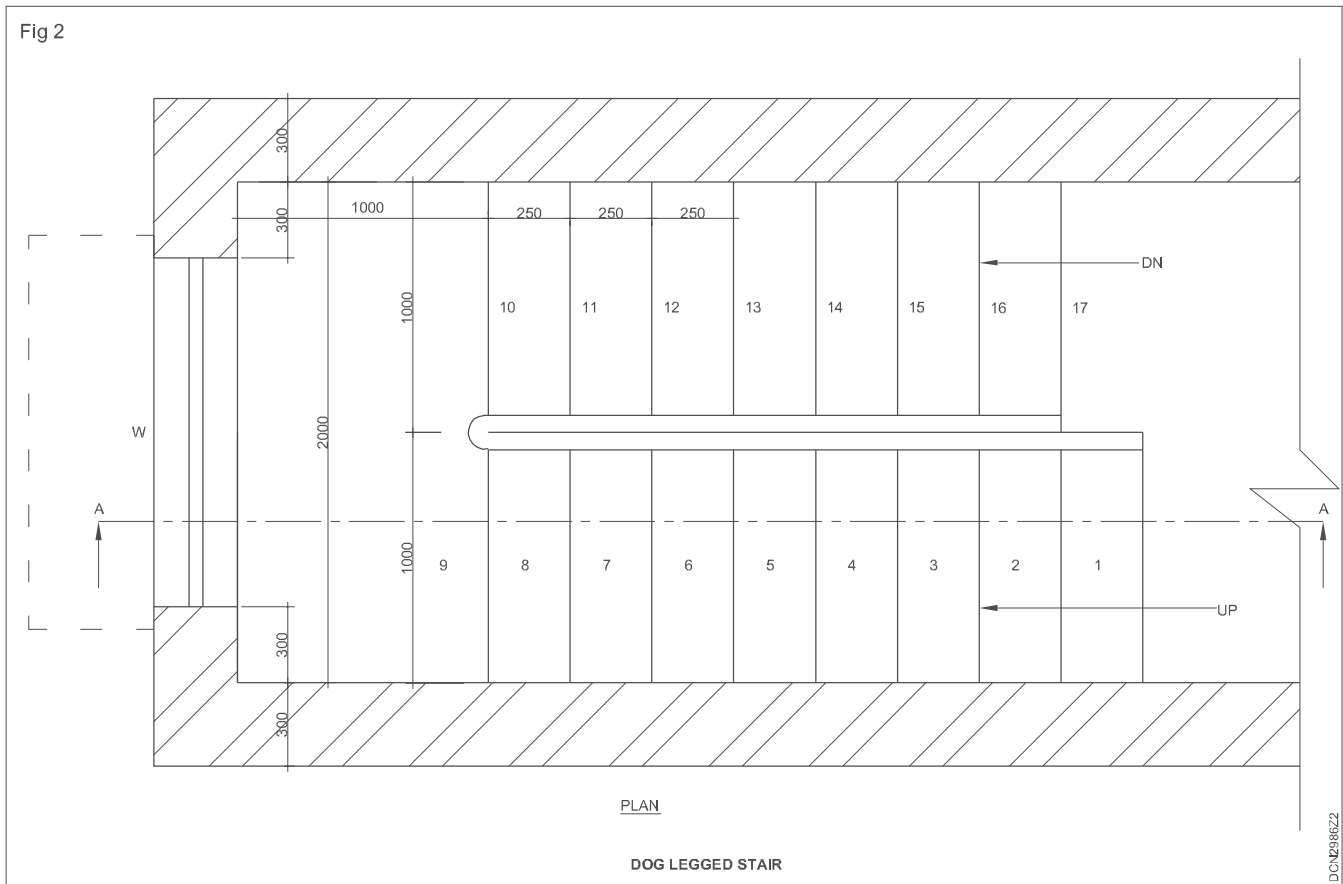
PLAN

- Draw the plan of half turn R.C.C dog legged stair room as per data given with proper number of treads as shown figure 2.
- Draw the landing after nine risers.

- Draw the window in plan.
- Dimension the drawing properly.

Section Elevation

- Draw the Sectional Elevation of the stair by drawing projectors upward from each treads.(fig 1)
- Draw the handrail details as pre given datas.
- Draw the Elevation of the window.
- Dimension the drawing properly.



Lift or elevators

- Objectives :** At the end of this exercise you shall be able to
- prepare the data table of the different loading capacity of lift
 - draw the schematic diagram of lift well etc for a load of 10 persons
 - draw the typical arrangements of a lift.

PROCEDURE

TASK 1: Draw the plan and section of lift well (Fig 1)

Load		Car inside		Lift Well		Entry	Entry
Persons	Kg	A	B	C	D	E	F
4	272	110	70	190	130	80	160
6	408	110	110	190	160	80	160
8	544	130	110	190	190	80	160
10	680	135	130	190	210	80	160
13	884	200	110	250	190	90	160
16	1088	200	130	250	210	100	160
20	1360	200	155	250	240	100	160

- Draw the size of machien room.
- Draw the lift well 1.90 x 1.53m.
- Draw the wall thickness 30cm.
- Draw the headroom height 2.2m.
- Develop the elevation by projecting each and every point from plan as shown in figure 1.

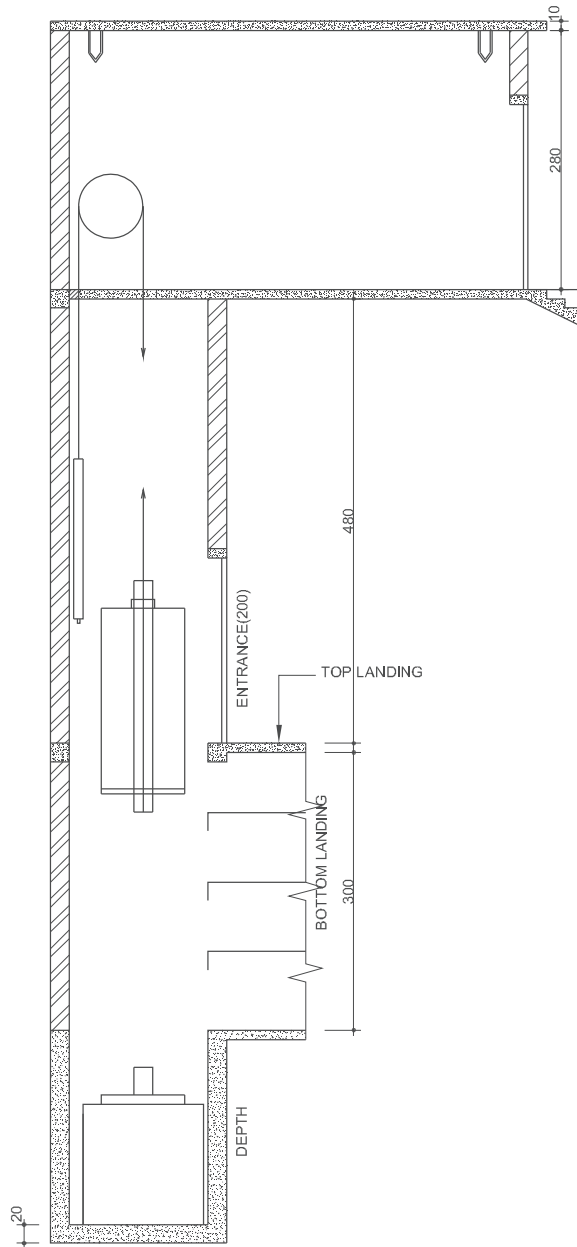
- Complete the plan and section of lift well.

The total head room has been calculated on the basis of car height of 2.2m.

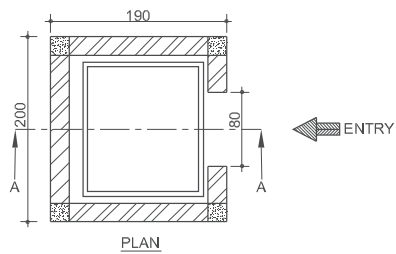
In the case of manually operated doors clear entrance will be reduced by the amount of projection of handle on the landing door.

Four and six passenger’s lifts are generally limited to a speed of 1 m/s.

