V CONCLUSION AND RECOMMENDATION

Conclusion

A shallow bowed strut is subjected to a lateral central concentrated load acting toward the center of curvature, the axial thrust induced by the bending of the bowed strut may cause the bowed strut to buckle so that the curvature becomes suddenly reversed. The critical lateral buckling load depends on the types of end-fixation and the initial curvature of bowed strut. An energy analysis has been used to solve this buckling problem herein, and it is based on the stability with respect to finite displacements.

On the basis of energy buckling criterion, it is shown that the buckling mode of a hinged bowed strut is symmetrical when it has a geometry λ^* less than 10.0 and is unsymmetrical when λ^* is greater than 10.0, but for the clamped case this deviding value of λ^* is 24.0. In the case of classical buckling criterion the dividing value of λ_1, is $\sqrt{4.5}$ for the hinged bowed strut.

The results for both classical and energy buckling criteria are compared with experimental results. It is seen that, for higher values of rise of bowed strut, the experimental critical lateral buckling loads agree quite well with the energy buckling criterion, and are always higher than that calculated by classical theory.

Recommendation for further work

The theoretical and experimental investigations had been carried out on the elastic lateral buckling behavior and the instability of the shallow bowed strut having both hinged and clamped ends with various amounts of initial curvature subjected to a lateral central concentrated load. It was approached from a very basic view point. However, the results will be of fundamental values in the future study. The following suggestions are made for the further work:

(1) An investigation of fatigue life should be conducted with concentrated load greater than the critical lateral buckling load applied at midspan of bowed strut for varying amounts of initial bow.

(2) The varying of the point of application of lateral load along the span of the bowed strut will be investigated.

(3) The effect of uniformly distrubuted loads will be studied. However, this is in connection with the buckling of ships plating and its consequent fatigue life.

(4) The investigation of bowed struts which are made of other materials.

(5) Other shape of cross section and length of bowed strut should be studied.