A STRUCTURAL VIEW OF CASUALTY ESTIMATION

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Attached to this paper as an Appendix is Section 6, "Damage Estimates," of the study entitled "Seismic Retrofitting Alternatives for San Francisco's Unreinforced Masonry Buildings. Estimates of Construction Cost and Seismic Damage." In order to compare retrofit alternatives, it was necessary to estimate damage for each alternative as well as casualties. Since a database of information about the 2,000 unreinforced masonry (URM) buildings was available, damage was estimated by computer on an individual building-by-building basis. Often, this may not be possible or feasible, but the parameters needed to estimated casualties would be the same in any case

Most of the parameters themselves are highly variable and cannot be predicted with certainty for any individual building. However, as more buildings are included in an inventory the values selected will become more representative. It has been estimated that, considering the process to estimate seismic damage, the coefficient of variance (considering random variation, not systematic errors) for a single building may be between .5 and 1.0, but with each 100 buildings added to the inventory, this coefficient will reduce by a factor of 10. So, if a relatively large number of buildings are considered, damage can be satisfactorily estimated, assuming the values selected for the parameters are accurate to begin with.

In order to calculate estimates of casualties that consider as many effective characteristics of the situation as possible, the parameters listed in Table 1 are needed. The major headings can be considered minimum data and the sub-items are important refinements.