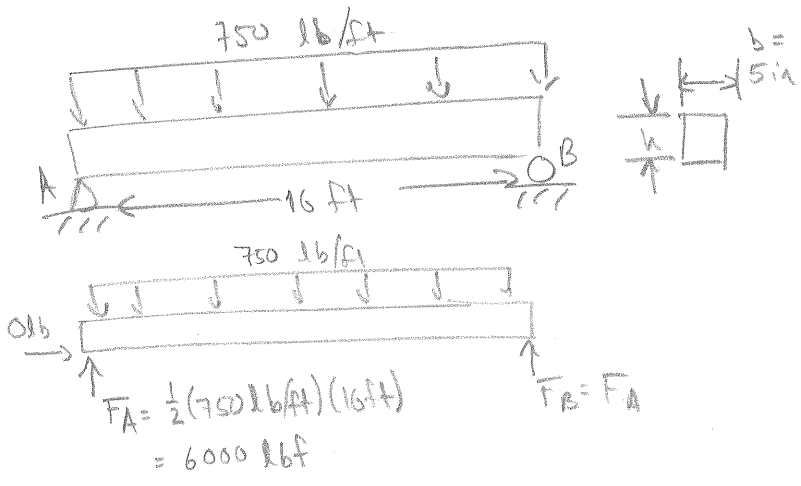
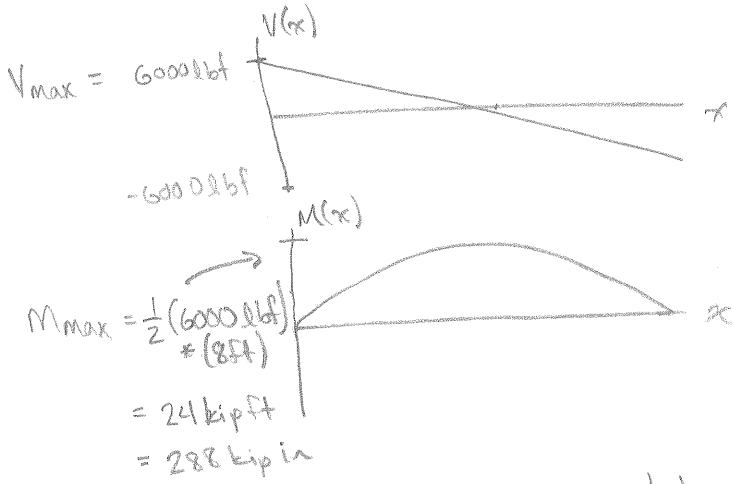


13.13)



Minimum h for
 $\sigma_{all} = 1750$ psi
 $\tau_{all} = 130$ psi



Need to find h in two cases: to satisfy the limit on normal stress and to satisfy the limit on shear stress. The required h will then be the greater of these two values.

$$\sigma_{max} = \frac{M_{max} c}{I} = \frac{M_{max} (\frac{h}{2})}{\frac{1}{12} b h^3}$$

$$h = \left(\frac{6 M_{max}}{\sigma_{max} b} \right)^{1/2} = \left(\frac{6 (288 \cdot 10^3 \text{ lb in})}{(1750 \frac{\text{lb}}{\text{in}^2}) (5 \text{ in})} \right)^{1/2} = 14.1 \text{ in}$$

$$\tau_{max} = \frac{V Q}{I b} = \frac{V_{max} (\frac{1}{4} h) (\frac{1}{2} h) (b)}{(\frac{1}{12} b h^3) (b)}$$

$$h = \frac{3}{2} \frac{V_{max}}{\tau_{max} b} = \frac{3}{2} \frac{6000 \text{ lb}}{(130 \frac{\text{lb}}{\text{in}^2}) (5 \text{ in})} = 13.8 \text{ in}$$

$$\boxed{h = 14.1 \text{ in}}$$