



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: Evaluation of slope bottom tuned liquid dampers in reduction of earthquake vibrations of Structure

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SHORT ABSTRACT

In this study, an attempt has been made to systematically investigate the performance of sloped bottom TLD for controlling the dynamic response of reinforced concrete (RC) frame with various types slope such as central slope, dual triangular slopes, end slope, combination of central and end slope and combination of dual triangular slopes and end slope considering a wide range of slope angles at bottom of TLD. Performances of sloped bottom TLD and flat bottom TLD are also evaluated and compared. The influence of tuning ratio and depth ratio on performance has been investigated for the flat bottom TLD. Effect of slope angles on performance of TLD has been investigated and optimum slope for maximum reduction of response of structure is evaluated. The range of slope for which effectiveness of slope bottom TLD is improved over flat bottom TLD is evaluated. The liquid mass reduction due to application of slope at the bottom of TLD is evaluated and it is considered as additional benefit of slope bottom TLD. For the TLD with central slope at the bottom, reduction in displacement is seen to increase with the amount of slope. Dual triangular slope TLD has been found to be more efficient at an angle of 20°. End slope TLD has been found to be efficient at an angle of about 30° and has a range of 30°- 45° for improved performance over flat TLD. TLD with combination of central slope and end slope and combination of dual triangular slopes, a marginal improvement in performance is observed at central slope / dual triangular slopes of 2.5°-5° and end slope of 25°.