SEISMIC BEHAVIOR OF ASYMMETRIC BUILDINGS WITH SUPPLEMENTAL DAMPING

Rakesh K. Goel

Department of Civil and Environmental Engineering, Cal Poly State University, San Luis Obispo, CA 93407, U.S.A.

SUMMARY

This paper investigated the response of asymmetric-plan buildings with supplemental viscous damping to harmonic ground motion using modal analysis techniques. It is shown that most modal parameters, except dynamic amplification factors (DAFs), are affected very little by the plan-wise distribution of supplemental damping in the practical range of system parameters. Plan-wise distribution of supplemental damping significantly influences the DAFs, which, in turn, influence the modal deformations. These trends are directly related to the apparent modal damping ratios; the first modal damping ratio increases while the second decreases as CSD moves from right to left of the system plan, and their values increase with larger plan-wise spread of the supplemental damping. The largest reduction in the flexible edge deformation occurs when damping in the first mode is maximized by distributing the supplemental damping such that the damping eccentricity takes on the largest value with algebraic sign opposite to the structural eccentricity.