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Connection Design for Casey Civil

6-29-11 "Shear tab"
per AISC

Loads: DL = 105 lb (materials)

LL = 32.6 psf (wind) = 11630 lb @ connection

Welds 1/4" fillet ea side, 4 locations per conn., Assume with 4" weld, E70 electrodes

$$A_w = 0.707(0.25)(4) = 0.71 \text{ in}^2 \quad \text{one } 1/4" \text{ weld} = 4 \times \frac{1}{16} \text{ units}$$

Most restrictive load pattern in shear

$$\frac{R_n}{\Omega} = (4)(4 \text{ units})(0.928) = 14.8 \text{ k}$$

$$\frac{R_n}{\phi} = 14.8(4) = 59.2 \text{ k}$$

$$R_u = 1.63 \text{ k} \quad \frac{R_n}{\Omega} > R_u \quad \underline{\text{GOOD}}$$

Bolts: $S_{min} = 2\frac{2}{3}(\frac{5}{8}) = 1.67 \text{ in}$ min edge dist. from center of hole to edge = $1\frac{1}{8} \text{ in}$

ASTM 325 std. high str. bolts $\frac{5}{8} \text{ in } \phi$ Std. sized holes = $\frac{5}{8} + \frac{1}{16} = \frac{11}{16} \text{ in}$

$$F_{nv} = 60 \text{ ksi} \quad A_b = \pi(\frac{5/8}{2})^2 = 0.307 \text{ in}^2$$

$$F_u = 120 \text{ ksi}$$

$$\frac{R_n}{\Omega} = \frac{60(0.307)}{0.75} = 24.5 \text{ k per bolt} \quad \frac{R_n}{\phi} = 24.5(4) = 98 \text{ k}$$

$$\frac{R_n}{\Omega} > R_u \quad \underline{\text{GOOD}}$$

Shear tabs:

Clip - min 4" in shear direction (assumed)

$$A_{clip} = .25(4) = 1 \text{ in}^2$$

$$R_{nv} = 1(60 \text{ ksi}) = 60 \text{ k} \quad R_{nv} > R_u \quad \underline{\text{GOOD}}$$

Plate - min 4" in shear direction (assumed)

$$R_{nv} = 60 \text{ k} \quad R_{nv} > R_u \quad \underline{\text{GOOD}}$$

