

DISCUSSION

The Importance of Tension Chord Bracing

Paper by JAMES M. FISHER
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Discussion by **Cedric Marsh**

It is of interest to observe that in the summary to this paper, the true action of columns in a truss is described, and shows why lateral bracing is *not* required.

If a cable is passed through a tubular column, anchored to the column ends and tensioned, causing compression on the tube, the buckling length is always the actual length. Place the cable outside the column, as in Fig. 1 of the paper, and it is seen that, as the end of the column is displaced, the direction of the axial force remains along the column. There is no loss of potential energy, hence no destabilizing force.

Given that point A is restrained and force P remains vertical, then the lateral displacement of B will cause an increase in the force in the strut, AB, (Fig. 13) to $P/\cos\theta$, but it is still in neutral equilibrium, and the strut can only buckle as a column of length AB.

Even if the column is fixed at the end A, due to the freedom of B to move laterally, the effective length K is still 1 for out-of-plane buckling. In this case, lateral bracing may be desirable in order to reduce K .

Were the arguments for bracing tension chords valid, then a pony truss, with the compression chord stabilized laterally only by the rigidity of the web members, would be subject to a similar analysis.

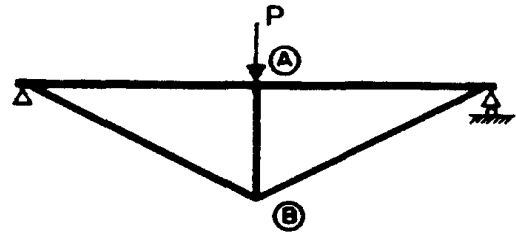


Figure 1

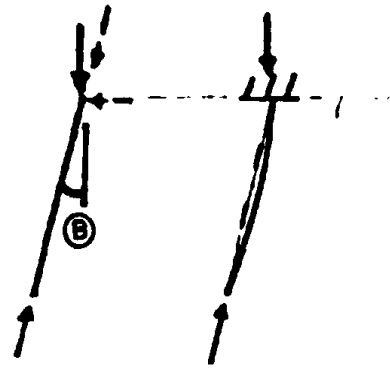


Figure 13

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