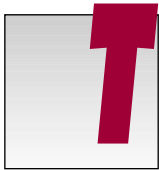




BUILDING CODES— Where Do You Stand?



There are many topics in our society the mere mention of can immediately cause

people to go on the defensive, or offensive, depending on which perspective one has. Politics, religious beliefs, taxes, and yes, building codes have this effect.

What is it about building codes that can divide one community, while in another bring the community together?

In order to answer this we need to first look at codes and their history in this country.

Codes first made their recognizable appearance in the 17th century. Codes of that period were directed at addressing safety issues surrounding the rapid spread of fires in urbanized communities. The extensive use of wood combined with the close proximity of structures made for a volatile situation.

Interestingly enough, the extensive use of brick, much of it unreinforced, to address the fire issue of that period, inadvertently increased the risk seen today in communities throughout the central US from shaking during a seismic event.

More comprehensive building codes were introduced in the mid 1800's. Building regulations were of two types: housing codes and building codes. Housing codes were intended to reduce the ill effects of residential overcrowding by addressing air and light issues into individual dwellings.

Building codes of the late 19th century began to focus on construction methods



FEMA News Photo—1994 Northridge Earthquake

and materials. Recent efforts in the code development process have begun to emphasize performance rather than specific material and construction methods. Performance provisions not only allow the designer to choose appropriate materials and methods to achieve the code standard, but also opens up the

opportunities for manufactures to introduce new materials and methods that can contribute to reduce construction cost.

Code Development

The code development process is addressed through periodical forums throughout the country which are open to

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allow input from a wide variety of professional organizations and groups in the building community, as well as the general public.

Significant changes to the codes, as well as the adoption and enforcement of them, have occurred for a number of reasons. Sadly, some of these changes came following a significant event, such as an earthquake or other event causing great loss of life and property. Research over time also has an influence on baseline information, such as maps used in the seismic provisions.

Almost since the creation of codes, building cost increases, whether real or perceived, surface as the key issue following significant changes in the code. Strong arguments on both sides of the issue have been made, and for this reason, studies specifically addressing the issue have been undertaken over the years. In studies done on previous versions of the code, research has shown that building codes do not significantly increase building cost, and adoption of statewide codes can actually help reduce the cost.

For instance, criticism of the cost of codes in the 1950's and 1960's centered on the inefficiencies of having numerous codes, inconsistently applied. Builders

often were required to alter their construction methods and materials from one community to the next, which meant spending more time and money. As more and more communities have adopted uniform codes, the differences among codes no longer contributes to higher cost.

In 2000 there was another significant change which resulted from the consolidation of the three prominent code organizations (International Conference of Building Officials, which published the Uniform Building Code; the Building Officials and Code Administration International, Inc., which published the BOCA National Building Code; and the Southern Building Code Congress International, Inc. which published the Standard Building Code) into what is now known as the International Building Code (IBC).

The most significant advantage to this consolidation is the uniformity that it brings to the building profession. As the code is adopted, code officials from jurisdiction to jurisdiction will be able to offer consistent code policies which in turn will benefit engineers, architects, designers, and contractors. Cost again should be reduced with the uniformity the code will bring while opening up new opportunities for manufacturers to offer innovative products. Further study of the

cost issue should resolve any uncertainties associated with this latest generation of the code.

In August 2001, the National Fire Protection Association issued a draft building code, NFPA 5000, which was published in its final version in 2002. The NFPA, like the IBC will use the NEHRP Provisions as the basis for their seismic requirements further enhancing the uniformity that users of the codes seek.

While traditionally the requirements in the codes were intended to meet goals of health, safety, welfare and property protection, they have been expanded in recent years to include other societal goals. Some of these goals are: Energy, Conservation, Accessibility, Disaster mitigation, Historic preservation and Affordability.

One result of the periodic updating and expansion of the codes is that buildings built before the current building codes were enacted are probably not in full compliance. So, communities have had to develop special provisions to deal with existing buildings for general safety.

The introduction of these provisions can have a greater cost associated with it than cost associated with new construction covered under the new code.

Current Statewide Building Codes

These maps developed by the Institute for Business and Home Safety represent the currently adopted and enforced STATEWIDE building codes for commercial and residential construction. Although the states may adopt a model building code, the changes made to that code during the adoption process often vastly affect the performance of structures built to that "revised" code. For additional information on these maps and further details on the each states code, visit the Institute for Business and Home safety web site at: www.ibhs.org



Buildings that are covered by current building codes: Maroon – Statewide Code
Gray – Some Buildings
White – None

Government Involvement

As a general rule, the Federal government does not get directly involved in the adoption process at the state and local level. The code adoption process is primarily a State's rights issue.

However, agencies such as the Federal Emergency Management Agency (FEMA) strongly believe that building codes are the most effective way of ensuring that future construction will be able to survive the many different hazards that States face. This belief is reinforced through programs which support hazard mitigation at the state and local level.

Other federal agencies such as the US Department of Housing and Urban Development (HUD) has been interested in building codes in general, and building rehabilitation codes in particular, for several years. In addition to codes, they also provide a variety of design and technology tools to help with rehabilitation work. But, like FEMA, they are not directly involved in the code process.

Government involvement at the state and local level becomes a little more involved. Perhaps the most important role of government at these levels is trying to achieve a balance between competing and often conflicting public priorities. Among other priorities, they have an obligation to advance the goal of providing safe living and working environments for their citizens while promoting economic development and protecting the environment. The challenge is balancing these priorities in an ever changing community environment.

As pointed out previously, although the federal government is not in the "code" business, changes have taken place at the federal level which reflects a revised view of hazards and their potential impact on communities. In 1990, presidential executive order 12699 required all federal agencies to issue regulations or procedures that incorporate cost-effective seismic safety measures for all new federal buildings that are leased, assisted, or regulated by the federal government by February of 1993. The goal of the Order is to "reduce the risk to the lives of persons who would be affected by earthquake failures of federally assisted or regulated buildings and to protect



public investments, all in a cost effective manner." The Orders also specifies a mechanism to review the nation's model building codes and standards and determine which ones meet the intent of the Executive Order. At this time, the IBC and the ASCE-7 Standard for Design Loads have been determined to meet the intent of the Executive Order, while older model codes, such as the Standard Building Code, which are still widely used, do not.

Following the implementation of Executive Order 12699 came Executive Order 12941 which directed federal agencies to evaluate existing federal owned and leased buildings to identify buildings that were potentially hazardous and to plan for seismic rehabilitation of those facilities.

As a result of these executive orders, more importance was placed on the adoption and enforcement of appropriate building codes and the seismic provisions contained within them at the local and state levels of government.

Additional emphasis on the adoption of building codes comes in the form of potential mitigation funding that a local community or state receives. Legislation passed by Congress a few years ago permits FEMA to offer additional Hazard Mitigation Grant Program (HMGP) funds to States that meet certain planning

criteria, which includes having an adequate State-wide building code in place. Adoption of the IBC as the State code would potentially significantly increase the amount of post-disaster mitigation funds for States after the next disaster, no matter what the cause.

