

FACTORED LOADS (Cont'd)

$$Bm_Wt := b \cdot d \cdot \gamma_{beam} \cdot g = 52.889 \cdot \frac{\text{lbf}}{\text{ft}}$$

$$Deck_thk := 6 \cdot \text{in}$$

$$\gamma_{deck} := \gamma_{beam}$$

$$Beam_Spa := 1.75 \cdot \text{ft}$$

$$Deck_Wt := Deck_thk \cdot Beam_Spa \cdot \gamma_{deck} \cdot g = 59.5 \cdot \frac{\text{lbf}}{\text{ft}}$$

$$Total_DL := Bm_Wt + Deck_Wt = 0.112 \cdot \frac{\text{kip}}{\text{ft}}$$

$$M_{dl_pos} := \frac{Total_DL \cdot L_u^2}{8} = 3.596 \cdot \text{kip} \cdot \text{ft}$$

(Assuming simple spans)

$$DF_{LL_mom} := \frac{Beam_Spa}{6.7 \cdot \text{ft}} = 0.261$$

Live load distribution factor

$$Axle_load := 40 \cdot \text{kip}$$

$$Axle_spa := 6.67 \cdot \text{ft}$$

$$M_{II} := \frac{Axle_load}{2 \cdot L_u} \left(L_u - \frac{Axle_spa}{2} \right)^2 \cdot DF_{LL_mom} = 52.37 \cdot \text{kip} \cdot \text{ft}$$

(2 wheels placed at center of span)

$$M_u := 1.25 \cdot M_{dl_pos} + 1.75 \cdot M_{II} = 96.143 \cdot \text{kip} \cdot \text{ft}$$

$$V_{dl_pos} := 0.5 \cdot Total_DL \cdot L_u = 899.111 \cdot \text{lbf}$$

$$V_{II} := \left(1 + \frac{L_u - Axle_spa}{L_u} \right) \cdot Axle_load \cdot DF_{LL_mom} = 16.54 \cdot \text{kip}$$

(2 wheels placed at end of span)

$$V_u := 1.25 \cdot V_{dl_pos} + 1.75 \cdot V_{II} = 30.069 \cdot \text{kip}$$