

FEMA Mitigation Publications

EARTHQUAKE

Publication Number

These publications are provided in support of the National Earthquake Hazards Reduction Program (NEHRP)

74 Reducing the Risk of Nonstructural Earthquake Damage: A Practical Guide (1994)

Practical information for owners, operators, and occupants of office and commercial buildings about the vulnerabilities posed by earthquake damage to nonstructural items and how to deal with these potential problems.

83 Seismic Considerations for Communities at Risk (1995)

A guide for local communities on how to determine if they are at risk from a seismic hazard and what steps to take to reduce that risk, including adopting and enforcing a suitable building code. (Revised version will be available in 2002)

84 Societal Implications: Selected Readings

This book of readings provides participants in the building process at the local, state, and regional levels with information on the most significant societal implications of adopting new or improved seismic regulations for new buildings. Included are papers on such topics as estimated impact of the NEHRP Recommended Provisions on design and construction costs, seismic hazards in various areas of the U.S., seismic safety codes, current seismic hazard mitigation practices and programs, and recent seismic safety policy research. Also contains an extensive bibliography, a list of information sources, and a glossary of terms.

88  Guidebook for Developing a School Earthquake Safety Program (January 1990)

Provides guidelines to assist the school community (principals, teachers, staff, and parents) in developing an earthquake safety program.

99 Improving Seismic Safety of New Buildings: A Non-Technical Explanation of NEHRP Provisions (1995)

Provides information for non-technical users to assist in assessing the seismic risk to their buildings and their community and to determine what mitigation actions can be taken to reduce the risk.

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Many of these publications are available on the FEMA website.

The website publications have a weblink button under the publication number. Click on the button to go directly to the website.

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- 140** **Guide to Application of the NEHRP Recommended Provisions in Earthquake-Resistant Building Design (1995)**
This guide introduces the concepts presented in the NEHRP Provisions and provides descriptive material that will foster use of the provisions. It is for design professionals, building regulatory officials, and researchers.
- 154** **Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook (1988)**
Detailed instructions for non-technical users to determine the seismic safety of buildings by conducting a 15-30 minute inspection, using a form to document building characteristics observable only from the outside. (Revised version to be ready by end of 2001)
- 155** **Rapid Visual Screening of Buildings for Potential Seismic Hazards: Supporting Documentation (1988)**
A set of documents explaining, in non-technical language, the methodology used to develop the above Handbook (FEMA 154). (Revised version to be ready by end of 2001)
- 156** **Typical Costs for Seismic Rehabilitation of Existing Buildings, Second Edition, Volume I - Summary (1994)**
An approach for estimating the cost of seismic rehabilitation of all types of buildings nationwide, based upon a sample of over 2000 actual projects. For design professionals, building inspectors, and building owners.
- 157** **Typical Costs for Seismic Rehabilitation of Existing Buildings, Second Edition, Volume II - Supporting Documentation (1995)**
Background information on the statistical methodology used in Volume I and guidance on how to calculate the range of uncertainty associated with costs. Forms for the calculations are also provided.
- 159** **Earthquake – A Teacher’s Package for K-6 (Tremor Troop)**
Curriculum for teachers to use for kindergarten through 6th grade classes.
- 172** **NEHRP Handbook of Techniques for the Seismic Rehabilitation of Existing Buildings (1992)**
A compendium of widely accepted techniques for the seismic structural and non-structural rehabilitation of a broad spectrum of buildings and components, primarily for the use of engineers.
- 173** **Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings: Supporting Report**
This Supporting Report includes additional information and commentary such as background documentation, annotated bibliographies, and reproductions of selected laws and ordinances. Presented in summary form in Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings: Handbook (FEMA-174).

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- 174** **Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings: Handbook**
This Handbook, together with FEMA-173, Supporting Report, provides the information needed to develop a seismic rehabilitation program, with particular reference to establishing priorities. The Handbook is intended to help local jurisdictions make informed decisions on rehabilitating seismically hazardous existing buildings by providing nationally applicable guidelines. It discusses the pertinent issues that merit consideration, both technical and societal, and suggests a procedure whereby these issues can be resolved.
- 178** **NEHRP Handbook for Seismic Evaluation of Existing Buildings (1992)**
A nationally applicable multi-step methodology that allows engineers to identify buildings or components that pose a life-safety risk in case of earthquakes. Used as a standard for evaluating seismic safety of Federal buildings in compliance with Executive Order 12941. FEMA-310 is the revised version of this handbook.
- 198** **Financial Incentives for Seismic Rehabilitation of Hazardous Buildings – An Agenda for Action - Volume 1: Findings, Conclusions, and Recommendations**
The intent of this document, together with Volume 2 (FEMA-199) and Volume 3 (FEMA-216), is to identify and describe the existing and potential regulatory and financial mechanisms and incentives for reducing risks posed by existing buildings in an earthquake. Volume 1 includes a discussion of the methodology used for these documents, background information on financial incentives, as well as findings, conclusions and recommendations for use by decision makers at local, state and national levels.
- 199** **Financial Incentives for Seismic Rehabilitation of Hazardous Buildings – An Agenda for Action - Volume 2: State and Local Case Studies and Recommendations**
The intent of this document, together with Volume 1 (FEMA-198) and Volume 3 (FEMA-216), is to identify and describe the existing and potential regulatory and financial mechanisms and incentives for lessening the risks posed by existing buildings in an earthquake. Volume 2 includes detailed descriptions of the twenty case studies that were examined as part of the project.
- 227** **Benefit-Cost Model for the Seismic Rehabilitation of Hazardous Buildings Volume 1: A User's Manual**
The two benefit-cost models presented in this report are designed to help evaluate the economic benefits and costs of seismic rehabilitation of existing hazardous buildings. The single class model analyzes groups of buildings with a single structural type, a single use, and a single set of economic assumptions. The multi-class model analyzes groups of buildings that may have several structural types and uses. The User's Manual presents background information on the development of the benefit-cost model and an introduction to the use of benefit/cost analysis in decision-making. It reviews the economic assumptions of benefit-cost models, with and without the value of life. The User's Manual guides the user through the model by presenting synopses of data entries required, example model results, and supporting information. Seven applications of the models are presented: five of the single-class model, two of the multi-class model (Note: Computer software to run the benefit/cost model is available on 3" diskettes and can be used on IBM compatible personal computers with at least 386 CPU. The computer must also have Windows and Quattro Pro).