What has emerged in the code debate, is not necessarily a reflection of the executive orders or some other requirement, but what is deemed an "appropriate" code for a given community. Although regional codes have evolved into one code, this does not mean that the new code has erased the "regional" issues which codes must address. In other words, a community in the North West will not be building to resist hurricane force winds associate with coastal communities, or, in the case of seismically prone areas that communities with a lower seismic are not building to one comparable to areas with a higher hazard. This balancing of requirements and regional issues is accomplished by looking at the historical evidence of the hazard as well as the current research findings for a given area.

Building codes in and of themselves are generally accepted in the broad scheme of things as appropriate to addressing life safety. Where difficulty arises most often is within the various provisions which

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make up the code. For the purpose of this discussion only the seismic provisions will be addressed.

Seismic Provisions

Seismic provisions or seismic code refers to the seismic design requirements included within building codes. In the past, local governments sometimes viewed the seismic sections of a code as optional, adopted at local discretion. This may have more to do with the fact that the understanding of the seismic threat in areas outside of more seismically prone areas such as the west coast is relatively new. Seismic provisions are now fully integrated into the modern code. This integration, however, has not reduced the perception of the seismic code as being separate. Attempts to modify or remove the provisions can have an adverse effect on other portions of the code which is not always understood by those making the decision to do so.

Traditionally seismic provisions were a reflection of the earthquake hazard found among the western states. Not until the early 1990's did seismic provisions begin showing up in codes in the central and eastern US, which equates to a large percentage of structures not built to resist earthquake effects.

Do Codes Impede Community Growth and Prosperity?

One of the most frequently used arguments with respect to codes is the idea that codes will impact the prosperity of a community. According to a FEMA report "Promoting the Adoption and Enforcement of Seismic Building Codes: A Guide for State Earthquake and Mitigation Managers" building codes have not hurt the economies of the 41 states that have them, nor have they hurt the 95% of all U.S. cities and towns that have some form of codes adopted. Studies on the added seismic design cost based on previous codes, adds only a few percent to the cost of a new building. Studies which are just beginning to look at the cost issue for the new codes are expected to revile the same findings. A key point which needs to be stressed in regard to a communities hazards and the steps which they take to address them, is that a strong



code is not an admission of community weakness, but rather a sign of community strength. Demonstrating the communities willingness to reduce the long term effects including certain liabilities.

As highlighted in the article "Taking the Heat and Realizing the Dream" on page ??? codes can be a point of contention but ultimately they prove beneficial to a community. What makes a code successful is the involvement of the community in the adoption process as well as the support for the enforcement of that code.

Involvement does require some effort by interested parties. The first step should be to find out all you can about the current codes for your jurisdiction. This will govern your options for action. If you find your jurisdiction lacks an adequate code you will need to convince your community to initiate a building code. Typically, the building code ordinance is drafted, reviewed legally, proposed and debated through public hearings, and voted on and adopted by the municipality. Specific information on how to approach code adoption or changes can be found in a variety of publications including "Reducing Earthquake Hazards in the Central United States - Seismic Building Codes" published by CUSEC.

Conclusion

Since the inception of building codes, there has been an ongoing debate over the need to balance the cost of implementing building codes against the need to provide life safety from potentially devastating events, such as fires, floods, hurricanes, and earthquakes. Building codes have evolved over time as our engineering and scientific understanding of the built environment has improved. Change to codes will always be accompanied by issues of concern for the impact the code, which in its self is not a bad thing.

The bottom line is we should all be working to make our communities safer places to live and work. No one is immune to the effects of a disaster, whether it is man-made or natural. An acceptable level of safety is achievable within cost considerations, and without detriment to the community. Failure by all parties involved in community development to reduce the risk will certainly place a community in greater danger following the event than would be experienced if reduction efforts such as code adoption measures had been made prior.

Where can you get further information?

ICC

5205 Leesburg Pike, Suite 1201
Falls Church, VA 22041
(703) 931-4533
www.intlcode.org

BOCA

4051 West Flossmoor Road
Country Club Hills, IL 60478-5795
(800) 214-4321
www.bocai.org

ICBO

5360 S. Workman Mill Road
Whittier, CA 90601
(800) 284-4406
www.icbo.org

SBCCI

900 Montclair Road
Birmingham, AL 35213
(205) 591-1853
www.sbcci.org

NFPA

1 Batterymarch Park
Quincy, MA 02269
(800) 344-3555
www.nfpa.org

IBHS

1408 North Westshore Blvd, Ste 208
Tampa, FL 33607
(813) 286-3400
www.ibhs.org

Building Seismic Safety Council

1201 L Street, NW, Suite 400
Washington, D.C. 50005
(202) 289-7800
www.bssconline.org

Central US Earthquake Consortium

2630 E. Holmes Road
Memphis, TN 38118
(800) 824-5817
www.cusec.org

FEMA Publications

P.O. Box 2012
Jessup, MD 20794
1 (800) 480-2520



Taking the Heat and Realizing the Dream—One City’s Perspective

By **Lea Stokes**
MS Emergency Management Public Information Officer

Madison, MS—Wal-Mart, Home Depot and even the famous golden arches of McDonald’s were willing to conform to the building codes of Madison, Miss.

In the past 15 years, city leaders stuck to such zoning codes as underground utilities, a stringent sign ordinance, sidewalks, sprinkler systems and no visible cell phone towers.

The city seems to be proof that zoning ordinances and building codes won’t deter commercial growth and development.

“The first time we unveiled it (city plan) to the public, the nay-sayers were out in force,” said Madison Mayor Mary Hawkins-Butler. “We were told we were

“We were told we were anti-business and we’d deter growth. They said Madison would dry up and blow away. Now, there’s not enough banks to hold their money.”

anti-business and we’d deter growth. They said Madison would dry up and blow away. Now, there’s not enough banks to hold their money.”

In the early 1980s, city officials held public meetings to gain input into zoning and building codes. As a result of those meetings some 20 years ago, the city routinely ranks as Mississippi’s fastest growing city. Officials can also boast about Madison’s low crime rates, and high public education ratings.

“We interviewed the people and this is the people’s plan,” she said. “They



wanted to define Madison’s borders and upgrade subdivision regulations, sign ordinances, landscaping ordinances and preserve the historical district. With all that in mind, we went to work.”

A drive through Madison reveals muted earth-tone colors and bricks on all businesses. Much like the city of Germantown, Tenn., one of the cities Hawkins-Butler said officials visited when deciding on Madison’s future.

But the original codes that many viewed as too stringent, such as sprinkler systems and underground utilities, became a strong point for city work crews and firefighters, said Tom Lariviere, manager of the city’s building department and fire chief.

“It prevents some of the problems we could have in windstorms or in a minor ice storm - those could have put people

out of power,” he said. “And if we have a fire, it’s very small. Plus, they (business owners) recover money on insurance premiums. Insurance premiums are cheaper than non-sprinkler buildings.”

City officials found out early on in the planning for the city that many people were very unhappy in conforming their businesses and communities.

“It’s been hot,” said Hawkins-Butler. “We were sued in every court. Both the city and the aldermen were sued personally. It’s easy to take the path of least resistance. My job would’ve been a lot easier.”

The ordinances did not grandfather in any business or subdivision, Hawkins-Butler said.

