



June 6, 2014

Report 14SPR15.2

Paul Magargee  
Light Pole System  
17032 Rancho Lane  
Yorba Linda, CA

**Subject:** Light Pole Repair Sleeve Analysis for Three-Sided Base.

Dear Paul:

We have reviewed your proposed sleeve detail and methods for repair of existing light poles due to deterioration near the base. The proposed system consists of a base plate welded to a three sided bent plate. An existing light pole would be cut off above the damaged area and bolted to the 3 sides of the bent plate with 2-  $\frac{3}{4}$ " diameter blind bolts on each side (6 total). The three sided bent plate is to be 30 inches tall. All structural steel is to be ASTM A36. All welds shall be made with E70-XX electrodes (70 ksi capacity) using pre-qualified welding procedures in accordance with AWS D1.1 (latest edition).

The design of this system is based on providing a retrofit base with equal or greater strength than what is being replaced ("like-for-like"). The strength of the existing poles were determined based on the following factors; base plate, pole, weld and anchor bolt capacities. The loading for the model is based on a wind criteria of 110 MPH and an exposure category C. Based on the 2013 California Building Code (CBC). The loads were applied to a finite-element structural analysis model and the strength of the new retrofit system was determined.

Based on our model and analysis, we have determined that the proposed system is structurally acceptable. Per Figures 1,3,5 the model areas of high stress have been presented in red areas low or no stress have been noted in blue. This is a visual representation of various stresses including flexural, tension, compression, and shear. Figure 2,4,6 displays the deflections.

Based on our findings we recommend the following. All bases shall have 1/4" fillet welds between base and bent plate. All light poles shall be secured to new bent plate base with 2- 5/8" Diameter blind bolts (A307) each side (6 total). 5 inch max diameter light pole with a maximum head area of 2.5 SF.

For poles under 20'-0"

- Base plate to be 3/4" thick min.
- Body shall be 1/4" thick (A36) min.

For poles over 20'-0" under 25'-0"

- Base plate to be 3/4" thick min.
- Body shall be 5/16" thick (A36) min, or 1/4" thick (A572) steel.

For poles over 25'-0" and under 35'-0"

- Base plate to be 1" thick min.
- Body shall be 1/2" thick (A36) min, or 7/16" thick (A572) steel.

Please feel free to call with any questions or if we can be of additional assistance.