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- 228** **Benefit-Cost Model for the Seismic Rehabilitation of Hazardous Buildings
Volume 2: Supporting Documentation**
Supporting Documentation complements the User's Manual (FEMA-227, Volume 1), by providing four appendices that help the user understand how benefit-cost models are constructed. The appendices include: 1) a review of relevant literature; 2) a section on estimating costs for seismic rehabilitation; 3) a compilation of tables for the Seattle building inventory; and 4) some insights into the building rehabilitation of the nine cities visited during this project (Note: Computer software to run the benefit/cost model is available on 3" diskettes and can be used on IBM compatible personal computers with at least 386 CPU. The computer must also have Windows and Quattro Pro).
- 232** **Home Builders Guide for Earthquake Design**
This guide provides details to home builders and owners to ensure that homes include structural features that resist earthquake forces.
- 233** **Earthquake Resistant Construction of Gas and Liquid Fuel Pipeline Systems Serving, or Regulated by, the Federal Government**
This publication reviews past performance of gas and liquid fuel pipeline systems in earthquakes, and provides available standards and technologies that can protect these facilities against future earthquake damage. It also provides an overview of federal mitigation measures that have been taken to protect pipeline systems.
- 237** **Development of Guidelines for Seismic Rehabilitation of Buildings — Phase 1: Issues Identification and Resolution**
This report was intended to assist in the preparation of Guidelines for the Seismic Rehabilitation of Existing Buildings. The report identifies and analyzes issues that might impact the preparation of the Guidelines and offers alternative and recommended solutions to facilitate their development and implementation. Also discussed are issues concerned with the scope, implementation, and format of the Guidelines, as well as coordination efforts, and legal, political, social, and economic aspects. In addition to issues concerning historic buildings, research and new technology, seismicity and mapping, engineering philosophy and goals are discussed. The report concludes with a presentation of issues concerned with the development of specific provisions for major structural and nonstructural elements.
- 240** **Earthquake Preparedness (What Every Childcare Provider Should Know) (April 1993)**
 Provides information to childcare providers to prepare for an earthquake. Provides tips for preparing an emergency and disaster plan.
- 241** **Identification and Reduction of Nonstructural Earthquake Hazards (For Schools) (July 1993)**
 This publication is intended for school property managers to use in identifying nonstructural hazards and what actions they can take to reduce these hazards.
- 253** **Seismic Sleuths – Earthquake Curriculum for 7-12 graders**
Curriculum supplement for teachers to use for 7th through 12th grade students.