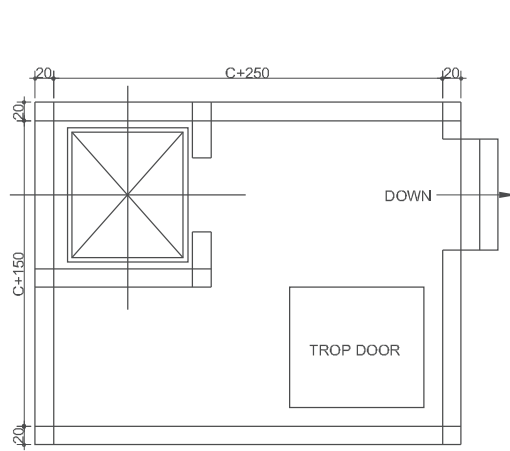
Fig 1



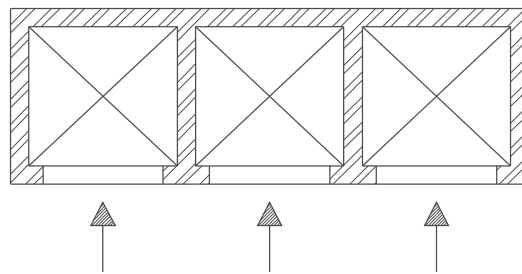
SECTION AA



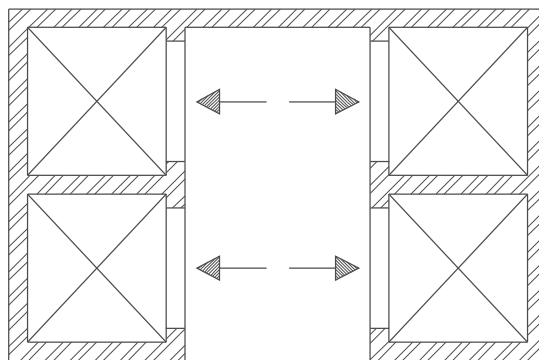
PLAN



MACHINE ROOM PLAN



STRAIGHT LINE ARRANGEMENT



ALCOVE ARRANGEMENT FOR LIFT

ESCALATOR AND LIFT WELL

DCN2987H1

Moving stairs (escalators)

Objective : At the end of this exercise, you shall be able to,
 • draw the plan and section of moving stairs (escalators).

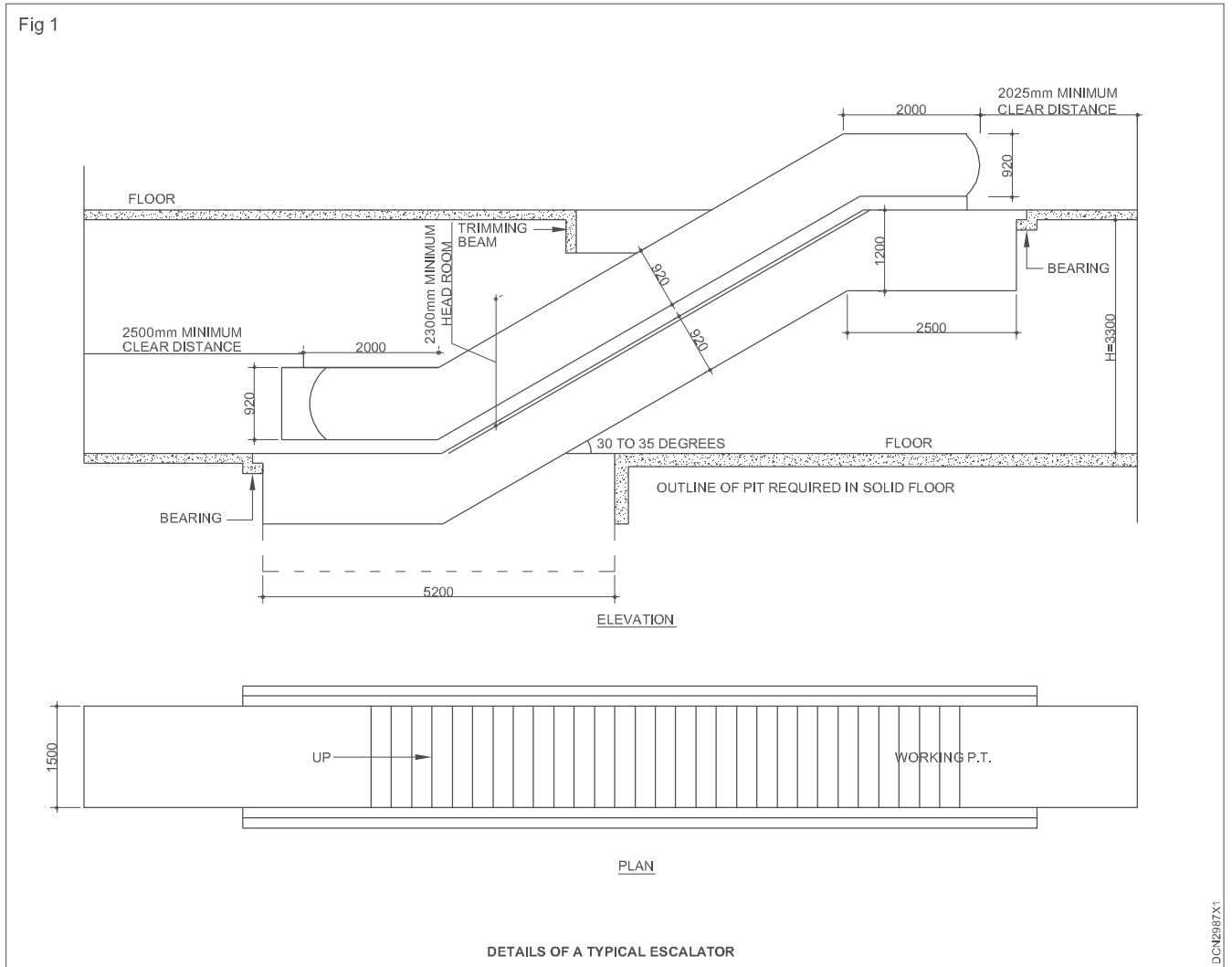
TASK 1 : Draw the plan and section of moving stairs (escalators). (Fig 1)

DATA

Room size = 6 x 2.50 m.
 Wall = 30 cm.
 Height of floor = 3.30 m.
 Width of landing = 1 m.

Width of stair = 1.50 m.

Complete the drawing showing all details as shown in figure 1.



Ramp

Objective : At the end of this exercise, you shall be able to,

- draw the plan and section of ramp.

TASK 1 : Draw the plan section of simple ramp (Fig 1)

DATA

Length = 5 m,

Breadth = 3m.

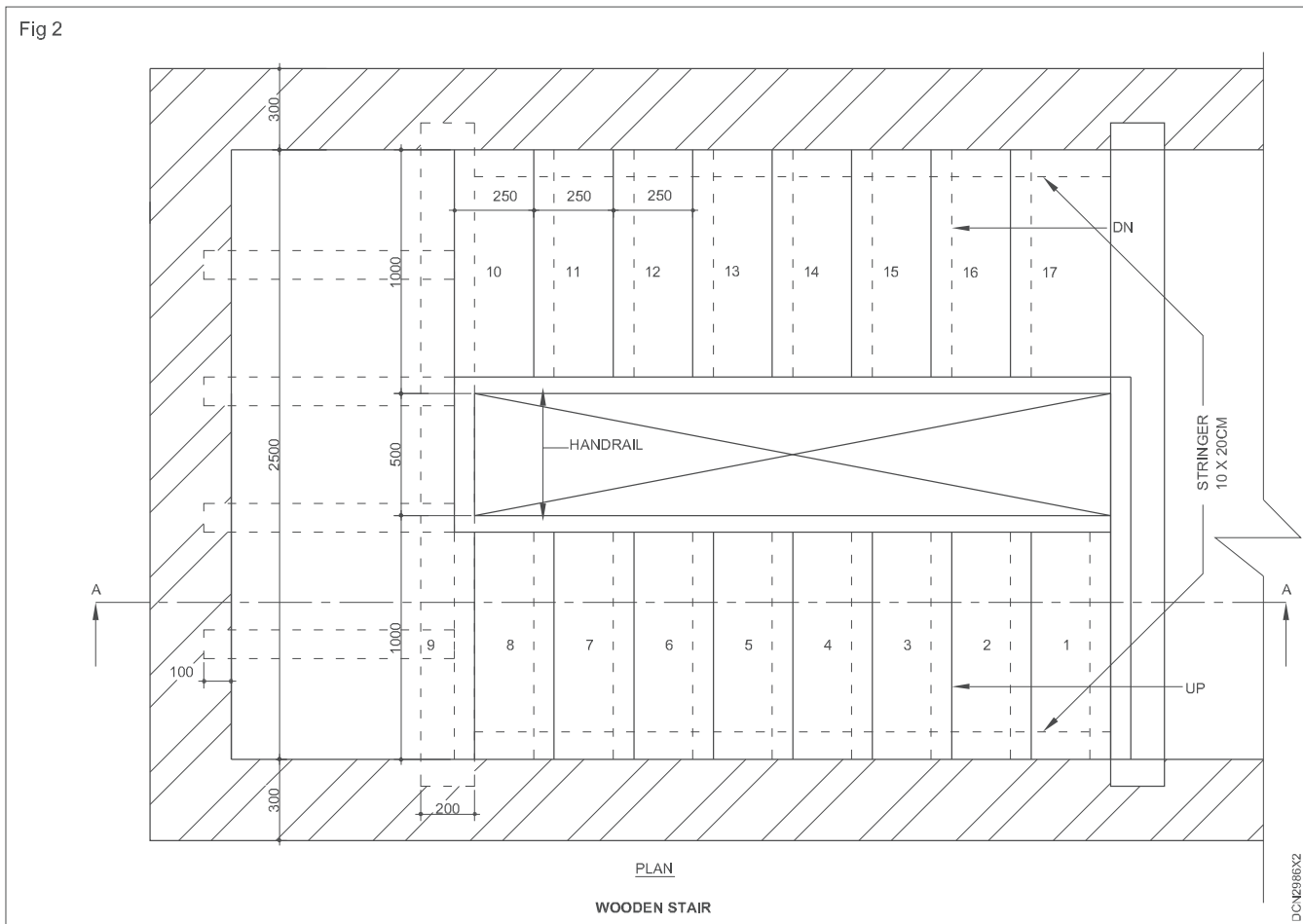
Slope 1 in 10, Level difference 20 cm.

