$L := 16 \cdot ft \qquad q := 40 \cdot \frac{lbf}{ft} \qquad V_{max} := q \cdot \frac{L}{2}$

$b_w := 4 \cdot in \quad h_w := 5 \cdot in \quad b_f := 4 \cdot in \quad t_f := 2 \cdot in$

$$t(y) := \begin{cases} b_w & \text{if } y \le h_w \\ b_f & \text{otherwise} \end{cases}$$

$$y_g := \frac{\int_{0 \cdot in}^{h_w + t_f} t(y) \cdot y \, dy}{\int_{0 \cdot in}^{h_w + t_f} t(y) \, dy} \qquad y_g = 3.5 \, in$$

from bottom

$$Q(Y) := \int_{Y}^{h_w + t_f} t(y) \cdot \left(y - y_g\right) dy$$

valid for Y above cog

$$I_x := \int_{0 \cdot in}^{h_w + t_f} t(y) \cdot \left(y - y_g\right)^2 dy$$

$y_{atop\_web} := h_w$

$$Shear\_Flow\_atop\_web := \frac{V_{max} \cdot Q\left(y_{atop\_web}\right)}{I_x}$$

$$Shear\_Flow\_atop\_web = 55.98 \, \frac{lbf}{in}$$