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- 255** **Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model Volume 1: A User's Manual**
This User's Manual and accompanying software present a second-generation cost-benefit model for the seismic rehabilitation of federal and other government buildings. Intended for facility managers, design professionals, and others involved in decision making, the cost/benefit methodology provides estimates of the benefits (avoided damages, avoided losses, and avoided casualties) of seismic rehabilitation, as well as estimates of the costs necessary to implement the rehabilitation. The methodology also generates detailed scenario estimates of damages, losses, and casualties. The Manual describes the computer hardware and software required to run the program. It also explains how to install the program, how to use Quattro Pro for Windows, and how to enter necessary data. A tutorial provides a fully worked example. Benefit/Cost analyses of eight federal buildings are included (Note: Computer software to run the benefit/cost model is available on 3" diskettes and can be used on IBM compatible personal computers with at least 386 CPU. The computer must also have Windows and Quattro Pro).
- 256** **Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model Volume 2: Supporting Documentation Prepared for FEMA by VSP Associates, Inc: Sacramento, CA, 1994**
This Supporting Documentation contains background information for the User's Manual, including information on valuing public sector services, discount rates and multipliers, the dollar value of human life, and technical issues that affect benefit/cost analysis, such as seismic risk assessment and sensitivity analysis (Note: Computer software to run the benefit/cost model is available on 3" diskettes and can be used on IBM compatible personal computers with at least 386 CPU. The computer must also have Windows and Quattro Pro).
- 267** **Interim Guidelines Evaluation, Repair, Modification, and Design of Welded Steel Moment Frame Structures**
Provides interim (pending completion of SAC Steel Building Project) recommendations for design professionals and building regulatory officials on methods to design and construct or evaluate, inspect, and repair new and existing welded steel moment frame buildings. These buildings or structures are the type that did not perform as well as expected in the Northridge Earthquake.
- 273** **Guidelines for Seismic Rehabilitation of Buildings**
First-of-its-kind, performance-based, nationally-applicable, consensus-approved set of technical criteria on how to seismically rehabilitate existing buildings. Includes new approaches, analytical methods, and acceptance criteria for all building materials. For use by design professionals, building regulatory personnel, building owners, and researchers. (Superseded by FEMA-356 for design and construction purposes; use FEMA-273 for research purposes only)
- 274** **Commentary on the NEHRP Guidelines for the Seismic Rehabilitation of Buildings**
Provides technical background, supplementary information and related data to help users apply the Guidelines for Seismic Rehabilitation of Buildings. (FEMA-272)

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- 275** **Planning for Seismic Rehabilitation: Societal Issues**
Provides information and examples of different community efforts to reduce the risks presented by existing buildings.
- 276** **Example Applications of the NEHRP Guidelines for the Seismic Rehabilitation of Buildings**
This volume discusses and illustrates the process for applying the Guidelines (FEMA-273) through the use of real building examples taken from around the United States. Organized around a wide variety of typical building types, the volume presents descriptions of actual buildings that have been seismically rehabilitated. For each building type, there is a description of the characteristic structural system, a listing of typical seismic deficiencies commonly observed, corresponding suggested rehabilitation measures, and a tabulation of typical costs of seismic rehabilitation for that building type. Each building type is illustrated by at least two examples of real structures (one in a region of high earthquake risk, the other in moderate or low risk) that have undergone seismic rehabilitation. These mini-case studies include a photograph of the building, present a list of actual deficiencies found, and describe the rehabilitation scheme that was developed to correct the deficiencies. Several historic buildings, and examples using innovative technologies such as seismic isolation, energy dissipation, and seismic dampers, are included in the case studies. For each major construction material (steel, concrete, wood and masonry), one building is presented with example calculations for a FEMA-273 analysis. These calculations provide a detailed, step-by-step illustration of all of the key procedures contained in FEMA-273.
- 306** **Evaluation of Earthquake-Damaged Concrete and Masonry Wall Buildings, Basic Procedures Manual**
This document provides practical criteria and guidance for evaluating earthquake damage to concrete and masonry wall buildings. Component Damage Classification Guides and Test and Investigation Guides are included. Detailed drawings accompany the text.
- 307** **Evaluation of Earthquake Damaged Concrete and Masonry Wall Buildings, Technical Resources**
This document provides background and theoretical information to be used in conjunction with the guidelines given in FEMA 306. Relevant analytical and experimental findings are included, as well as additional background information on the Component Damage Classification Guides.
- 308** **The Repair of Earthquake-Damaged Concrete and Masonry Wall Buildings**
Intended for design engineers, building owners, building officials, insurance adjusters, and government agencies, this document provides practical guidance for the repair and upgrading of earthquake-damaged concrete and masonry wall buildings. The publication contains sections on performance-based repair design, repair technologies, categories of repair, and nonstructural considerations. The last section includes Repair Guides, which provide outline specifications for typical repair procedures.

