



1427 E. Piedmont Dr, Suite 2 • Tallahassee, FL 32308 • (877) 221-SAFE • www.flash.org • flash@flash.org

## Hurricanes

### A Hurricane Overview

#### What Is a Hurricane?

A hurricane is a powerful tropical storm that measures several hundred miles in diameter. Hurricanes have two main parts. The first is the eye of the hurricane, which is a calm area in the center of the storm. Usually, the eye of a hurricane measures about 20 miles in diameter, and has very few clouds. The second part is the wall of clouds that surrounds the calm eye. This is where the hurricane's strongest winds and heaviest rain occur.

#### How Hurricanes Form

Hurricanes need warm tropical oceans, moisture and light winds above them. If the right conditions last long enough, a hurricane can produce violent winds, incredible waves, torrential rains and floods.

Hurricanes rotate in a counterclockwise direction around an "eye." Hurricanes have winds of at least 74 miles per hour. There are on average six Atlantic hurricanes each year; over a three-year period, approximately five hurricanes strike the United States coastline from Texas to Maine.

#### Tropical Depression

A tropical depression is an organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds of 38 mph.

#### Tropical Storm

A tropical storm is an organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39-73 mph.

#### When a Hurricane Strikes

When hurricanes move onto land, the heavy rain, strong winds and heavy waves can damage buildings, trees and cars. The heavy waves are called a storm surge. Storm surge is very dangerous and a major reason why you MUST stay away from the ocean during a hurricane warning or hurricane.

## Animación del dueño de una casa: Entablado de emergencia

### Entablado de emergencia: Cómo hacer e instalar cerramientos de contrachapado

Si su casa no está protegida por puertas y ventanas resistentes a los impactos, o no cuenta con cerramientos o paneles resistentes a los impactos, considere la

Versión de la



posibilidad de construir sus propios paneles de emergencia provisorios.

**Paso uno: planifique el trabajo.**

Cuente y mida todas las ventanas y puertas que tengan vidrios, incluidas las puertas cristaleras, las puertas deslizantes con vidrios y las claraboyas. También podría ser conveniente incluir las ventilaciones de los techos, sean planos o a dos aguas, y cualquier abertura que, en caso de resultar dañada, pudiese permitir la entrada de viento a la casa.

Mida cada abertura horizontalmente entre los lados internos del contramarco exterior y verticalmente desde el dintel hasta la parte inferior del contramarco superior.

**Agregue 8" (20 cm) tanto a la altura como al ancho para que el panel sea 4" (10 cm) más grande que la abertura en todos sus lados.**

**Cuando tenga que medir una ventana cuyo dintel sobresalga de la pared, mida desde la parte de arriba del dintel hasta la parte de arriba de la ventana y agregue 4" en lugar de 8".**

Las planchas de contrachapado generalmente miden 4' x 8' (aprox. 1,20 m x 2,40 m) de ancho. Esto lo ayudará a calcular cuántas planchas necesita comprar. Asegúrese de comprar planchas de contrachapado de 5/8" (1,5 cm) como mínimo, para exteriores (CDX).

**Paso dos: prepare las herramientas y los elementos de ferretería.**

Para este trabajo, se necesita serrucho o sierra circular, taladro y mechas, martillo y llave inglesa, guantes de trabajo y gafas de seguridad.

También se necesitan distintos elementos de ferretería, incluidos tornillos, anclajes para madera o mampostería, tuercas y arandelas grandes. Es posible que tenga que usar distintos tipos de tornillos, ya que se necesitan tornillos diferentes dependiendo de que la casa tenga estructura de madera o de mampostería.

**Para las casas de madera** se usan tirafondos (tornillos de fijación) y anclajes permanentes con revestimiento de plástico.

**Para las casas de mampostería** se usan pernos regulables y grapas de empotramiento galvanizadas permanentes.

**Paso tres: ponga manos a la obra.**

Si alguien lo ayuda a realizar este trabajo, las cosas serán mucho más fáciles.

Primero, haga agujeros del mismo diámetro que los pernos o tornillos en cada esquina de la plancha de contrachapado, a una distancia de 2" (5 cm) del borde, y a intervalos de 12" (30,5 cm) alrededor de todo el panel.

Luego, sostenga firmemente la plancha de contrachapado sobre la abertura para marcar dónde tiene que hacer los agujeros de fijación.

