



1. A Simply supported beam MB 400@61.6 kg/m has an effective span of 5 m. Find the design bending strength of the beam, the design shear strength of the beam, the intensity of udl that the beam may carry under service condition, the maximum deflection? Assume that the beam is laterally supported. use E250 steel?

2. A 5.5 m span simply supported beam contains an I- section which is fabricated with plates of following dimensions;

flanges 380 mm X 20 mm

web 1600 mm x 15 mm

Classify flanges, web and section. determine the plastic moment capacity of the cross section about its strong axis assuming that the compression flange is restrained against lateral buckling. the grade of steel is E250?

3. Design a laterally supported beam of effective span 6 m for the following data

Grade of steel= Fe410

Max bending moment  $M=150$  kN-m

Max shear force  $V=210$  kN

4. Design a simply supported beam of span 4 m carrying a reinforced concrete floor capable of providing lateral restraint to the top compression flange. The uniformly distributed load is made up of 20kN/m imposed load and 20kN/m dead load. Assume fe 410 grade steel.?

5. Design a simply supported I-section to support the slab of a hall 9 mx 24 m with beams spaced at 3 m c/c. The thickness of slab is 100 mm. consider a floor finish load of 0.5 kN/sq-m and a live load of 3 kN/sq-m. The grade of steel is Fe410. assume that an adequate lateral support is provided to the compression flange?

6. Determine the design bending strength of ISLB 350@486 N/m considering the beam to be

a) laterally supported

b) laterally unsupported

The design shear force is less than the design shear strength. the unsupported length of beam is 3 m. assume steel of grade Fe410?

7. Design a beam of 5m effective span, carrying a uniform load of 20kN/m if the compression flange is laterally unsupported. And also check for deflection and shear.

Draw to scale i) the

cross-section, ii) the longitudinal section and iii) plan?

8. A concentrated load of 400 kN acts on MB 400 through a stiff bearing plate of dimension 250 mm along the length of the beam. Check the web for buckling and crippling?