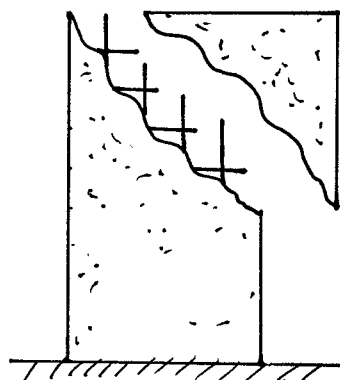
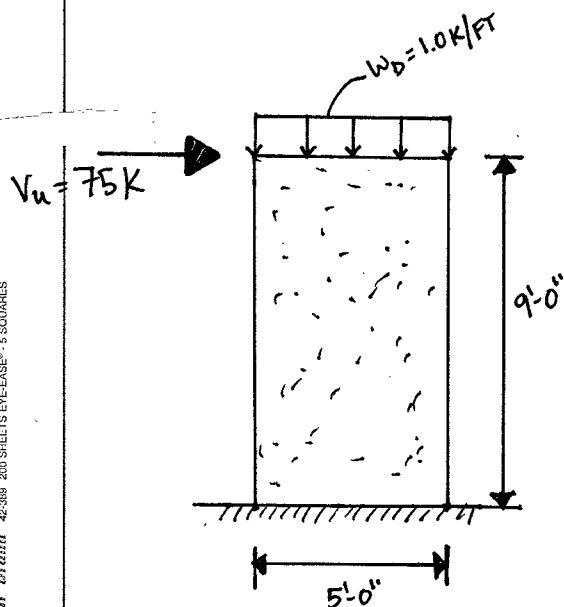




APPROXIMATE FAILURE MODE

WALL THICKNESS, $t = 8$ IN

$$f'_c = 3000 \text{ PSI}$$

$$f_y = 60,000 \text{ PSI}$$

SHEAR REDUCTION FACTOR, $K = 5/6$

$$V_c = 2 \lambda \sqrt{f'_c} b_w d \quad \text{ACI EON 22.5.5.1}$$

$$\lambda = 1.0$$

$$b_w \rightarrow 8 \text{ IN}$$

$$d \rightarrow 5 \text{ FT}$$

$$V_c = 2(1.0) \sqrt{3000 \text{ PSI}} (8 \text{ IN})(60 \text{ IN})(5/6)$$

$$V_c = 43.8 \text{ K}$$

$$\phi V_c = 0.75(43.8 \text{ K}) = 32.8 \text{ K}$$

REQUIRED SHEAR STRENGTH OF REBAR

$$V_s = \frac{V_u - \phi V_c}{\phi} = \frac{75 \text{ K} - 32.8 \text{ K}}{0.75} = 52.3 \text{ K}$$

REQUIRED SPACING OF REBAR (#4 BARS)

$$s = \frac{A_v f_{yt} d}{V_s} = \frac{(0.2 \text{ IN}^2)(60,000 \text{ PSI})(5 \text{ FT})}{52.3 \text{ K}}$$

$$s = 13.8 \text{ IN} \quad \text{IN ONE DIRECTION}$$

OR

$$s = 27.5 \text{ IN} \quad \text{IN TWO DIRECTIONS} \\ \text{(IE \#4 BARS @ 24" VERTICAL AND HORIZONTAL)}$$