12 mm thick cement plaster over c.c. 1:2:4.

Hand rails 50mm dia GI pipes on both sides.

Baluster 25mm dia GI pipe and newel post 50 mm dia GI pipe.

- Select a Scale of drawing 1:25.
- Draw plan of Ramp as per given data as shown Figure 1.
- Draw sectional elevation by projecting the plan as per given data as shown in figure 1. (To develop the sectional view draw upward projector from each end and complete the section)
- Draw hand rail details (Baluster, Newel post, etc) as per data given.
- Dimension the drawing as shown in figure 1.



Types of sloped roofs

Objectives : At the end of this exercise you shall be able to

- draw the sectional elevation of lean-to-roof
- draw the sectional elevation of couple roof.

PROCEDURE

TASK 1 : Draw the section of lean-to-roof to a scale 1:50 (Fig 1a)

DATA

- Clear span = 2000mm.
- Thickness of main wall = 200mm.
- Thickness of verandah wall = 200mm.
- Cross section size of wall plate = 150 x 100mm.
(verandah wall)
- Cross section size of bressmer = 100 x 200mm.
(main wall)
- Cross section size of rafter = 50 x 125 mm.
- Cross section size of battens = 50 x 30 mm at 350 mm C/C.
- Cross section size of leave boards = 25 x 200 mm.
- Elevation projection = 600mm.
- Pitch of the roof = 30° or 1/3 of span.
- Width of corbal stone = 450mm.

- Draw main wall and verandah wall 2000mm clear span between them.
- Draw wall plate on the top of verandah wall.
- Draw rafter at angle 30° to the horizontal above the wall plate.
- Draw corbel and bressmer in the main wall, at the position where rafter touches the main wall as show in figure.
- Draw battens above the rafter.
- Draw roof tiles above the battens.
- Draw eave board at end of rafter.
- Complete the drawing as shown in figure 1.



TASK 2: Draw the sectional elevation of coupleroof (Fig 1b)

Draw the section of couple roof to a scale 1:50.

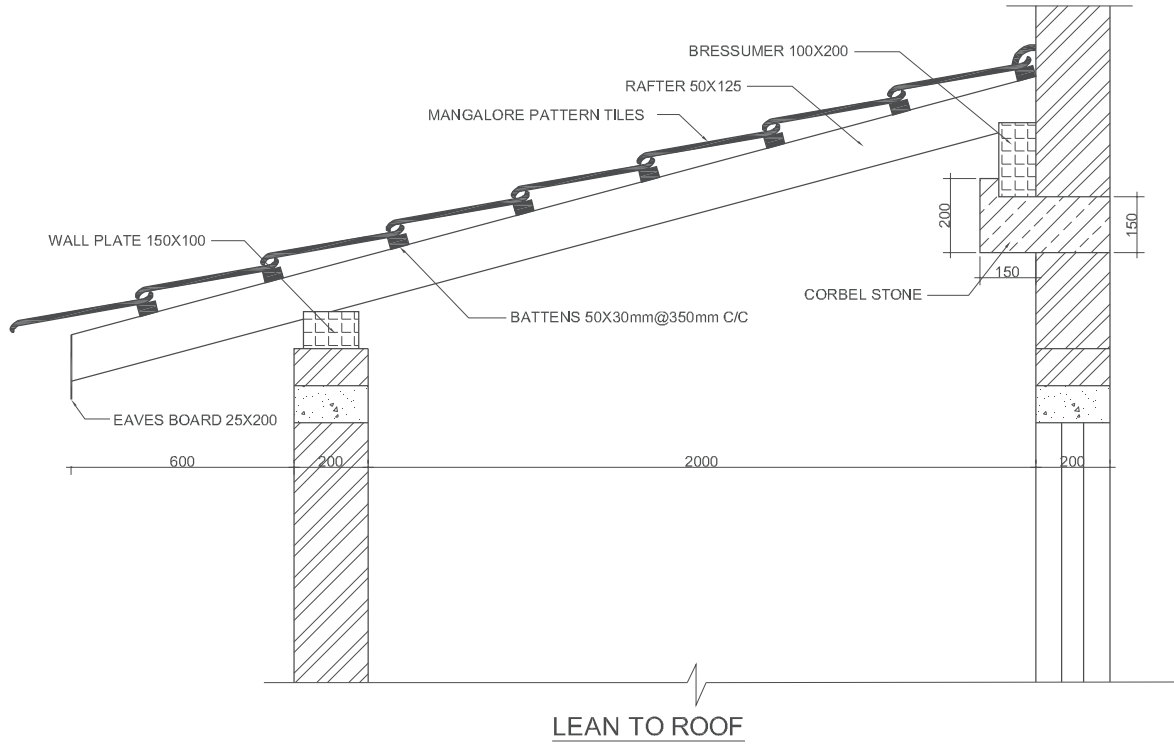
DATA:

- Span = 3000mm.
- Thickness of main wall = 200mm.
- Cross section size of wall plate = 150 x 100mm.
- Cross section size of Ridge piece = 80 x 200mm.
- Cross section size of common rafter = 50 x 125mm.
- Cross section size of battens = 50 x 30mm at 350 mm C/C.
- Cross section size of eave boards = 25 x 200mm.
- Eave projection = 600mm.
- Pitch of the roof = 30° or 1/3 of span.

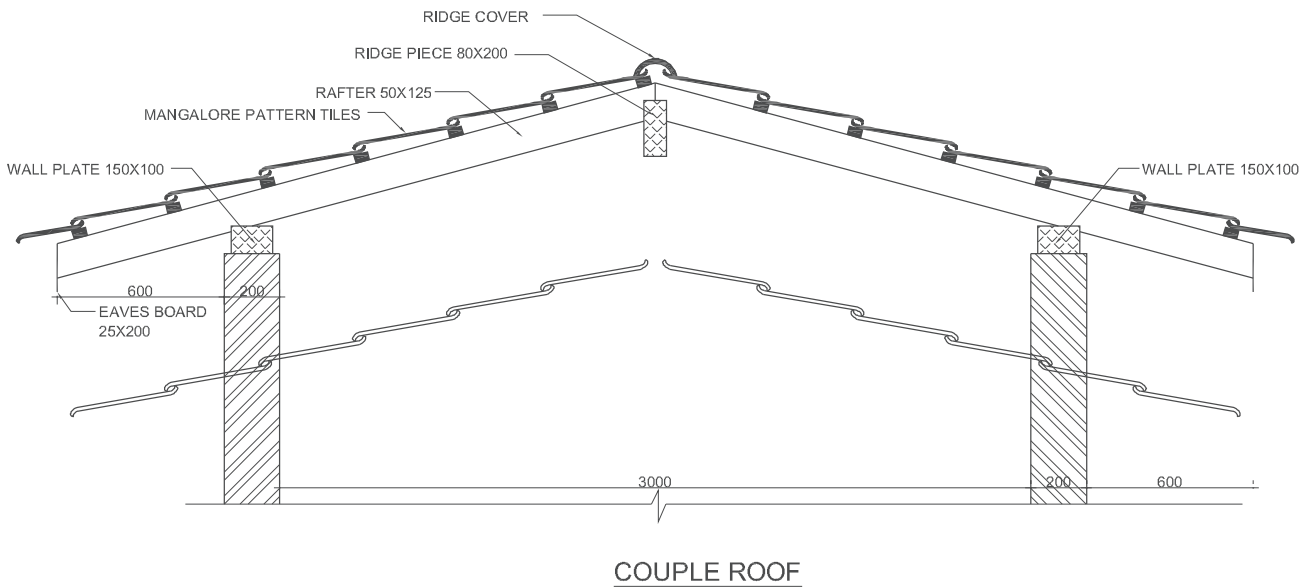
- Draw wall plate above the top of main wall.
- Draw common rafter with 30° slope above the top wall plate.
- Draw ridge piece at the junction of common rafter.
- Draw eaves board at the end of common rafter.
- Draw battens above the common rafter.
- Draw roof tiles above the battens.
- Draw ridge cover above ridge piece.
- Completer the drawing as shown in figure 1.