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- 310 Handbook for the Seismic Evaluation of Buildings: A Pre-Standard**
An improved and updated version of FEMA 178 (q.v.), for engineers, that incorporates advances in technology, information derived from recent earthquakes, higher than life-safety performance levels, and a three-tiered approach.
- 315 Seismic Rehabilitation of Buildings: Strategic Plan 2005**
In addition to providing a discussion of the mission, history, and previous results of FEMA's Existing Building Program (EBP), this publication provides four objectives and 25 tasks to be carried out through the EBP in the years to come. The four objectives are to: 1) promote seismic rehabilitation and advance the implementation of previously developed materials; 2) monitor the use of and refine existing materials; 3) develop new seismic rehabilitation tools; and 4) consider new program directions for the EBP. Estimated costs for the next 10-15 years and guidelines for plan implementation are also included. The Plan broadens the EBP's original goal by emphasizing the protection of the nation's economy by limiting fatalities, life-threatening injuries, as well as property and economic losses from earthquakes by increasing the number of seismically resistant buildings in all areas of identified earthquake risk. This publication is expected to provide FEMA managers with guidance on the conduct of the EBP program in the years to come and takes the EBP to a new threshold: implementation through support of commitments to seismic rehabilitation in the United States.
- 318 Existing School Buildings: Incremental Seismic Retrofit Opportunities (1995)**
Provides technical guidance to school district facility managers for linking specific incremental seismic retrofit opportunities to specific maintenance and capital improvement projects. Users of the document will typically: (1) identify a maintenance/capital improvement project about to be planned or undertaken and go to the applicable matrix or matrices; (2) identify the building types in which the project will be undertaken and note all the applicable seismic retrofit opportunities; (3) review the applicable retrofit measure descriptions provided and incorporate some or all of the applicable measures; and (4) use risk analysis to help in prioritizing a large number of applicable retrofit measures.
- 343 Case Studies: An Assessment of the NEHRP Guidelines for the Seismic Rehabilitation of Buildings**
This document analyzes the fundamentals and usefulness of the NEHRP Guidelines for the Seismic Rehabilitation of Buildings and its companion Commentary (FEMA 273/274). The text is divided into the following sections: background and conduct of the case studies project; summary of key findings; guidelines usability; guidelines technical adequacy; and design and construction costs. Brief descriptions of case studies are included in the text, as well as recommendations for improvements and further research.
- 356 Prestandard and Commentary for the Seismic Rehabilitation of Buildings**
This is the successor document to FEMA-273. Using the same performance-based and nationally applicable basic concepts, approaches, and methodologies, this document converts FEMA-273 into mandatory language and brings it up to date to reflect lessons learned from recent earthquakes and results of new research and other studies. The Standards Committee of the American Society of Civil Engineers is processing this document with the objective of developing an American National Standards Institute (ANSI) approved standard.

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357 Global Topics Report on the Prestandard and Commentary for the Seismic Rehabilitation of Buildings

This document is a complete record of the changes and reasons for the changes that were made in converting FEMA-273 into FEMA-356. As such, it is a reference document.

366 HAZUS®99 Estimated Annualized Earthquake Losses for the United States

This loss study is an important milestone in a long-term, FEMA-led effort to analyze and compare the seismic risk across regions in the U.S. and supports the mission of the NEHRP – to develop and promote knowledge and mitigation practices and policies that reduce fatalities, injuries, and economic and other expected losses from earthquakes.

368 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, 2000 edition, Part 1: Provisions

This document, for building professionals, presents criteria for earthquake resistant design and construction.

368 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, 2000 edition, Part 2: Commentary

This commentary provides background and supporting information for the Part 1: Provisions document.



Seismic Retrofitting of Non-Structural Elements: Lighting in the Los Angeles Unified School District Report on Costs and Benefits of Natural Hazard Mitigation (1997)

Along with the structural modification of buildings, there are many non-structural measures that can be taken to protect people and property from seismic hazards. The suspended lighting retrofit project for the Los Angeles Unified School District that was initiated after the Northridge Earthquake disaster provides one such example.

Facilities Management of Existing School Buildings: Two Models (1994)

This document presents two models that offer ways a school district administration, regardless of size, may improve earthquake safety for its existing buildings. Model A is intended for districts in which facilities planning is mainly reactive, and crisis management is practiced. Model B is for districts in which facilities planning is a proactive function within an overall facilities management process.

FLOOD

15 Design Guidelines for Flood Damage Reduction

Provides information to design professionals and state and local building officials on how to design flood damage resistant buildings.

37 Flood Insurance Study Guidelines and Specifications for Study Contractors (January 1999)



Guidelines to define policies and procedures for the preparation of FISs, re-studies, and LMMP projects.

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- 54** **Elevated Residential Structures**
Provides information to design professionals and state and local building officials on how to elevate residential buildings to reduce flood damages.
- 55** **Coastal Construction Manual**
Provides information to design professionals and state and local building officials on how to design and construct coastal buildings to resist hurricane-related damage.
- 85** **Manufactured Home Installation in Flood Hazard Areas**
Provides information to design professionals, state and local building officials, and manufactured home installers on how to install manufactured homes in flood hazard areas to resist flood damages.
- 102** **Floodproofing Non-Residential Structures**
Provides information to design professionals and state and local building officials on how to design and construct dry flood-proofed, non-residential buildings.
- 114** **Design Manual for Retrofitting Flood-prone Residential Structures (September 1986)**
Provides information to design professionals, homeowners and state and local building officials on how to retrofit flood-prone residential buildings.
- 116** **Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials**
Provides information to state and local officials on how to reduce flood related losses.
- 165** **Alluvial Fans: Hazards and Management**
Provides information to design professionals and state and local building officials on how to mitigate flood damages on alluvial fans.
- 186** **Mandatory Purchase of Flood Insurance Guidelines (May 1997)**
The 1994 National Flood Insurance Reform Act imposes significant new obligations on lenders and their servicers. These guidelines are intended to supplement, not replace, a review of the applicable statutes and regulations.
- 213** **Answers to Questions About Substantially Damaged Buildings (March 1991)**
Provides information to homeowners and state and local floodplain management officials on how to properly determine if a building is substantially damaged in accordance with National Flood Insurance Program regulations.
- 234** **Repairing Your Flooded Home (Joint FEMA - American Red Cross publication)**
Provides information to building owners and state and local officials on how to repair flood-damaged buildings.
- 257** **Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas**
Provides an overview of the state-of-the-art mitigation measures for coastal flood and erosion hazards.

