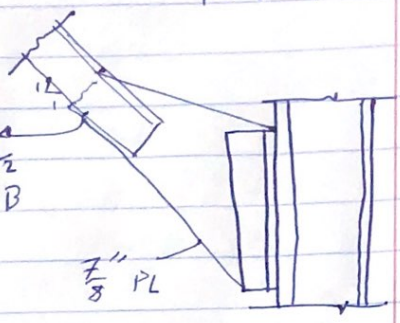
Mohanad Maayad Shannak — Part 3

118 1401



Q.7 A36 Steel

double angle

$D_s = 35$ K

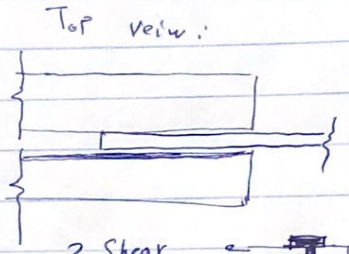
$L_s = 105$ K

Gusset Plate: thick. = 7/8"

3/4" A325-N bolts ✓ including threads in Shear Plan

$f_y = 36$ ksi

$F_u = 58$ ksi



$T_u = 1.2D + 1.6L = 210$ K

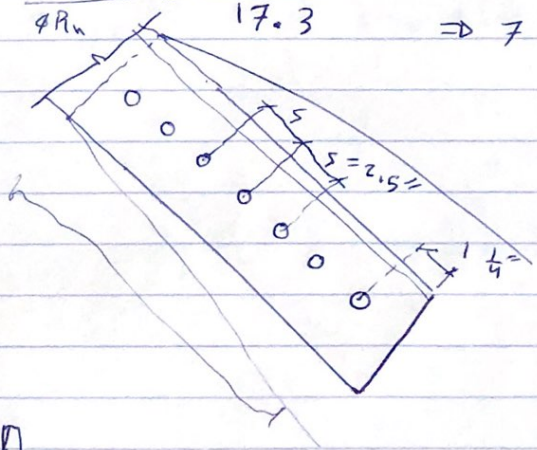
— Bearing type Conn. ⓝ : for one bolt:

$$\phi R_n = 0.8\left[0.75\, F_{nv}\, A_{bolt}\right] = 17.3 \text{ K/bolt.}$$

from Table J3.2 ⇒ $F_{nv} = 48$ ksi

$A_b = \frac{d^2\pi}{4} = 0.6$ in²

$$\#\text{ of bolts} = \frac{T_u}{\phi R_n} = \frac{T_u/2}{\phi R_n} = \frac{210/2}{17.3} = 6.07 \text{ bolts} \Rightarrow 7 \text{ bolts.}$$



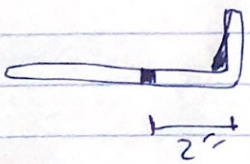
$s_{min} = 2\frac{2}{3}\, d_{bolt}$

$= 2.33"$

$s = 2.5"$

edge distance from J3.4:

$s' = 1\frac{1}{4}"$



Check for ~~Yield~~

Connected Parts:

for bolt (interior): Bearing: $\phi R_n = 0.75(2.4\, d\, t\, f_u) = (0.75)(2.4)\left(\frac{7}{8}\right)^2 (58)$

$= 79.9$ K

Tear out: $\phi R_n = 0.75(1.2\, L_c\, t\, F_u)$

$L_c = 2.5 - \frac{7}{8}$

$= 1.625$ "

$= 74.2$ K

$\phi R_n = 74.2$ K > ~~T~~ $T_{\text{from bolt.}} = R_u = \frac{210/2}{7_{\text{bolt.}}} = 15$ K

ϕR_n from two angels $= \phi R_n (2)(0.9) f_y A_{\text{for angle}} = 243$ K

3.75 in²

for bolt exterior: Bearing: $\phi R_n = 79.9$ K

Tear out: $\phi R_n = (.75)(1.2)\left(1.25 - \frac{7/8}{2}\right)\left(\frac{7}{8}\right)(58)$

$= 37$ K > T = 15 K

No Problem.

$\phi R_{n\ \text{diagonal}} > R_u$

243 K > 210 K.