

CVL 304

Design of steel structure

Assignment 2

Date of submission : 16th April 2014

1. A column is made up of 2 ISLC 300 placed back to back with a distance of 200 mm between its back faces. The length of the column is 8 m. It's one end is fixed and the other is hinged. Calculate the load carrying capacity of the column and also design a suitable lacing system.
2. Design a column of effective length 5m to carry an axial load of 550 kN using ISMB 175. Design the batten connection also.
3. A simply supported steel joist with 4m effective span carries a udl of 40kN over its span inclusive of self weight. The beam is supported laterally throughout. Design the beam if $f_y = 260 \text{ MPa}$
4. Design a beam of 5m effective span carrying a uniform load of 20kN/m if the compression flange is laterally unsupported($f_y=250\text{MPa}$)
5. Calculate the strength of a discontinuous strut of length 3.2m. The strut consists of two unequal angles 100mm X 75mm X 8mm($f_y=250\text{MPa}$) with long legs connected and placed
 - (a) on the opposites of a gusset plate
 - (b) on the same side of a gusset plate
6. Design a stanchion 3.5m long in a building subjected to an axial load of 350kN. Both the ends of the stanchion are effectively restrained in direction and position.
7. Design the beam of effective span 6m and subjected to a bending moment of 105.3kNm, if the compression flange is laterally unsupported throughout.
8. Design a suitable slab base for a column section ISHB 200 supporting an axial load of 400kN. The base plate is to rest on a concrete pedestal M15 grade
9. Design a grillage foundation for a column subjected to an axial load of 3000kN. The bearing capacity of soil is 150kN/sqm and the size of base plate is 750 X 750mm.