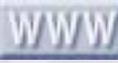
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- 258** **Guide to Flood Maps**
Provides information on how to properly use FEMA Flood Insurance Rate Maps.
- 259** **Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings**
Provides engineering design and economic guidelines to engineers, architects, and local code officials about what constitutes technically feasible and cost-effective retrofitting measures for flood prone residential structures. It focuses on retrofitting one to four family residences subject to flooding situations without wave actions.
- 265** **Managing Floodplain Development in Approximate Zone A Areas: A Guide for Obtaining and Developing Base (100-year) Flood Elevations (July 1995)**
 Provides guidance for community officials, property owners, developers, surveyors, and engineers who may need to determine Base (100-year) Flood Elevations (BFEs) in special flood hazard areas designated as Approximate Zone A on the FEMA Flood Insurance Rate Maps.
- 281** **Hurricane Opal: Building Performance Assessment Report**
Provides information to designers and state and local officials on how to reduce flood related losses based on lessons learned from Hurricane Opal.
- 290** **Hurricane Fran in North Carolina: Building Performance Assessment Report**
Provides information to designers and state and local officials on how to reduce flood related losses based on lessons learned from Hurricane Fran.
- 311** **Guidance on Estimating Substantial Damage**
Provides detailed information to state and local floodplain managers about how to calculate substantial damage in accordance with the National Flood Insurance Program regulations (includes software that performs necessary calculations).
- 312** **Homeowner's Guide to Retrofitting: Six Ways to Protect Your House From Flooding (June 1998)**
 Provides information on how to protect homes from flooding.
- 317** **Property Acquisition Handbook for Local Communities**
 Helps local communities through the property acquisition process – from making a buyout decision to managing and maintaining acquired open space.
- 347** **Above the Flood: Elevating Your Floodprone House (May 2000)**
 This new publication is intended for builders, code officials and homeowners. Includes recommendations for Using Future Conditions Hydrology for the National Flood Insurance Program. For this study, the advantages and disadvantages of several options were explored. It recommends FEMA incorporate future conditions data prepared by the communities into NFIP maps for regulatory and insurance purposes, with reduced insurance rates within the future conditions floodplain.

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- 348** **Protecting Building Utilities From Flood Damage – Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems (November 1999)**
 This manual discusses flood protective design and construction for utility systems in new buildings and modifications to utility systems in existing buildings.
- FIA-12** **A Guide For Community Officials – Appeals, Revisions, and Amendments to National Flood Insurance Program Maps (December 1993)**
This guide provides basic information about the technical standards to be applied and the administrative procedures to be followed by local officials and others who request changes to FEMA Flood Insurance Rate Maps.
- FIA-15** **National Flood Insurance Program Community Rating System Manual**
The Community Rating System, part of the National Flood Insurance Program, helps reduce the cost of flood insurance for those communities using floodplain management practices. This is a guide for any community looking for ways to reduce flood losses.
- FIA-20** **Converting the National Flood Insurance Program to the North American Vertical Datum of 1988 (June 1992)**
The National Geodetic Survey has determined that it is necessary to adjust the national vertical control network. To remain in agreement with the national standard, FIA will be converting its products to the North American Vertical Datum of 1988.
- FIA-22** **Building Performance: Hurricane Andrew in Florida**
Provides information to professional designers and state and local officials on how to reduce flood and high wind related losses based on lessons learned from Hurricane Andrew.
- FIA-23** **Building Performance: Hurricane Iniki in Hawaii**
Provides information to professional designers and state and local officials on how to reduce flood and high wind related losses based on lessons learned from Hurricane Iniki.
- FIA-TB-0** **Technical Bulletins: User's Guide with Key Word and Subject Index (September 1999)**
Provides information on how to obtain and use NFIP bulletins.
- FIA-TB-1** **Technical Bulletin 1: Openings in Foundation Walls (April 1993)**
Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to design and install openings in foundations to reduce flood damages.
- FIA-TB-2** **Technical Bulletin 2: Flood-Resistant Materials Requirements (April 1993)**
Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to use flood damage resistant materials.

FEMA Mitigation Publications

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FIA-TB-3 Technical Bulletin 3: Non-Residential Floodproofing - Requirements and Certification (April 1993)

Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to design and construct dry flood-proofing for non-residential buildings.

FIA-TB-4 Technical Bulletin 4: Elevator Installation (April 1993)

Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to design and install elevators to reduce flood damages.

FIA-TB-5 Technical Bulletin 5: Free-of-Obstruction Requirements (April 1993)

Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials about how to design coastal building foundations to reduce flood damages.

FIA-TB-6 Technical Bulletin 6: Below-Grade Parking Requirements (April 1993)

Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to design and construct below grade parking that does not increase flood damages.

FIA-TB-7 Technical Bulletin 7: Wet Floodproofing Requirements (December 1993)

Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to design and install wet flood-proofing to reduce flood damages.

