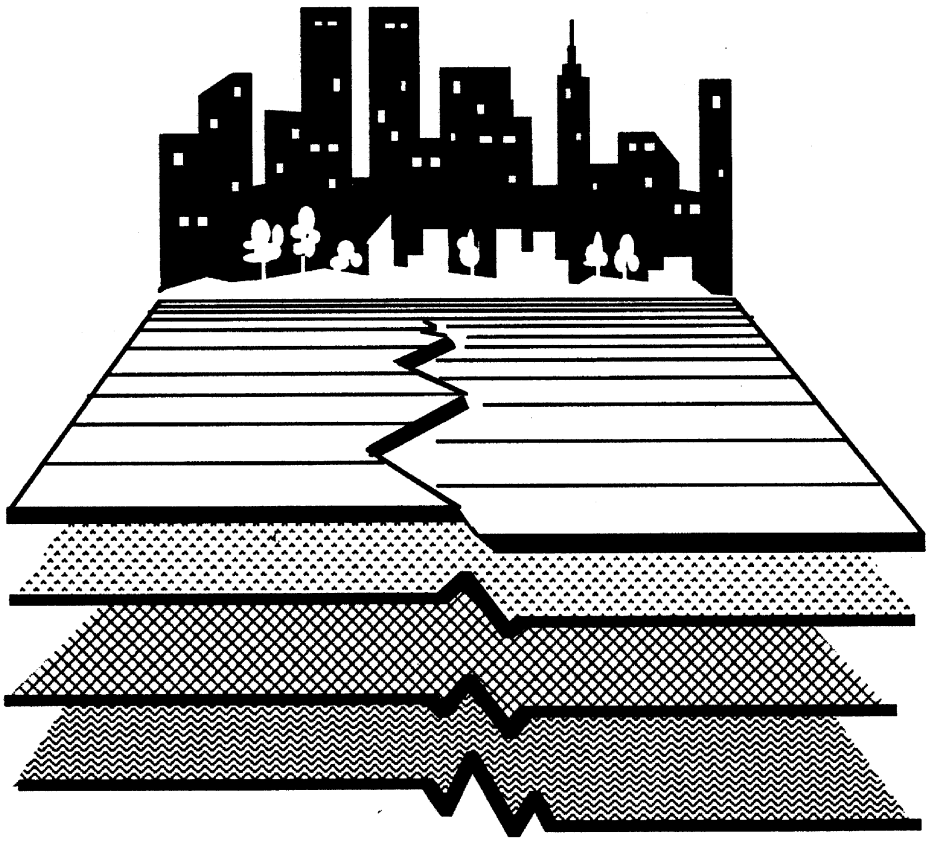
PRESTANDARD AND COMMENTARY FOR THE SEISMIC REHABILITATION OF BUILDINGS



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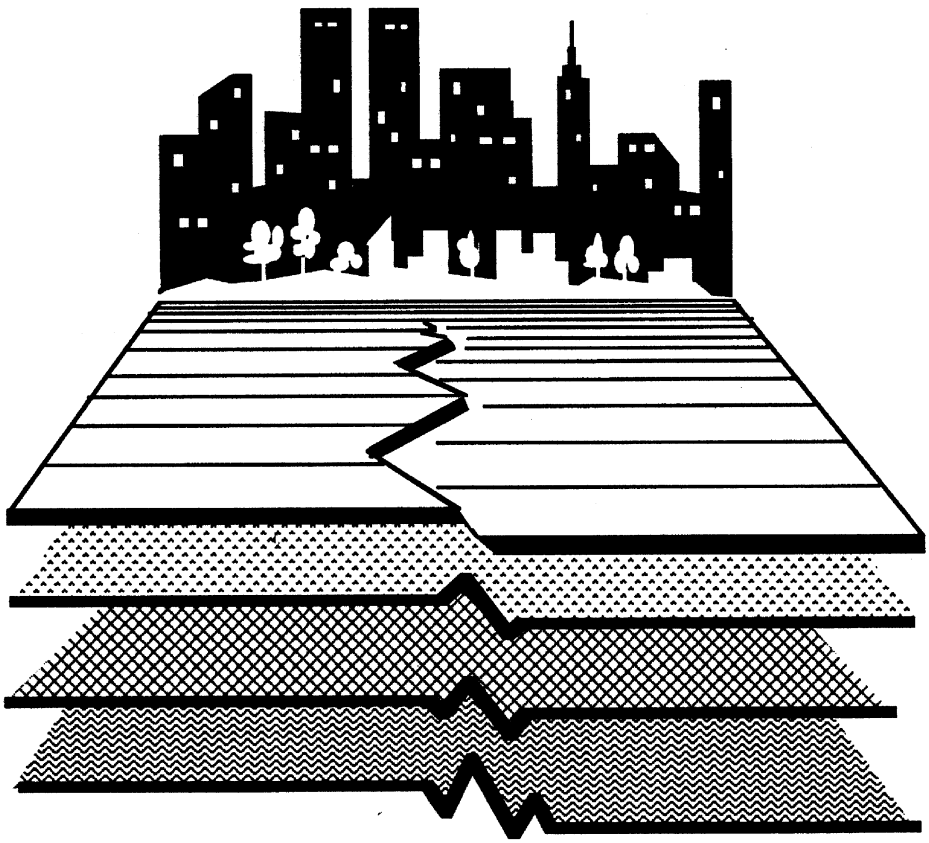

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PRESTANDARD AND COMMENTARY FOR THE SEISMIC REHABILITATION OF BUILDINGS

Prepared by
AMERICAN SOCIETY OF CIVIL ENGINEERS
Reston, Virginia

Prepared for
FEDERAL EMERGENCY MANAGEMENT AGENCY
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ASCE Standards Program and the Structural Engineering Institute

The Structural Engineering Institute (SEI) of the American Society of Civil Engineers (ASCE) was created in 1996 as a semi-autonomous organization within ASCE to focus on serving the needs of the broad structural engineering community. The mission of SEI is to advance the profession of structural engineering by enhancing and sharing knowledge, supporting research, and improving business and professional practices. SEI is comprised of three divisions: Technical Activities, Business and Professional Activities, and Codes and Standards Activities.

The standards activities of SEI operate under the umbrella of ASCE's standards program. ASCE has over 125,000 members worldwide. More than 7,000 of these members participate on over 500 technical committees, 44 of which are active Standards Committees that have resulted in over 30 published standards, to date. In addition to individual participation, ASCE's standards program actively encourages participation by representatives of affected organizations, thereby expanding the input into the standards developing process well beyond ASCE's 125,000 members to ensure a high level of exposure and participation.

ASCE's standards program, and hence SEI's activities, are governed by the Rules for Standards Committees (referred to herein as ASCE Rules). These Rules are reviewed and approved by the American National Standards Institute (ANSI), which accredits ASCE as a standards developing organization (SDO). Membership and participation in ASCE's standards program is open to both members and non-members of ASCE. Standards committees are required to publicize their activities through ASCE News and to distribute meeting agendas at least 30 days in advance, to afford all interested parties the opportunity to participate. To further extend beyond its membership, ASCE distributes press releases on new standards activities, and to announce when a standard progresses into the public ballot phase. ASCE's Public Relations Department maintains a list of over 400 civil engineering related publications, and it is common for 40 to 50 press releases to be distributed, thereby notifying and soliciting comments from several hundred thousand individuals.

An ASCE standards committee must have a minimum of 12 members, though, current committees range in size from 12 to over 200 members. To join a standards committee, an application must be completed which describes the individual's qualifications and interest in the respective subject. However, acceptance of an applicant is not based solely on technical qualifications. During the initial formation of a standards committee, membership is open to any interested party, provided they can demonstrate that they are directly or indirectly affected by the activity.