- Draw the main wall with 3000 mm clear span.

Fig 1



(a)



(b)

TYPE OF SLOPE ROOFS

DCNZ1088H1

Types of sloped roofs

Objectives : At the end of this exercise, you shall be able to,

- draw the sectional elevation of couple close roof
 - draw the sectional elevation of single collar roof
 - draw the sectional elevation of collar and scissors roof.
-

TASK 1 : Draw the section of couple close roof to scale 1:50 (Fig 1a)

DATA

Span	= 4000mm.
Thickness of main wall	= 200mm.
Cross section size of wall plate	= 150 x 100 mm.
Cross section size of Ridge piece	= 80 x 200mm.
Cross section size of Common rafter	= 50 x 125mm.
Cross section size of tie joist	= 40 x 150mm.
Cross section size of battens	= 50 x 30mm at 350 mm C/C.
Eaves projection	= 600mm.
Pitch of the roof	= 30° or 1/3 of span.

- Draw the main walls with 4000 mm clear span.
- Draw wall plate above the top of main wall.

- Draw common rafter with 30° slope above the top of wall plate.
- Draw ridge piece at the junction of common rafter.
- Draw tie joist horizontally above the wall plate.
- Draw eaves board at the end of common rafter.
- Draw battens above the common rafter.
- Draw roof tiles above the battens.
- Draw roof ridge cover above ridge piece
- Complete the drawing as shown in figure 1.

— — — — —

TASK 2 : Draw the sectional elevation of single collar roof (Fig 1b)

Draw the section of single collar roof to a single 1:50.

DATA

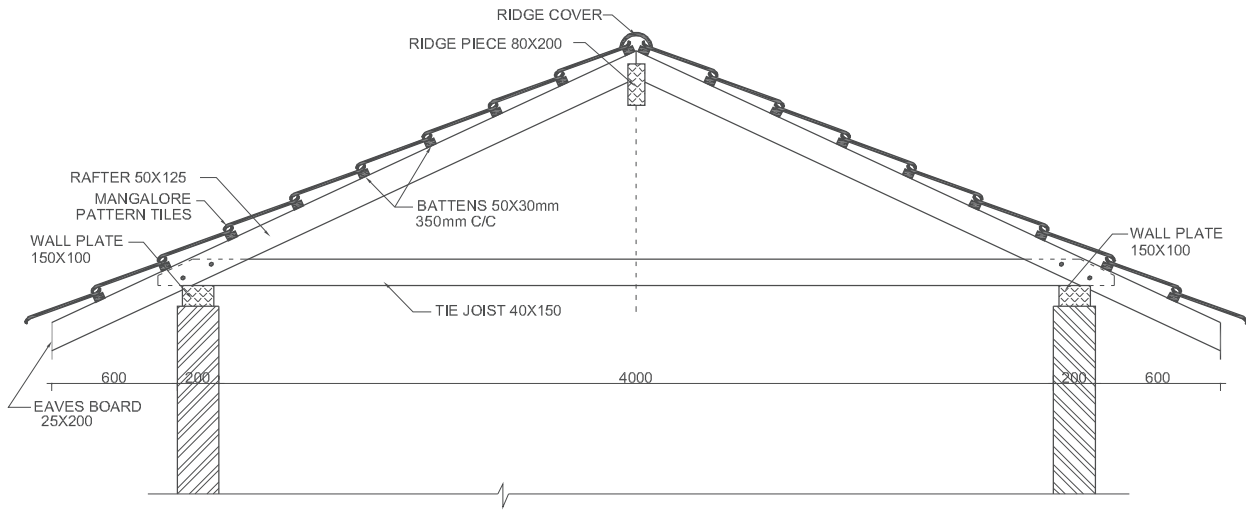
Span	= 5000mm.
Thickness of main wall	= 200mm.
Cross section size of wall plate	= 150 x 75mm.
Cross section size of Ridge piece	= 80 x 200mm.
Cross section size of common rafter	= 50 x 125mm.
Cross section size of collar	= 40 x 125mm.
Cross section size of battens	= 50 x 30mm at 350 mm C/C.
Cross section size of eaves boards	= 25 x 200mm.
Pitch of the roof	= 30° or 1/3 of span.

- Draw the main walls with 5000 mm clear span.
- Draw wall plate above the top of main wall.

- Draw common rafter with 30° slope above the top of wall plate.
- Draw ridge piece at the junction of common rafter.
- Draw collar horizontally from the middle of common rafter.
- Draw eave board at the end of common rafter.
- Draw battens above the common rafter.
- Draw roof tiles above the battens.
- Complete the drawing as shown in figure 1.

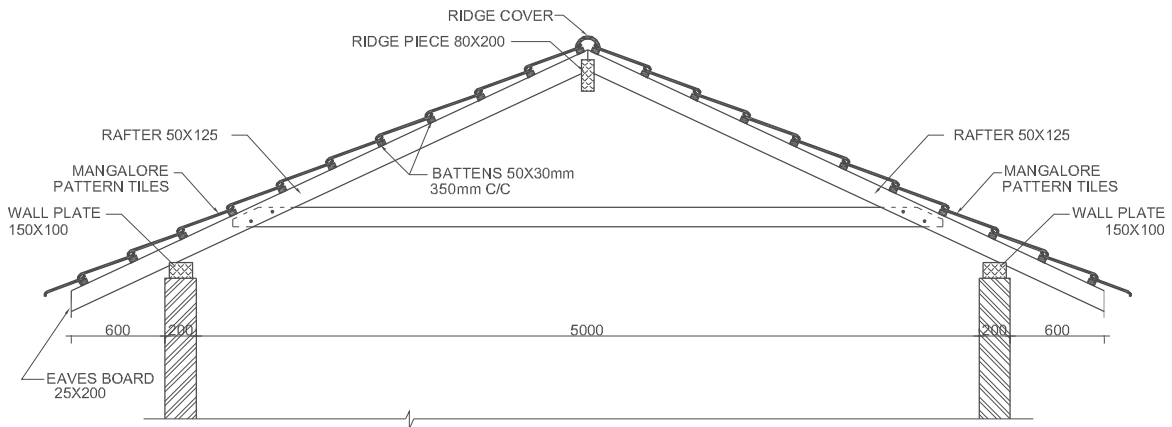
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Fig 1



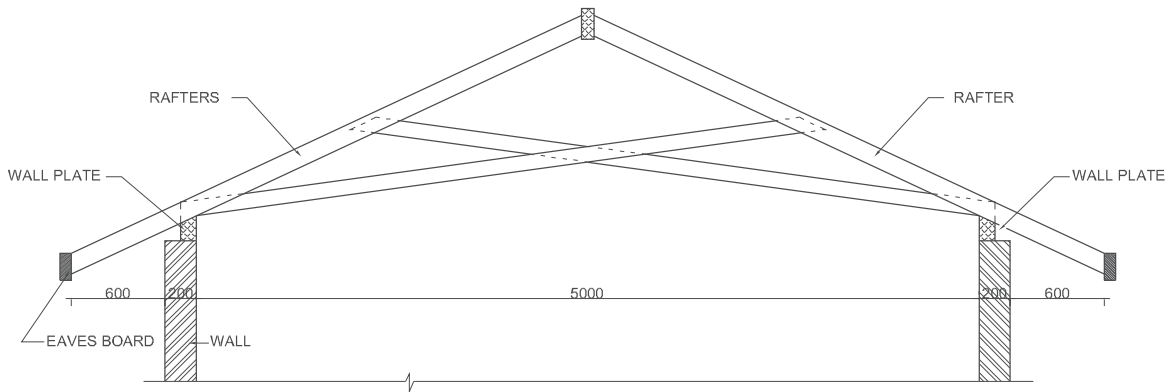
CLOSE COUPLE ROOF

(a)



SINGLE COLLAR ROOF

(b)



COLLAR AND SCISSORS ROOF

(c)

TYPE OF SLOPE ROOFS

2XCNZ1088X2

Task 3: Draw the section of collar and scissors roof (Fig 1c)

Draw the section of collar and scissors roof to a scale 1:50.

Data

Span = 5000 mm.

Thickness of main wall = 300mm.

Cross section size of wall plate = 150 x 75 mm.

Cross section size of ridge piece = 80 x 200mm.

Cross section size of common rafter = 50 x 125mm.

Cross section size of scissors = 50 x 125 mm.

Cross section size of battens = 50 x 30 mm at 350 mm C/C.

Cross section size of eave boards = 25 x 20 mm.

Elevation projection = 600mm.

Pitch of the roof = 30° or 1/3 of span.

