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# Natural Disaster Assistance for Missouri Citizens - Natural Disaster Recovery for Historic Buildings

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Department of Natural Resources fact sheet

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The destruction to historic buildings caused by natural disasters can be significant.

A moderately severe tornado, for example, is capable of lifting the roof off a historic building and, in the process, widely scattering its contents. The most intense tornado can lift a frame building in its entirety. Often, when a tornado passes over a structure, the rapid reduction in air pressure will cause the higher pressure inside to cause the building to explode.

Evaluation of damage to buildings is one of the first and most essential steps to undertake after a natural disaster. Building departments and private engineers will determine which damaged buildings are safe to enter.

In the rush to repair communities, it may be easier to demolish damaged historic buildings than to undertake repair, but understanding laws and policies for disaster relief often enables communities to restore these buildings.

## **Immediate Post-Disaster Actions for Historic Buildings**

After an historic building has been deemed safe to enter, immediate steps should be taken to stabilize the structure:

- Ensure gas, electricity and water are shut off.
- Consult a licensed engineer or preservation architect about structural stability of buildings and chimneys.
- Check walls and ceilings for misalignment from the foundation.
- Temporarily secure broken boards with plywood. Secure doors and window openings with appropriate coverings. Keeping additional moisture out of the building is a key step in preserving the structure.
- Salvage from debris broken historic elements such as bricks or decorative elements for reuse or replication.
- Maintain protective roof coverings. Continued attention must be paid to temporary repairs. Repairing gutters and downspouts will help move water away from the building.

## **Maintaining Preservation Standards**

Common effects of disasters on historic places, such as cracked walls, roofs that have been removed, water-damaged plaster and wet furnishings, usually can be repaired. Although the aftermath of a disaster is not “preservation as usual,” generally accepted standards should be followed even in the rush to repair.

For historic buildings, general and broad rules-of-thumb are good guides after disasters, as well as before:

- Repair rather than replace. Retain original features and materials wherever possible. Repair is historically and economically preferable to replacement.
- Replace with similar features. If replacement is necessary, use items that match the original in design and materials
- Retain historic character. If matching replacements are impossible because features are unavailable or too expensive, try to reproduce the salient visual characteristics of the original, such as material, composition, proportion and color.
- Return to the original. When possible, replace previously missing parts and remove inappropriate modernizations.

## **Repairing Storm-Damaged Historic Buildings**

### **Roofs**

Roofs form the first line of defense of any historic building and are vital in keeping damaging moisture out of the building.

- Because a roof is damaged does not mean it is a complete loss. Get expert advice, particularly because damage may not be visible.
- Metal roofs may be more difficult to repair, especially when they have become bent out of shape due to wind damage. Portions may be reusable.
- Metal flashings at parapets, chimneys, dormers, valleys, ridges and porches, are especially vulnerable and should be checked thoroughly.

### **Masonry and Mortar Repairs**

Mortar in an historic building can be weakened by the damaging winds of a tornado. Settlement can lead to cracking in masonry walls, which can compromise the structure.

- Compatibility of materials is important. Similar brick types should be used in repairs. Portland cement mortar or stucco should be avoided.
- A good type of mortar to use for most brick is one composed of lime, sand and portland cement. A typical mix appropriate for historic buildings might include three parts lime, one part portland cement and 10-to-12 parts sand.
- The use of portland cement for stucco repair may cause the old material around the patch to powder and deteriorate. It is important when patching stucco to use as dry a mix as possible to avoid shrinking and cracking.

## **Wood**

- Be sure the building is fastened to its foundation, and tie together roof, walls and floors to strengthen the structural system.
- Reinforce rotted or insect-infested beam-ends by adding flitch plates or “sisters.”
- If the disaster recovery is used as an opportunity to upgrade the utilities in an historic structure, avoid drilling multiple holes through joists and beams, thus destroying or weakening the historic fabric.

## **Windows and Doors**

Windows and doors can be among the most important and decorative features in an historic building. If replacement of windows and doors is determined to be necessary, a partial replacement of components such as window sash alone should be considered. If window or door frames are replaced, the exterior trim should closely match the original.

## **Restoration Hazards**

- Fire: Never use an open flame or heat gun when working on wooden trim; both present a severe fire hazard.
- Asbestos: Wind and water damage, or work to repair this damage, can cause asbestos fibers, which were used in thousands of different construction materials, to become airborne. Missouri asbestos regulations differ for regulated and unregulated structures.
- Regulated structures (includes institutional, commercial, public, industrial or residential structures that contain more than four dwelling units) – A Missouri-certified asbestos inspector must perform an inspection for the presence of asbestos prior to the structure being renovated or demolished. Additional requirements such as notification or use of asbestos professionals may be required depending on the results of the inspection.
- Unregulated structures (a residential structure of less than four units) – While an asbestos inspection is not required, it can be a good idea. If asbestos-containing materials are detected on the site of a disaster, make sure all work halts immediately and professionals are brought in to clean it up.

Detailed information is available in the *Asbestos Requirements for Demolition and Renovation Projects* fact sheet (PUB2157), online at [dnr.mo.gov/pubs/pub2157.pdf](http://dnr.mo.gov/pubs/pub2157.pdf), or by contacting the Air Pollution Control Program at 800-334-6946.

- Lead Paint: Any stripping or scraping of paint on old buildings may uncover lead paint and release lead-contaminated dust, which is potentially poisonous to children. Equally dangerous is the use of heat guns or flames, which vaporize the lead in old paint.

## Financial Assistance for Recovery

Federal and state tax incentives exist for the rehabilitation of historic buildings. Most rehabilitation costs incurred as part of disaster recovery efforts may qualify for these credits.

- Federal Historic Rehabilitation Tax Credit: A 20 percent federal rehabilitation tax credit exists for substantially rehabilitated historic buildings. The credit applies to income-producing, depreciable structures only. Properties must be listed individually in the National Register of Historic Places or be a contributing element of a National Register Historic District. Rehabilitation must be substantial, meaning rehabilitation costs must exceed either the greater of \$5,000 or the adjusted basis of the building. All rehabilitation work must meet the Secretary of the Interior's "Standards for Rehabilitation."
- A 10 percent federal credit also exists for non-historic buildings.
- Missouri Historic Rehabilitation Tax Credit: A 25 percent Missouri rehabilitation tax credit exists for substantially rehabilitated historic buildings. The credit applies to income-producing, depreciable structures or to an owner's personal residence. Properties must be listed individually in the National Register of Historic Places or be a contributing element of a National Register Historic District. Rehabilitation must be substantial, meaning rehabilitation costs must exceed 50 percent of the basis of the property. All rehabilitation work must meet the Secretary of the Interior's "Standards for Rehabilitation."

## Bibliography

The information in this publication was prepared by the Missouri Department of Natural Resources' State Historic Preservation Office, with assistance from the National Park Service, Preservation Assistance Division.

Carl L. Nelson, *Protecting the Past From Natural Disasters*, Washington, D.C., The Preservation Press, 1991.

*Safeguarding Your Historic Site: Basic Preparedness and Recovery Measures for Natural Disasters*. Federal Emergency Management Agency, Region 1, 1993.

## For More Information

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