

December 2019

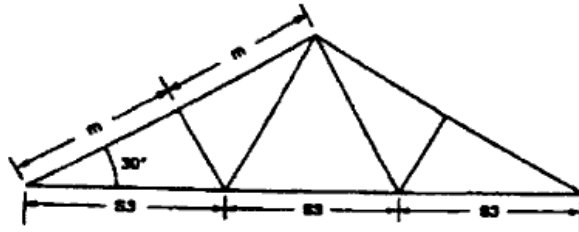
CIVIL ENGINEERING DRAWING

Time Allowed: 4 Hours

Full Marks: 70

Answer to Group-A is compulsory and answer questions from Groups-B, C & D, as directed.

1. Line diagram of a simply supported fink steel roof truss with effective span 7500mm is shown in the figure. rafter and tie are made up of double ISA 100x100x6 angle iron section. All other members of roof truss are made up with 75x75x6 angle iron section. The truss is supported on 250mm thick concrete bed block laid over 500mm thick brickwork. Use base plate at supports. The roof is covered with C.G.I. sheets. Thickness of gusset plate is 10mm.
- a) Draw the elevation of the steel roof truss and level the members. Show details of connecting roofing sheets with member of the truss.
- b) Draw to an enlarged scale details of Ridge joint. 10+8



Group-B
Answer any one question.

2. Draw to a suitable scale sectional front view and plan of a simple slab type road culvert with the following dimensions – i) Clear span 1800, bed level 1500 below G.L., thickness of deck slab 200, road width 4000, height of deck slab from G.L. 2000, road crust 150, ii) Abutment slab bearing 200, depth of foundation for abutment 2500 below G.L., thickness of abutment 600, foundation width 800, iii) Bed slab 150 over a layer of B.F.S. iv) Parapet 300 x 900. Assume the other data if necessary. (All dimensions are in mm). 18
3. Hydraulic and other details are available as follows for the construction of a pipe culvert with two vents – i) Bed level R.L. = 100.00m. ii) Road formation level = 104.00m, iii) Top width of road = 4.7m, iv) Footpath on the either side = 1.0m, v) Hard soil available at = 99.00m, vi) R.L. of invert pipe on D/S = 99.915m, vii) R.L. of invert pipe on U/S = 100.415m, viii) Total length of pipes = 18m, ix) Diameter of Hume pipes available is not less than 1.0m, x) Thickness of pipes = 10 cm, Bedding for pipes is of concrete for a depth of 0.3 x dia. of pipe. Face wall is cut of masonry in C.M. 1:4; top width - 30 cm; bottom width - 1.0m; bed concrete for face wall - 30cm thick; offset of face concrete - 15cm; M.W.L. at face wall - 1.7m; Height of face wall - 2.0m. Water face is kept vertical. Provide splayed wing wall with suitable dimensions. Draw to suitable scale end view half in elevation and half on cross section. (All dimensions are in mm). 18

Group-C
Answer any one question.

4. Draw the front view and side view of two different depths of columns from the given data. Bottom column ISHB 300 x 250 @ 58.5kg/m; top column ISWB 250 x 200 @ 49.5kg/m; filter plate 200 ISF 25 - 500; splice plate 250 ISF 14 - 800; bearing plate 300 ISF 30 - 300; web cleat ISA 200 x 150 with 12 mm thick. (All dimensions are in mm). 18
5. Draw front elevation and side elevation showing details of connection of two beams to the column head using following data: Beam 2 nos. ISLB 250 @ 27.5kg/m; Column 1 Nos. ISWB 225 @ 33.5kg/m. Cleats 4 Nos. ISA 150 x 75 x 8; Cap plate 350 x 150 x 12; Rivets 16mm dia (All dimensions are in mm). 18

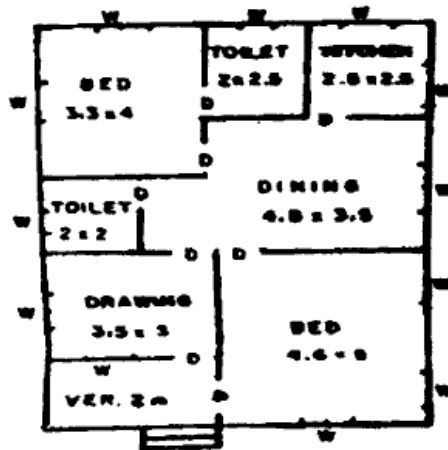
Abase connection for a column is to be made with the following members: i) Base plate- 1 no. 800x800x25, ii) Column- 1 no ISHB 200, b=200, $t_f=9$, $t_w=8$, iii) Web cleats- 2 nos ISA 80x80x8, iv) Flange Cleats- 2 nos ISA 80x80x10, 800 long, v) Gusset plate- 2 nos 800x600x12, suitably tapered, vi) Provide 20mm dia. Riveted connection, pitch and nos. to your estimation. Show four holes suitably placed in the base plate for 25mm dia. holding down bolts. Draw the elevation and plan of base connection. (All dimensions are in mm) 18

Group-D

Answer any one question.

A small residential building consists of two rooms with front veranda and attached latrine at the back as shown in the line diagram. The followings are the given below: 16

i) Rooms shown in figure (inside measurements), ii) Front veranda 2000 wide (inside measurements), iii) Plinth height 450 from G.L. iv) Thickness of main wall 200, v) Height of lintel 2000 from finished floor level vi) Ceiling height 3000, vii) Roof slab 150, viii) Blocking course 200, ix) Door and window each room consist of 3 windows 1000 x 1500 and one door 1000 x 2000 and the front with one additional door 750 x 2000 for the latrine consist of two windows 600 x 600, x) Chajja over window may be provided. Draw to a suitable scale the plan and front view of the building. Assume any data if necessary. (All dimensions are in mm)



Draw the elevation of the section ABCD by the following data:

Plinth height 450 from G.L. Thickness of main wall 200. Height of lintel 2000 from finished floor level. Ceiling height 3000. Roofslab 150. Assume any data if necessary. (All dimensions are in mm). 16

