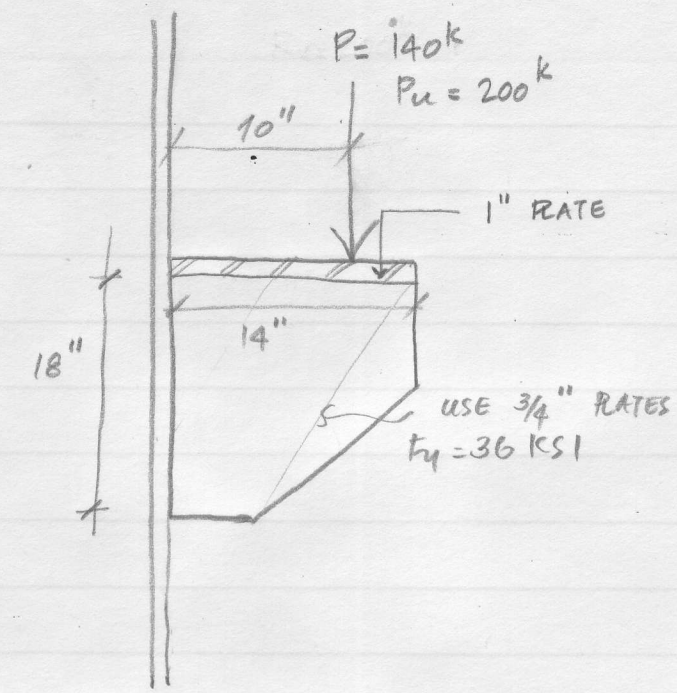
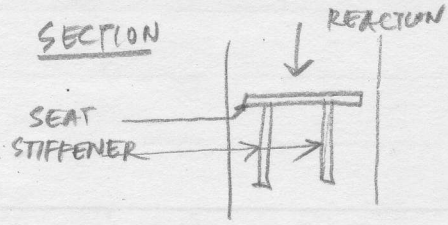
STIFFENED SEAT



SECTION



$M_u = 200 \times 10$
$= 2000$ k-in

$\frac{W}{2} = 7"$
$e_s = 10"$
eccentricity $= 3"$

(1) CHECK SHEAR AREA

$A_v = 2(0.75)(18)$
$= 27 \text{ in}^2$
$V_n = 0.6 F_y A_w = 0.6(36)(27)$
$= 583.2$
$\phi V_n = 0.9(583) = 524 > 200^k$ (OK)

(2) BEARING STRESS DUE TO ECCENTRICITY

$P/A + M/S$

Assume equal distribution $P_u = 100^k$

$f_b \not< \phi(1.8 F_y)$

$$\frac{100^k}{14(0.75)} + \frac{200 \times 3"}{\frac{0.75(14^2)}{6}}$$

$= 9.52 + 24.48$
$= 34$ KSI < 48.6 KSI (OK)

$\phi(1.8 F_y) = 0.75(1.8 \times 36)$
$= 48.6$ KSI

(3) LOCAL BUCKLING CRITERIA

$t_s > w / 95/\sqrt{F_y}$
$= \frac{14(\sqrt{36})}{95}$
$= 0.88"$

(4) WELD SIZING

$l_w = 2(18)(2) = 72"$
$S_{weld} = 2 \cdot \frac{d^2}{3} = \frac{2 \times 18^2}{3} = 216 \text{ in}$

$P/A = \frac{200}{72} = 2.77$ k/in

$\frac{M}{S} = \frac{2000}{216} = 9.25$ k/in

$r = \sqrt{2.77^2 + 9.23^2}$
$= 9.63$ k/in

$a = \frac{9.63}{22.3} = 0.43"$

PROVIDE $1/2"$ WELD

$\phi R_n = 0.75a(0.707)(0.6 F_{EXX})$
$= 22.3a$

QUESTION

(1) How should I check local buckling?
(2) If I use a reduced Q value to account for slender element, how will I determine my KL/r?