- Draw the main walls with 5000 mm clear span.
- Draw wall plate above the top of main wall.
- Draw common rafter with 30° slope above the top of wall plate.
- Draw ridge piece at the junction of common rafter.
- Draw scissors from common rafters as shown in figure 1.

Draw types of sloped roofs

Objective : At the end of this exercise, you shall be able to,

- draw the section of double or purlin roof.
-

TASK 1 : Draw the section of double for purlin roof (Fig 1a)

Draw the section of double or purlin roof to a scale 1:50.

DATA

Span = 5000mm.

Thickness of main wall = 300 mm.

Cross section size of wall plate = 150 x 75 mm.

Cross section size of Ridge piece = 80 x 200mm.

Cross section size of Common rafter = 50 x 125 mm.

Cross section size of tie joist = 50 x 100 mm.

Cross section size of battens = 50 x 30mm at mm C/C.

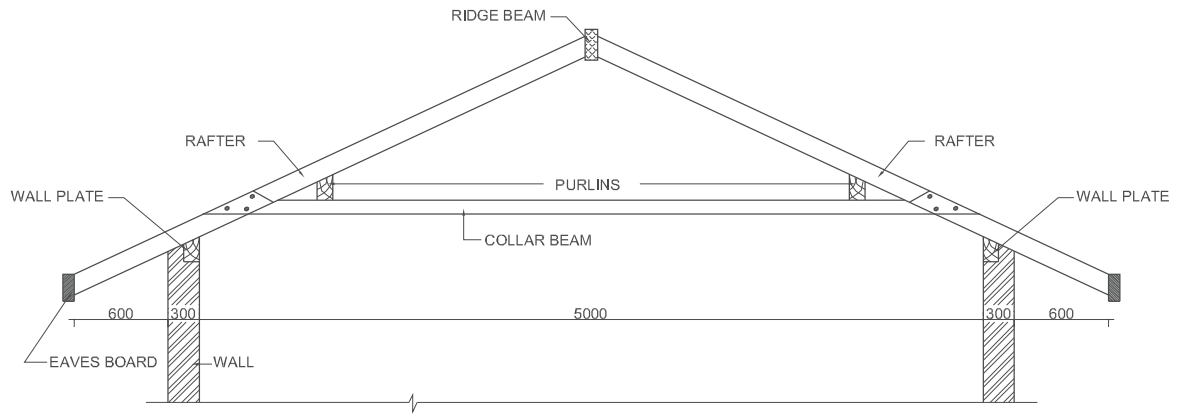
Cross section size of elevation boards = 50 x 200mm.

Elevation projection = 600 mm.

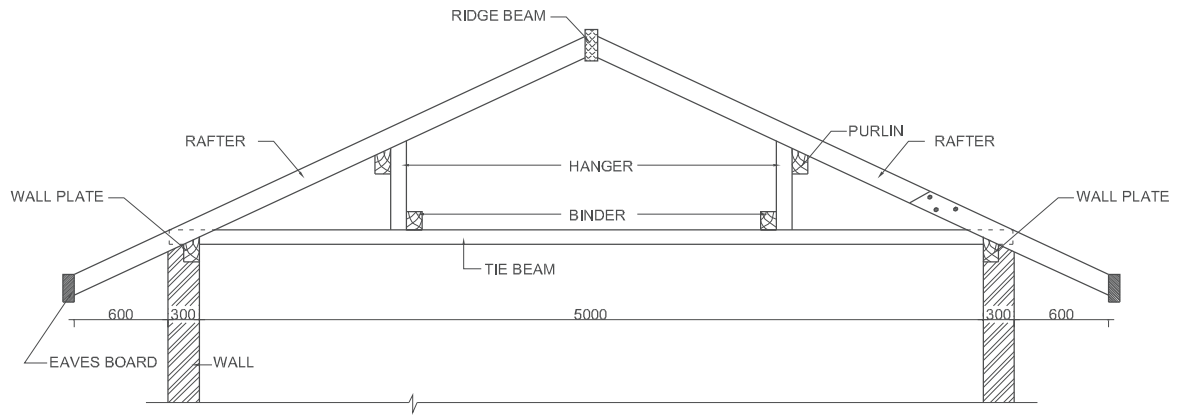
Pitch of the roof = 30° or 1/3 of span.

- Draw the main walls with 5000mm clear span.
- Draw wall plate above the top of main wall.
- Draw common rafter with 30° slope above the top of wall plate.
- Draw ridge piece at the junction of common rafter.
- Draw collar beam and purlins from common rafter as shown in figure.
- Draw eave board at the end of common rafter.
- Draw battens above the common rafter.
- Draw roof tiles above the battens.
- Draw elevation board at the end of common rafter.
- Draw battens above the common rafter.
- Complete the drawing as shown in figure 1.

Fig 1



(a) DOUBLE OR PURLIN ROOF



(b) RAFTER AND PURLIN ROOF

TYPE OF SLOPE ROOFS

DCN21088Y1

Steel roof truss

Objectives: At the end of this exercise you shall be able to

- draw the elevation of steel truss
- draw details of joint of steel.

PROCEDURE

TASK 1 : Draw the elevation of steel truss (Fig 1a)

Draw the section of steel truss to a scale 1:50.

Data

Span = 7200mm.

Thickness of main wall = 300mm.

Tie beam = ISA 75 x 75 x 6.

Principal rafter = 2 - ISA 75 x 75 x 6.

Purlin = ISA 100 x 75 x 6.

Struts = ISA 65 x 65 x 6.

Gusset plate = 6 mm thick.

Gusset angle = 2 - ISA 75 x 75 x 75 x 6.

Base plate = 300 x 250 x 10.

Anchor bolt = 20 mm dia.

- Draw the centre line of the steel truss, as per the inclinations in the key diagram.
- Draw the thickness of the members parallel to the centre line.
- Draw the gusset plate and rivets.
- Complete the drawing as shown in figure 1.



TASK 2: Draw the details of base connection of steel truss (ISOMETRIC VIEW) (Fig 1b)

Draw the section of steel roof truss a scale 1:10.

DATA

Thickness of main wall = 300 mm.

Tie beam = ISA 75 x 75 x 6.

Principal rafter = 2 - ISA 75 x 75 x 6.

Gusset plate = 6 mm thick.

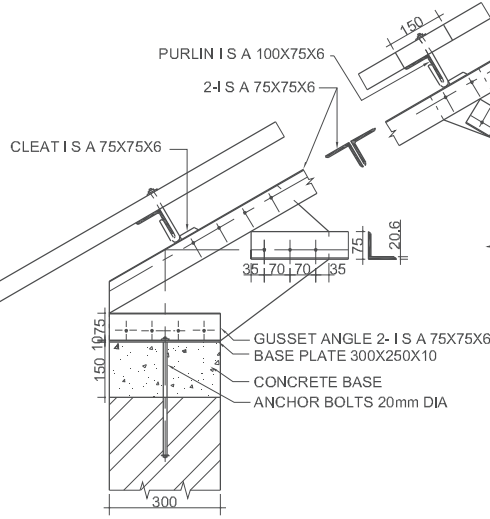
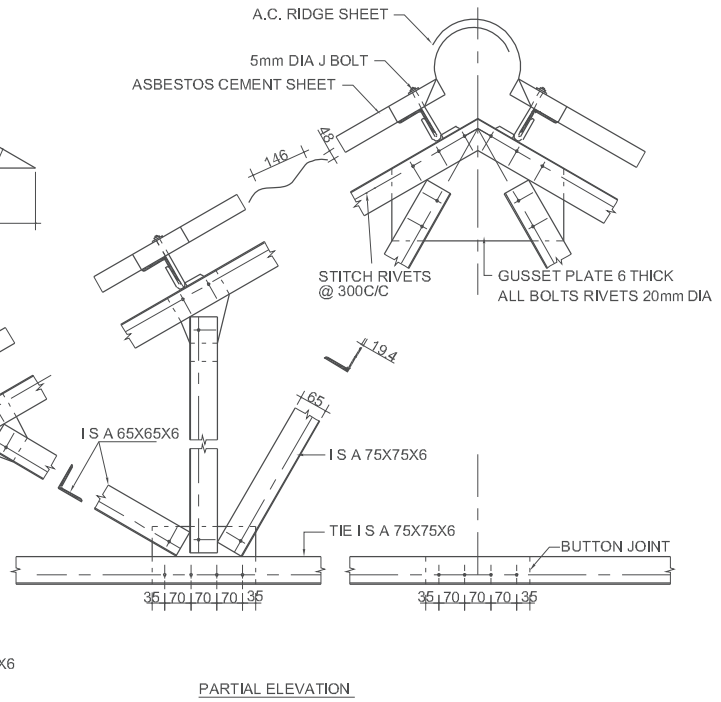
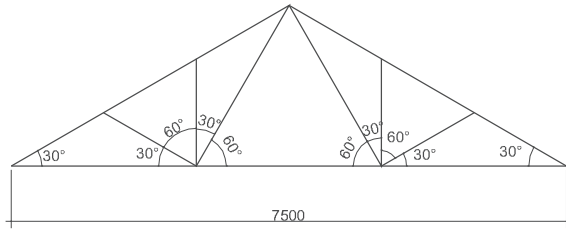
Gusset angle = 2 - ISA 75 x 75 x 6.

