

## 1.051 Structural Engineering Design

### Problem Set 5

(Assigned: 11/19; Due: 11/26)

## TENSION MEMBERS

### 1. Effective Net Area

Determine the effective net area of the MC12x31 shown in Fig. 1. Assume the holes are for 1-in bolts.

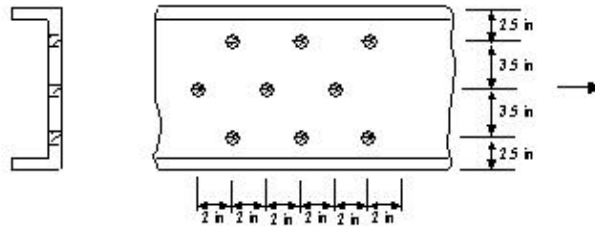


Figure 1

### 2. Tensile and Block Shear Strength of Bolted Members

The 7x4x3/8 angle shown in Fig. 2 is connected with three 1-in bolts. If the angle consists of A36 steel, determine its block shear strength. Compare the results with the tensile design strength of the member.

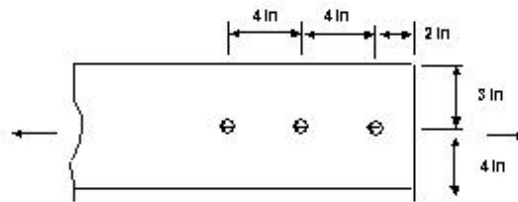


Figure 2

### 3. Tensile and Block Shear Strength of Welded Members

Compute the tensile design strength of the  $6 \times 6 \times 1/2$  angle shown in Fig. 3 if it consists of a steel with  $F_y=50$  ksi and  $F_u=65$  ksi. Consider block shear as well as the tensile strength of the angle.

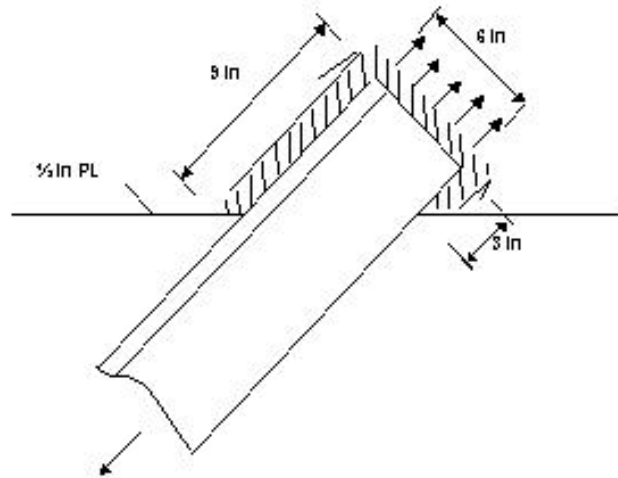


Figure 3