Simple vibration control system for shear structures under earthquakes

by

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Abstract

Conventional vibration control methods have problems that they are too complex and that they increase their costs of manufacturing and maintenance. In this research we propose a simple vibration-controlled flexible structure in which highly damping rubbers are inserted between two rigid frames, which incline toward each other. These structures are modeled to a system that has two degrees of freedom. Experiments involving two conditions, in which vibration is controlled and not controlled, are conducted. Under these conditions, the effectiveness of these structures for several earthquakes is demonstrated. Numerical analyses have also performed to make sure the effectiveness obtained by the experiments.

Keywords: Vibration Control, Earthquakes, Highly Damping Rubber, Shear Structure

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One-dimensional consolidation analysis taking account of secondary compression during primary consolidation

by

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Abstract

A practical one-dimensional consolidation analysis technique for predicting the consolidation time curve and the excess pore water pressure dissipation of clays exhibiting secondary compression is described. The constitutive soil model is based on the equation governing the secondary compression rate of decease in void ratio. This model uses four parameters, namely, $C_r$, $C_a$, $e_0$, and $e_\infty$, that can be easily determined from the conventional standard oedometer test to check the validity of the proposed soil model, the consolidation time curves observed in oedometer specimens are compared with those obtained by the analysis. Satisfactory agreement is obtained between the computed behavior and oedometer observations.

Keywords: One-dimensional consolidation, Secondary compression, Clay, Finite difference method

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