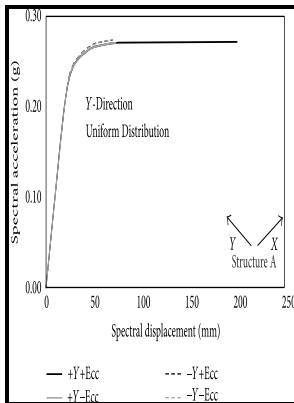# Non-linear seismic analysis of fully base isolated structures on flexible soils

Institut für Baustatik und Konstruktion Eidgenössische Technische Hochschule - Chapter 9

Description: -

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Mendelsohn, Erich, -- 1887-1953.
Structural dynamics -- Mathematical models.
Soil mechanics -- Mathematical models.
Foundations -- Earthquake effects -- Mathematical models.
Earthquake resistant design -- Mathematical models.Non-linear
seismic analysis of fully base isolated structures on flexible soils
-
Bericht (Institut für Baustatik und Konstruktion ETH Zürich) -- Nr.
162Non-linear seismic analysis of fully base isolated structures on
flexible soils
Notes: Bibliography: p. [101]-[105].
This edition was published in 1988

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Tags: #Frontiers

Structural Performance of Isolated Steel Beam

For spring model soil IV, 185% in S7 and 162% in S12. In general, subject to FF excitations, seismic isolation is to some extent more effective for stiff structures than for flexible structures; for stiff structures, this approach is more effective under FF excitations than under NF excitations; for flexible structures, is approximately equally effective under NF and FF excitations. The used time step for numerical solution was selected as 0.

Review of Guidelines for Seismic Design of Structures with Damping Systems ~ Fulltext

Earthquake response of bridges with sliding systems and lead-rubber bearing with soil structure interaction. As an adverse effect, the mean deck acceleration response under the FF excitations increases from 0. EN 15129 guidelines specify that in order to assure a stable behavior of the devices under cyclic loading, variations in a series of loads, relevant to the same displacement, shall be limited as follows: where subscripts 2 and 3 are relevant to quantities at the 2 nd and 3 rd load cycle, respectively, and subscript i at the i th-load cycle on the test, excluding the first 1 st cycle.

Seismic risk management of piles in liquefiable soils stabilised with cementation or lattice structures

Input ground motion is modelled as a spectral density function compatible with a response spectrum for combination of acceleration coefficient and site coefficient. A numerical example of application of the method is also provided in the paper.

Seismic behavior of Isolated Bridges : Engineering

A next section presents a preliminary evaluation of the effectiveness of seismic isolation for long-period structures using the inelastic spectrum concept.

Structural Performance of Isolated Steel Beam

Considering their slenderness, the piers are relatively flexible.

Structural Performance of Isolated Steel Beam

Further, the increased displacement demands at abutments are accommodated with specially designed expansion joints that allow large seismic movements in both horizontal directions. Overall, taking an average calculation for the relative displacement of the shorter building under different applied motions shows that the BI system is capable to reduce displacement responses up to 77.

Earthquake responses of a base

These results are consistent with the frequency contents of the NF and FF excitations and their significant different effects on structures with short and long periods. This difference is not observed in the two components of ordinary far-field ground motions. Based on the results from the analysis, it ap- pears that the potential for overestimation of bending de- mand would occur for rigid types of culvert structures buried at shallow depths by as much as 30 to 35 percent.

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