As the committee begins its work to bring the standard into suitable condition for balloting, the committee also must ensure that its membership is "balanced." ASCE Rules define a balanced committee and require that members be classified into one of three categories: Producer, Consumer, or General Interest. For standards of regulatory interest, a subclass of General Interest is established for Regulators. Each of the three categories must compose from 20 to 40 percent of the total committee membership. When the subclass of Regulators is established, they must compose 5 to 15 percent of the total membership.

Producers include representatives of manufacturers, distributors, developers, contractors and subcontractors, construction labor organizations, associations of these groups, and professional consultants to these groups. Consumers include representatives of owners, owner's organizations, designers, consultants retained by owners, testing laboratories retained by owners, and insurance companies serving owners. General Interest members include researchers from private, state and federal organizations, representatives of public interest groups, representatives of consumer organizations, and representatives of standards and model code organizations. Regulators include representatives of regulatory organizations at local, state, or federal levels of government.

Recognizing that committee members are volunteers whose time and travel budgets are limited, ASCE's Rules are designed to allow members to fully participate in the work of the standards committee without attending committee meetings. Responding in writing to letter ballots is a proven and effective means of participation.

ASCE's ANSI accreditation ensures that all standards developed for the civil engineering profession that are intended to become part of the laws which govern the profession have been developed through a process that is fully open, allows for the participation of all interested parties, and provides participants with due process. Standards resulting from this ANSI process are true national voluntary consensus standards which serve and benefit the general public.

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Foreword

The preparation of this prestandard was originally undertaken with two principal and complementary objectives. The first was to encourage the wider application of the *NEHRP Guidelines for the Seismic Rehabilitation of Buildings*, FEMA 273, by converting it into mandatory language. Design professionals and building officials thus would have at their disposal a more specific reference document for making buildings more resistant to earthquakes. This volume fully meets this first objective.

The second objective was to provide a basis for a nationally recognized, ANSI-approved standard that would further help in disseminating and incorporating the approaches and technology of the prestandard into the mainstream of design and construction practices in the United States. How successfully this volume achieves the second objective will become apparent with the passage of time, as this prestandard goes through the balloting process of the American Society of Civil Engineers.

Several additional related efforts were ongoing during the development of this prestandard. A concerted effort was made to gather any new information produced by these endeavors. Topics varied considerably, but typically covered approaches, methodologies, and criteria. Whenever an analysis of the new information disclosed significant advances or improvements in the state-of-the-practice, they were included in this volume. Thus, maintaining *FEMA 273* as a living document—a process to which FEMA is strongly committed—is continuing.

FEMA and the Project Officer are deeply thankful to the members of the Project Team and consultants, the Project Advisory Committee, and the staff of the American Society of Civil Engineers for their dedicated efforts in completing this prestandard, which is a significant addition to the bibliography on seismic safety of existing buildings.

The Federal Emergency Management Agency

Preface

The title of this document, FEMA 356 *Prestandard and Commentary for the Seismic Rehabilitation of Buildings,* incorporates a word that not all users may be familiar with. That word—prestandard—has a special meaning within the ASCE Standards Program in that it signifies the document has been accepted for use as the start of the formal standard development process, however, the document has yet to be fully processed as a voluntary consensus standard.

Users of this prestandard should be aware that the ASCE Standards Committee on Seismic Rehabilitation of Buildings is currently reviewing, discussing, and potentially revising the document prior to issuing it as a voluntary consensus standard. The Standards Committee, with over 150 members, has voted to accept this prestandard as the initial draft for their standard which, upon completion, will be suitable for adoption by building codes and inclusion in contracts. In early 2001, the Standards Committee will begin committee balloting on this document to be followed by an open public ballot period. The process the Standards Committee will follow will be in accordance with the ASCE Rules for Standards Committees. These rules have been approved by the ASCE Board of Direction and by the American National Standards Institute (ANSI). A copy of these rules may be found in the ASCE Official Register.

If you would like to participate in the formal standard development process either as a member of the Standards Committee or as part of the public ballot process, please contact ASCE's Standards Coordinator, Kim Brubaker, ASCE, 1801 Alexander Bell Drive, Reston, VA 20191.

American Society of Civil Engineers

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