Designation: E 2026 – 99

An American National Standard

Standard Guide for the Estimation of Building Damageability in Earthquakes[1]

This standard is issued under the fixed designation E 2026; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

Lenders, insurers and equity owners in real estate are giving more intense scrutiny to earthquake risk than ever before. The 1989 Loma Prieta earthquake, which caused more than $6 billion in damage, accelerated an already established trend for improved loss estimation in California; the 1994 Northridge event with over $20 billion in damage has completed the process—loss analysis is now an integral part of real estate financial decision making. Financial institutions are in need of specific and consistent measures of future damage loss for this decision process. The long used notion of "probable maximum loss" (PML) has become, for many, a catch phrase to encapsulate all earthquake issues into a simple number that can be used to qualify or disquality a potential commitment. Unfortunately, there has been no previous industry or professional consensus on what PML means or how it is computed. This guide presents specific approaches, which the real estate and technical communities can use to characterize the earthquake vulnerability of buildings. It recommends use of new terms, probable loss (PL), and scenario loss (SL) in the future to make specific the type of damageability measures used. Use of the term Probable Maximum Loss (PML) is not encouraged for future use.

Introduction
1. Scope
   1.1 Purpose
   1.2 Objectives
   1.3 Considerations beyond scope
   1.4 Organization of this guide
   1.5 Limitations
   1.6 Commentary
2. Terminology
   2.1 Definitions
   2.2 Commentary
3. Significance and Use
   3.1 Uses
   3.2 Principles
   3.3 Minimum reporting requirements
   3.4 Qualifications of the loss estimator
   3.5 Representation of seismic risk
   3.6 Projects comprised of multiple buildings
   3.7 Retrofit scheme development
   3.8 Use of computer assessment tools
   3.9 Additional services
   3.10 Independent peer review
   3.11 Commentary
4. Probabilistic ground motion hazard assessment
   4.1 Objective
   4.2 Levels of inquiry in probabilistic ground motion hazard assessment
   4.3 Level G0 inquiry
   4.4 Level G1 inquiry
   4.5 Level G2 inquiry
   4.6 Commentary
5. Building stability assessment
   5.1 Objective
   5.2 Levels of inquiry in building stability assessment
   5.3 Conclusions and findings
   5.4 Level BS0 inquiry
   5.5 Level BS1 inquiry
   5.6 Level BS2 inquiry
   5.7 Level BS3 inquiry
   5.8 Retrofit recommendations

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.