FIA-TB-8 Technical Bulletin 8: Corrosion Protection for Metal Connectors in Coastal Areas (August 1996)

Provides guidance on the need for, selection of, and use of corrosion-resistant metal connectors for the construction of buildings in coastal areas.

FIA-TB-9 Technical Bulletin 9: Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings (September 1999)

A guide to the NFIP regulations for the design and construction of breakaway walls beneath elevated buildings in Coastal High Hazard Areas (Zones V, VE, and V1-V30).

I-98 (Flood) Bulletin: Use of Flood Insurance Study (FIS) Data as Available Data



A guide for the use of FEMA draft or preliminary FIS data as "available data" for floodplain development.

L-153 Retrofitting Flood-prone Residential Structures (Brochure)

Provides basic information on retrofitting flood prone residential buildings.

L-198 After a Flood: The First Steps (brochure)

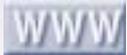
Provide basic information for homeowners on how to recover from a flood.

Publication Number

FF 81-65 Floodproofing for Non-Residential Structures

Provides basic information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to dry floodproof non-residential buildings to reduce flood damages.

Student Manual for the Independent Study Course #9, Managing Floodplain Development Through the NFIP (August 1999)



This student manual from the Independent Study #9 has been provided in the Mitigation Library as a study tool for the Association of State Flood Plain Managers (ASFPM) Certified Floodplain Manager Exam.

The President's Long-Term Recovery Action Plan for the 1997-1998 Florida Winter Storms (May 1998)

In 1998, the President activated the Long-Term Recovery Task Force under the Direction of FEMA because of flooding and severe wind damage from a series of storms in virtually every county of Florida. The Action Plan, developed by the Task Force, provides direction on the recovery effort for Federal departments and agencies, based on identified local and state needs. It also includes a chapter describing the state's three-tiered planning system that facilitates the development and implementation of local mitigation strategies, as well as an appendix documenting the success of mitigation measures taken after previous storms.

The President's Long-Term Recovery Action Plan for the March 1998 Alabama Floods (April 1998)

The President's Long-Term Recovery Action Plan for the March 1998 Georgia Floods (April 1998)

In March 1998, the President activated the Long-Term Recovery Task Force under the Direction of FEMA because of widespread flooding from severe storms across the states of Alabama and Georgia. The Action Plans developed by the Task Force provide direction on the recovery effort for Federal departments and agencies, based on identified local and state needs. It includes a chapter for local officials on community actions to reduce future vulnerability to flooding and an appendix documenting the success of mitigation measures taken after previous floods.

Federal Programs Offering Non-Structural Flood Recovery and Floodplain Management Alternatives, Executive Office of the President (June 1998)



The goal of this handbook is to provide information to local officials and other interested parties about Federal programs that support a non-structural approach to floodplain management.

Repairing Your Flooded Home

A poster on repairing your flooded home.

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Property Acquisition Handbook for Local Communities

A comprehensive, step-by-step guide for local communities interested in acquiring flood-prone properties.



Interim Guidance For State and Local Officials - Increased Cost of Compliance Coverage (September 1997)

Provides information on the increased cost of compliance coverage under the National Flood Insurance Program and how it relates to a community's administration of floodplain management laws and ordinances following a flood.

Guide For Preparing Technical Support Data Notebook

This engineering study data package provides guidelines and specifications for study contractors.

Assessment of Structural Flood-Control Measures on Alluvial Fans (October 1993)

This report was prepared in 1993 by the U.S. Army Corps of Engineers at FEMA's request.



Technical Mapping Advisory Council 1999 Annual Report (January 31, 2000)

Congress passed the National Flood Insurance Reform Act in 1994 directing FEMA to establish the Technical Mapping Advisory Council to recommend ways to improve Flood Insurance Rate Maps and the mapping process.



Modernizing FEMA's Flood Hazard Mapping Program: Map Modernization Program Progress Reports (September 1999)

FEMA developed a plan in 1997 to modernize the FEMA flood-mapping program. This is the September 1999 progress report on that effort.



Guidelines for Determining Flood Hazards on Alluvial Fans (February 23, 2000)

This document provides an approach that considers site-specific conditions in the identification and mapping of flood hazards on alluvial fans.



Riverine Erosion Hazard Areas, Mapping Feasibility Study (September 1999)

This study addresses requirements in the National Flood Insurance Reform Act of September 1994 to determine whether it is technologically feasible to map riverine erosion hazard areas.



Evaluation of Erosion Hazards (April 2000)

The report, required by the National Flood Insurance Reform Act of 1994, addresses perceived deficiencies of the National Flood Insurance Program and its treatment of long-term coastal erosion. The report was conducted by a private, independent entity. It recommends that FEMA map coastal erosion hazard areas and include the cost of expected erosion losses when setting flood insurance rates along the coast.

Cooperating Technical Communities Guidance Document (July 1999)

This guide is for regional, state and local agencies considering whether to become a Cooperating Technical Community partner with FEMA.

FEMA Mitigation Publications

Publication Number

Cooperating Technical Community Questions and Answers (July 1999)

This document provides answers to frequently asked questions about the Cooperating Technical Communities initiative.

