

ELEMENTRY STRUCTURAL DESIGN

(STEEL)

ASSIGNMENT:-1:-DESIGN OF TENSION MEMBER

1. Write Short Note on: 1) SHEAR LAG EFFECT 2) LUG ANGLE
2. A single unequal angle 100x 75x 6 mm is connected to a 10mm thick gusseted plate at the end with six 16mm diameter bolts to transfer tension. Determine the design tensile strength of the angle assuming that the yield and ultimate stress of steel used are 250MPa and 410MPa. Assume that longer lag is connected to gusseted plate.
3. Determine the tensile strength of an angle ISA 100x75x6 mm connected to the gusseted plate by 4mm weld at toe and back. Take $f_y = 250$ MPa.
4. Select suitable angle section to carry a factored tensile load of 210kN assuming a single row of M20 bolts and $f_y = 250$ MPa.
5. Design a tie member of roof truss subjected to working loads of 80kN (DL) and 120kN (LL). Use double angle section connected back to back on either side of gusset plate of 8mm thick. Use bolted connection. Take $f_y = 250$ MPa and $f_u = 410$ MPa for both member and bolt material.
6. Design a tension member to carry a factored load of 230kN. Use single angle with 4mm fillet weld for the connection to gusseted plate. Length of member is 3 m. Take $f_y = 250$ MPa and $f_u = 410$ MPa.