

عنوان مقاله:

High Volume Seismic Restraint Program Design for Non-structural Building Components

محل انتشار:

چهارمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1382)

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خلاصه مقاله:

TERRA FIRM EARTHQUAKE PREPAREDNESS INC. (Terra Firm Inc.) has been involved in the installation of seismic restraint systems for non-structural building components for the past eight years. Based in Vancouver, British Columbia, Canada, the company has recently had an opportunity to participate in a high volume seismic mitigation program for critical infrastructure such as hospitals, universities, colleges, schools, and provincial government buildings. This paper will discuss the lessons learned to date in translating engineering theory to non-structural seismic mitigation practice under the \$133 Million CND program. A non-structural seismic mitigation program consists of such key elements as seismic risk assessments, retrofit cost estimating, component selection, seismic engineering, installation, quality assurance, and mitigation tracking and documenting. Non-structural components, or operational and functional components (OFCs), can be divided into three subcomponents: Architectural (external and internal), Building services (mechanical, plumbing, electrical, and telecommunication), and Building contents (common and specialized). There are three primary risks associated with the failure and/or dislocation of OFCs in a building: Life safety of the occupants, Functionality and performance of the facility, and Property loss. Even during low to moderate intensity ground shaking, when there is little to no damage to the structure, failure of non-structural components is common. There are numerous methods for quantifying the risk levels of OFCs. The Canadian Standards Association (CSA) recently released an excellent, objective seismic risk assessment guideline known as CSA S832-01. CSA S832-01 considers soil conditions, seismic zone, aspect ratio, flexibility, building type, quality of existing seismic restraint, pounding potential, business continuity/resumption, and life safety to occupants. The outcome of this assessment, the total risk, is the product of vulnerability and consequences (see Section 6, Risk Assessments). Once the non-structural components within a building have been listed, they can be tabulated and sorted by risk level. This methodology aids the owner of the facility in prioritizing his/her seismic mitigation efforts.

کلمات کلیدی:

Operational and Functional Components, Non-structural Components, Seismic Restraint, Seismic Risk Assessment, Risk Mitigation, Architectural Components, Mechanical Components, Electrical Components

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