

Appendix E

WHERE TO GO FOR INFORMATION

INTRODUCTION

This appendix is designed to provide the concerned individual and community with additional sources of information on various topics. It begins with a list of national, regional, and federal government sources of information on seismology, seismic design and construction, seismic building code provisions, and disaster assistance. A list of publications on various subjects addressed in this book appears next following by a list of Internet information sources. Much information is best obtained at the local level; therefore, the reader is urged to contact local academic institutions and the local chapters of the various professional, materials, and building officials' organizations as well as the national and regional sources named here.

NATIONAL AND REGIONAL ORGANIZATIONS

American Concrete Institute

P.O. Box 19150/22400 W. Seven Mile Road
Detroit, Michigan 48219-1849
(313)532-2600

American Consulting Engineers Council

1015 15th Street, N.W., Suite 802
Washington, D.C. 20005
(202)347-7474

American Forest and Paper Association

1250 Connecticut Avenue, N.W., Suite 200
Washington, D.C. 20036
(202)463-2700

American Institute of Architects

1735 New York Avenue, N.W.
Washington, D.C. 20006
(202)626-7300

American Institute for Architectural Research

1735 New York Avenue, N.W.
Washington, D.C. 20006
(202)879-7750

American Institute of Steel Construction

1 East Wacker Drive, Suite 3100
Chicago, Illinois 60601-2001
(312)670-2400

American Insurance Association

1130 Connecticut Avenue, N.W., 10th Floor
Washington, D.C. 20036
(202)828-7100

American Insurance Services Group, Inc.

85 John Street
New York, New York 10038
(212)669-0400

American Iron and Steel Institute

671 Newcastle Road, Suite 1
Newcastle, California 95658-9702
(916)663-1989

American Planning Association

1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036-1997
(202)872-0611

American Plywood Association

7011 South 19th Street, Box 11700
Tacoma, Washington 98411-0700
(206)565-6600

American Public Works Association

Council of Emergency Management
1313 East 60th Street
Chicago, Illinois 60637
(312)667-2200

American Red Cross
National Office of Disaster Assistance
18th and E Streets, N.W.
Washington, D.C.
(202)857-3718

American Society of Civil Engineers
345 East 47th Street
New York, New York 10017
(212)705-7496

Applied Technology Council
555 Twin Dolphin Drive, Suite 550
Redwood City, California 94065
(415) 595-1542

Associated General Contractors of America
1957 E Street, N.W.
Washington, D.C. 20006
(202)393-2040

Association of Bay Area Governments
P.O. Box 2050
Oakland, California 94604
(510)464-7900
e-mail: jeanncp@abag.ca.gov

Association of Engineering Geologists
323 Boston Post Road, No. 2D
Sudbury, Massachusetts 01776
(617)443-4639

Association of Major City Building Officials
505 Huntmar Park Drive, Suite 210
Herndon, Virginia 22070
(703)437-0100

Association of the Wall and Ceiling Industries International
1600 Cameron Street
Alexandria, Virginia 22314-2705
(703)684-2924

Battelle Human Affairs Research Centers
4000 N.E. 41st Street
Seattle, Washington 98105
(206)525-3130

Brick Institute of America
11490 Commerce Park Drive, Suite 300
Reston, Virginia 22091-1532
(703)620-0010

Building Officials and Code Administrators International
4051 West Flossmoor Road
Country Club Hills, Illinois 60478-5795
(708)799-2300

Building Owners and Managers Association, International
1201 New York Avenue, N.W., Suite 300
Washington, D.C. 20005
(202)408-2662

Building Seismic Safety Council
1201 L Street, N.W., Suite 400
Washington, D.C. 20005
(202)289-7800
e-mail: cheider@nibs.org

Canadian National Committee on Earthquake Engineering
National Research Council of Canada
Division of Research Building
Ottawa, Ontario, Canada K1A 0R6
(416)996-5845

California Seismic Safety Commission
1900 K St., Suite 100
Sacramento, California 95814
(916)322-4917

Center for Earthquake Research and Information
Memphis State University
Memphis, Tennessee 38152
(901)678-2007
e-mail: stevens@ceri.memphis.edu

