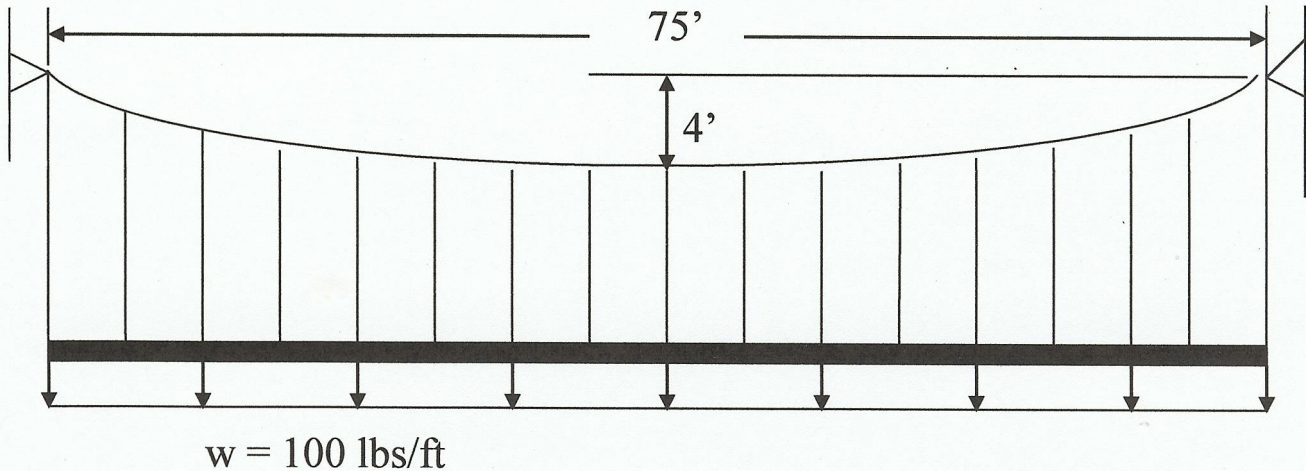


**Problem 4: Cables – Distributed Loads**

1. Determine the maximum tension in the cable and where it occurs.
2. Determine the minimum tension in the cable and where it occurs.
3. How long is the cable?



$$T_{\text{Max}} = \frac{w_0 L}{2} \sqrt{1 + \left(\frac{L}{4h}\right)^2} = \frac{100(75)}{2} \sqrt{1 + \left(\frac{75}{(4)(4)}\right)^2}$$

$$T_{\text{Max}} = 17,970 \text{ lbs} = \underline{17.97 \text{ Kips}}$$

$$T_{\text{min}} = F_H = \frac{w_0 L^2}{8h} = \frac{100(75)^2}{8(4)} = 17,578 = \underline{17.58 \text{ Kips}}$$

$$L_{\text{Tot}} = \frac{L}{2} \left[ \sqrt{1 + \left(\frac{4h}{L}\right)^2} + \frac{L}{4h} \sinh^{-1} \left( \frac{4h}{L} \right) \right]$$

$$= \frac{75}{2} \left[ \sqrt{1 + \left(\frac{4(4)}{75}\right)^2} + \frac{75}{4(4)} \sinh^{-1} \frac{4(4)}{75} \right] = \underline{75.6'}$$