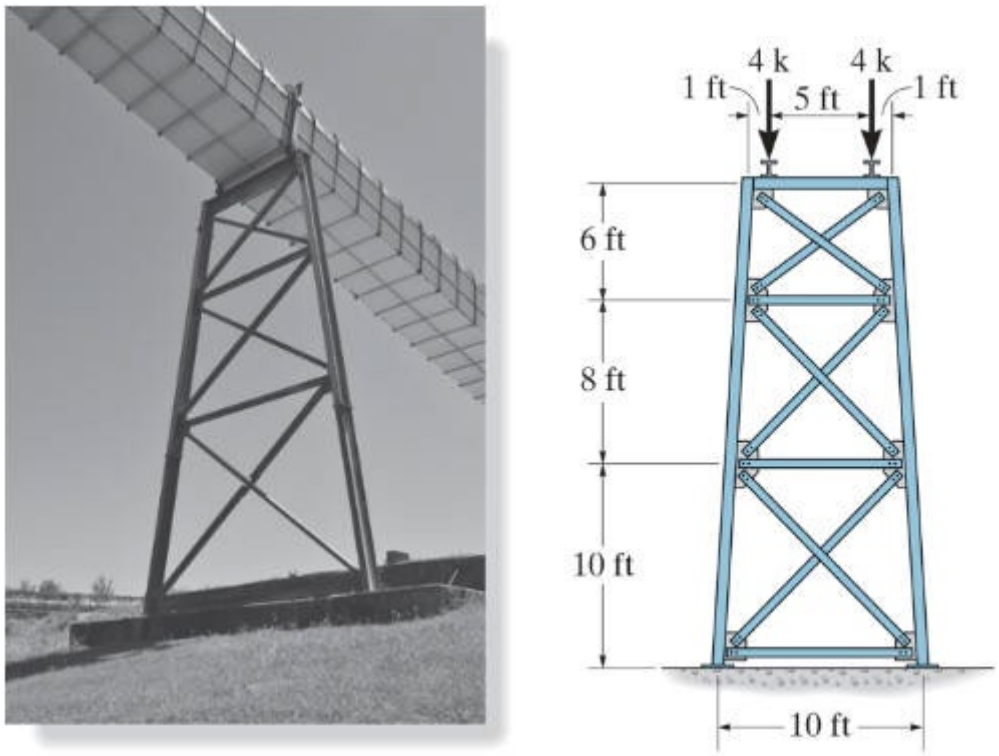
CIVL 4122 Homework #30 **Name: _____**

The steel-trussed bent in the photo supports a portion of the pedestrian bridge. It is constructed using two wide-flange columns, each having a cross-sectional area of 4.44 in^2 and a moment of inertia of 48.9 in^4. As shown in the figure, a similar member is used at the top to support the bridge loading, which is estimated to be 8k. The ends of this member are welded to the columns, and the bottoms of the columns are welded to base plates which in turn are bolted into the concrete.

Each truss member has a cross-sectional area of 2.63 in^2, bolted at its ends to gusset plates. These plates are welded to the web of each column. Establish a structural model of the bent and justify any assumptions you have made. Using this model, the forces in the truss members are determined, and the axial force in the columns is found using a computer program for the structural analysis. Neglect the members' weight and use the centerline dimensions shown in the figure. Compare your results with those obtained using the method of joints to calculate the force in some of the members. Take $E = 29(10^3)$ ksi..

Hand in a copy of the ***cover page*** and an image displaying the forces and moments in the frame.



(a) (b)

Figure 1. Structural bent support a walkway (a) photograph, and (b) geometry and loading.