Center for Earthquake Studies
One University Plaza
Cape Girardeau, Missouri 63701-4700
(314)651-2000

Central U.S. Earthquake Consortium
2630 E. Holmes Road
Memphis, Tennessee 38118-8007
e-mail: cusec@ceri.memphis.edu

Concrete Masonry Association of California and Nevada
6060 Sunrise Vista Drive, Suite 1875
Citrus Heights, California 95610
(916)722-1700

Concrete Reinforcing Steel Institute
933 North Plum Grove Road
Shaumburg, Illinois 60173-4758
(312)517-1200

Council of American Building Officials
5205 Leesburg Pike, Suite 708
Falls Church, Virginia 22041
(703)931-4533

Earthquake Engineering Research Center
University of California at Berkeley
1301 South 46th Street
Richmond, California 94844-4698
(415)231-9403
e-mail: eerclub@berkeley.edu

Earthquake Engineering Research Institute

449 14th St., Suite 320
Oakland, California 94612-1902
(510)451-0905

Earthquake Engineering Research Library

California Institute of Technology
Mail Code 104-44
Pasadena, California 91125
(818)395-4227
e-mail: eerlib@caltech.edu

Insurance Information Institute

110 Williams Street, 24th Floor
New York, New York 10038
(212)669-9200

Insurance Institute for Property Loss Reduction

73 Tremont Street, Suite 510
Boston, Massachusetts 02108-3910
(617)722-0200

International City Management Association

777 N. Capitol St., N.E.
Washington, D.C. 20002-4201
(202)289-4262

International Conference of Building Officials

5360 South Workman Mill Road
Whittier, California 90601
(213)699-0541

Masonry Institute of America

2550 Beverly Boulevard
Los Angeles, California 90057
(213)388-0472

Metal Building Manufacturers Association

1230 Keith Building
Cleveland, Ohio 44115-2180
(216)241-7333

National Association of Independent Insurers

2600 River Road
Des Plaines, Illinois 60018
(708)297-7800

National Association of Home Builders

15th and M Streets, N.W.
Washington, D.C. 20005
(202)822-0200

National Center for Earthquake Engineering Research

c/o Science and Engineering Laboratory.
SUNY-Buffalo
342 Copen Hall
Buffalo, New York 14260
(716)636-3379
e-mail: nernceer@ubvms.cc.buffalo.udc

National Committee on Property Insurance

10 Winthrop Square
Boston, Massachusetts 02110
(617)423-4620

National Concrete Masonry Association

2302 Horse Pen Road
Herndon, Virginia 22070-0781
(703)435-4900

National Conference of States on Buildings Codes and Standards

505 Huntmar Park Drive, Suite 201
Herndon, Virginia 22070
(703)437-0100

National Coordinating Council on Emergency Management

7297 Lee Highway, Suite N
Falls Church, Virginia 22042
(703)533-7672

National Elevator Industry, Inc.

185 Bridge Plaza, North, Suite 310
Ft. Lee, New Jersey 07024
(201)944-3211

National Emergency Managers Association

c/o Executive Director, Commonwealth of
P.O. Box 59
Kentucky, Department of Military Affairs, Division of
Disaster and Emergency Services
Lexington, Kentucky 40501-0059
(502)564-8680

National Fire Sprinkler Association

Route 22 and Robin Hill Park, Box 1000
Patterson, New York 12563
(914)878-4200

National Institute of Building Sciences

1201 L Street, N.W., Suite 400
Washington, D.C. 20005
(202)289-7800

Natural Hazards Research and Applications Information Center

University of Colorado
Campus Box 482
Boulder, Colorado 80309-0482
(303)492-6818
e-mail: hazctr@colorado.edu