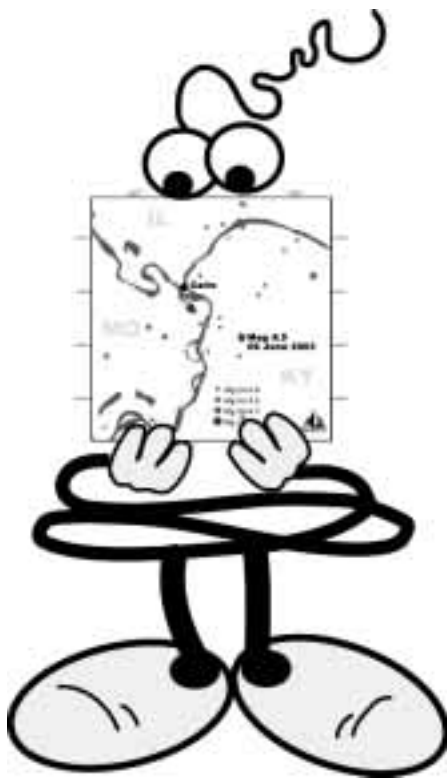
She said citizens supported the ordinances by a three-to-one ratio.

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“There were so many people at the public meetings, that we had to recess one meeting and move it from City Hall to a school auditorium,” she said. “It’s call people power. The public has to feel ownership of their city. We made no bones about it - the residents were going to be first and we were not interested in putting our city on the table for negotiations.”

For more information about the city of Madison, go to the city’s Web site at www.ci.madison.ms.us.



Algeria Earthquake Reconnaissance Report Available from EERI with Color Satellite Images

The Earthquake Engineering Research Institute is pleased to announce that a report entitled *The Boumerdes, Algeria, Earthquake of May 21, 2003* has just been published on the earthquake of moment magnitude $M_w=6.8$ that shook northern Algeria, about 50 km east of the capital city of Algiers. This 56-page report was prepared by the EERI reconnaissance team, which was joined by many Algerian scientists, engineers, and researchers. In addition, there is an eight-page insert containing six color high-resolution satellite images of the affected area taken at three different times: a year prior to the earthquake, immediately post-earthquake, and a month after the quake. The insert summarizes the remote-sensing team’s findings.

The affected area is heavily developed and urban. Approximately 2,300 people were killed and more than 11,000 injured. Total economic loss was estimated at US\$5 billion. Damage was reported in an area about 100 km long and 50 km wide, centered on the city of Boumerdes. About 182,000 housing units were damaged, of which more than 19,000 collapsed or were rendered uninhabitable. The earthquake left upwards of 120,000 people homeless. Most of the construction in the damaged areas was built in the last 30 years. This earthquake highlights the particular vulnerabilities of both large cities and megacities in the developing world.

The report covers the political and social context that affected the quality of construction and the challenges of reconstruction, as well as social and economic impacts, geosciences, buildings and industrial facilities, lifeline systems, and response and recovery. It also includes recommendations to reduce urban vulnerability and improve construction practices and emergency response. The technical editor is Fouad Bendimerad of EMI and RMS, Inc., Newark, California.

The report’s price is \$15.00 plus shipping and sales tax for California residents. To place an order online, visit http://www.eeri.org/cds_publications/. The Algeria Report is listed under “New Products.” This web site page also has information about other EERI publications and special deals. Orders can also be placed by calling 510/451-0905, or e-mailing eeri@eeri.org.

HOW DO BUILDING CODES HELP YOU AND YOUR COMMUNITY?

Andrea Lanier Papageorge
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As a professional in the construction industry, building codes impact the work you do everyday. But where did building codes come from, why are codes so important, and how do they really help you?

Building regulations are not new phenomena. The earliest building code can be traced back almost 4,000 years ago to the Code of Hammarubi. The code stated that if a house

collapsed and caused the death of the owner, the home builder would be put to death. The first building codes in the United States, established in 1625, addressed fire safety and specified materials for roof coverings. In 1630, Boston outlawed chimneys made with wood and thatch roof coverings. Larger U.S. cities began using building codes in the early 1800s. In 1915, the world's first building safety code organization was established to provide a forum for exchange of ideas regarding building safety and construction regulations.

Modern building codes regulate a myriad of safety systems including design and structural requirements, fire prevention, electrical, plumbing and mechanical systems, property maintenance, energy efficiency and zoning. The phrase "building code" usually refers to a family of codes, such as the International Codes, that are coordinated with each other to address these specific areas of code application.

Arguments against local jurisdiction adoption and enforcement of new building codes and building code provisions range from increased costs to undue governmental interference. However,

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Smart Codes in Your Community: A Guide to Building Rehabilitation Codes

This report from the U.S. Department of Housing and Urban Development provides a thorough, yet easy-to-follow guide for developing "smart codes", construction codes that encourage alteration and reuse of existing structures. Redeveloping underused buildings could boost local economies, revitalize neighborhoods, and help meet growing demand for additional housing, industrial, and retail space. However, complex, outdated local codes often impede the ability of many communities to rehabilitate and reuse existing buildings. As a result, some States and localities are examining and rewriting their building codes to spur reinvestment in existing structures.

This report reviews the general regulatory environment governing reuse of existing buildings and provides examples of recent State and local efforts to reduce regulatory complexities. To begin the process of creating "smart codes", the report recommends creating a local stakeholders' committee to articulate problems that exist with a community's current regulatory approach to renovating existing buildings. Additional strategies include exploring other options and models that exist and comparing these models with current local regulations. The report also recommends that after communities adopt new rehabilitation codes, they should establish follow-up procedures, such as training for code enforcement officials.

Smart Codes in Your Community: A Guide to Building Rehabilitation Codes is available for free download from the [HUD USER Web site](http://HUDUSER.org), or HUD USER

P.O. Box 23268
 Washington, DC 20026-3268
 Toll Free: 1-800-245-2691
 TDD: 1-800-927-7589
 Local: 1-202-708-3178
 Fax: 1-202-708-9981



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the benefits of codes and code enforcement far outweigh any argument against code adoption.

“Arguments against local jurisdiction adoption and enforcement of new building codes and building code provisions range from increased costs to undue governmental interference.”

First and foremost, codes protect public health, safety and welfare. Protection from fire, structural collapse, earthquakes, wind, and other natural and man-made disasters are among the most important functions of building codes. The adoption and active enforcement of the latest construction codes are essential to the natural disaster mitigation process. Construction built to code is proven better able to withstand damage from natural disasters. Therefore, it makes sense that insurance companies

recognize communities with strong codes and enforcement and those communities benefit from reduced property insurance costs.

Building codes can also save property owners money. Home and business owners put a substantial investment into their properties. A properly constructed building will be more resistant to general deterioration. Codes can conserve energy, resulting in cost savings to the consumer in lower bills and reducing the use of natural resources.

The overall well being of communities with strong code enforcement helps to protect property values over time. Codes enhance the economic development of a community. Businesses are more likely to find a community a more attractive place to invest if model codes consistent with other jurisdictions are adopted and enforced.

Rather than increasing construction costs, codes can keep construction costs down by providing uniformity in the construction industry. Uniformity helps building and materials manufacturers to do business on a larger scale, allowing cost savings to be passed on to

consumers. Codes provide minimum standards in construction that are applied to the quality and durability of construction materials.

Building codes contain the latest in construction materials and techniques, allowing more innovative design and construction while providing the most up-to-date life-safety provisions. Building codes are developed by experts in the construction industry. Building and fire officials, architects, engineers, trade associations and many other professional organizations participate in the code development process.

