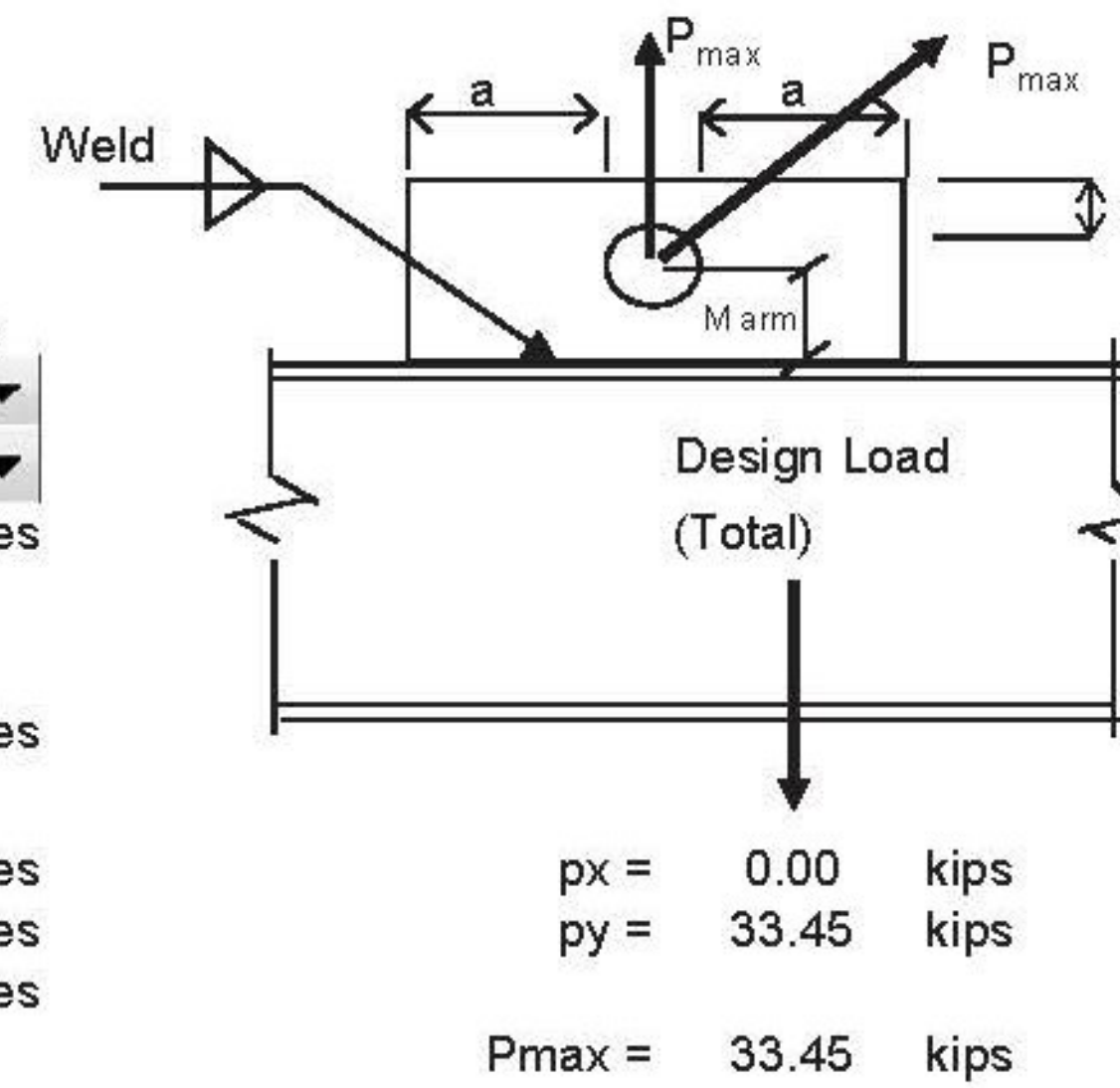




CONSTRUCTION LEADERS

Design of Lifting Beams Connections

Input: Service Load = 22.3
 Impact factor = 1.5
 Design Load = 33.45 Kips
 Design Angle = 90
 # of Legs of Sling = 1
 d = 1.5 inches
 t = 1 inch
 F_u = 58 ksi
 a = 2 inches
 F_y = 36 ksi
 e = 2 inches
 h = 5.5 inches
 l = 6 inches



Ultimate Tensile Load

$P_u = 2 \cdot a \cdot t \cdot F_u = 232.0$ kips
 $P_{allow} = 0.20 \cdot P_u = 46.40$ kips

Design Load is O.K.!
46.40 > 33.45

Lug Tearout (P_{max} Diagonal)

Load Factor = 1
 $P_{allow} = 1.67 \cdot F_b \cdot t \cdot e^2 / d = 105.81$ kips
 $e_{min} = 1.01$ inches

Design Load is O.K.!
105.81 > 33.45

Allowable Crushing

$P_p = 0.9 \cdot F_y \cdot t \cdot d = 48.60$ kips

Design Load is O.K.!
48.60 > 33.45

Shear

$P_u = 2 \cdot (0.4) \cdot F_y \cdot e \cdot t = 57.60$ kips

Design Load is O.K.!
57.60 > 33.45

Weld Design

$M_{arm} = 2.75$ inches
 $S_w = d^2 / 3 = 10.08$ in²
 $A_w = 11$ in

$f_m = 0.00$ kips/inch
 $f_v = 3.04$ kips/inch
 $f_t = 0.00$ kips/inch
 $f_w = 3.04$ kips/inch

use 1/4 fillet weld

Vermont Agency of Transportation

RECEIVED

ON: May 28, 2015

and Checked for

CONFORMANCE

BY: CB DATE: 6-22-2015