National Research Council Board on Natural Disasters

2101 Constitution Avenue, N.W., Room HA286
Washington, D.C. 20418
(202)334-1964
e-mail: cclarke@nas.edu

Portland Cement Association

5420 Old Orchard Road
Skokie, Illinois 60077
(312)966-6200

Precast/Prestressed Concrete Institute

175 West Jackson Boulevard, Suite 1859
Chicago, Illinois 60604
(312)786-0300

Rack Manufacturers Institute

8720 Red Oak Boulevard, Suite 201
Charlotte, North Carolina 28217
(704)522-8644

School Education Safety and Education Project

State Seismologist
Geophysics Department, AD-50
University of Washington
Seattle, Washington 98195
(206)545-7563

Seismological Society of America

201 Plaza Professional Building
El Cerrito, California 94530
(415)525-5474

Southern Building Code Congress International

900 Montclair Road
Birmingham, Alabama 35213
(205)591-1853

Steel Deck Institute, Inc.

P.O. Box 9506
Canton, Ohio 44711-9506
(216)493-7886

Steel Plate Fabricators Association, Inc.

2400 South Downing Avenue
Westchester, Illinois 60154-5102
(708)562-8750

Southeastern United States Seismic Safety Consortium

Department of Civil Engineering
The Citadel, The Military College of South Carolina
Charleston, South Carolina 29401
(803)792-7677

Southern California Earthquake Center

University of Southern California
University Park
Los Angeles, California 90089-0740
(213)740-5849
e-mail: jandrews@coda.usc.edu

The Masonry Society

2619 Spruce Street
Boulder, Colorado 80302
(303)939-9700

Western Seismic Safety Council

Washington State Department of Emergency Services
4220 East Martin Way
Olympia, Washington 98504
(206)459-9191

Western States Clay Products Association

9210 South, 5200 West
West Jordan, Utah 84084
(801)561-1471

Western States Seismic Policy Council

1995 Arizona Administrative Support Offices
Northern Arizona University
P.O. Box 4099
Flagstaff, Arizona 86011
(800)628-6754
e-mail: wsspc@vlshnu.glg.nau.edu

Utah Seismic Safety Commission

c/o Utah Geological Survey
2362 South Foothill Drive
Salt Lake City, Utah 84109
(801)467-7970

FEDERAL AGENCIES**Federal Emergency Management Agency**

Mitigation Directorate, Program Development
Branch
500 C Street, S.W.
Washington, D.C. 20472
(202)646-2794

Region I (Boston)
J. West McCormack Building, Room 442
Boston, Massachusetts 02109-4595
(617) 223-9540

Region II (New York)
26 Federal Plaza, Room 1338
New York, New York 10278-0002
(212) 255-7209

Region III (Philadelphia)
Liberty Square Building, 2nd Floor
105 S. Seventh Street
Philadelphia, Pennsylvania 19106-3316
(215) 931-5608

Region IV (Atlanta)
1371 Peachtree Street, N.E., Suite 700
Atlanta, Georgia 30309-3108
(404) 853-4200

Region V (Chicago)
175 West Jackson Boulevard, 4th Floor
Chicago, Illinois 60604-2698
(312) 408-5500

Region VI (Dallas)
Federal Regional Center, North Loop 288
Denton, Texas 76201-3698
(817) 898-5104

Region VII (Kansas City)
911 Walnut Street, Room 200
Kansas City, Missouri 64106
(816) 283-7061

Region VIII (Denver)
Denver Federal Center
Building 710, Box 25267
Denver, Colorado 80225-0267
(303) 235-4811

Region IX (San Francisco)
Building 105
Presidio of San Francisco
San Francisco, California 94129-1250
(414) 923-7100

Region X (Seattle)
Federal Regional Center
130 228th Street, S.W.
Bothell, Washington 98021-9796
(206) 487-4604

National Geophysical Data Center
National Oceanic and Atmospheric Administration
325 Broadway
Boulder, Colorado 80303
(303)497-6084

National Institute of Standards and Technology
Center for Building Technology
Room B168, Building 226
Gaithersburg, Maryland 20899
(301)975-5296
e-mail: dtodd@enh.nist.gov

National Science Foundation
Earthquake Systems
4201 Wilson Boulevard
Arlington, Virginia 22230
(703)306-1236
e-mail: Wanderso@nsf.gov

**U.S. Geological Survey, Office of Earthquakes,
Volcanoes and Engineering**

905 National Center, M.S.101
12201 Sunrise Valley Drive
Reston, Virginia 22092
(703)648-4000

345 Middlefield Road
Menlo Park, California 94025
(415)853-8300

USGS National Earthquake Information Center
Denver Federal Center
Mail Stop 966, Box 25046
Denver Federal Center
Denver, Colorado 80225
(303)236-1586

PUBLICATIONS

The Earthquake Problem in General

Bolt, B. A. 1992. *Earthquakes: a Primer*. San Francisco, California: W. H. Freeman and Company.