Base plate = 300 x 250 x 10.

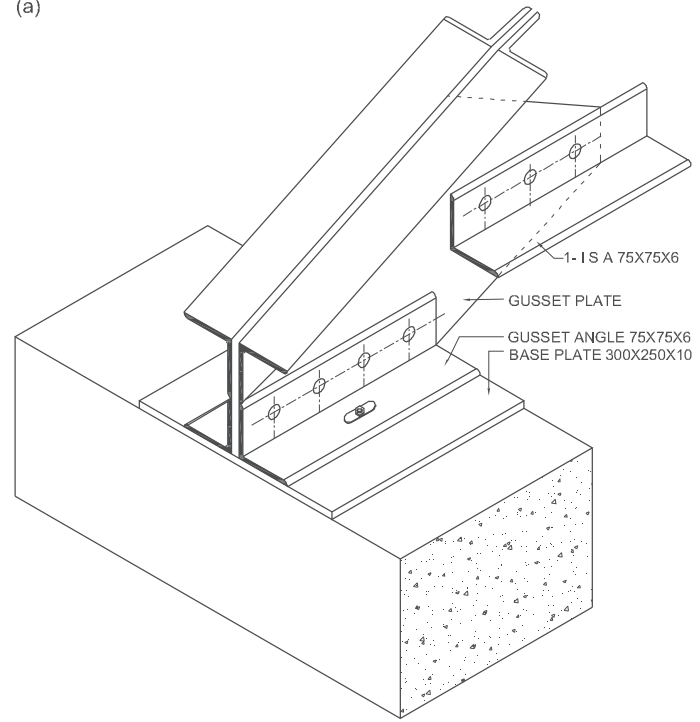
Anchor bolt = 20 mm dia.

- Draw the isometric view of wall.
- Draw the base plate above wall.
- Draw gusset angle and gusset plate.
- Draw the principal rafter and tie beam.
- Complete the drawing as shown in figure 1.

Fig 1



(a)

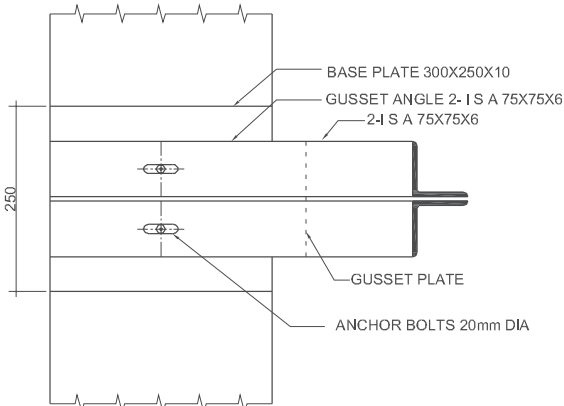


BASE CONNECTION
ISOMETRIC VIEW

(b)

ALL DIMENSIONS ARE IN CMS

STEEL TRUSS



D:\CNE\089511

Tubler steel truss

Objectives: At the end of this exercise, you shall be able to

- draw the elevation of tubler steel truss
 - draw details of tubler steel truss.
-

TASK 1 : Draw the elevation of tubular steel truss (Fig 1)

Draw the elevation of tublar steel truss a scale 1:50.

DATA

Span	= 10000mm.	• Draw the centre line of the tubular steel truss.
Thickness of main wall	= 250mm.	• Draw the thickness of the members parallel to the centre line.
Dia of principal rafter	= 50mm.	• Complete the drawing as shown in figure 1.
Tie beam	= 50mm.	
Purlin	= 50mm.	
Struts	= 25mm.	
Centre post	= 40mm.	
Base plate	= 250 x 250 x 10.	
Bolts	= 12 mm dia.	

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TASK 2 : Draw the details of base connection of tubular truss at A,B & C (Fig 1)

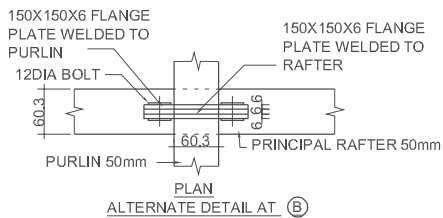
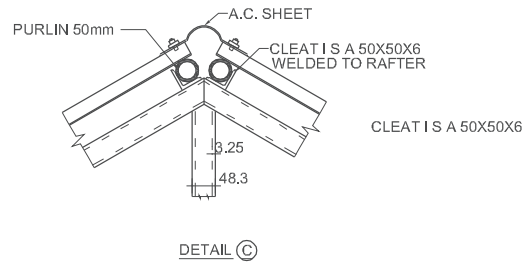
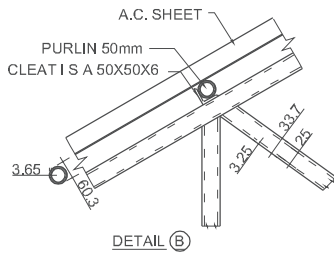
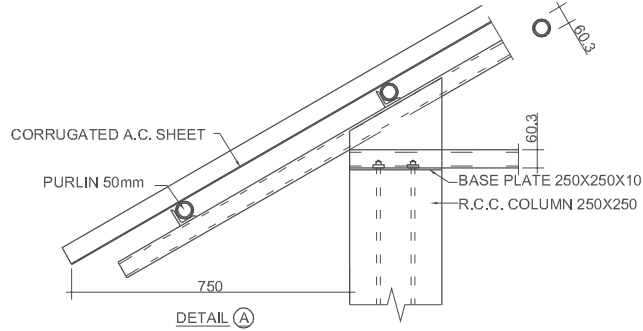
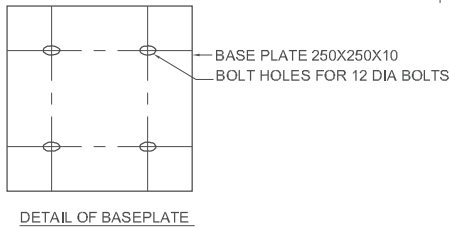
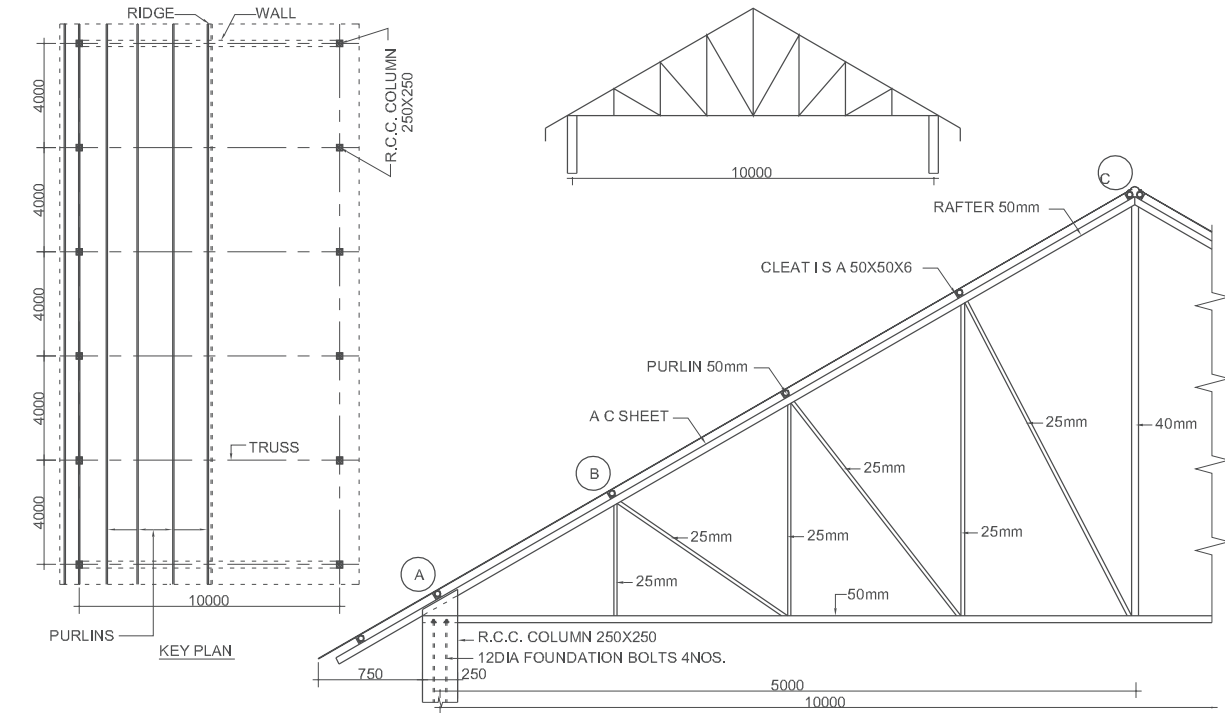
Draw the section of tubular steel truss a scale 1:10.

