

Translation of Seismic Intensities for Facilitating Civil Defense Activities (1) -Integration with the aseismic diagnostic test-

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1. Introduction

Recently Japan Central Disaster Prevention Council reported, after revising seismic source region of anticipating Tokai earthquake and due calculation, that the affected area by JMA seismic intensity 5 or more would be wider than that previously estimated. Stimulated by such warning, various kinds of countermeasures were turned to improvement in local disaster prevention in the Tokai area especially. Some of those are the encouragement for applying the aseismic diagnostic test of man-made structure and for dissemination seminars. So, the attention for earthquake protection in family level has apparently been increasing. However, reality is far from the target to acquire safety against earthquakes. The reason is simply that no body knows to what extent one should strengthen one's dwelling house.

In Shizuoka prefecture which locating closest to the epicenter, the situation is clear enough. Since the maximum seismic intensity they may suffer is estimated 6+ or higher on the JMA seismic intensity scale, they need to strengthen their houses so as to withstand against such violent shaking. In other areas where lesser seismic intensities may attack, it would be over protection and cost much to strengthen houses as if they are in Shizuoka prefecture.

At the dissemination seminar, audients used to give a question as [It's not clear that to what extent we have to prevent for anticipating seismic intensity in the area where we live] This question made us to start exploring better answer to them. One of the answers would be to provide a familiar guideline for household's level prevention in due consideration of probable seismic intensities. From this point of view, we started an examination.

2. Method

The essential points for getting familiar guideline are as follows.

i) First, the relation of seismic intensity to structural damage for dwelling houses is made clear. And, in parallel the relation of seismic intensity to the score of aseismic diagnostic test is elucidated.

ii) Then, the relation between the score of aseismic diagnostic test and structural damage of dwelling can be correlated as a function of seismic intensity.

iii) Finally, we can reveal, under a given seismic intensity, the damage status of a dwelling of which score of aseismic diagnostic test is known according to seismic intensity.

Regarding relations are from Okada's studies and data are from our field study in devastated area at Kobe earthquake.

We introduced 4 different strengthening statuses in intelligible terms for citizen. Those are as follows.

Minimum level target: no death or heavy injury

Second level target: no serious hindrance of living

Third level target: no leakage by rain

Fourth level target: no trouble for daily life

3. Pilot calculations

We performed some pilot calculations at a model area, urban cities along the JR-Chuo Line applying estimated seismic intensities due to a coupled event of Tokai and Tonankai earthquakes, which are proposed by Sugito et al.

We figured out the spatial distribution, in 500mX500m segmental unit, of the lower bound of score of aseismic diagnostic test for each of above-mentioned targets.

4. Conclusion

In this paper we attempted to paraphrase a technical word of seismic intensity so as easy to citizens while demonstrating 4 different living conditions. It was made by connecting the score of aseismic diagnostic test of dwelling houses. The result, though necessary to develop more, enables citizens to give more option at strengthening their houses and so to make easier from family economy.