Gere, J. M., and Shah, H. C. 1984. *Terra Non Firma: Understanding and Preparing for Earthquakes*. Stanford, California: Stanford University Alumni Association.

These two books are the best general surveys of the earthquake problem and very easy to understand. Bolt's book emphasizes the seismological aspects and Gere and Shah emphasize engineering, but both are comprehensive.

Levy, M., and Salvadori, M. 1995. *Why the Earth Quakes*. New York: W. W. Norton and Company.

This is a good general up-to-date survey of the world's earthquake problem and how engineers are dealing with it. It has been written by two distinguished engineers with a gift for simple explanation of technical issues.

Steinbrugge, K. 1882. *Earthquakes, Volcanoes, and Tsunamis, an Anatomy of Hazards*. New York: Skandia American Group.

This is a detailed but readable summary of the earthquake problem in the United States by one of the leading earthquake engineers and researchers.

The Seismic Hazard in the United States

For the information needed to define a specific location's seismic situation, contact local academic institutions for geologists, geophysicists and seismologists, state geologists, regional offices of the USGS and FEMA, national earthquake information centers, and state and regional seismic safety organizations. Also see the following section on Internet resources.

Algermissen, S. T. 1984. *An Introduction to the Seismicity of the United States*. Oakland, California: Earthquake Engineering Research Institute.

Seismic Codes and Provisions

For information about the seismic building code provisions in effect in a specific location, contact local building officials. Additional information is available from the three national model code groups: the Building Officials and Code Administrators International, the International Conference of Building Officials, and the Southern Building Code Congress International.

Federal Emergency Management Agency/Building Seismic Safety Council. 1994. *NEHRP Recommended Provisions for Seismic Regulations for New Buildings*, 2 volumes and maps, Publications 222A and 223A. Washington, D.C.: FEMA.

This is the current edition of this resource document. It is reflected in the seismic provisions of the model building codes and in the American Society of Civil Engineers national load standard.

Harris, James R. 1992. "An Overview of Seismic Codes." *Civil Engineering Practice* (Fall).

This is an excellent summary of the basis of seismic codes and their historical evolution.

Seismic Design

American Institute for Architectural Research. 1994. *Buildings at Risk: Seismic Design Basics for Practicing Architects*. Washington, D.C.: American Institute for Architectural Research.

This is a self-study course on seismic design for architects, but it provides a good overview of the subject for anyone interested in buildings. The materials include a videotape and an accompanying publication.

Arnold, C., and Reitherman, R. 1982. *Building Configuration and Seismic Design*. New York: John Wiley and Sons.

This is a summary of seismic design from an architectural viewpoint with emphasis on architectural decision-making as a determinant of seismic performance. It also contains a clear nontechnical explanation of the nature of ground motion and how it affects buildings.

Federal Emergency Management Agency/Building Seismic Safety Council. 1995. *Guide to Application of the 1991 NEHRP Recommended Provisions in Earthquake-Resistant Design of Buildings*, Publication 140. Washington, D.C.: FEMA.

This companion document to the 1991 Edition of the *NEHRP Recommended Provisions* is used in courses on application of the provisions requirements.

Federal Emergency Management Agency/Building Seismic Safety Council. 1995. *A Nontechnical Explanation of the 1994 NEHRP Recommended Provisions*, Publication 99. Washington, D.C.: FEMA.

An introduction to the current edition of the *Provisions* for those without an engineering background.

Federal Emergency Management Agency. 1994. *Reducing the Risk of Nonstructural Earthquake Damage: A Practical Guide*, Publication 74. Washington, D.C.: FEMA.