Guidelines and Specifications for Flood Map Production Coordination Contractors, Final Draft (February 17, 1999)

These guidelines define the technical requirements, coordination and documentation activities, and product specifications for Flood Map Production Coordination Contractor functions in support of FEMA and the National Flood Insurance Program.

Base Map Specifications for the New Digital Flood Insurance Rate Map Product (May 26, 1999)

In accordance with the map modernization objectives, FEMA has developed base map specifications for a new Digital Flood Insurance Rate Map.

Cooperative Technical Partners (CTP) Website

The CTP initiative is an innovative program to create partnerships between FEMA and NFIP communities, regional agencies and State agencies that have the interest and technical capability to become more active participants in the FEMA Flood Hazard Mapping process. For more information, please go to www.fema.gov/mit/tsd/CTP_main.htm, where you'll find frequently asked questions, guidance information for prospective partners, CTP news by state, success stories, and other useful information.

Hurricane and Wind

22 Building Performance: Hurricane Andrew Against the Wind

A guide for homeowners to improve their home's survival against high winds. Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to reduce flood and high wind losses based on lessons learned from Hurricane Andrew.

23 Building Performance: Hurricane Iniki in Hawaii

Provides information to professional designers and state and local land use, floodplain management, zoning, and building officials on how to reduce flood and high wind related losses based on lessons learned from Hurricane Iniki.

FEMA Mitigation Publications

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- 320** **Taking Shelter From The Storm - Building a Safe Room Inside Your House (August 1999)**
An information and design guide for homeowners and builders on constructing in-house Safe Rooms for protection from extreme wind hazards from tornadoes and hurricanes. The booklet includes:
- a homeowner risk assessment worksheet;
 - guidance for selecting a shelter design;
 - detailed construction plans for builders and contractors; and
 - cost estimates.
- 338** **Building Performance Assessment Team (BPAT) Report – Hurricane Georges in the Gulf Coast (March 1999)**
The BPAT process guides state and local governments through post-hurricane reconstruction and new construction to enhance future building design and construction.
- 339** **Building Performance Assessment Team (BPAT) Report – Hurricane Georges in Puerto Rico (March 1999)**
The BPAT process guides state and local governments through post-hurricane reconstruction and new construction to enhance future building design and construction.
- National Performance Criteria for Tornado Shelters (May 28, 1999)**
These performance criteria are to be used by design professionals, shelter manufacturers, building officials, and emergency management officials to ensure that shelters constructed in accordance with these criteria provide a consistently high level of protection.
- Against The Wind, Protecting Your Home From Hurricane Wind Damage**
This brochure discusses what you can do to protect your home from the next hurricane.
- Economic Impact Assessment of Hurricane Floyd for New Jersey (March 2000)**
This report, completed by the Commerce Department's Economic Development Administration at FEMA's request, provides a comprehensive assessment of the economic impact of Hurricane Floyd on the affected areas of New Jersey.
- Economic Impact Assessment of Hurricane Floyd for North Carolina (March 2000)**
This report, completed by the Commerce Department's Economic Development Administration at FEMA's request, provides a comprehensive assessment of the economic impact of Hurricane Floyd on the affected areas of North Carolina.

FEMA Mitigation Publications

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Economic Impact Assessment of Hurricane Floyd for Virginia (March 2000)

This report, completed by the Commerce Department's Economic Development Administration at FEMA's request, provides a comprehensive assessment of the economic impact of Hurricane Floyd on the affected areas of Virginia.

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[www](#)

Design and Construction Guidance for Community Shelters (July 2000)

This document is a guidance manual for engineers, architects, building officials, and prospective shelter owners. It presents important information about the design and construction of community shelters that will provide protection during tornado and hurricane events.

Tornadoes: Nature's Most Violent Storms

A Preparedness Guide Including Safety Information for Schools (1992)

This preparedness guide for schools explains the cause of tornadoes, provides diagrams of how they form, describes variations of tornadoes, and classifies tornadoes by strength. Maps and statistics are given for several outbreaks across the United States. The guide shows how weather radar provides information on developing storms. Maps and charts reveal the frequency of tornadoes and number of deaths caused by tornadoes in each state.

Tornado Protection: Selecting and Designing Safe Areas in Buildings (June 1990)

This brochure helps architects design facilities which protect against high winds from tornados and hurricanes. It provides information on tornado characteristics, including formation and damage intensity and also on the hazardous and protective elements of buildings. Case studies from three schools that were either partially or totally destroyed by tornadoes are highlighted.

Dam Safety

31 Safety of Non-federal Dams—A Review of the Federal Role, National Research Council (NRC), (Nov 1982)

The NRC organized the Committee on the Safety of Non-federal Dams, at the request of FEMA, to study issues related to the safety of non-federal dams. It's objective was to determine the proper role of the U.S. Government in enhancing the dam safety programs of individual states.

64 Emergency Action Planning Guidelines for Dams, Interagency Committee on Dam Safety (October 1998)

[www](#)

The general purpose of these guidelines is to encourage thorough, consistent emergency action planning to help save lives and reduce property damage in areas that would be affected by dam failure or operation.

