Comparative Test of Seismic Resistance of Outdoor Photovoltaic Cabinets Used in Schools

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Can finite element models predict seismic demands of a single-door electrical cabinet?
In this study, Finite Element (FE) models of a single-door electrical cabinet and concrete shear wall structure validated through experimental data are used for a decoupled analysis to estimate the seismic demands of the electrical cabinet.

Can structural models be used to evaluate the seismic response of electrical cabinets?
Existing studies using decoupled or coupled analysis to consider the effect of structures on the cabinet also use a simplified structural model and evaluate the seismic response of the electrical cabinet system without validation of the developed structural model [8, 9, 10].

Are solar panels earthquake-resistant?
For seismic design, analysis is relatively straightforward for positively attached systems to the ground or roof structure. This design methodology for assessing the structural adequacy of separate solar arrays under seismic load is studied. Earthquake-resistant construction is meant to safeguard PV systems from earthquakes.

Can FE models be used to assess the seismic performance of cabinets?
In previous studies, idealized models such as frame or stick models were used to assess the seismic performance of cabinets rather than detailed 3D FE models due to the complexities of the electrical cabinet system such as bolt and welding connections [5, 6, 7].

This introduction to the NEHRP Recommended Seismic Provisions is intended to provide these interested individuals with a readily understandable explanation of the intent of the earthquake ...

If the shake table tests are two-dimensional, the tests should at short periods (per ASCE 7) be used to calibrate comparable two-dimensional analyses, T = fundamental period

Other types of testing are nonlinear response history analysis and shake table testing, below is an excerpt from SEAOC Report PV1-2012 describing require-ments for these types of testing.

This paper presents the seismic performance of ground-mounted photo-voltaic (PV) modules. The seismic performance of the PV module is evaluated for sets of near-field (NF) and far ...

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This study investigates the deformation performance of photovoltaic glass curtain walls within a modular steel frame through a series of quasi-static cyclic tests.

This design methodology for assessing the structural adequacy of separate solar arrays under seismic load is studied. Earthquake-resistant construction is meant to safeguard PV systems ...

A shaking table test of the cabinet was conducted at the Seismic Research and Test Center, Pusan National University, in which a 6-degrees-of-freedom shaking table can be performed.

In this paper, the seismic behaviour prediction for a safety-related electrical cabinet with respect to its stability by analysis is compared with the results of a successive test that was performed with the ...

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