This is a complete survey of the nonstructural problem aimed at building and facilities managers. It includes a clear explanation of earthquake effects on buildings and nonstructural components and systems.

Lagorio, H. J. 1990. *Earthquakes – An Architect's Guide to Nonstructural Seismic Hazards*. New York: John Wiley and Sons.

This book is an excellent general survey of seismic design, hazard, and risk from an architectural and planning viewpoint. The title is really a misnomer, however, because only one chapter on "nonstructural building elements" describes in detail types of damage to equipment and building contents and even this is more of a general survey of the problem.

Stratta, J. L. 1986, *Manual of Seismic Design*, Prentice-Hall, Englewood, NJ

This manual written by an experienced California engineer presents practical advice on seismic design for design professionals.

Reports on Significant Earthquakes and Earthquake Damage

Ayres, J. M., Sun, T. Y., and Brown, F. R. 1967. *Report on Nonstructural Damage to Buildings Due to the March 27, 1964, Alaska Earthquake*. Washington, D.C.: National Academy of Sciences.

Ayres, J. M., and Sun, T. Y. 1973. *Nonstructural Damage, San Fernando, California, Earthquake of February 9, 1971*, Vol. 1, Part B. Edited by L. M. Murphy. Washington, D.C.: National Oceanic and Atmospheric Administration.

These two documents are pioneer reports by a mechanical and electrical engineering team that, for the first time, showed the serious effects of earthquakes on the nonstructural components and systems of modern buildings. They remain the best studies on nonstructural earthquake damage that have been published.

Bennett, J. H., and Sherburne, R. W., Eds. 1983. *The 1983 Coalinga, California Earthquakes*, Special Publication 66. Sacramento: California Department of Conservation, Division of Mines and Geology.

California Seismic Safety Commission. 1995. *Turning Loss to Gain: the January 17, 1994 Northridge Earthquake*. Sacramento: California Seismic Safety Commission.

Earthquake Engineering Research Institute. 1980. *Reconnaissance Report, Imperial County, California, Earthquake of August 13, 1978*. Oakland, California: EERI.

Earthquake Engineering Research Institute. 1980. *Reconnaissance Report, Northern Kentucky Earthquake, July 27, 1980*. Oakland, California: EERI.

Earthquake Engineering Research Institute. 1983. *A Preliminary Report, Miramichi, New Brunswick, Canada, Earthquake Sequence of 1982*. Oakland, California: EERI.

Earthquake Engineering Research Institute. 1984. *Coalinga, California, Earthquake of May 2, 1983: Reconnaissance Report*. Oakland, California: EERI.

Earthquake Engineering Research Institute. 1988. "The 1985 Mexico Earthquake." *Earthquake Spectra* 4(3,5).

Earthquake Engineering Research Institute. 1988. "The Whittier Narrows Earthquake of October 1, 1987." *Earthquake Spectra* 4(1,2).

Earthquake Engineering Research Institute. 1990. "Loma Prieta Earthquake of October, 1989: Reconnaissance Report." *Earthquake Spectra*, Supplement to Vol. 6 (May).

Earthquake Engineering Research Institute. 1995. "Northridge Earthquake of January 17, 1994. Reconnaissance Report." *Earthquake Spectra*, Supplement C to Vol. 11 (April).

Earthquake Engineering Research Institute. 1995. "Nonstructural Damage, Chapter in Northridge Earthquake of January 17, 1994, Reconnaissance Report." *Earthquake Spectra*, Supplement C to Vol. 11 (April).

Earthquake Engineering Research Institute. 1995. *The Hyogo - Ken Nanbu Earthquake: Great Hanshin Earthquake Disaster January 17, 1995, Preliminary Reconnaissance Report*. Oakland, California: EERI.

Housner, George, Chairman. 1990. *Competing Against Time, Report to Governor Deukmejian from the Governor's Board of Inquiry on the 1989 Loma Prieta Earthquake*. Sacramento, California: Governor's Board of Inquiry.

