

ATC-26-3

**U.S. Postal Service Field Manual:
Postearthquake Safety Evaluation of Buildings
(Interim)**

Prepared for

U.S. Postal Service
Facilities Department
Office of Design and Construction
Design Division
Washington, D.C.
Donald W. Evick, Program Manager

by

Applied Technology Council
555 Twin Dolphin Drive, Suite 550
Redwood City, California 94065

Adapted from ATC-20 by
FLUOR DANIEL, INC.
Irvine, California

PRINCIPAL
Christopher Rojahn

ATC BOARD CONTACT
Thomas Atkinson

PUBLICATIONS CONSULTANT
RDD Consultants, Inc.

PROJECT ENGINEERING PANEL
Joseph Nicoletti, Chair
Warner Howe
Charles Lindbergh
Rene Luft
Frank McClure
Richard Parmelee
Todd Perbix
Lawrence Reaveley
John Theiss

Preface

In 1989, the U.S. Postal Service (USPS), as part of a national emergency preparedness program, requested the Applied Technology Council (ATC), already under contract to USPS, to develop procedures for postdisaster safety evaluation of buildings. The procedures were to be based on those already developed for earthquakes in the ATC-20 report (ATC, 1985), which was written specifically for volunteer structural engineers and local building officials.

This ATC-26-3 report provides interim procedures and guidelines for determining if earthquake-damaged buildings can be safely occupied. The technical content of the ATC-20 report, originally developed for ATC by R.P. Gallagher Associates, Inc., has been modified to meet the needs of the U.S. Postal Service and to allow maximum postearthquake participation by U.S. Postal Service engineers and Facility Managers. Also included are recommended posting procedures and placards designed specifically for the USPS.

Fluor Daniel, Inc., an architect/engineer/construction firm with experience in the seismic evaluation of buildings, served as a primary ATC-26-3 project subcontractor. The research and engineering work was performed by Richard M. Drake and Philip J. Richter.

Members of the Project Engineering Panel who provided general review and guidance for the project were: Joseph Nicoletti (chair), Warner Howe, Charles Lindbergh, Rene Luft, Frank McClure, Richard Parmelee, Todd Perbix, Lawrence Reaveley, and John Theiss. Joann Dennett of RDD Consultants, Inc. served as Publications Consultant. The affiliations of these individuals are provided in Appendix A, which also includes a list of ATC-20 project participants.

ATC gratefully acknowledges the valuable direction and cooperation provided by Donald Evick, USPS Program Manager, and Les Hegyi, USPS Project Manager. ATC also acknowledges Ronald P.

Gallagher, who provided the rapid evaluation example, and the sponsors of the ATC-20 report: the California Governor's Office of Emergency Services (OES), the California Office of Statewide Health Planning and Development (OSHPD), and the Federal Emergency Management Agency (FEMA).

Christopher Rojahn—ATC Executive Director

Table of Contents

Preface	iii
1. Introduction	1
Purpose and Scope	1
Background	1
2. Overview of Building Safety Evaluation Procedures	3
Basic Building Safety Evaluation Techniques	3
Important Facilities	5
Right to Inspect	5
Posting Classification System	7
Posting and Barricading Procedures	7
Changing Posting Classification	9
Aftershocks	9
Use of Judgment Required	10
3. Initial Damage Report	13
Pre-Event Documentation	13
Initial Damage Report Criteria	13
Inspection Procedure	15
4. Rapid Evaluation Method	17
Rapid Evaluation Criteria	17
Inspection Procedures	18
5. Detailed Evaluation Method	25
Detailed Evaluation Criteria	25
When the Structural System is not Viewable	26
Posting Criteria	26
Inspection Procedure	27

6. Inspection and Posting of Wood Frame Structures	35
Dwellings and Small Buildings	35
Commercial, Institutional, and Industrial Structures	36
7. Inspection and Posting of Masonry Structures	43
8. Inspection and Posting of Tilt-up Structures	51
9. Inspection and Posting of Concrete Structures	57
10. Inspection and Posting of Steel Frame Structures	73
11. Inspection and Posting of Geotechnical Conditions	81
12. Inspection and Posting of Nonstructural Elements	87
Important Facilities—Operational Considerations	90
13. Engineering Evaluation Method	99
14. Human Factors Following Disasters	101
Dealing with the Public, Employees, and Owners of Damaged Property	101
Coping with Stress in the Field	102
15. Field Safety for Engineers	105
Safety in the Field	105
Hazardous Materials	105
Recognition of Hazardous Materials	106
Actions to be taken	106
Field Equipment	106
Appendix A: ATC Project Participants	109

Appendix B: Posting Placards	111
Appendix C: Example 1—Rapid Evaluation	115
Scenario	115
Damage Assessment.....	115
Appendix D: Example 2—Detailed Evaluation	123
Scenario	123
Damage Assessment.....	123
References	131
Illustration Credits	132