

Foreword

These ten years, the spread of computers has made it possible to estimate the earthquake response of complicated structures. The progress of observation technique and the arrangement of more than one thousand strong motion seismometers all over Japan brought a lot of strong earthquake records to us. It has been recognized from these records that peak acceleration of the ground motion is greater than we previously expected, however, damages to structures is not so severe as we estimate them from the value of peak acceleration. Therefore, many researchers have their interests on dynamic strength of structures.

For the next step, the following items are considered to be important especially in populated cities in Japan, that is, their earthquake resistant properties and their responses to strong earthquake. Each number of victims in past earthquakes in Japan depended on deeply whether a big fire after the earthquake occurred or not, and the fire is closely related to the density of population, materials of buildings, and strength of life line systems, etc.. We must know not only the response of individual structures but also behaviors of a populated city as a complex of structures to a strong earthquake in order to reduce its earthquake hazard. We have few data on city's behaviors because damage survey in the past earthquakes were not made from the above mentioned viewpoint.

Insufficiency of data is not good for earthquake engineering, because it is one of engineerings based on mostly past experiences.

We have a strong earthquake with damage every two years in Japan, therefore, we may expect a future strong earthquake in the near future, because the last earthquake "Miyagiken-Okai" was occurred in 1978.

We must not fail to obtain good data of the responses and behaviors of a city to a coming strong earthquake.

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