By referencing the most up-to-date building codes during project development, you can incorporate the knowledge that has been learned from past natural disasters, lessen future energy costs, improve community property values and reduce property insurance fees, in addition to improving life safety for your building's inhabitants. Adhering to the latest building codes means you are referencing the highest level of building safety and fire prevention expertise, and much, much more.



BUILDING CODES RULE IN THE CONSTRUCTION OF HOMES

By Ed Sauter

In today's information-packed world, building codes typically fall to the bottom of the list of leisure reading. Chances are you are familiar with the aspects of the code that impact your daily business but have little interest in the code process until a new ruling affects your bottom line. However, unlike many aspects of business out of your immediate control, you can and should have an impact on the code process. The secret is understanding the process and learning how to establish codes that work to your advantage.

Until 1994, three separate bodies were the primary developers of codes throughout the United States, based upon geographic region. These groups - the Building Officials and Code Administrators International (BOCA), the Southern Building Code Congress International (SBCCI), and the International Conference of Building Officials (ICBO) - developed the BOCA National Building, Standard Building, and the Uniform Building Codes, respectively. In addition, the three groups jointly were responsible for producing the CABO One- and Two-Family Dwelling Code. However, the entities opted to pool their resources to develop one code writing body known as the International Code Council (ICC). The reason for the collaborative effort was the pursuit of a single set of comprehensive codes to take the place of the various codes being enforced.

The result of the non-profit ICC organization was the development of the International Building Code (IBC) for commercial structures and the International Residential Code (IRC) for one- and two-family dwellings. ICC released the first IRC in 2000 and it has



already been adopted in a number of states and local jurisdictions. Chances are, as one concerned with the construction of concrete homes, if you don't already fall under the IRC-2000, you will soon fall under its authority.

Adoption Rules

While the stage has been set for the widespread adoption of the IRC, many are surprised to learn that a code has no technical or legal weight until a jurisdiction adopts it. While some states adopt the codes, which make the code apply statewide, other states leave the process to local jurisdictions.

"The IBC and IRC simply act as a measuring stick until the codes are adopted at a state or local level," said Steve Skalko of the Portland Cement Association (PCA). Skalko is a former director of building inspections for Macon, Ga., and has applied his expertise to guide PCA's code efforts for the past 15 years. "Right now, we are at a crossing point for construction codes as

more and more states and localities adopt the IRC," he said.

Even before a new edition of a code is approved by the ICC membership, the cycle of proposed modifications to the base code begins again. Codes are typically updated on a three-year cycle through a series of public hearings. Throughout the three-year period, the codes are constantly revised through a series of amendments and public hearings, and the best chance to impact the codes lies here through the amendment process.

A public hearing, largely attended by major industry lobbyists sent to represent their particular industry, is held to propose and review changes to the code. While the IRC Code Change committee is comprised of building officials, homebuilders and architects, any citizen can propose a change to the code. However, don't get the idea that you can simply waltz into the meeting, air your complaints and rewrite the code, as this

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is far from the standard process. A detailed procedure and established timelines must be followed for submitting changes and much of the consideration is done without your input before it comes to a vote.

“Although no formal decisions are made at this public hearing,” said Skalko, “the tone is set for changes that will be finalized at the next meeting with the committee. The testimony of both proponents and opponents is heard and is judged based on technical merit.”

challenged are placed on the agenda for the annual business meeting of the ICC.

At the annual business meeting, the code officials with voting powers hear all issues on challenged items once again. Their votes can accept the recommendation of the IRC Committee, or their votes can change the recommendation to a different action. When the vote is held, you have a total of three minutes to make your case (two minutes to explain and an additional minute for rebuttal to those who can also argue against your comments), a vote is then called for and it either passes or is

annual basis. The process may slow however, as the ICC is examining having supplements published every 18 months instead of every 12 months. Under this scenario, the IBC and IRC code books will still be published every three years.

If understanding the code-making process is the crucial first task in affecting change, the next step is knowledge of current provisions and issues on the table that may have an impact on your business. For example, under the previously adopted CABO code, there were provisions for



FEMA News Photo—1994 Northridge Earthquake

Challenges Heard

The IRC Code Change Committee then reviews and makes recommendations on suggested changes. Items are recommended either for approval as submitted, approval with minor modifications, or not to be approved. The recommendations are then published as a challenge agenda and anyone wishing to challenge the recommendation of the IRC Committee can do so. Only those items

rejected. For example, the IRC Committee may have recommended approval. The voting membership could disagree with the committee and recommend disapproval. That becomes the final action on the code change.

After voting is complete, the final actions are incorporated into a published supplement that shows differences in the code provisions from the last printed edition. The cycle then continues on an

construction of foundations for one- and two-family dwellings. The seismic zones throughout the country dictated what was required of the foundation in each geographic area, but during the transition from CABO to IRC, the map of the seismic zones changed. The map has moved higher seismic zones to the East Coast, where previously these restrictions did not resist. As part of this evolving process, there has been

more attention to requirements for reinforcing in higher seismic areas. For the concrete foundation contractor community, this change may equate to altering their provisions for poured wall construction, resulting in higher costs and more labor.

Another crucial issue affecting those involved in the construction of concrete homes is the National Fire Protection Association efforts. The trend in the national model building codes, both the IBC and the National Fire Protection Association Standard 5000, is to require the minimum life-safety provisions for fire with the most rigorous structural design requirements for buildings. Both national and model codes include more restrictive seismic requirements that can be unfavorable to those involved in concrete construction, to include provisions for increased thermal resistance insulation for energy conservation and more relaxed fire- and life-safety requirements. All not only jeopardize buildings and their inhabitants, but also will dramatically reduce the ability to specify concrete as a solution for residential construction.

Recognizing the importance of involvement at the local level, industry representatives and citizens in New York and New England formed the Fire Safety Construction Advisory Council (FSCAC) with the intent of introducing modifications in the local code that ensure a reasonable level of property and life safety through the concept of a balanced design. A similar coalition exists in Minnesota and consideration is being given to development of such a coalition in both Maryland and Pennsylvania.

Residential Standard

Yet another issue that should be on the radar screen for the home industry is ACI development of a residential concrete standard. The standard is being developed to serve as a document that can be referenced by the IRC, much like ACI-318 which is the accepted reference standard for commercial concrete construction under the IBC. Under development for the past seven years,

the document is expected to clear the committee for ACI technical review within the year.

While there are no absolutes, Skalko is quick to point out that special interest groups and citizens do have an impact on the process. In other words, you can make a difference and should take an active role in amending codes that impact your business.

Since code adoption is an open process, all necessary information is available to the public. The first step is reviewing your statewide code, if one exists, since state codes always outweigh local codes. Getting involved and knowing the key players is the next step. Identify the jurisdiction that has authority over the areas that affect your business and determine who is in charge so you can form relationships with these officials. It also is advantageous to get on their mailing lists and regularly attend scheduled code meetings. Finally, form organizations with other contractors, builders, and architects to learn more about the existing codes and how to change them. There is power in numbers.