Data

Thickness of main wall	= 250mm.	• Draw the wall.
Dia. of principal rafter	= 50mm.	• Draw the base plate above wall.
Tie Beam	= 50mm.	• Draw bolts.
Purlin	= 50mm.	• Draw the principal rafter and tie beam.
Struts	= 25mm.	• Complete the drawing as shown in figure 1.
Centre post	= 40mm.	
Base plate	= 250 x 250 x 10.	
Bolts	= 12 mm dia.	

— — — — —

Fig 1



ALL JOINTS ARE WELDED.

50mm - 50mm NOMINAL BORE MEDIUM CLASS STEEL TUBE
 40mm - 40mm NOMINAL BORE MEDIUM CLASS STEEL TUBE
 25mm - 25mm NOMINAL BORE MEDIUM CLASS STEEL TUBE

ALL DIMENSIONS ARE IN CMS

TUBULAR STEEL TRUSS

DCN21089X1

King post roof truss

Objectives : At the end of this exercise you shall be able to

- draw the elevation of king post truss
- draw details of each joint of king post truss.

PROCEDURE

TASK 1 : Draw the elevation of king post roof truss (Fig 1)

Draw the section of king post truss a scale 1:50.

DATA

Span = 700 cm.

Thickness of main wall = 30cm.

Cross section size of wall plate = 10 x 15cm.

Cross section size king post = 10 x 10cm.

Cross section size of principle rafter = 10 x 15cm.

Cross section size of struts = 10 x 10cm.

Cross section size of Tie Beam = 10 x 20mm.

Cross section size of commonrafter = 5 x 10mm.

Cross section size of ridge piece = 5 x 17.5cm.

Cross section size of purlin = 7.5 x 17.5cm.

Size of cleat = 20 x 10 x 2.5cm.

Cross section size of battens = 5 x 3cm @ 35cm
C/C.

Cross section size of eaves boards = 5 x 20cm.

Eaves projection = 60cm.

Pitch of the roof = 30° or 1/3 of span.

- Draw two main walls with clear span 7000mm.
- Complete the drawing as shown in figure 1.

- Draw concrete bed block 300 x 100 mm on the top of main wall.
- Draw 7600 x 200 mm rectangle for tie beam.
- Draw centre line of king post truss.
- Draw centre line of struct .(30° inclination)
- Draw wall plate at the end of tie beam as shown in figure 1.
- Draw the centre line of principle rafter.
- Draw parallel line from the centre line to inside and outside according to the size of members. (king post, strut, principle rafter)
- Draw ridge piece above the king post.
- Draw purlin above the principle rafter.
- Draw cleat to support the purlin.
- Draw common rafter above the purlin.
- Draw battens above the comon rafter.
- Draw the roof tiles above the battens.
- Draw eave boards at the end of common rafter.

TASK 2 : Draw the details of ridge connection king post truss (Fig 1 - #A)

Draw the detail (A) of king post truss in a scale 1:10.

DATA

Cross section size of king post =10 x 10 cm.

Cross section size of principle rafter = 10 x 15cm.

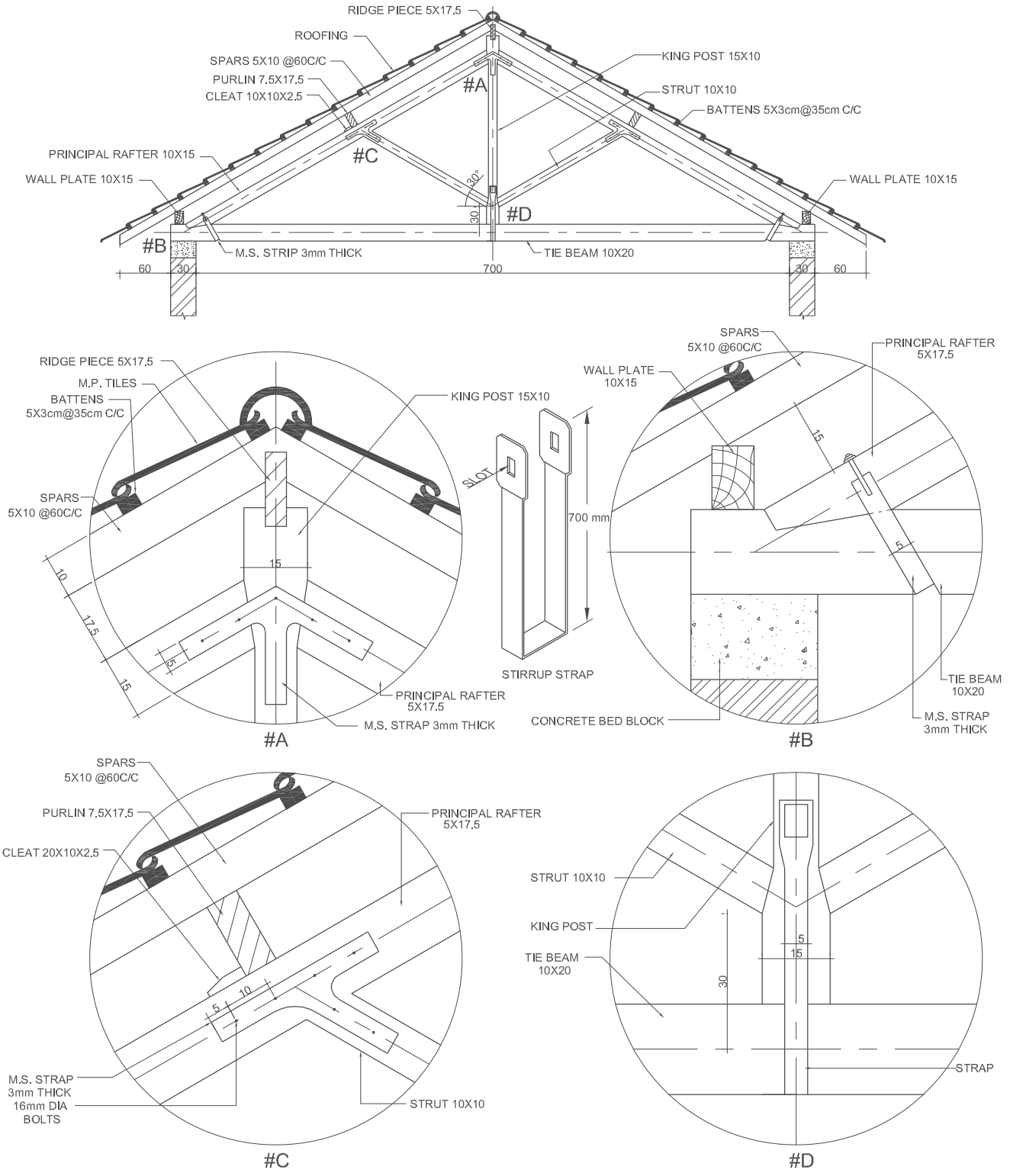
Cross section size of common rafter = 5 x 10 cm.

Cross section size of ridge piece = 5 x 17.5 cm.

- Draw the king post and principle rafter.

- Draw ridge piece above the king post.
- Draw common rafter above the principle rafter.
- Draw M.S strap at connection of strut and principle rafter.
- Draw battens above the common rafter.
- Draw tiles above the battens.
- Complete the drawing as shown in figure A.

Fig 1



ALL DIMENSIONS ARE IN CMS

KING POST ROOF TRUSS

DC/2/090/H1

TASK 3 : Draw the details of wall, tie beam, principle rafter of king post roof truss (Fig 1 - #B)

Draw the detail (B) of king post truss a scale 1:10.

DATA

Thickness of main wall = 30 cm.

Cross section size of wall plate = 10 x 15 cm.

Cross section size of principle rafter = 10 x 15 cm.

Cross section size of common rafter = 5 x 10 cm.

Cross section size of Tie beam = 10 x 20 cm.

- Draw the section of main wall.

- Draw 300 x 100 mm rectangle for concrete bed block.
- Extend the bed block top line to the right.
- Draw 200 mm parallel line above the block. (Tie beam)
- Draw wall plate, principle rafter, M.S strap, common rafter etc and complete the drawing as shown in figure B.

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TASK 4: Draw the details of strut and principle rafter connection of king post truss (Fig 1 - #C)

Draw the details C of king post truss in a scale 1:10/

DATA

Cross section size of struts = 10 x 10 cm.

Cross section size of principle rafter = 10 x 15 cm.

Cross section size of common rafter = 5 x 10 cm.

Cross section size of purlin = 7.5 x 17.5 cm.

Size of cleat = 20 x 20 x 5 cm.

