

Homework No. 3: Tension Members – Design Strength and Effective Area

- Problem No. 1

A C8x11.5 is connected to a gusset plate with $\frac{7}{8}$ in. diameter bolts as shown in the figure. The steel is A572 Gr. – 50. If the member is subjected to dead load and live load only, what is the total service load capacity if the live-to-dead load ratio is 3.

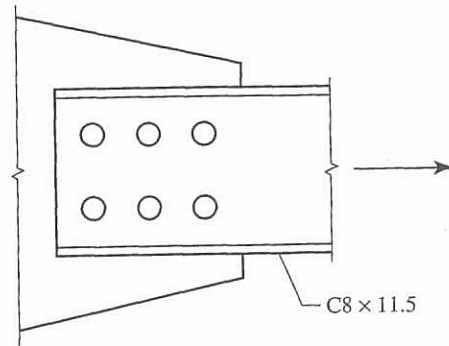


FIGURE P3.2-2

- Problem No. 2

A W16x45 of A992 steel is connected through its flanges with $\frac{7}{8}$ in diameter bolts as shown in the figure below. Calculate the design strength in tension.

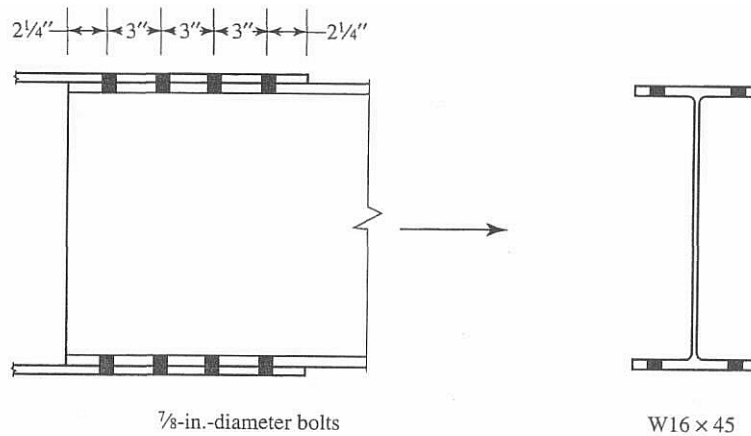


FIGURE P3.3-6

- Problem No. 3

See Problem 3.3-1 in the text-book (Segui) on page 84

Determine the effective area A_e for each case shown in the figure below.

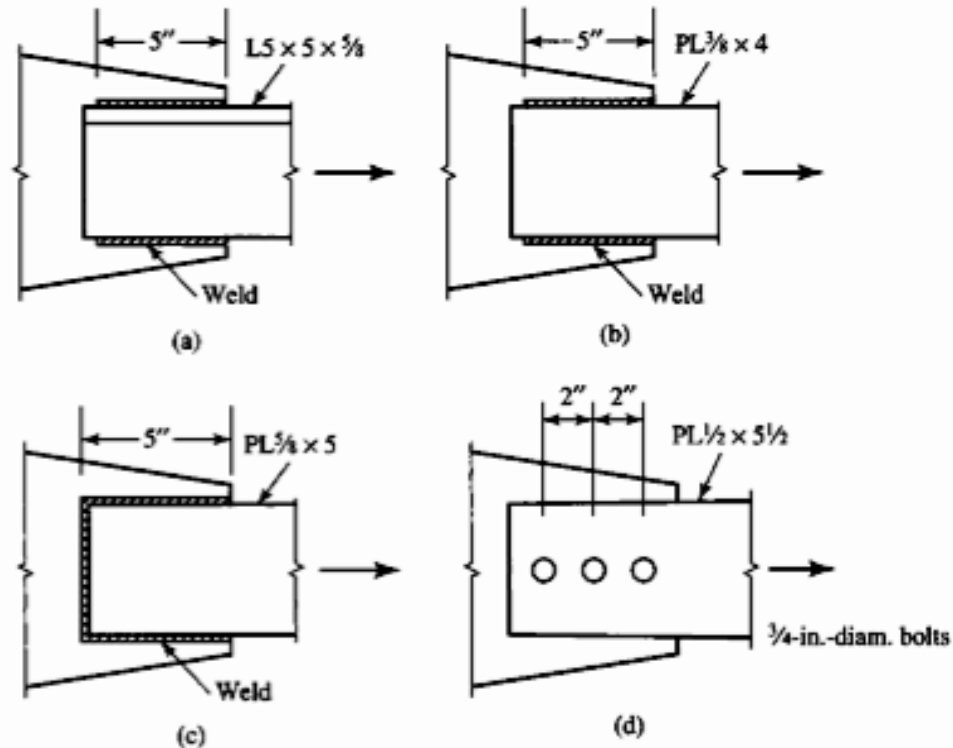


FIGURE P3.3-1

- Problem No. 4

See Problem 3.2-6 in the text-book (Segui) on page 84

A double angle tension member, $2L 3 \times 2 \times \frac{1}{4}$ in. LLBB, of A36 steel is subjected to a dead load of 12 kips and a live load of 36 kips. It is connected to a gusset plate with one line of $\frac{3}{4}$ in. diameter bolts through the long legs. Does this member have enough strength.

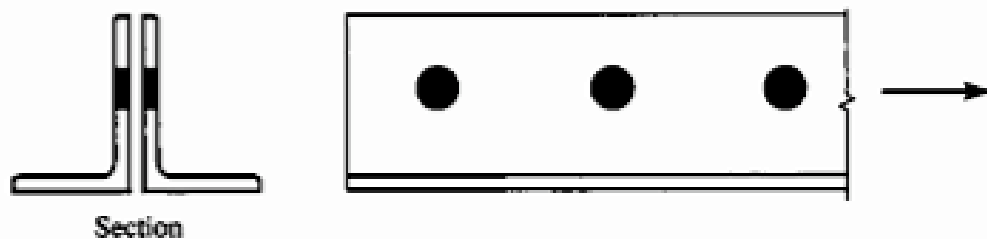


FIGURE P3.2-6