While anyone can propose a change to a code, those successful in affecting change usually have a well-thought-out decree with strong supporting data and evidence. Code officials will ask technical questions and information should be reliable or you will lose easily lose credibility. Since the amendment process is the best chance to influence the code and its effect on your business, you must abide by the detailed procedure and timelines in submitting changes and attendance at the public hearings to provide expert testimony.

“When the IRC starts to show up in the marketplace, you can play an active role in the state or local adoption process,” said Skalko. “Once adoption of a code occurs, you are expected to follow it, so now is your chance to influence and take control of your bottom line by becoming actively involved in the code process.”

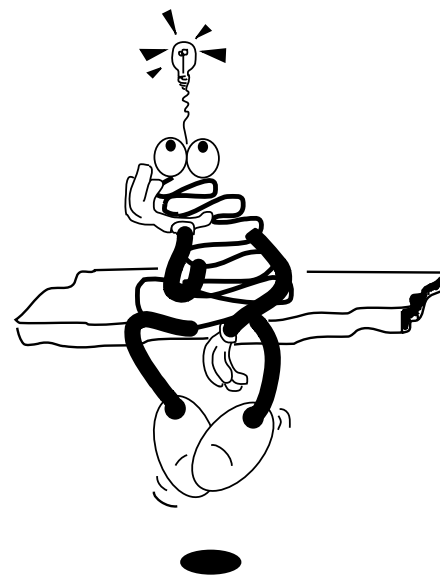
Finally, it is important to lean on those associations that are uniquely positioned and staffed to assist you in these efforts. The Concrete Foundations

Association (CFA) of North America is a voluntary, non-profit organization dedicated to the advancement of concrete contractors. The CFA represents the interests of its members and the industry on several code and regulatory bodies, to include the American Concrete Institute’s code for residential concrete (ACI-332), and cold-weather concrete standards. The Association also offers educational seminars and counsel on how to impact local code bodies and processes. Call CFA at 866-232-9255 or visit www.cfawalls.org for more information.

CFA’s ally, the Portland Cement Association, has three full time code development professionals who monitor, attend, propose modifications and argue the case of the cement industry in several code venues. Contact Skalko at 478-477-5028, sskalko@portcement.org or visit www.pca.org.

Ed Sauter is executive director of the Concrete Foundations Association. He can be contacted at esauter@cfawalls.org or visit www.cfawalls.org.

This article originally appeared in the January 2003 issue of Concrete Homes



Monographs on Fundamentals of *Seismic Protection for Bridges and Seismic Design with Supplemental Energy Dissipation Devices* Available from EERI

The Earthquake Engineering Research Institute is pleased to announce that a 184-page hardcover monograph entitled *Fundamentals of Seismic Protection for Bridges* by Mark Yashinsky and M. J. Karshenas has just been published. It covers the basic aspects of the seismic performance of bridges during past earthquakes, current practices in the seismic analysis and design of new bridges, and retrofit strategies. Also included is an extensive glossary of terms pertaining to bridges and their elements. Its price is \$45.00 plus shipping and sales tax for California residents. EERI members will receive this monograph at no charge.

The monograph examines how bridge performance has been affected by construction, design details, proximity to different hazards, and the characteristics of surrounding soil. In exploring current practices for new bridges, it deals with how to design bridges for the variety of hazards that can occur during an earthquake. Also described are seismic demands on

bridges and performance-based design; i.e., how to design and detail bridges and their elements to meet performance requirements.

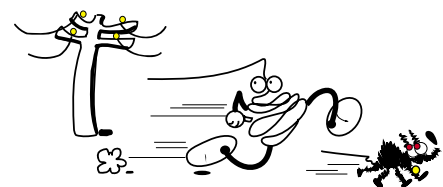
Additionally, the monograph focuses on the steps that a comprehensive bridge retrofit program would require, including the prioritizing, screening, and selection processes, as well as the analysis needed to identify vulnerabilities and develop alternate retrofit strategies.

The most recent EERI monograph prior to the above is entitled *Seismic Design with Supplemental Energy Dissipation Devices* by Robert D. Hanson and Tsu T. Soong. Issued in 2001, it imparts basic concepts of supplemental energy dissipation technology to design engineers, architects, and building officials so that they can understand its benefits and limitations in structural applications. It summarizes information on the use of this recent innovation in designing new earthquake-resistant buildings and upgrading the seismic performance of existing buildings.

The following areas are covered

- The physical consequences of adding energy dissipation systems to a structure for various types of input motion
- Summary of generic energy dissipation device characteristics
- Summary of pros and cons of specific device characteristics in meeting selected design objectives
- Seismic design limits for selecting energy dissipation systems
- Design approaches for the limits of elastic or inelastic response.

Its price to non-EERI members is \$45.00 plus shipping and sales tax for California residents (\$35.00 for EERI members). To place an order online, visit http://www.eeri.org/cds_publications/catalog/ and click on the Publications link under the "Categories" heading. This web site page also has information about other EERI publications and special deals. Orders can also be placed by calling 510/451-0905, or e-mailing eeeri@eeeri.org.



In Memory of William R. “Ronn” Padgett



Early this spring CUSEC lost one of its greatest champions, former Kentucky EMA Director and past CUSEC Board Chairman, William R “Ronn” Padgett.

Mr. Padgett was a strong advocate of CUSEC’s partnership approach to addressing the seismic hazard. This belief went beyond the traditional way of viewing partnerships which in many cases can be tightly confined. He was instrumental in the formation of the CUSEC Latin American Partnership which built on the idea that there are other areas which share similar issues with respect to the seismic hazard as we do in the central US. These same views also lead CUSEC to take on a more holistic approach to its efforts.

Mr. Padgett had a lighter side as well. A habitual doodler Mr. Padgett was constantly creating interesting images, usually associated with a particular meeting that he was attending. One such meeting was a CUSEC Board meeting in which he doodled a picture which included an image that would later become the basis for the new CUSEC logo.

His occasional phone call or e-mailed joke will be greatly missed by all who knew him.

PADGETT, William R. “Ronn”, 58, of Lexington, husband of Muriel Amos “Mickey” Padgett passed away Fri., April 2, 2004. Ronn was born Fri., July 26, 1946, the son of William Fisher and Isabel Lanham

Padgett of Perryville, Ky. He retired in 2002 as the Director of the Ky. Division of Emergency Management. He was a graduate of Centre College and held a masters degree in public administration. He was commissioned in the U.S. Navy in 1969 and retired as a Lt. Col. in the National Guard. He was deeply involved in the Partners of the Americas. He was a member and past president of the Ky.-Ecuador Partners and served two terms as a board member and one term as treasurer on the International Board of Directors of the Partners of the Americas. He was a recipient of a Kellogg Fellowship in International Development. He was a member of several professional organizations including KEMA, NEMA, CUSEC and the KYNGA. In retirement he worked with FEMA and as a consultant. In addition to his wife and parents, he is survived by his children, Gretchen Honican, Kathleen Padgett, and Bomark Padgett; two grandchildren, Abigail and Griffin Honican; a brother, Kenneth L. Padgett; nieces and nephews and cousins.

CUSEC—A Year in Transition

The past year has been one that stands out in many ways for CUSEC. The high point of the year included celebration of CUSEC's 20th anniversary which included participation from many of the past founding directors including Tennessee Director, Lacy Suiter, Missouri Director, R.D. Ross, Mississippi Director, Jim Maher, and Illinois Director Tom Ortziger. Also in attendance was past CUSEC Executive Director, Harvy Ryland.

