

## FOREWORD

More than a year has passed, since the Hyogoken-nambu earthquake caused the great disaster in the Hanshin-Awaji area including a million city of Kobe. One of the most important lessons from the earthquake is the necessity of retrofitting of structures constructed before current seismic design codes enforced. Most of the seriously damaged buildings and houses were constructed before the building code revision in 1981, especially, constructed before 1971 code revision took, while new buildings and houses showed fairly good performance.

An importance to retrofit pre-code buildings has been pointed out since early 1970's. The building damage due to 1978 Miyagiken-oki earthquake and other earthquakes before Hyogoken-nambu earthquake indicated the existence of vulnerable buildings. However, less attention had been paid before the Kobe event. Buildings evaluated their seismic capacities and strengthened had been very limited. Such works had been done only for school buildings, city halls, hospitals in limited areas such as Shizuoka prefecture and Tokyo metropolitan area. Less done for privately owned buildings and buildings in other areas including Hanshin-Awaji area. After the Kobe, the importance of retrofitting vulnerable buildings and houses has been strongly recognized. It is a pity to say, but, the victims of more than 6,000 awoke the rest Japanese people. The law for promotion of retrofitting pre-code buildings and houses was enforced on December 25, 1995. Now, a lot of retrofitting works are going on in all over the country.

It is estimated that more than 3.6 million buildings and more than 14 million wooden houses were constructed before code revisions, and 10 to 20 % of them are vulnerable. It is a hard and a long way to strengthen all buildings and houses. However, it should be completed to mitigate disaster in future earthquakes.



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