Jennings, P. C., Ed. 1971. *Engineering Features of the San Fernando Earthquake, February 9, 1971*. Pasadena: California Institute of Technology.

Moehle, J. P., Ed. 1994. *Preliminary Report on the Seismological and Engineering Aspects of the January 17, 1994 Northridge Earthquake*. Berkeley, California: Earthquake Engineering Research Center.

Murphy, L. 1973. *San Fernando, California, Earthquake of February 9, 1971*. Washington, D.C.: National Oceanic and Atmospheric Administration.

National Academy of Sciences Committee on the Alaska Earthquake. 1970. *The Great Alaska Earthquake of 1964*. Washington, D.C.: National Academy of Sciences.

National Institute of Standards and Technology. 1990. *Performance of Structures During the Loma Prieta Earthquake of October 17, 1989*, Publication 778. Washington, D.C.: U.S. Government Printing Office.

National Institute of Standards and Technology. 1994. *1994 Northridge Earthquake: Performance of Structures, Lifelines, and Fire Protection Systems*, Publication 5396. Washington, D.C.: U.S. Government Printing Office.

Nuttli, Otto, et al. 1986. *The 1886 Charleston, South Carolina, Earthquake – a 1986 Perspective*, Circular 98. Washington, D.C.: U.S. Geological Survey.

Oakeshott, G. B., Ed. 1975. *San Fernando, California, Earthquake of 9 February, 1971*, Bulletin 196. Sacramento: California Division of Mines and Geology.

Earthquake Loss Estimation Studies

Major loss estimation studies sponsored by governmental agencies are listed below. Some of these studies are now somewhat dated, but it is expected that a number of new studies will be conducted in the future once a new loss estimation methodology being developed for FEMA by the National Institute of Building Sciences is completed in 1996.

Davis, J. F., et al. 1982. *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*, CDMG Special Publication 61. Sacramento: California Division of Mines and Geology.

Davis, J. F., et al. 1982. *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California*, CDMG Special Publication 60. Sacramento: California Division of Mines and Geology.

Federal Emergency Management Agency. 1985. *An Assessment of Damage and Casualties for Six Cities in the Central United States Resulting from Earthquakes in the New Madrid Seismic Zone*. Washington, D.C.: FEMA.

Federal Emergency Management Agency/Central U.S. Earthquake Preparedness Project. 1990. *Estimated Future Earthquake Losses for St. Louis City and County, Missouri*, FEMA Publication 192, Earthquake Hazards Reduction Series 53. Washington, D.C.: FEMA.

National Oceanic and Atmospheric Administration. 1972. *A Study of Earthquake Losses in the San Francisco Bay Area: Data and Analysis*. Washington, D.C.: NOAA.

National Oceanic and Atmospheric Administration. 1973. *A Study of Earthquake Losses in the Los Angeles, California Area*. Washington, D.C.: NOAA.

Reichle, M. S., et al. 1990. *Planning Scenario for a Major Earthquake, San Diego-Tijuana Metropolitan Area*, CDMG Publication 100. Sacramento: California Division of Mines and Geology.

Steinbrugge, K. V., et al. 1987. *Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area*, CDMG Special Publication 78. Sacramento: California Division of Mines and Geology.

Topozada, T. R., et al. 1988. *Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone*, CDMG Special Publication 99. Sacramento: California Division of Mines and Geology.

U.S. Geological Survey. 1975. *A Study of Earthquake Losses in the Puget Sound, Washington Area*, USGS Open File Report 75-375. Washington, D.C.: USGS.

U.S. Geological Survey. 1976. *A Study of Earthquake Losses in Salt Lake City, Utah Area*, USGS Open File Report 76-89. Washington, D.C.: USGS.

U.S. Geological Survey. 1980. *Metropolitan San Francisco and Los Angeles Earthquake Loss Studies: 1980 Assessment*, USGS Open File Report 81-113. Washington, D.C.: USGS.

The Economics of Earthquakes

Federal Emergency Management Agency/VSP Associates. 1991. *A Benefit-Cost Model for the Seismic Rehabilitation of Hazardous Buildings*, FEMA Publications 227, 228, 255. Washington, D.C.: Federal Emergency Management Agency.

