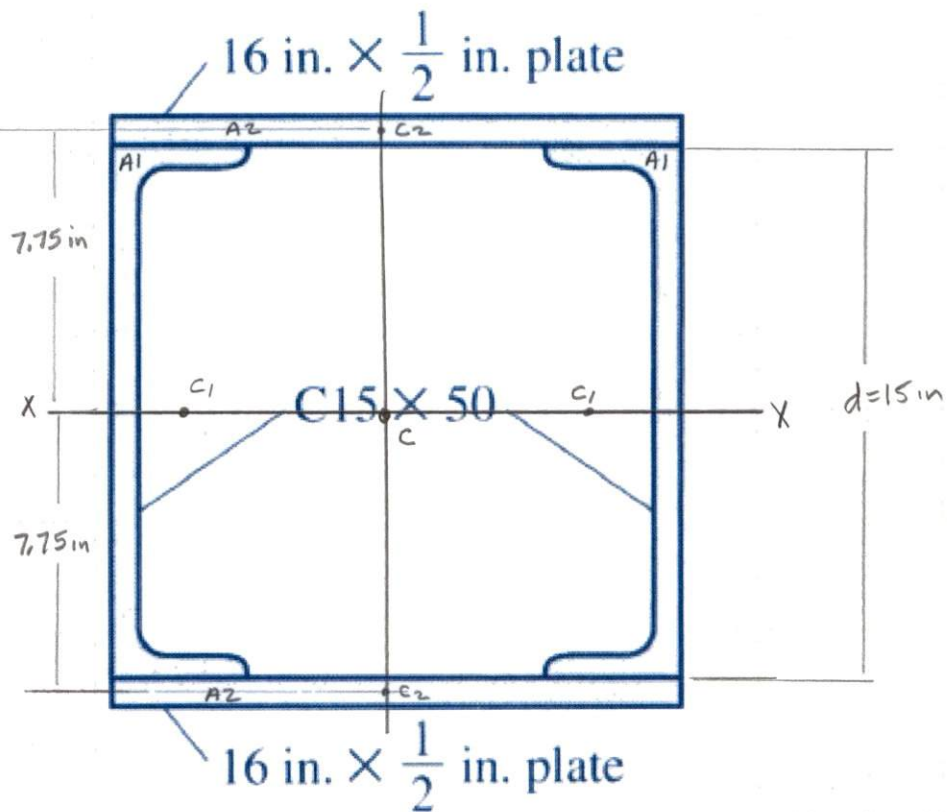


8-28. 8-26 to 8-31 For each built-up section shown in Figs. P8-26 to P8-31, determine the moment of inertia and the radius of gyration of the section with respect to the horizontal centroidal axis.

Solution.



From Table A-3(a)

$$\begin{aligned} \text{C15 x 50} \quad A &= 14.7 \text{ in.}^2 \\ d &= 15.00 \text{ in.} \\ I_x &= 404 \text{ in.}^4 \end{aligned}$$

$$\begin{aligned} I_x &= 2(404 \text{ in.}^4) + \left[\frac{16 \text{ in.} (0.5 \text{ in.})^3}{12} + 16 \text{ in.} (0.5 \text{ in.}) (7.75 \text{ in.})^2 \right] \times 2 \\ &= 808 \text{ in.}^4 + 961.3 \text{ in.}^4 \\ &= \underline{1770 \text{ in.}^4} \end{aligned}$$

$$\begin{aligned} r_x &= \sqrt{\frac{I_x}{A}} = \sqrt{\frac{1770 \text{ in.}^4}{2(14.7 \text{ in.}^2) + 2(16 \text{ in.})(0.5 \text{ in.})}} = \sqrt{\frac{1770 \text{ in.}^4}{45.4 \text{ in.}^2}} \\ &= \underline{6.24 \text{ in.}} \end{aligned}$$