BOLTS = 3/4" DIAMETER
Tensile = 60ksi
Shear = 30ksi

Pull = ?
Factor of safety = 2.0

Pull plate for use on:
Gross area: 60 ksi

Area one bolt:

\[ A = \frac{\pi D^2}{4} = \frac{\pi (3/4")^2}{4} = 0.442\text{ in}^2 \]

Total:

\[ A_{\text{total}} = \frac{0.442\text{ in}^2}{\text{bolt}} \times 3 \text{ bolts} \]

\[ T = \frac{V}{A_{\text{total}}} \]

\[ T = \frac{60\text{ ksi}}{3} = 20\text{ ksi} \]

\[ P = V = 20\text{ ksi} \times A_{\text{total}} = \frac{20\text{ ksi}}{1\text{ in}^2} \times (0.442\text{ in}^2) \times 3 \text{ bolts} \]

\[ = 39.8\text{ kips} \]

Controlled by plate shear.

Gross area:

\[ \text{net} = [6" - (3/4" \times 3\text{ holes})] \times (1/2) \]
Ultimate Tensile Strength of Bearing Plate = \( \frac{30 \text{kpsi}}{2.0} = 15 \text{kpsi} \)

Shear Force Present

\[ \text{Total Shear} = (1.75\text{" long})(\frac{1}{2}\text{") (6 of them}) = 5.25 \text{in}^2 \]

\[ \text{Pall} = \text{Vall} = \text{Tall \ A shear} = \frac{15 \text{kips}}{\text{in}^2}, 5.25 \text{in}^2 = 78.75 \text{k} \]

Bearing between bolt & plate is controlled by pressure area:

\[ \tau = \frac{P}{A}, \text{ Pall} = \text{Tall Across} \]

\[ \text{Pall} = \frac{60 \text{kpsi}}{2.0} \frac{(6\text{"})(\frac{1}{2}\text{")}}{2.0} = 90 \text{k} \]

Controlled by net area:

\[ \text{Pall} = \text{Tall A net} = \frac{80 \text{kpsi}}{2.0} \frac{(6 - \frac{3}{4}\text{"})(\frac{1}{2}\text{")}}{2.0} = 75 \text{k} \]