

Title: Assessment of seismic indoor damage based on estimation of furniture behavior

MIKA KANEKO

Overturning or sliding of furniture subjected to earthquake shaking may injure building occupants even when the building structural frame does not suffer severe damage. Overturned furniture may also become obstacles to evacuation and relief activities after an earthquake. The purpose of this study is to develop a simple and convenient methodology which estimates the risks of overturning or sliding of furniture due to earthquake motions. In this study, basic characteristics of behavior of furniture due to various input excitations are examined by many analytical studies and shaking table tests. It becomes clear that how the overturning and sliding behavior of furniture depends on its size, slenderness, floor condition, and magnitude and predominant frequency of an input excitation. Based upon these studies, simple equations to express relations between overturning ratios, overturning criteria or sliding displacement of furniture and characteristics of input excitations are proposed. These equations can be used conveniently to predict indoor damage of buildings due to scenario earthquakes and to estimate efficiency of seismic countermeasures for buildings.