

LRFD for Steel Superstructures

NCBDS - to set up M.Dash

Click "LRFD"
Input ADTT (ADT*T%*D%*P)
Run "Layout and Elevations"
Update "DF and Loads"
"Activate M. Dash"

Merlin Dash

Open Merlin Dash
Open "MD" input file
Check inputs
Calculate Qn and Zr for Shear Connector input

"Qn" LRFD 6.10.10.4.3-1

$$Q_n = 0.5 * A_{sc} * \sqrt{f'_c * E_c}$$

$$Q_n = 0.5 * ((0.75)^2 * \pi / 4) * \sqrt{4000 * 150^{1.5} * 33 * \sqrt{4000}}$$

$$Q_n = 27356 \text{ lbs}$$

$$Q_n = 27.356 \text{ K}$$

"Zr" LRFD 6.10.10.2-1

$$Z_r = \alpha * d^2 \geq 5.5 * d^2 / 2$$

$$\alpha = 34.5 - 4.28 * \log(N)$$

$$N = 365 * 75 * n * (ADTT)_{sl}$$

$$ADTT_{sl} = ADT * T\% * D\% * P \quad (\text{LRFD } 3.6.1.4.2-1)$$

$$ADTT_{sl} = 3850 * 0.04 * 0.65 * 1.0$$

$$ADTT_{sl} = 100$$

$$N = 365 * 75 * 1 * 100$$

$$N = 2737500$$

$$\alpha = 34.5 - 4.28 * \log(2737500)$$

$$\alpha = 6.948$$

$$Z_r = 6.948 * (0.75)^2$$

$$Z_r = 3.908$$

$$Z_r \geq 5.5 * (0.75)^2 / 2 \geq 1.55 \quad \text{OK}$$