

$$\text{pcf} \equiv \frac{\text{lbf}}{\text{ft}^3} \quad \text{kip} \equiv 1000 \cdot \text{lbf} \quad \text{ksi} \equiv \frac{\text{kip}}{\text{in}^2} \quad \text{psf} \equiv \frac{\text{lbf}}{\text{ft}^2} \quad \text{kcf} \equiv \frac{\text{kip}}{\text{ft}^3} \quad \text{plf} \equiv \frac{\text{lbf}}{\text{ft}}$$

$$\text{PDL} := \begin{pmatrix} 55 \\ 63 \\ 63 \\ 63 \\ 63 \\ 63 \\ 63 \\ 63 \\ 55 \end{pmatrix} \text{ kip}$$

$$d := \begin{pmatrix} 6.1042 \\ 15.9375 \\ 25.7708 \\ 35.6041 \\ 45.4374 \\ 55.2707 \\ 65.1040 \\ 74.9373 \\ 84.7706 \end{pmatrix} \text{ ft}$$

$$n := \text{length}(\text{PDL}) = 9$$

$$\underline{\underline{L}} := 90.875 \text{ ft}$$

$$M1n := \frac{1}{L} \cdot \sum_{i=1}^n \left[\text{PDL}_i \cdot (L - d_i) \cdot d_i \right] = \cdot \text{ft} \cdot \text{kip}$$

$$x := 0, 0.001 \cdot L.. L$$

$$\text{PDL}_0 = 55 \cdot \text{kip} \quad \text{PDL}_1 = 63 \cdot \text{kip} \quad \text{PDL}_2 = 63 \cdot \text{kip} \quad \text{PDL}_3 = 63 \cdot \text{kip} \quad \text{PDL}_4 = 63 \cdot \text{kip}$$

$$d_0 = 6.104 \text{ ft} \quad d_1 = 15.938 \text{ ft} \quad d_2 = 25.771 \text{ ft} \quad d_3 = 35.604 \text{ ft} \quad d_4 = 45.437 \text{ ft}$$

$$\text{PDL}_5 = 63 \cdot \text{kip} \quad \text{PDL}_6 = 63 \cdot \text{kip} \quad \text{PDL}_7 = 63 \cdot \text{kip} \quad \text{PDL}_8 = 55 \cdot \text{kip}$$

$$d_5 = 55.271 \text{ ft} \quad d_6 = 65.104 \text{ ft} \quad d_7 = 74.937 \text{ ft} \quad d_8 = 84.771 \text{ ft}$$