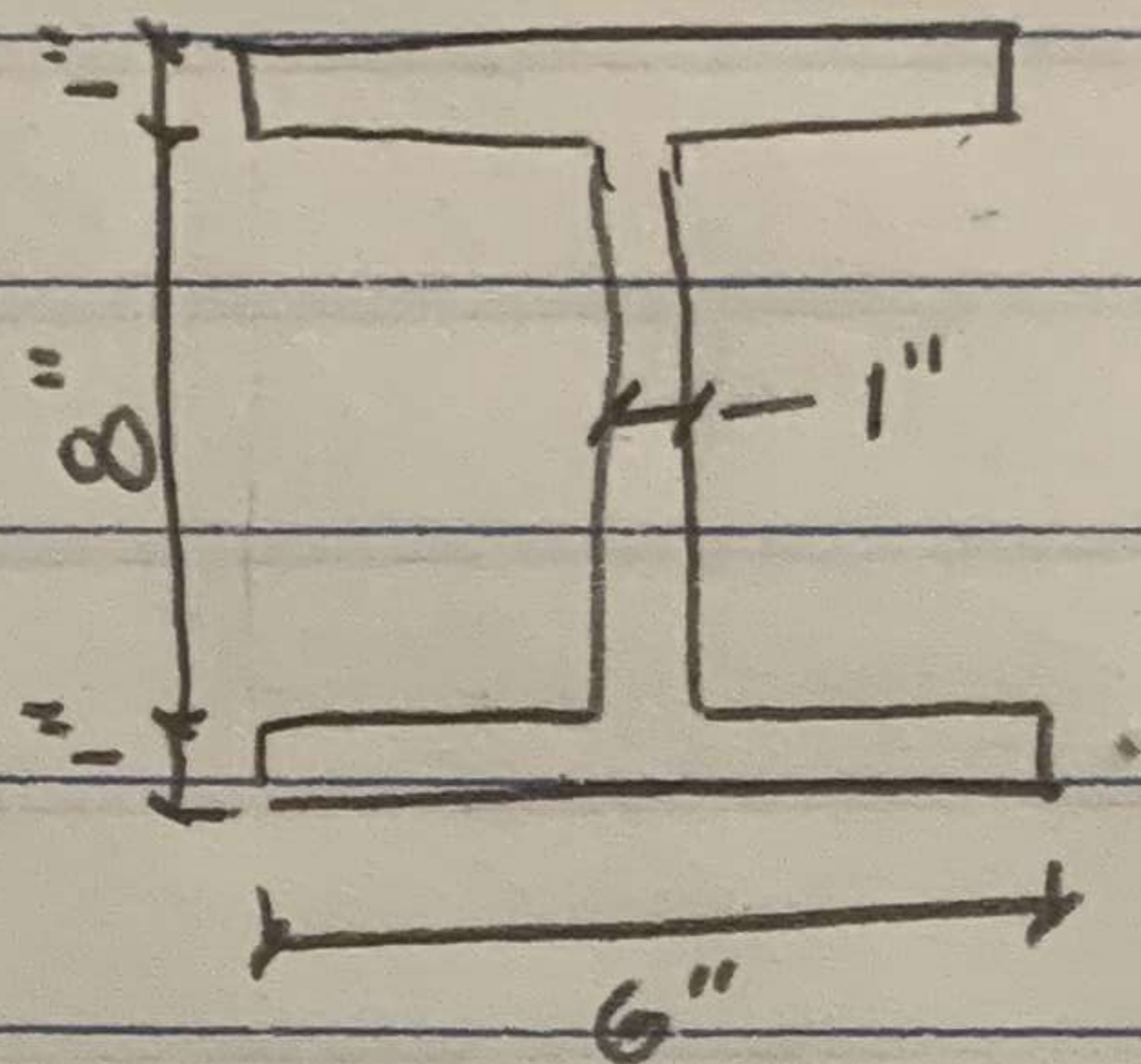


# NCARB STRUCTURAL

5. GIVEN:

$$I = bd^3/12$$

$$S = I/c$$



$$b = 6''$$

$$h = 10''$$

$$h_w = 8''$$

$$t_w = 1''$$

REQUIRED:

$$I_{cx} = \frac{bh^3}{12} - \frac{(b-t_w)h_w^3}{12} \rightarrow \frac{1}{12}(bh^3 - bh_w^3 + t_w h_w^3)$$

$$S_x = \frac{I}{c}$$

$$I_{cx} = \frac{1}{12}((6 \times 10^3) - (6 \times 8^3) + (1 \times 8^3))$$

$$= \frac{1}{12}((6000 \text{ in}^4) - (3072 \text{ in}^4) + (512 \text{ in}^4))$$

$$= \frac{1}{12}(3440 \text{ in}^4)$$

$$= 286.666 \text{ in}^4$$

$$S_x = \frac{I}{c} \rightarrow \frac{1}{6} \left[ bh^2 - \frac{h_w^3}{h} (b-t_w) \right]$$

$$S_x = \frac{1}{6} \left[ (6 \times 10^2) - \frac{8^3}{10} (6-1) \right]$$

$$= \frac{1}{6} \left[ 600 - \frac{512}{10} (5) \right]$$

$$= \frac{1}{6} (600 - 256)$$

$$= \frac{1}{6} (344)$$

$$= 57.33 \text{ in}^3$$