3.5-5 A C7 × 9.8 tension member is connected to a ⅜-in.-thick gusset plate as shown in Figure P3.5-5. Both the member and the gusset plate are A36 steel.

a. Compute the available block shear strength of the tension member for both LRFD and ASD.

b. Compute the available block shear strength of the gusset plate for both LRFD and ASD.

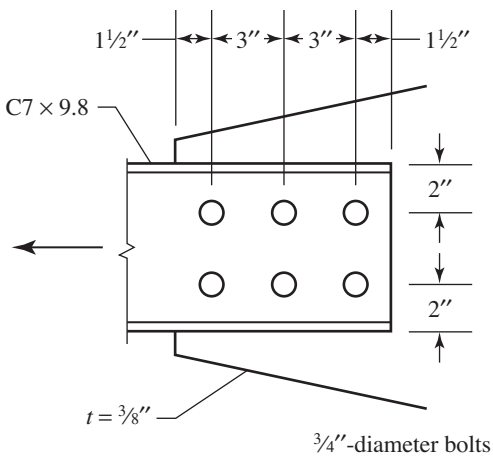

FIGURE P3.5-5

3.5-6 A double-channel shape, 2C8 × 18.75, is used as a tension member. The channels are bolted to a ⅜-inch gusset plate with ⅞-inch diameter bolts. The tension member is A572 Grade 50 steel and the gusset plate is A36. If LRFD is used, how much factored tensile load can be applied? Consider *all* limit states.

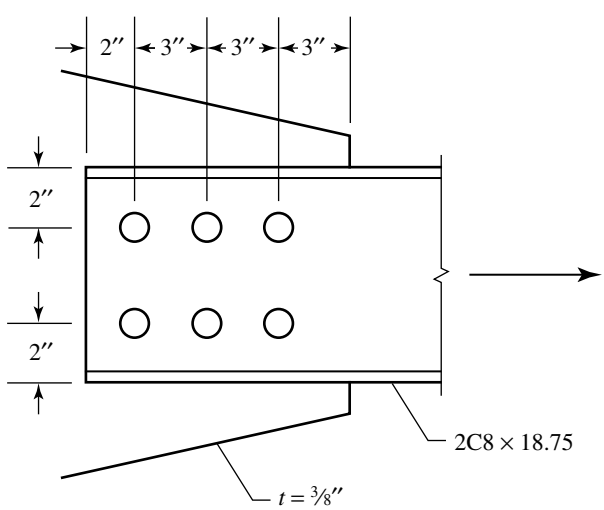

FIGURE P3.5-6

Design of Tension Members

3.6-1 Select a single-angle tension member of A36 steel to resist the following service loads: dead load = 50 kips, live load = 100 kips, and wind load = 45 kips. The member will be connected through one leg with 1-inch diameter bolts in two lines. There will be four bolts in each line. The member length is 20 feet.

a. Use LRFD.

b. Use ASD.

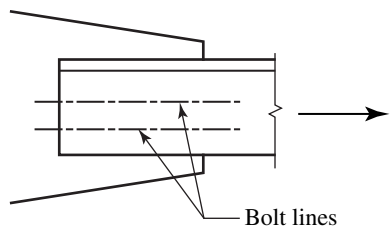

FIGURE P3.6-1

3.6-2 Use A36 steel and select a double-angle tension member to resist a service dead load of 20 kips and a service live load of 60 kips. Assume that the member will be connected to a $\frac{3}{8}$-inch-thick gusset plate with a single line of five $\frac{7}{8}$-inch diameter bolts. The member is 15 feet long.

a. Use LRFD.

b. Use ASD.

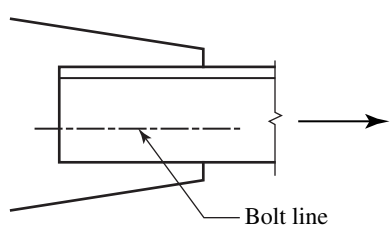

FIGURE P3.6-2

3.6-3 Select an ST shape to be used as a 20-ft-long tension member to resist the following service loads: dead load = 38 kips, live load = 115 kips, and snow load = 75 kips. The connection is through the flange with three $\frac{3}{4}$-inch diameter bolts in each line. Use A572 Grade 50 steel.

a. Use LRFD.

b. Use ASD.