12. CONCLUSIONS

The authors have described their site observations and information they have gathered during this investigation. Although this work is not so detailed, it is unique as an inter-disciplinary work of various disciplines of science and engineering such as geology, seismology, tectonics, geotechnical and earthquake engineering. This investigation was carried out to cover both engineering and scientific aspects of this earthquake.

The following conclusions may be drawn from this study:

- Although fault plane traces observed during site investigations are limited, they confirm the fault plane solutions given by several institutes.
- The seismic characteristics of this earthquake were generally consistent with empirical relations developed for Turkish earthquakes by Aydan et al. (1996) and Aydan & Hasgür (1997).
- Structural response analyses showed that buildings with 4-8 stories must had been subjected to very large earthquake loading if the empirical relation (Eq. 7.1) holds between the natural periods of structures and story number. Since similar type structural responses were observed in the Erzincan earthquake of March 13, 1992 and the Dinar earthquake of Oct. 1, 1995, the municipalities in Turkey must re-consider the allowable story number unless the building method of these structures is changed.

The causes of heavy damage to RC structures in this earthquake were:

(a) Poor workmanship,
(b) Poor quality of concrete,
(c) Lack of implementation of seismic codes in structural design,
(d) Use of fragile hollow bricks, and
(e) Resonance phenomenon due to ground conditions.

Masonry structures with stories less than 3 performed very well even they were founded on alluvial deposits if they were built with the appropriate use of RC slabs.

While many mosques had their minarets toppled, which were generally of masonry type, pylons were not damaged.

Three bridges suffered structural damage during the earthquake. However, the damage at Lokman Hekim Bridge was due to permanent displacement of ground

Wide-spread liquefaction and lateral spreading of ground were observed for a length of 50 km. The damage in Ceyhan town is thought to be due to the soil conditions prone to liquefaction.

Rock, soil slope and embankment failures were observed in many locations. Soil slope and embankment failures were associated with lateral spreading of ground as a result of liquefaction of the ground.

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