The year's events also include the addition of Alabama as its newest member state. A growing body of research which showed the regional impact that earthquakes could have in the eastern TN and North Alabama area, prompted the inclusion of Alabama as the eighth CUSEC state. Coincidentally the occurrence of a 4.6 magnitude event in Fort Payne Alabama which according to the USGS Did You Feel it web site had 17302 felt reports covering 12 states. Validating the potential for regional damage and the need for a collaborative approach to addressing the risk.

The year also saw a large turnover in the organization. The Board of Directors which is made up of the eight state emergency management directors from the CUSEC States had the largest single turnover since CUSEC inception. Judge William R. Harper from Arkansas stepped down and was replaced by Col. Wayne Ruthven, Indiana Director and

Board Chairman Patrick Ralston retired and was replaced by Luther Taylor, and Director John White of Tennessee retired and was replaced by Major General James Bassham.

Significant changes also took place at the Earthquake Program Manager level. Amanda Capps has replaced Linda Egler in Alabama, Steve Olgelsby filled the vacancy created after Dave Boyer retired, Keith Chambers filled a newly created earthquake program managers position replacing Jana Fairrow who had served in the earthquake program managers position in Illinois, Gayla Weber replaced Randy Scrivner in Missouri, and the biggest change to occur with the hiring of the new earthquake program manager for Arkansas, Shanene Thomas.

Ms. Thomas replaced, Dan Cicirello, who was affectionately known by his friends within the CUSEC family as the other "Man in Black". Dan retired after many years with state government - 20 of those years as the earthquake program manager. His knowledge not only of the CUSEC program over those years but the knowledge of the earthquake program on a national scale was invaluable.

Although in retirement he continues to stay actively involved in the earthquake program in Arkansas through the Arkansas Governor's Earthquake Advisory Council.

FEMA Launches NEHRP Web Page

FEMA which is one of four agencies that oversees the implementation of National Earthquake Hazards Program (NEHRP) recently unveiled a web site dedicated to promoting the NEHRP.

The National Earthquake Hazards Reduction Program (NEHRP) is the Federal Government's program to reduce the risks to life and property from earthquakes. The NEHRP agencies are FEMA, the National Institute of Standards and Technology (NIST); the National Science Foundation (NSF); and the United States Geological Survey (USGS).

The web site offers visitors detailed information about the program, including best practices, links to seismic hazard maps contained on the USGS web site, publications and resources, information on state earthquake programs throughout the US, as well as information on the earthquake loss estimation tool HAZUS.

The NEHRP web page can be found under the Mitigation and Flood Insurance Program link on the FEMA opening page at www.fema.gov or by going directly to the NEHRP link at <http://www.fema.gov/hazards/earthquakes/nehpr/>

Visitors will find the information on the NEHRP web site to be both informative and useful.



CUSEC Welcomes International Paper Corporation as Newest Corporate Sponsor



The Central United States Earthquake Consortium is pleased to announce International Paper Corporation as its newest corporate partner.

International Paper has significant global businesses in paper and paper distribution, packaging and forest products, including building materials. The company has operations in nearly 40 countries, employs approximately 83,000 people worldwide and exports its products to more than 120 nations. Sales of almost \$25 billion annually are derived from businesses located primarily in the United States, Europe, Latin America, Asia/Pacific and Canada.

Working with key stakeholders such as International Paper, CUSEC seeks new and innovative approaches to reducing the risk faced throughout the central US from earthquakes. International Paper's commitment to its own risk management, coupled with the regional efforts of CUSEC and all of its partners, is a win-win approach to building the strong collaborative approach necessary to addressing the seismic hazard in the central US.

Information on becoming a corporate sponsor can be found on the CUSEC web site: www.cusec.org
Make a difference join today!



The Applied Technology Council (ATC) and Multidisciplinary Center for Earthquake Engineering Research (MCEER) are pleased to announce the availability of the ATC-29-2 Report, *Proceedings of Seminar on Seismic Design, Performance, and Retrofit of Nonstructural Components in Critical Facilities*, the result of the third in a series of ATC/MCEER seminars on this subject first held in October 1990. Funded by the National Science Foundation, the Seminar presented current research, practice, and informed thinking pertinent to seismic design, performance, and retrofit of nonstructural components and distribution systems in buildings, with a special focus on critical facilities.

The Proceedings contain 43 technical papers describing state-of-the-art technical information pertaining to the seismic design,

ATC-29-2 Report, Proceedings of Seminar on Seismic Design, Performance, and Retrofit of Nonstructural Components in Critical Facilities

performance and retrofit of nonstructural components in critical facilities, such as computer centers, hospitals, manufacturing plants with especially hazardous materials, and museums with fragile/valuable collection items. The papers were presented at a seminar in Newport Beach, California in October, 2003. Topics addressed include: current practices and emerging codes; seismic design and retrofit; risk and performance evaluation; system qualification and testing; and advanced technologies.

The Proceedings are now available at our online store under Building Seismic Hazard Mitigation; Nonstructural Components on CD-ROM in PDF format, or in hardcopy .

If you have any questions, you may also contact the Applied Technology Council at 201 Redwood Shores Parkway, Suite 240, Redwood City, CA 94065; Phone: 650/595-1542; Fax: 650/593-2320; E-mail, atc@ATCCouncil.org.

- "No analysis" design concept;
- Use of some seismic resisting systems and elements not permitted in the current AASHTO provisions;

- Capacity spectrum design procedures;
- Displacement capacity verification ("Pushover") analysis; and
- Cost comparisons and implications.

Development of the consensus-based *Guidelines* was funded by the National Cooperative Highway Research Program (NCHRP) Project 12-49, and in part by the Federal Highway Administration as part of MCEER's Highway Project. The project included a distinguished advisory panel of experts in earthquake engineering and bridge engineering, and received significant input and guidance from the NCHRP Project Panel as well as from the AASHTO Highway Subcommittee on Bridges and Structures seismic design technical committee (T-3). As a result, the *Recommended Guidelines* reflect a broadconsensus opinion of leaders in the field of seismically designed bridges and highway structures and can be considered the most advanced bridge seismic design tool available today.

Sam Penny, author and lecturer announced the introduction of his new novel, *Broken River*, September 27 at the 2004 National Earthquake Conference held in St. Louis, Missouri, on September 26-30, 2004.



Author Sam Penny visits CUSEC



Penny says, "Though my characters are fiction, the physical events in my novels are real and they will

happen, we just don't know when the New Madrid Seismic Zone will once again fracture. However, we do know that the planning and mitigation we do today will determine how catastrophic that future earthquake will be."

Broken River tells of what happens to the Ohio and Mississippi Rivers when a 7.9 magnitude earthquake once again strikes the New Madrid Fault. It is a sequel to Penny's first novel, *Memphis 7.9*, Book 1 of *The 7.9 Scenario*, published last year.

"Imagine the center of the United States destroyed by a giant earthquake that breaks the Mississippi and Ohio Rivers: the dams, the weirs, the levees, the flood controls that the Army Corps of Engineers built over the past 120 years.

Can it happen?" Penny asks. "You can bet on it. The U.S. Geological Survey says the chance of it happening in the lifetime of the majority of the people now living in the U.S.A. is one in ten."

