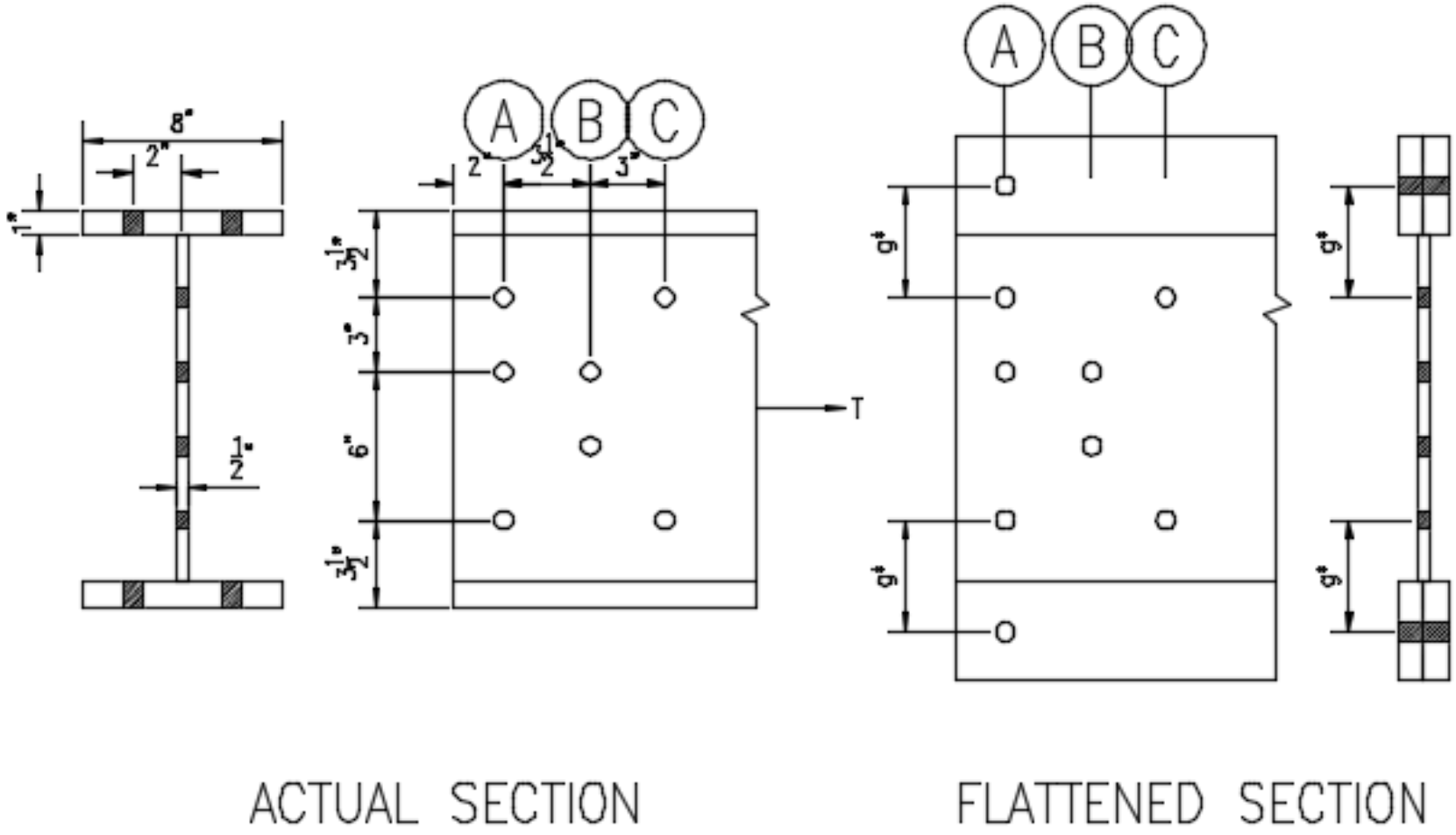
Problem Set No. 1

Analysis and Design of Tension Members

- Problem 1. Given a non standard WF shape shown below with (Fy = 36ksi, Fu = 58ksi). The bolts are 3/4 inch in diameter. The connection is bolted at the flange and web as shown . Use LRFD method. Use effective gage distance between the flange hole and adjacent web hole is g*. Enclose final answer.



- Determine
  1. The value of equivalent gage distance between the web and the adjacent hole g*.
  2. The Tensile Capacity ΦTn using LRFD method.
  3. The Allowable Tensile Load using FS of 1.67 for yielding at gross section and 2.0 for fracture at the connection.
  4. Is there a possible failure path if the member is connected at the web only>

Problem No. 2.

Select a double angle tension member to carry (40 kips DL) and (20 kips LL), member is (15)ft long and will be connected to any one leg by single line of 7/8” diameter bolts. Use A-36 steel. Assume 3 bolts per line.