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Determine the size of the steel I.

**MAX MOMENT**

\[ \Sigma N = 0 = 2400(12) - 2400(4) + M_{\text{max}} \]

\[ M_{\text{max}} = 19200 \cdot 4.4 = 85.2 \text{ k-ft} \]

**ASSUME WOOD CONTROLS STRAIN:**

\[ M_{\text{wood}} = \frac{f}{E} = \frac{1.4}{18000} = 0.00078 \text{ in-kips} \]

**PORTION OF MOMENT CARRIED BY STEEL:**

\[ M_{\text{steel}} = M_{\text{total}} - M_{\text{wood}} = 19.2 - 11.2 = 8.0 \text{ k-ft} \]

**STRAIN COMPATIBILITY TO FIND d STEEL:**

\[ \frac{E_{\text{wood}}}{E_{\text{steel}}} \cdot \frac{6}{\alpha} = 10 \]

\[ \alpha = 5.143^\circ \]

\[ d_{\text{steel}} = 10.29^\circ \]

**FIND b STEEL:**

\[ M_{\text{steel}} = 8 \times 12 = 96 \cdot \frac{b d^2}{6} = 20 \cdot \frac{b}{6} \]

\[ b = 0.272^\circ \]