In Book 2 of *The 7.9 Scenario*, the captains of two boats on the Mississippi River try to save their ships and passengers from the worst earthquake to strike the United States in nearly 200 years. Their experiences tell what to expect along our great waterways when our land is once again torn by an

earthquake the size of those that struck in 1811 and 1812.

The 7.9 Scenario is an analytical study developed by Penny over the past seven years. "I used government data to determine the impact of a giant New Madrid Fault earthquake under the Mississippi River on the United States. I was startled to find that my calculations estimated a damage zone in the central United States of over 300,000 square miles with 60,000 people killed, 300,000 injured, and 8,000,000 homeless should a 7.9 magnitude earthquake strike the New Madrid Fault today. The dams and levees making up the core of our water control and transportation system would be destroyed."

Our nation could lose as much as 10% of its gross domestic product to this earthquake, enough to plunge it into the worst depression it has ever seen.

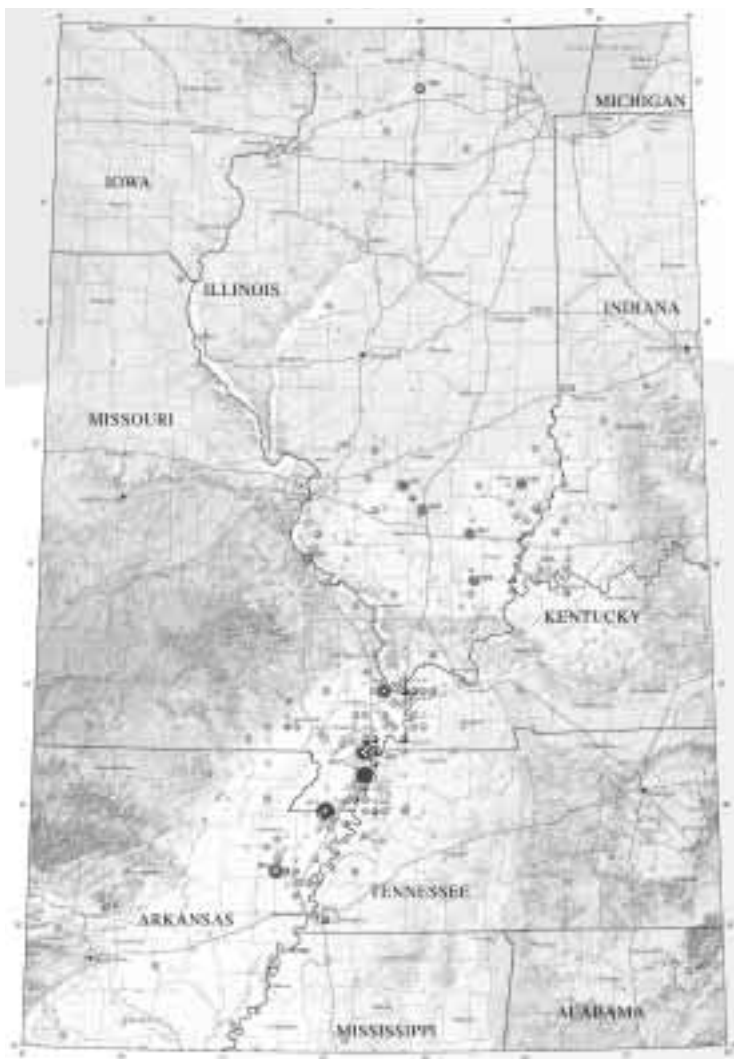
Penny continues, "Are the authorities doing enough to reduce these numbers? No. Are they even aware? Some are, but even those who know seem reluctant to push the issue. Can you do something? Yes, but only if you know what can happen WHEN, not IF, a giant earthquake once again strikes the New Madrid Fault. I intend to shine a light on this problem until the country takes notice."

7.9 and *Broken River* are the first two novels of a four part series scheduled for 2003 through 2005. Visit Penny's website at www.the79scenario.com for information about the series.

Contact: Sam Penny
205 Rainbow Drive #10503
Livingston, TX, 77399-2005
Email: sampenny@the79scenario.com



New USGS Map Highlights Central U.S. Earthquake History



A new map from the U.S. Geological Survey and the Central United States Earthquake Consortium shows that Central States, including Arkansas, Tennessee, Missouri, Kentucky and Indiana are among the most seismically active states east of the Rocky Mountains. More than 800 earthquakes are cataloged on the map that depicts the locations of earthquakes large enough to be felt, since 1699.

The large-format colored map, "Earthquakes in the Central United States - 1699-2002 identifies the infamous New Madrid earthquakes of 1811 and 1812 which by today's standards would have been disastrous magnitude 8.0 + temblors. But it also shows many smaller, but still destructive earthquakes including a magnitude 6.3 earthquake which shook

eastern Arkansas in January of 1843; a magnitude 6.6 earthquake which shook residents of six states on Halloween morning in 1895 and was centered in southeastern Missouri; and a magnitude 5.4 earthquake which cracked foundations and toppled tombstones in southeastern Illinois in November of 1968.

"Many people in this region have felt earthquakes and many have not," said Eugene Schweig,

scientist-in-charge of the USGS Central U.S. Earthquake Center in Memphis, TN. "What's most important to understand is that in this space of 300 years, we've seen some dramatic earthquakes in this region. That's a very short amount of time compared to the geologic history of the Earth. People in the Central U.S. should realize that large earthquakes have happened in this region and will again. With the dramatic development of the past 20 years, a lot of people are at risk and they may not know it. The historical perspective provided by this new map reminds us that we must not be complacent about earthquake dangers in Central United States."

Although earthquakes cannot be reliably predicted or prevented today, the new map and accompanying web site are

intended to increase public awareness of Northeastern earthquake hazards.

"This USGS map graphically illustrates that Missouri has a sleeping giant (earthquake potential) in our backyard. Every year, hundreds of minor earthquakes occur and some are felt in this the region. This new map shows our citizens that earthquakes in the mid-west are active, and the potential for a damaging earthquake is very real," Jerry Uhlmann, Missouri's State Emergency Management Agency Director said.

The largest and most frequent earthquakes are the shocks concentrated in the New Madrid seismic zone from northeastern Arkansas to southernmost Illinois. Other earthquakes are scattered abundantly as far north as a line from St. Louis to Indianapolis. The map summarizes effects of the most notable earthquakes, including one in southwestern Indiana less than 2 years ago.

"Development of this map for the central US clearly demonstrates the power of partnerships," said Jim Wilkinson, executive director of the Central U.S. Earthquake Consortium (CUSEC). "CUSEC working with the USGS has created a product which is mutually beneficial in raising public awareness to the seismic hazard in the central US from both the scientific and emergency preparedness perspectives."

Copies of the map are available by telephone, and on the internet. For a paper copy of "Earthquakes in the Central U.S., 1699-2002," call 1-888-ASK-USGS and request USGS map I-2812. Price is \$7 plus \$5 shipping and handling. For a digital version: download files free from <http://pubs.usgs.gov/i-map/i-2812/>.