These publications and their accompanying computer software enable the user to estimate the benefit-costs of rehabilitation programs for a variety of existing building types for any region in the United States. FEMA 227 and 228 deal with privately owned buildings and FEMA 255 covers federally owned buildings.

National Research Council Committee on Earthquake Engineering. 1992. *The Economic Consequences of a Catastrophic Earthquake*. Washington, D.C.: National Academy Press.

This report includes a number of papers that review the economic impacts of large earthquakes. The focus is on indirect economic effects.

Weber, Stephen F. 1985. "Cost Impact of the NEHRP Recommended Provisions on the Design and Construction of Buildings." In *Societal Implications: Selected Readings*, Publication 84. Washington, D.C.: FEMA.

This is the best reference to date for evaluating the effect on building design and construction costs of implementing seismic design.

Earthquake Hazard Mitigation Programs

Building Systems Development Inc. 1989. *Establishing Programs and Priorities for the Seismic Rehabilitation of Buildings*, FEMA Publications 45 and 46. Washington, D.C.: Federal Emergency Management Agency.

These reports focus on the kinds of programs that may be used to mitigate the hazard of existing buildings, how to establish priorities, and provides examples of programs that have been implemented.

INTERNET RESOURCES

World Wide Web (WWW) Sites

<http://adder.colorado.edu/~hazctr/Home.html> (be sure to spell "Home" with a capital "H")

The **Natural Hazards Research and Applications Center's Home Page** provides an introduction to the many programs and services provided by Hazards Center; current and back issues of the center's electronic newsletter, *Disaster Research*; our lists of hazard information sources and institutions, useful hazard periodicals, GIS hazard researchers, center publications, new books on hazards and disasters, upcoming hazards conference around the world; as well as an annotated inventory of other Internet resources.

<http://www.fema.gov/>

The **Federal Emergency Management Agency's Home Page** contains a lot of information (over 500 pages)-about the agency itself; current disaster situations; and disaster preparedness, response, recovery, and mitigation for families and businesses. The site includes dozens of hypertext links to other Internet resources via its Global Emergency Management Service (GEMS) page (<http://www.fema.gov/fema/gems.html>).

<http://www.ngdc.noaa.gov/seg/hazard/hazards.html>

The **National Geophysical Data Center (NGDC) Natural Hazards Data Page** includes databases, slide sets, and publications available from NGDC on geophysical hazards such as earthquakes, tsunamis, and volcanoes, as well as the *Natural Hazards Data Resources Directory* at (<http://www.ngdc.noaa.gov/seg/hazard/resource/hazdir.html>), published jointly with the Natural Hazards Center in 1990.

<http://www.usgs.gov>

The **U.S. Geological Survey Home Page** contains much useful information, including a natural hazards page (<http://info.er.usgs.gov/research/environment/hazards/index.html>) that provides information on earthquakes, volcanoes, coastal erosion, hurricanes, floods, and radon hazards.

<http://www.fedworld.gov>

FedWorld is designed to provide a window to virtually all U.S. federal information services, including those dealing with disasters. It lists all agency Internet servers, provides access to the National Technical Information Service and the numerous reports available from that agency, as well as and many other federal reports.

Gophers

nisee.ce.berkeley.edu/1

The **Earthquake Information Gopher** maintained by the National Information Service on Earthquake Engineering (NISEE) offers information on all aspects of earthquakes and earthquake engineering, other organizations involved in earthquake hazard mitigation, and links to many other interesting gopher sites.

nceer.eng.buffalo.edu

The **National Center for Earthquake Engineering Research (NCEER) Gopher** presents even more general earthquake and earthquake engineering information, a raft of downloadable information, and access to NCEER's QUAKELINE database.

Lists/Newsletters/Discussion Groups

FEMA E-Mail News Service

To subscribe, send the e-mail message "subscribe news" to majordomo@fema.gov.

QUAKE-L

Quake-L includes discussions concerning recent earthquake events. To subscribe, send the e-mail message "subscribe QUAKE-L [your name]" to listserv@vml.noDak.edu.