Resources

FEMA Mitigation Publications

Publication Number

- 93** **Federal Guidelines for Dam Safety**
The overall purpose of these guidelines is to enhance national dam safety. The immediate objective is to encourage high safety standards in the practices and procedures Federal agencies use or require of those they regulate for dam site investigation, design, construction, operation and maintenance, and emergency preparedness. As these guidelines are directly applied to make Federal dams safe, it is hoped that they will also influence state dam safety agencies and public and private dam owners to be more safety conscious where programs are now weak.
- 94** **Federal Guidelines for Selecting and Accommodating Inflow Design Floods for Dams**
 Interagency Committee on Dam Safety. The purpose of these guidelines is to provide thorough and consistent procedures for selecting and accommodating Inflow Design Floods (IDFs). However, they are not intended to provide a complete manual of all procedures used for estimating inflow design floods; the selection of procedures is dependent upon available hydrologic data and individual watershed characteristics. An engineer experienced in hydrology and hydraulics should perform all studies. The studies should be directed and reviewed by engineers experienced in dam safety and should contain a summary of the design.
- 316** **Model State Dam Safety Program, Association of State Dam Safety Officials for FEMA**
In an effort to create a guide for state officials initiating or improving state programs, this "Model State Dam Safety Program" was developed originally in 1987 and amended in 1997 to reflect the experience of state programs. It outlines the key components of an effective dam safety program. It does not mirror any particular state program nor does it supplant any state's existing criteria. It can be used as a guide in the development of more effective and sustainable state programs that will ultimately eliminate the unnecessary risks created by unsafe dams.
- 333** **Federal Guidelines for Dam Safety: Hazard Potential Classification Systems for Dams (October 1998)**
Provides the most complete and authoritative statement available on the desired management practices for promoting dam safety and the welfare of the public.
- 334** **The National Dam Safety Program Act Implementation Plan, FEMA, Sept 1997**
Developed as part of FEMA's response to Public Law 104-303 to establish and maintain a coordinated dam safety program.
- 336** **1997 Update Report on Review of State Non-Federal Dam Safety Programs, Vol. II. Association of State Dam Safety Officials, Oct 1998.**
Progress Through Partnerships: The National Dam Safety Program in Fiscal Year 1998-1999 (December 1999)
 This is the biennial report to Congress on the progress and partnership of the National Dam Safety Program.

FEMA Mitigation Publications

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Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners (October 1998)

An Emergency Action Plan (EAP) is a formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to minimize property damage and loss of life.

[www](#)

Selecting and Accommodating Inflow Design Floods for Dams (October 1998)

The purpose of these Guidelines is to provide thorough and consistent procedures for selecting and accommodating Inflow Design Floods (IDFs). However, they are not intended to provide a complete manual of all procedures used for estimating inflow design floods; the selection of procedures is dependent upon available hydrologic data and individual watershed characteristics. All studies should be performed by an engineer experienced in hydrology and hydraulics, directed and reviewed by engineers experienced in dam safety, and should contain a summary of the design.

All Hazards

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Report on Costs and Benefits of Natural Hazard Mitigation

[www](#)

This publication reviews the types of benefits that can accrue to different segments of society from mitigative measures, the types of costs that can be incurred by undertaking the actions, and the types of analyses needed to evaluate the cost-effectiveness associated with the mitigation measures.

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Second Report on Costs and Benefits of Natural Hazard Mitigation

[www](#)

This second publication in the FEMA Success Stories Publication Series contains case studies that highlight businesses that have reduced their risks to natural hazards. The case studies also focus on how these businesses have benefited from substantial returns on their investments since taking their mitigation actions.

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Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability

Focuses on a vision of sustainable communities and shows communities how prevention planning pre- and post-disaster can serve as a catalyst for creating more sustainable communities throughout the nation.

Multi-Hazard Identification and Risk Assessment

FEMA initiated a research project to clarify and document previous efforts to identify natural and technological hazards, and to assess associated risks. This report summarizes the findings.

ERT Mitigation Operations Manual (March 2000)

Provides standardized operational procedures to assist FEMA staff and DAEs who may be assigned to locales other than their home regions. Describes the functions to be performed by mitigation field management and staff as integral parts of the total FEMA response to catastrophic disasters that may involve the activation of the National Emergency Response Team.

FEMA Mitigation Publications

Publication Number



Hazard Mitigation grant Program Desk Reference (October 1999)

Provides comprehensive information about FEMA's Hazard Mitigation Grant Program.

The Mitigation How To Series:

All files in the Mitigation How To Series are included in a separate section on this CD.



Acquisition/Relocation from Multiple Hazards: The Castaic School District in California. Report on Costs and Benefits of Natural Hazard Mitigation

Castaic Union School District, located in southern California, is a case study that demonstrates the threat from multiple hazards. After the 1994 Northridge Earthquake, Castaic Union School District conducted a study of the earthquake-related risks that threatened their elementary and middle schools, and administration buildings. The assessment revealed that earthquake-related structural damage was not the only risk the school district faced.

Resources

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