

FACTORED LOADS (Cont'd)

$$\text{Moment_Capacity} := \text{if} \left(\frac{M_u}{M_n} \leq 1.0, \text{"OK"}, \text{"Redesign"} \right)$$

$$\frac{M_u}{M_n} = 0.146$$

$$\text{Moment_Capacity} = \text{"OK"}$$

$$\text{Shear_Capacity} := \text{if} \left(\frac{V_u}{V_n} \leq 1.0, \text{"OK"}, \text{"Redesign"} \right)$$

$$\frac{V_u}{V_n} = 0.154$$

$$\text{Shear_Capacity} = \text{"OK"}$$

DEFLECTION

$$a := 0.5 \cdot (L_u - \text{Axle_spa}) = 4.665 \text{ ft}$$

$$I := \frac{b \cdot d^3}{12} = 1829 \cdot \text{in}^4$$

$$\Delta_{dl} := \frac{5 \cdot \text{Total_DL} \cdot L_u^4}{384 \cdot E \cdot I} = 0.028 \cdot \text{in}$$

$$\Delta_{ll} := \frac{\text{Axle_load} \cdot a \cdot \text{DF}_{LL_mom}}{24 \cdot E \cdot I} \cdot (3 \cdot L_u^2 - 4 \cdot a^2) = 0.402 \cdot \text{in}$$

$$\text{Deflection_limit} := \frac{L_u}{425} = 0.452 \cdot \text{in}$$

$$\text{Deflection_Capacity} := \text{if} \left(\frac{\Delta_{ll}}{\text{Deflection_limit}} \leq 1.0, \text{"OK"}, \text{"Redesign"} \right)$$

$$\frac{\Delta_{ll}}{\text{Deflection_limit}} = 0.89$$

$$\text{Deflection_Capacity} = \text{"OK"}$$

Midspan

$$\Delta_{l_msl} := \frac{\text{Axle_load} \cdot \text{DF}_{LL_mom}}{48 \cdot E \cdot I} \cdot L_u^3 = 0.259 \cdot \text{in}$$