- Draw 30° inclined parallel lines for principal rafter.
- Draw strut.
- Draw purlin and cleat above the principle rafter.
- Draw common rafter above the purlin.
- Draw M.S strap.
- Complete the drawing as shown in figure C.

— — — — —

TASK 5 : Draw the details of beam, king post & strut connection of king post truss (Fig 1- #D)

Draw the detail (D) of king post truss in a scale 1:10.

DATA

Cross section size of king post = 10 x 10 cm.

Cross section size of struts = 10 x 10 cm.

Cross section size of Tie beam = 20 x 10 cm.

Cross section size of ridge piece = 5 x 17.5 cm.

- Draw the tie beam and king post.
- Draw the strut both sides of the king post
- Draw M.S strap at connection of tie beam and king post.
- Complete the drawing as shown in figure D.

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Queen post roof truss

Objectives : At the end of this exercise, you shall be able to,

- draw the elevation of queen post truss
 - draw details of each joint of queen post truss.
-

TASK 1 : Draw the elevation of queen post roof truss (Fig 1)

Draw the section of queen post truss a scale 1:50.

DATA

Span = 1200 cm.

Thickness of main wall = 30 cm.

Cross section size of wall plate = 10 x 15 cm.

Cross section size of queen post = 15 x 17.5 cm.

Cross section size of principle rafter = 15 x 17.5 cm.

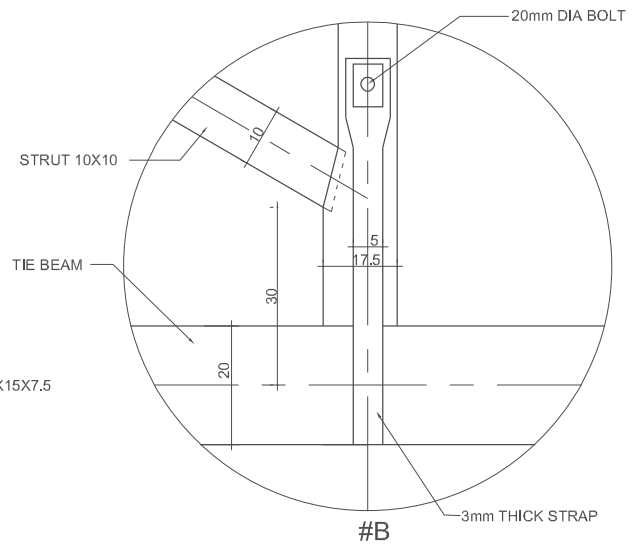
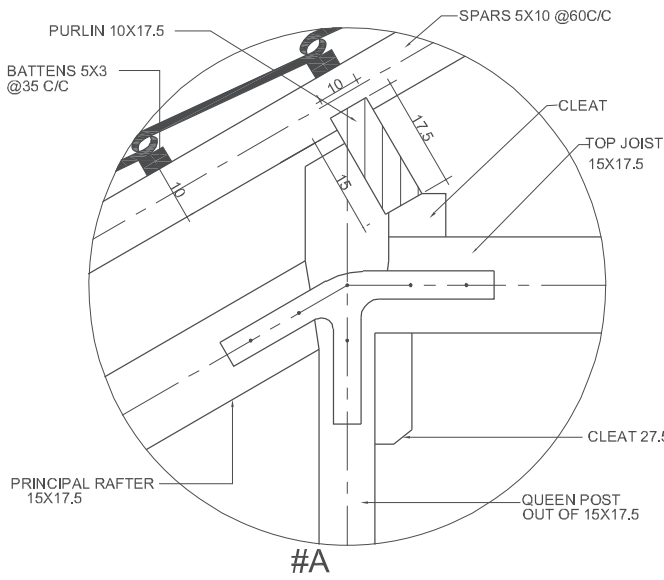
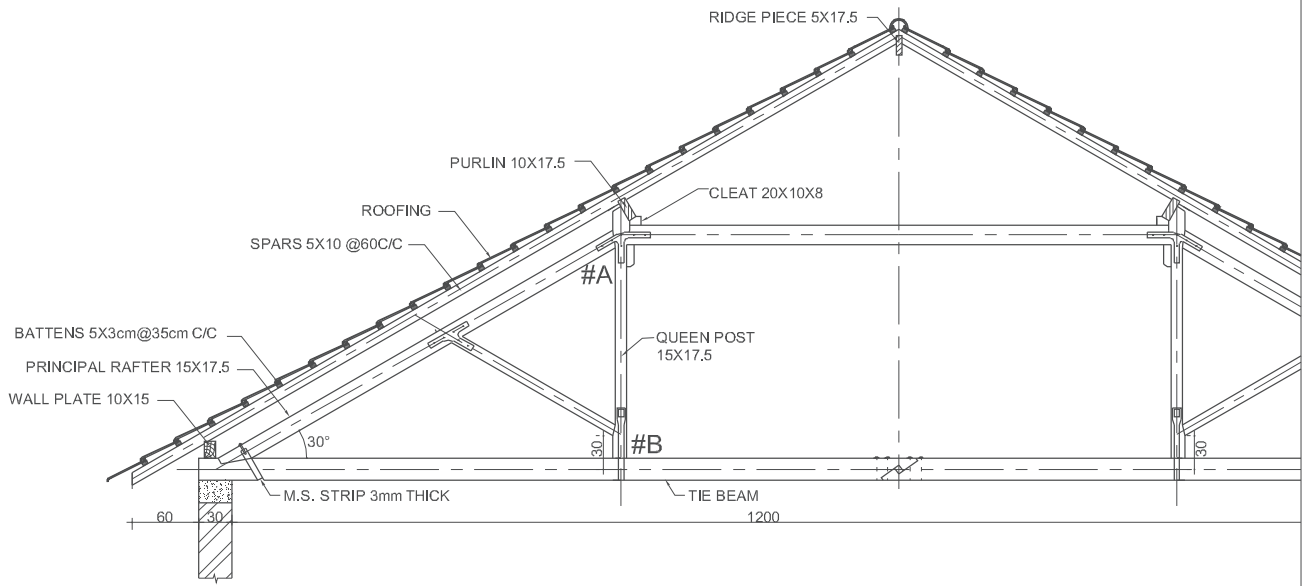
Cross section size of top joist = 15 x 17.5 cm.

Cross section size of struts = 15 x 10 cm.

Cross section size of Tie beam = 15 x 20 cm.

Cross section size of common rafter = 5 x 10 cm.

Fig 1



ALL DIMENSIONS ARE IN CMS

QUEEN POST ROOF TRUSS

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Cross section size of ridge piece = 5 x 17.5 cm.
 Size of cleat = 20 x 10 x 8 cm.
 Cross section size of battens = (5 x 3) cm @ 35cm C/C.
 Cross section size of elevation boards = 5 x 20 cm.
 Elevation projections = 60 cm.

- Pitch of the roof = 30° or 1/3 of span.
- Draw two main walls by with clear span 1200 cm.
- Draw concrete bed block 300 x 100 mm on the top of main wall.
- Draw 1260 x 20 cm rectangle for tie beam.
- Draw centre line of queen post truss.

- Draw wall plate at the end of tie beam as shown in figure 1.
- Draw lines parallel to the centre line to show the thickness of members. (queen post, top joist, strut, principal rafter)
- Draw purlin above the principal rafter.
- Draw Cleat to support the purlin.
- Draw common rafter above the purlin.
- Draw battens above the common rafter.
- Draw the roof tiles above the battens.
- Draw eave boards at the end of common rafter.
- Complete the drawing as shown in figure.

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TASK 2 : Draw the details of top joist queen post & principle rafter connection of queen post truss (Fig 1 - #A)

Draw the detail (A) of king post truss in a scale 1:10.

DATA

Cross section size of queen post = 15 x 17.5 cm.
 Cross section size of top joist = 15 x 17.5 cm.
 Cross section size of principal rafter = 15 x 17.5 cm.
 Cross section size of = 10 x 17.5 cm.
 Cross section size of = 5 x 10 cm.

- Draw the queen post.

- Draw the top joist on the right side of queen post.
- Draw the principal rafter left side of the queen post.
- Draw M.S strap at connection of tie beam and queen post.
- Draw the cleat and common rafter.
- Draw the roof tiles over the common rafter.
- Complete the drawing as shown in figure A.

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TASK 3 : Draw the details of the beam, queen post & strut connection of queen post Truss (Fig 1 - #B)

Draw the detail (B) of king post truss in a scale 1:10.

DATA

Cross section size of queen post = 15 x 17.5 cm.
 Cross section size of struts = 15 x 10 cm.
 Cross section size of Tie beam = 20 x 15 cm.
 Cross section size of ridge piece = 5 x 17.5 cm.

- Draw the tie beam and queen post.
- Draw the strut left side of the queen post.
- Draw M.S strap at connection of tie beam.
- Complete the drawing as shown in figure B.

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