Sincerely,



Jeremy C. Welton, SE  
Principal



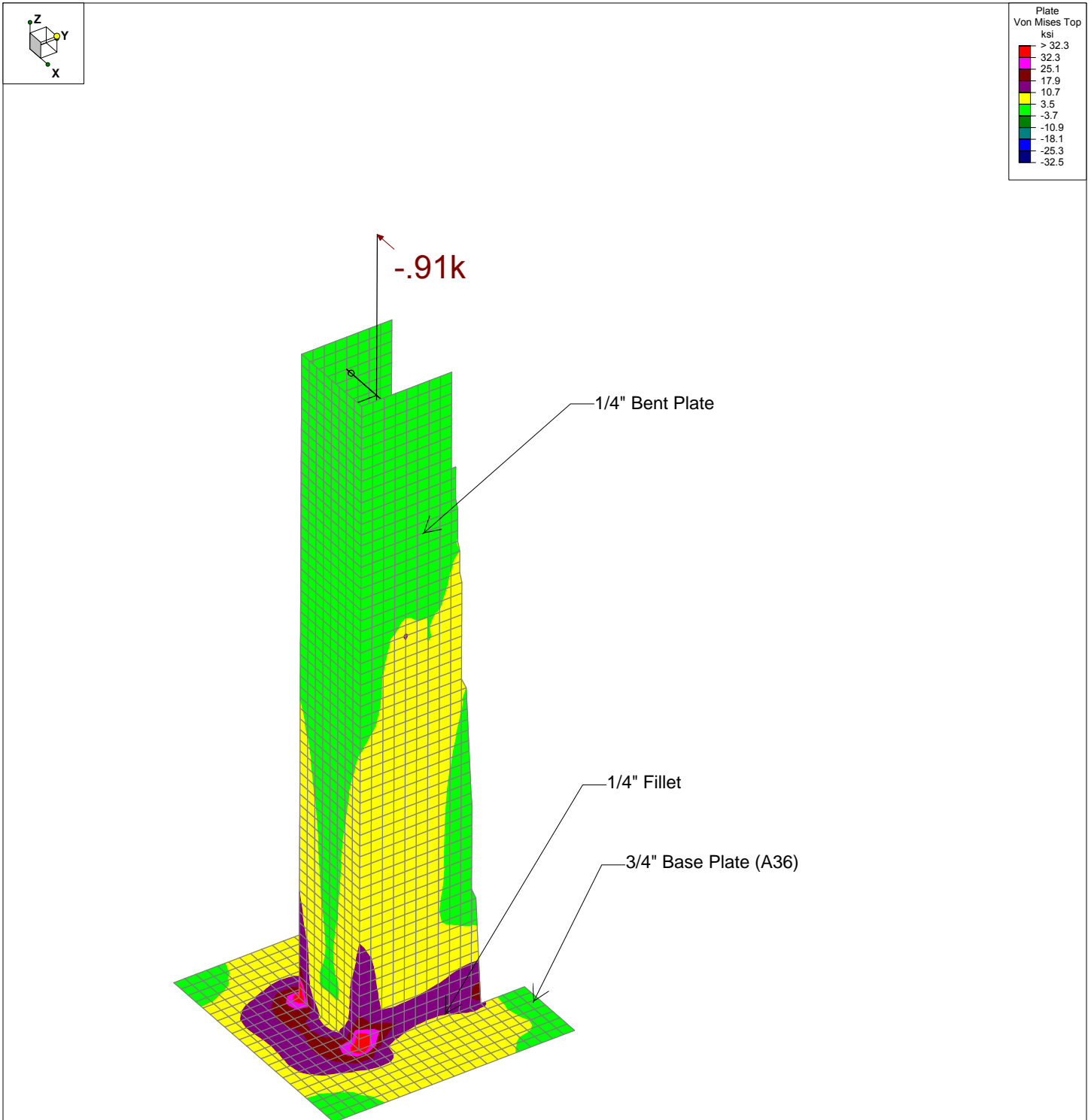


Figure 1: Von Mises 20'-0" max

Loads: BLC 1,  
Results for LC 1, Side to side

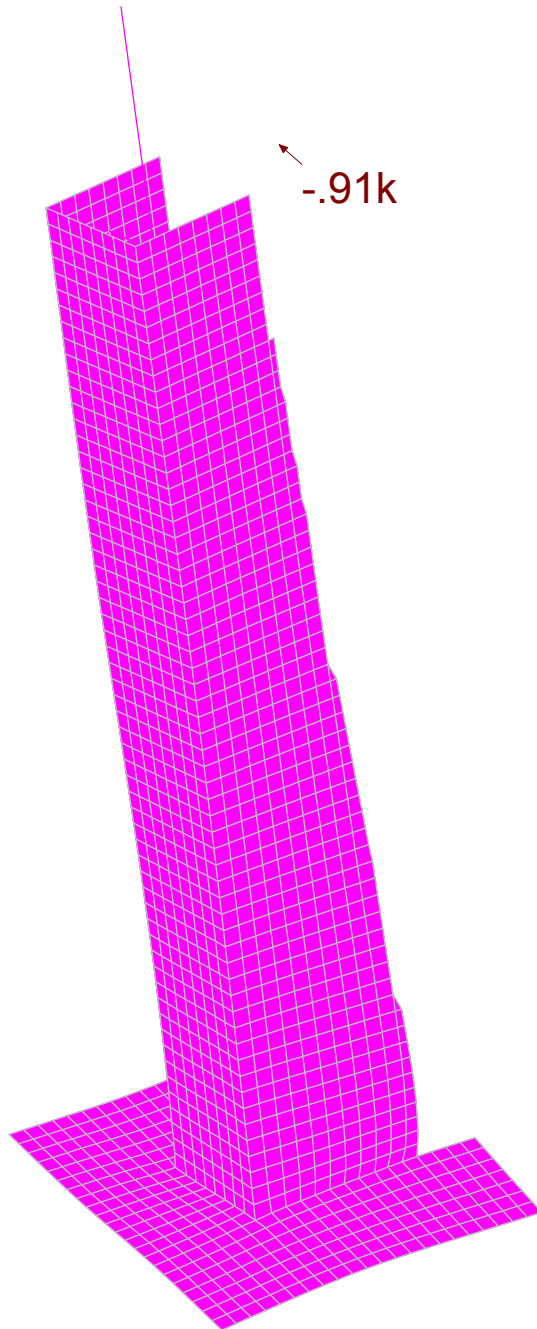
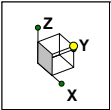


