

5.5 The accompanying figure shows part of a common type of roof truss, constructed mainly of timber and steel rods. Determine:

- The average compressive stress in the $8'' \times 8''$ diagonal member if the load in it is 20 k.
- The tensile stress in the $\frac{3}{4}''$ diameter threaded steel rod if the load in it is 4 k.
- The bearing stress between the timber and the $4'' \times 4''$ square steel washer if the hole in it is $\frac{7}{8}''$ diameter.
- The bearing stress between the brick wall column and the $8'' \times 10''$ timber if the load in the column is 15 k.
- The length L required to keep the dashed portion of the $8'' \times 10''$ member from shearing off due to the horizontal thrust of 16 k against the steel shoe. The $F_v = 120$ psi allowable.

