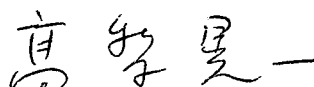


FOREWORD

Already more than two years passed since we experienced the devastating earthquake in Kobe and its vicinity. We learned a lot from the disaster, particularly to the knowledges for seismic design and structural construction. Common practice in seismic design and construction is changed then? I am afraid to say it is not changed. Why? There are two reasons. First, damage surveying after the earthquake showed the provisions for seismic design revised in 1980 are found to work well on the condition that good workmanship is provided in the construction. The second reason is that recent recession in economy hinders the up-grading in seismic design to ensure more reliable resistance against severe earthquake vibration.

Research for earthquake engineering, however, is stimulated indeed by the earthquake. Many projects started at the same time not only in traditional earthquake engineering fields, but also new and immature fields.

Personally, I am confronting a very serious problem related to connections in steel structures; fracture in the welded joints. When the building members are of large section, their rupture and yielding may occur almost simultaneously due to factors associated with their shapes and dimensions. And, the distortion speed of structural members may become large due to the violent quake motions, causing brittle fracture. Consequently, we have now a serious fracture problem related to the shape and scale effect of steel members, and also the effect of the loading speed. In order to provide an accurate explanation of why such a fracture occurred in the earthquake, and what conditions can prevent dangerous rupture, transdisciplinary co-operative research projects are required, covering the metallurgy, fracture mechanics and structural engineering. In addition, we need world wide co-operation to solve this perplexing problem. Particularly, tight partnership with U.S. colleagues is essential, who have common problems after the Northridge earthquake.



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