Figure 2: Deflection 20'-0" max

Loads: BLC 1,  
Results for LC 1, Side to side

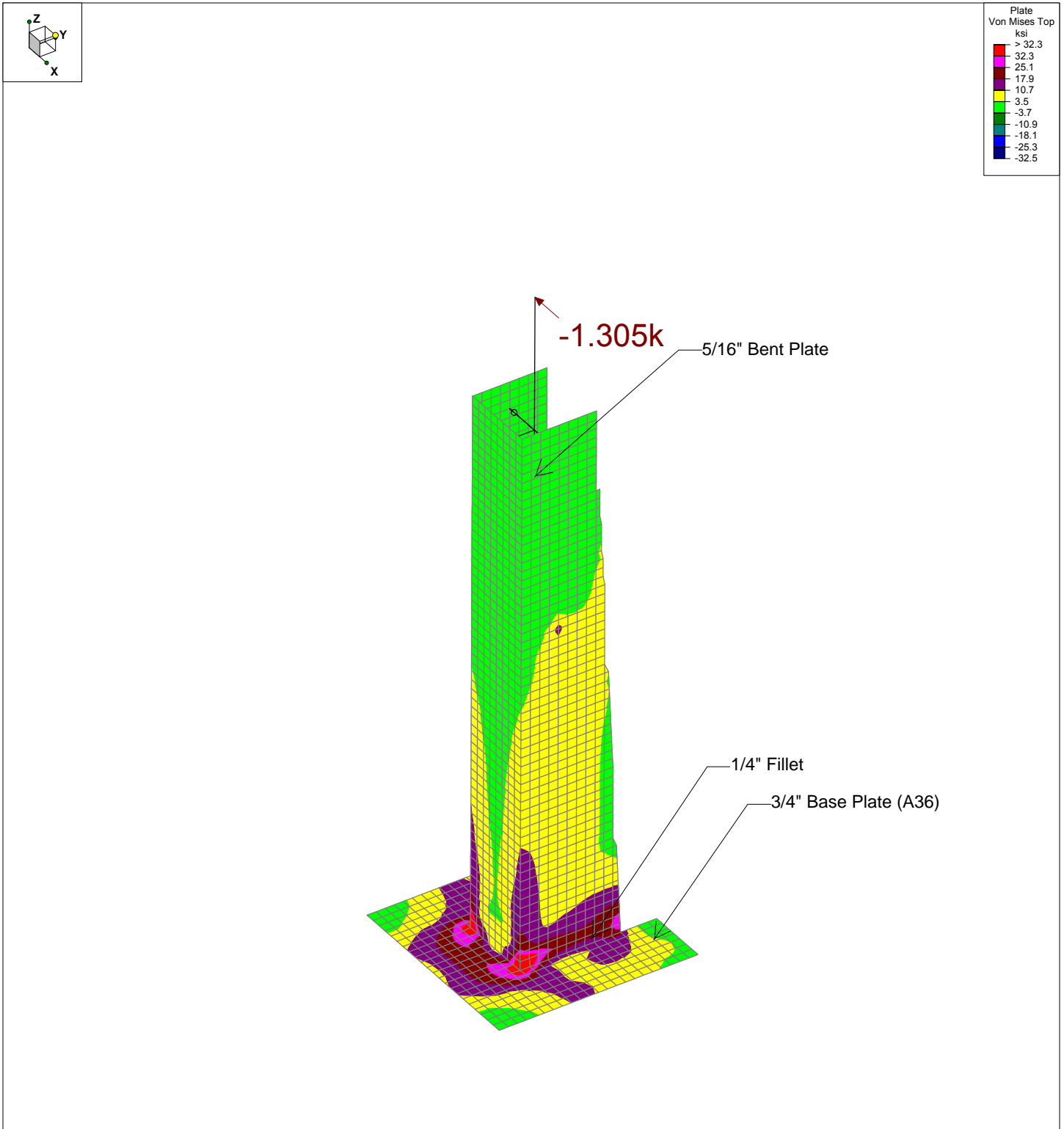


Figure 3: Von Mises 25'-0" max

