

SAFETY OF IDEALIZED STRUCTURES SUBJECTED TO EARTHQUAKES

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ABSTRACT

Modern concepts consider structural design as an attempt of an optimum solution, pointed out by a minimum total probable cost.

The paper is concerned with a method of structural analysis which should offer basic data for a decision in the sense of an optimum design solution.

A cumulative measure of damage produced by earthquakes, D , is used for structural analysis. This measure is a random variable for an earthquake of a certain intensity and of a certain spectral density. The conditional probability function of D , $F(d;i)$, is considered as a basic structural characteristic.

The function $F(d;i)$ is estimated by means of a Monte-Carlo procedure, using to this aim a computer which determines the measure of damage corresponding to several elements of an ensemble of artificially generated accelerograms. Some numerical results permit a discussion of the earthquake resistance of simple structures.

Practical application of the method is finally discussed.

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