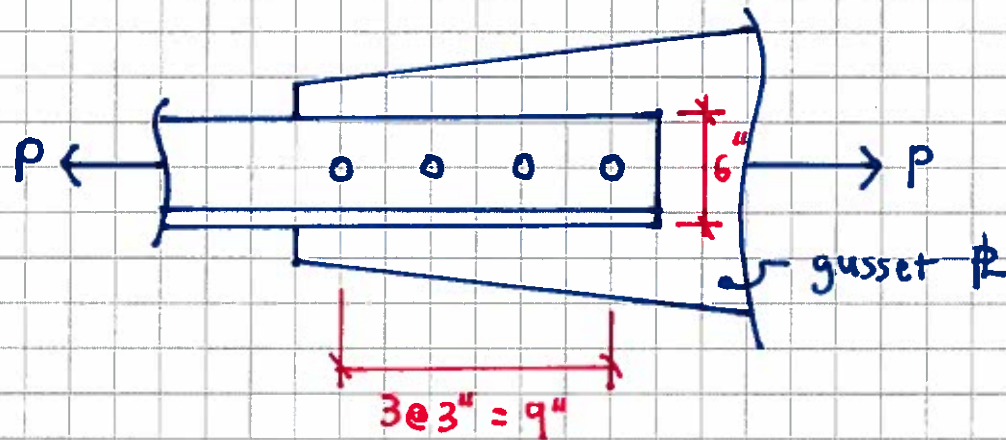


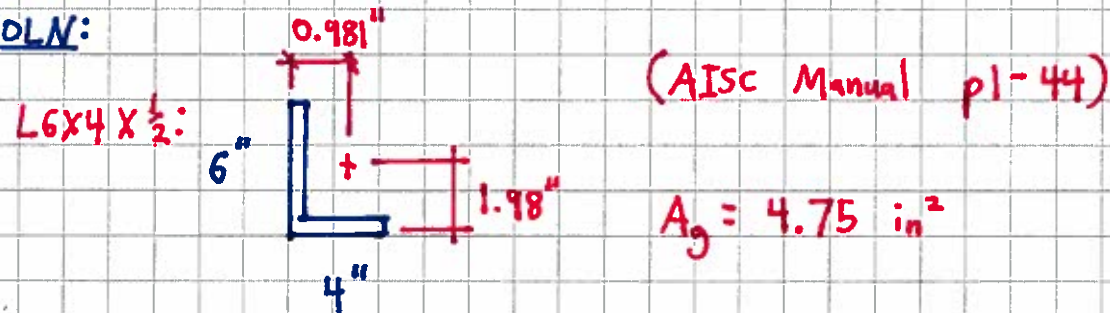
EXAMPLE 3.2

GIVEN: An $L6 \times 4 \times \frac{1}{2}$ is connected to a gusset plate using $\frac{3}{4}" \phi$ bolts



- REQ'D:
- Compute A_n & A_e
 - Repeat assuming angle is rotated 90° so that only the 4" leg is connected
 - Repeat if both legs are connected to plate by 3 bolts (unstaggered) in each leg

SOLN:



$$a) A_n = A_g - \sum A_{holes}$$
$$= 4.75 - (1 \text{ hole}) \left(\overset{\text{bolt diameter}}{\underset{\text{damage}}{\frac{3}{4}}} + \overset{\text{leg thickness}}{\underset{\text{overdrill/tolerance}}{\frac{1}{16}}} + \frac{1}{16} \right) \left(\frac{1}{2} \right)$$

$$\underline{A_n = 4.313 \text{ in}^2}$$

$$A_e = U A_n$$

$$\text{CASE 2: } U = 1 - \frac{\bar{x}}{l} = 1 - \frac{0.981''}{9''}$$

$$U = 0.891$$

$$\text{CASE 8: } U = 0.80 \quad (4 \text{ fasteners per line})$$

* We are permitted to use the larger

$$A_e = 0.891(4.313)$$

$$\underline{A_e = 3.842 \text{ in}^2}$$

b) $A_n = 4.313 \text{ in}^2$ ← Note: A_n doesn't change from part a

CASE 8: $U = 0.80$

CASE 3: $U = 1 - \frac{\bar{x}}{l} = 1 - \frac{1.98''}{9} = 0.78$

$A_e = 0.8(4.313)$

$A_e = 3.45 \text{ in}^2$

c) $A_n = 4.75 - (2 \text{ bolts})\left(\frac{3}{4} + \frac{1}{8}\right)\left(\frac{1}{2}\right) = \underline{3.875 \text{ in}^2}$

$U = 1.0$ ← all elements (ie both legs) are connected

$A_e = A_n = \underline{3.875 \text{ in}^2}$