Loads: BLC 1,  
Results for LC 1, Side to side

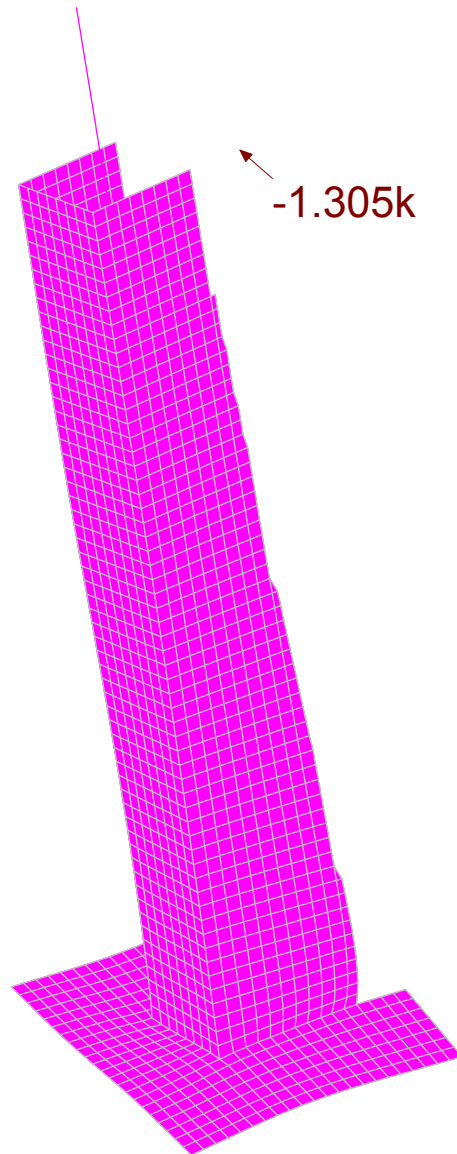
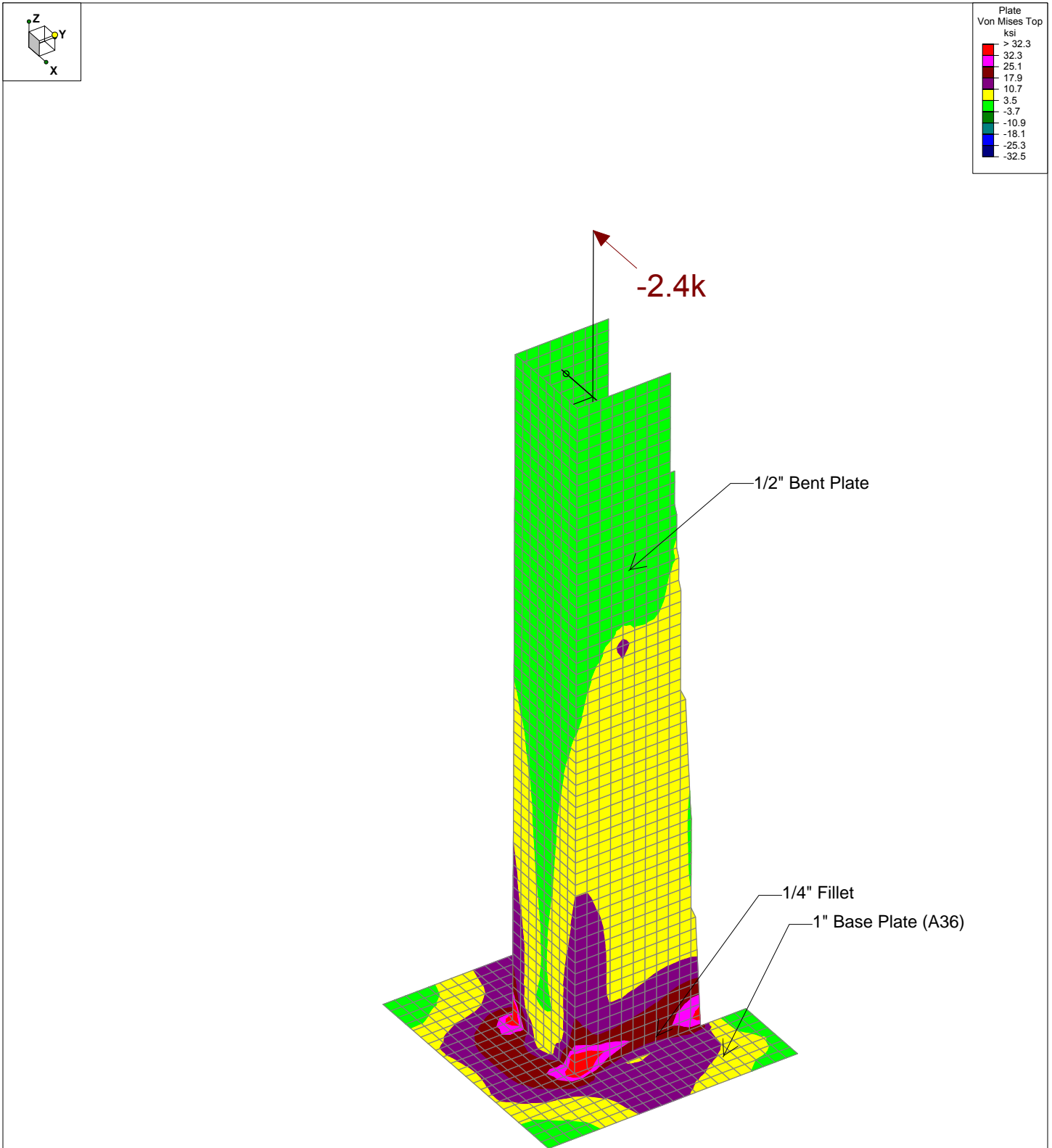