The USGS serves the nation by providing reliable scientific information to: describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life



Earthquakes in the Central United States—1699-2002

By Kenneth J. Wicks, Thomas W. Chappel, Richard L. Van Cester, G. Willem, and Rick P. Bradley

2002

About This Map

This map shows the distribution of earthquakes in the geotectonically active region of the central United States. It was prepared for a general audience and is not intended to be used to assess earthquake hazards for individual locations.

The map shows earthquakes that were reported between 1699 and 2002. The locations of earthquakes are shown by circles of varying diameters. The size of the circle indicates the magnitude of the earthquake. The circles are shaded to indicate the depth of the earthquake. The circles are shaded to indicate the depth of the earthquake.

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This map shows the distribution of earthquakes in the geotectonically active region of the central United States. It was prepared for a general audience and is not intended to be used to assess earthquake hazards for individual locations.

Three Centuries of Earthquakes



This map shows the distribution of earthquakes in the geotectonically active region of the central United States. It was prepared for a general audience and is not intended to be used to assess earthquake hazards for individual locations.

Earthquakes



Notable Earthquakes

Seismologists have recorded thousands of earthquakes in the past century. Of these, only a few are large enough to be felt over a wide area. The following earthquakes are considered to be the most notable in the past century. The following earthquakes are also included in the list of the most notable earthquakes in the past century.



1811-1812

December 16, 1811, 2.37 Mw
January 11, 1812, 2.37 Mw
February 1, 1812, 2.37 Mw

Location: New Madrid, Missouri (90°W, 36°N)

Impact: Significant damage to buildings and infrastructure.

1811-1812 The New Madrid earthquakes were a series of three major earthquakes that struck the New Madrid area in Missouri, Arkansas, and Tennessee in 1811-1812. The earthquakes were the largest in the history of the United States and caused significant damage to buildings and infrastructure. The earthquakes were caused by the movement of the Earth's crust in the New Madrid area.

AMERICAN EAGLE
The American Eagle is a well-known brand of clothing and accessories. It is known for its quality and style. The brand has a long history and is popular among many people. The American Eagle is a symbol of American style and fashion.

1843

March 4, 1843, 2.37 Mw

Location: New Madrid, Missouri (90°W, 36°N)

Impact: Significant damage to buildings and infrastructure.

1843 The New Madrid earthquakes were a series of three major earthquakes that struck the New Madrid area in Missouri, Arkansas, and Tennessee in 1811-1812. The earthquakes were the largest in the history of the United States and caused significant damage to buildings and infrastructure. The earthquakes were caused by the movement of the Earth's crust in the New Madrid area.

1895

December 1, 1895, 2.37 Mw

Location: New Madrid, Missouri (90°W, 36°N)

Impact: Significant damage to buildings and infrastructure.

1895 The New Madrid earthquakes were a series of three major earthquakes that struck the New Madrid area in Missouri, Arkansas, and Tennessee in 1811-1812. The earthquakes were the largest in the history of the United States and caused significant damage to buildings and infrastructure. The earthquakes were caused by the movement of the Earth's crust in the New Madrid area.

AN EARTHQUAKE SHAKES THE CITY
St. Louis Dispatch
The earthquake in New Madrid, Missouri, on December 1, 1895, was a major event. It caused significant damage to buildings and infrastructure. The earthquake was felt throughout the city and was a major event in the history of the United States.

1968

February 18, 1968, 2.37 Mw

Location: New Madrid, Missouri (90°W, 36°N)

Impact: Significant damage to buildings and infrastructure.

1968 The New Madrid earthquakes were a series of three major earthquakes that struck the New Madrid area in Missouri, Arkansas, and Tennessee in 1811-1812. The earthquakes were the largest in the history of the United States and caused significant damage to buildings and infrastructure. The earthquakes were caused by the movement of the Earth's crust in the New Madrid area.

1987

June 10, 1987, 2.37 Mw

Location: New Madrid, Missouri (90°W, 36°N)

Impact: Significant damage to buildings and infrastructure.

1987 The New Madrid earthquakes were a series of three major earthquakes that struck the New Madrid area in Missouri, Arkansas, and Tennessee in 1811-1812. The earthquakes were the largest in the history of the United States and caused significant damage to buildings and infrastructure. The earthquakes were caused by the movement of the Earth's crust in the New Madrid area.

2002

January 12, 2002, 2.37 Mw

Location: New Madrid, Missouri (90°W, 36°N)

Impact: Significant damage to buildings and infrastructure.

2002 The New Madrid earthquakes were a series of three major earthquakes that struck the New Madrid area in Missouri, Arkansas, and Tennessee in 1811-1812. The earthquakes were the largest in the history of the United States and caused significant damage to buildings and infrastructure. The earthquakes were caused by the movement of the Earth's crust in the New Madrid area.



New Madrid Seismic Zone
The New Madrid seismic zone is a region of high seismicity in the central United States. It is located in the New Madrid area of Missouri, Arkansas, and Tennessee. The zone is known for its large earthquakes and is a major seismic hazard in the region.

The New Madrid seismic zone is a region of high seismicity in the central United States. It is located in the New Madrid area of Missouri, Arkansas, and Tennessee. The zone is known for its large earthquakes and is a major seismic hazard in the region.



DATES TO MARK

Missouri Earthquake Awareness Week — February 2-5, 2004. Activities for the week will include: a workshop for business and industry, meeting of the MO Seismic Safety Commission, Central US Seismic Safety Council, USGS Saint Louis Hazard Mapping Project Workshop and capping off the week with a multitude of earthquake exhibits at the Saint Louis Science Center. Contact Susie Stoner at 573-526-9136 for more information.

2004 Annual IBHS Congress. Sponsor: Institute of

Business and Home Safety (IBHS). Orlando, Florida: **November 4-5, 2004** Information is available from IBHS, 4775 East Fowler Avenue, Tampa, FL 33617; (813) 286-3400; e-mail: info@ibhs.org; <http://www.ibhs.org/congress/>.

100th Anniversary Earthquake Conference: Commemorating the 1906 San Francisco Earthquake. 4/18-22/06 San Francisco, California. Contact: EERI, 499 14th Street, Suite 320, Oakland CA 94612-1934. eeri@eeri.org

<http://www.1906eqconf.org> or
<http://www.quake06.org/quake06.html>

Geotechnical and Bridge Seismic Design Workshop 10/28-29/04, Cape Girardeau, MO, Contact: Victoria Banales, Distance & Continuing Education, University of Missouri-Rolla, 107 ME Annex, Rolla, MO 65409-1560; 573-341-4278
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CUSEC's purpose is to help reduce deaths, injuries, damage to property and economic losses resulting from earthquakes occurring in the central United States. Basic program goals include: improving public awareness and education, mitigating the effects of earthquakes, coordinating multi-state planning for preparedness, response and recovery; and encouraging research in all aspects of earthquake hazard reduction.

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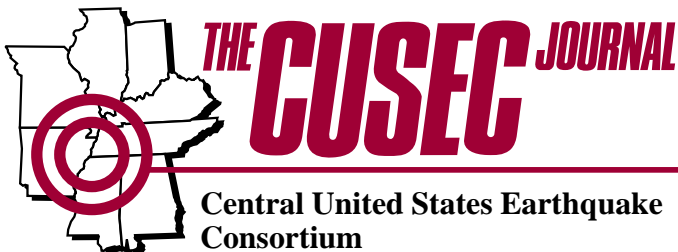
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