The Office of Technology Management

UNIVERSITY OF TEXAS ARLINGTON

Method for Determination of Natural Frequency of an Earthen Structure

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TECHNOLOGY NEED

Natural frequency is an important parameter for analyzing the seismic response of earthen embankment structures, such as dams and levees. The existing methods for determining the natural frequency correspond to low strain levels and do not incorporate the non-linear behavior of the material within the structure. This limits the utility of conventional approaches in determining the strain-dependent natural frequencies of earthen structures during earthquake events.

INVENTION DESCRIPTION/SOLUTION

We provide a novel algorithm that can be incorporated in software to analyze and predict the strain-dependent natural frequency of earthen structures. This algorithm is enabled by the premise that earthen structures act as filter to seismic waves of different frequencies. This approach accounts for material variability, incorporates the effect of non-linear behavior of geomaterials, and is applicable for any geometric configuration.

APPLICATIONS

- Software for dynamic response analyses
- Geo-technical software

KEY BENEFITS

- Incorporate non-linear behaviors
- Obtain strain-dependent natural frequency
- Predict post-earthquake condition of structure

STAGE OF DEVELOPMENT

Prototype

Extensive tests done

INTELLECTUAL PROPERTY STATUS

Provisional

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