

## FEMA Building Guidelines

The following rules are only a few of the federal guidelines established by FEMA. More information, including building plans and materials are available by calling 1-800-480-2520 and requesting publication FEMA P-320 (titled "Taking Shelter From the Storm: Building a Safe Room For Your Home or Small Business") or at the FEMA Safe Room website ([www.fema.gov/safe-rooms](http://www.fema.gov/safe-rooms)).

**High Winds** - Tested with a 3-second gust of 250 mph

- Walls, doors, and ceilings must be able to withstand the peak wind velocity without buckling or separating
- The shelter cannot overturn or slide



*A storm shelter that survived a deadly Moore, Oklahoma EF5 tornado.*

**Debris** - Tested with a 15 lb. two-by-four wooden board propelled at 100 mph (250 mph wind speed equivalent)

- The walls and ceiling of a shelter must resist penetration by a test object

### Other Requirements

- Shelters must have a protected ventilation system
- Shelters should have at least a fire extinguisher, flashlights, first-aid kit, 8 hours supply of drinking water, and a NOAA Weather Radio

### Additional Requirements for Underground Shelters

- Shelters must be watertight and resist flotation due to saturated soil
- Shelters must contain a transmitter of some sort to signal the location of the shelter to emergency personnel, should debris trap shelter occupants

## Where Can I Find More Information?



*An EF4 tornado struck Henryville, IN (Clark Co.) on March 2, 2012. Safe rooms offer "near-absolute protection" during these devastating events.*

Much more information is available online regarding specifications, pricing options, and other details. FEMA maintains a general storm shelter information site at: [www.fema.gov/safe-rooms](http://www.fema.gov/safe-rooms)

The National Storm Shelter Association standard, along with other industry news, is available at: [www.nssa.cc](http://www.nssa.cc)

Texas Tech University's National Wind Institute provides information on research, education, and all things wind: [www.depts.ttu.edu/nwi](http://www.depts.ttu.edu/nwi)

Also, be sure to check out NOAA/NWS long-time partner FLASH (Federal Alliance for Safe Homes) for safe room ideas and pricing: [www.srh.noaa.gov/jetstream/hwsafe](http://www.srh.noaa.gov/jetstream/hwsafe)

And of course, for your best source of area weather information and more details on storm shelters, visit our website at:

[www.weather.gov/louisville](http://www.weather.gov/louisville)

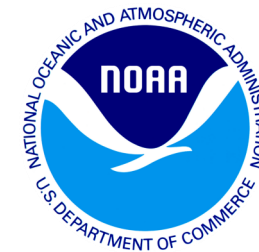


Courtesy of:  FLASH  
FEDERAL ALLIANCE FOR SAFE HOMES



# Safe Rooms

*The best way to protect you and your family from tornadoes.*



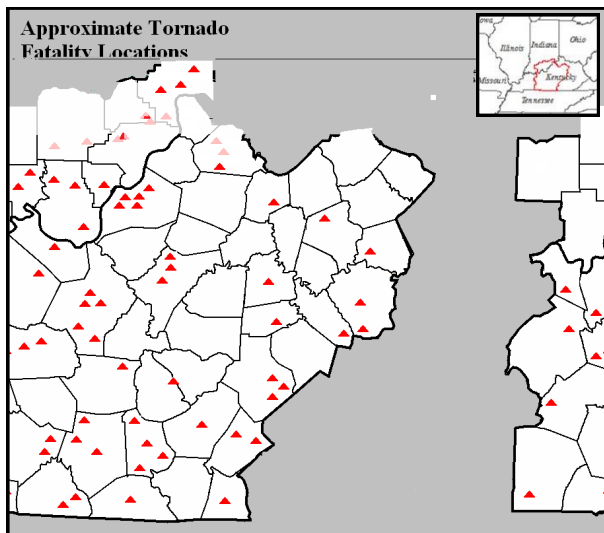
Department of Commerce  
National Oceanic and Atmospheric Administration

National Weather Service  
Louisville, Kentucky

## Why do I need a safe room?

You may hear a lot about “Tornado Alley” in the Great Plains, but southern Indiana and central Kentucky have an impressive record of tornadoes and associated damage:

- Southern Indiana and central Kentucky have experienced over 600 tornadoes since 1830.
- Tornadoes can occur during any time of the year in our area, but most occur between March and June.
- There have been 64 killer tornadoes, resulting in 435 fatalities. The most recent killer tornado occurred on March 2, 2012 when an EF4 killed 11 people in southern Indiana.
- Jefferson County, Kentucky has had the most tornadoes of any county, with 33.



Our area can get hit hard with tornadoes, and the recommended “interior room or closet” may not always be enough if a violent tornado hits. That’s why you should consider building or buying a safe room for your family or business. *It only takes **one** tornado to make a storm shelter worth the cost.*

## Are there different types of safe rooms?

There are three main types of safe rooms that are designed to protect you from severe weather. While each one is designed to keep you and your family safe, each has its own pros and cons.



**Underground:** A modern version of the old “storm cellars,” these rooms are usually safe from flying debris and high winds, but are less likely to be occupied if access requires outdoor exposure. Installation can be a problem, depending on the type of rock and the water table in your area.



**In-residence:** These act more like fortified closets, so they are more accessible when a tornado approaches. They are usually built into a new house using reinforced concrete, reinforced masonry, or wood/steel combinations. Building one into an existing house can be difficult and costly. Alternatives include pre-built metal shelters that are not only easier to install but can be placed almost anywhere in the house.

**Community:** If a family safe room is not an option, community safe rooms can hold multiple families (from 12 to as many as several hundred). Commonly used in manufactured housing areas, these shelters are usually above ground, exposing them to flying debris but saving many more lives than the safety that a typical home can provide.

*If a safe room is not a viable option, remember to seek shelter in the center of a basement underneath something sturdy. Protect yourself from debris. If a basement is not available, seek refuge in a small interior room on the lowest level of your home or business, away from windows.*

## What’s the best safe room?

There’s no one authority to tell you what is the best safe room, nor can the federal government endorse a specific type of safe room as being “the best.” However, safety standards for safe rooms and shelter components have been established by the Federal Emergency Management Agency (FEMA) to ensure that you will be protected in most tornadoes, while the National Storm Shelter Association has also established a safe room standard.



*The Wind Science and Engineering Research Center (WISE) at Texas Tech University tests various safe rooms and their components. One test uses this air cannon, which shoots 15-pound two-by-four wooden boards at safe room walls and doors to simulate flying debris. (Photo courtesy WISE)*

The Wind Science and Research Center at Texas Tech University performs these tests on safe rooms and various shelter components to see if they meet both sets of guidelines. Along with using a high-powered air cannon as shown above, researchers also use a wind tunnel to simulate the high winds and stress that walls would encounter. Depending on the type of shelter that is right for you, these tests and guidelines can help you choose the shelter that can best protect your family when a *real* tornado hits.