ARCH 324 - Structures 2, Winter 2009

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Find allowable for F.S. = 3:

\[ \text{AREA} = (4 \times 12) - (3 \times 11) = 15 \]

\[ I_x = \frac{4(12)^3}{12} - \frac{3(11)^3}{12} = 243.25 \]

\[ I_y = \frac{12(4)^3}{12} - \frac{11(3)^3}{12} = 39.25 \]

\[ K_{f_y} = \sqrt{\frac{243.25}{15}} = 4.027 \]

\[ r_y = \sqrt{\frac{39.25}{15}} = 1.618 \]

\[ \frac{K_{f_y}}{r_y} = \frac{1}{1.618} = 59.33 \]

\[ \frac{K_{f_y}}{r_x} = \frac{1}{4.027} = 0.25 \]

\[ X-X \text{ axis controls} - \]

\[ P_{cr} = \frac{\pi^2 EA}{(Kr/t)^2} = \frac{\pi^2 (29000)(15)}{71.52} = 8.894 \text{ kips} \]

\[ P_y = f_y A = 36 (15) = 540 < 839.4 \text{ kips} \]

\[ P_{allow.} = 540 / 3 = 180 \text{ kips} \]