Figure 4: Deflection 25'-0" max

Loads: BLC 1,  
Results for LC 1, Side to side



Loads: BLC 1,  
Results for LC 1, Side to side

Figure 5: Von Mises 35'-0" max

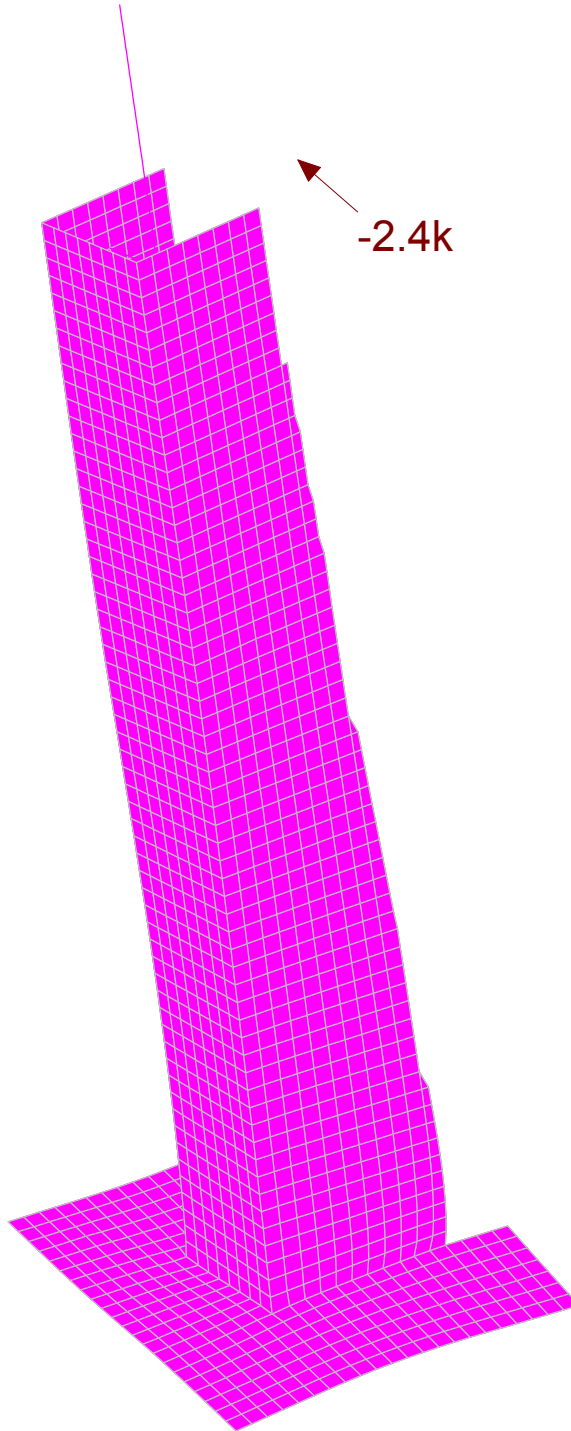
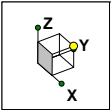


Figure 5: Deflection 35'-0" max

Loads: BLC 1,  
Results for LC 1, Side to side