ARCH 324 - Structures 2, Winter 2009

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Find allowable for F.S. = 3:

- Area: \(A = (4\times12) - (3\times11) = 15\)
- \(I_x = \frac{4(12)^3}{12} - \frac{3(11)^3}{12} = 243.25\)
- \(I_y = \frac{12(4)^3}{12} - \frac{11(3)^3}{12} = 39.25\)
- \(K_{Lx} = \sqrt{\frac{243.25}{15}} = 4.027\)
- \(r_y = \sqrt{\frac{39.25}{15}} = 1.1618\)
- \(K_{Ly} = \frac{1(24\times12)}{4.027} = 71.52\)
- \(K_{Lx} \frac{r_y}{r_y} = \frac{1(8\times12)}{1.1618} = 59.33\)

**X-X Axis Controls**

- \(P_{crx} = \frac{K^2EA}{(Kr/r)^2} = \frac{\pi^2(29000)(15)}{71.52^2} = 889.4\)

- \(P_y = F_yA = 36(15) = 540 < 889.4\)

- **Yielding Controls**

- \(P_{allow} = \frac{540}{3} = 180\)