**Si el dintel de la ventana está a ras de la pared, asegure el contrachapado por los cuatro costados.**

**Si el dintel de la ventana sobresale de la pared en la parte inferior, asegure el contrachapado por la parte de arriba y los costados.**

**Si las ventanas miden como máximo 3' x 4' (aprox. 90 cm x 120 cm) y están instaladas en una casa con estructura**

**de madera, use tirafondos de 1/4" de diámetro y anclajes permanentes con revestimiento de plástico.**

Los tirafondos deben penetrar por lo menos 1 3/4" (4,5 cm) en el muro y el marco ubicado alrededor de la ventana. En el caso de ventanas más grandes, use tirafondos de 3/8" de diámetro que penetren por lo menos 2 1/2" (aprox. 6,5 cm) en el muro y el marco ubicado alrededor de la ventana.

**Si las ventanas miden como máximo 3' x 4' (aprox. 90 cm x 120 cm) y están instaladas en una casa de mampostería, use pernos regulables de 1/4" de diámetro y grapas de empotramiento galvanizadas permanentes.**

Los pernos regulables deben penetrar como mínimo 1 1/2" (aprox. 4 cm) en el muro. En el caso de ventanas más grandes, use pernos regulables de 3/8" de diámetro que penetren por lo menos 1 1/2" en el muro.

**Si alguna ventana o puerta es más grande que una plancha de contrachapado, tendrá que unir los paneles con trabas de 2X4 (5 cm x 10 cm) a todo lo largo de la unión.**

Aplique las trabas de 2X4 en la parte exterior del panel de contrachapado con tornillos galvanizados (tornillos para entablados de exterior) calibre 10, de 2" (5 cm) de largo, a una distancia de 4" (10 cm) entre uno y otro.

Use el lado más ancho de las trabas de 2X4 para cubrir a lo largo toda la unión.

Cuando haya terminado, marque cada panel con el nombre de la abertura, para saber rápidamente dónde instalarlo cuando se aproxime una tormenta.

Guarde los paneles, las arandelas y las tuercas todos juntos en un lugar alejado del rigor de los elementos de la naturaleza. Recuerde que los cerramientos de contrachapado son únicamente para uso provisorio de emergencia. Si tiene pensado volver a usar los paneles en otras ocasiones, considere la posibilidad de impermeabilizarlos con pintura o un sellador para evitar que se comben con el tiempo.

Y asegúrese de visitar [flash.org](http://flash.org) para obtener más información acerca de cómo preparar su casa y proteger a su familia de un desastre.

## Animated How-To: TADD

### Turn Around Don't Drown®

Floods are the most common and widespread of all weather-related natural disasters. And flash floods are the most dangerous kind of floods, because they combine the destructive power of a flood with incredible speed and unpredictability.

Many weather conditions can cause a flash flood. They're often the result of heavy rainfall from slow-moving thunderstorms or new thunderstorms developing and moving over the same area or from the rain of hurricanes or tropical storms concentrated over one area.

Rapidly rising water creating a flash flood may occur with little warning.

Every year, more deaths are caused by flooding than from any other severe weather related hazard. Why? The main reason is that people underestimate the force and power of water.

Did you know that as little as six inches of moving water can knock you off your feet or cause you to lose control of your car&

And just two feet of water can cause a car even a big SUV to be swept off a road or bridge.

When cars are swept downstream into fast moving water often, the people inside them drown.

Tragically, emergency responders are often injured or killed as they attempt to rescue individuals trapped by flooding.

But many of these deaths are preventable.

Whether you are driving or walking, if you come to a flooded road, follow this simple rule: Turn Around Don't Drown.

Dont take a chance and cross a flooded road or bridge because you cant determine the depth of water or the condition of the road or bridge.

FLASH and the National Weather Service have some simple guidelines to help you and your family stay safe in flooding situations:

Do not camp or park your vehicle along rivers, streams or washes, particularly during threatening conditions.

If flooding occurs, get to higher ground. Stay away from areas subject to flooding like low spots, valleys, canyons or washes.

Avoid areas already flooded, especially if the water is flowing fast. Never try to cross flowing streams.

NEVER let your children play near flooded streams, storm drains, bayous, roads, rivers or creeks.

NEVER drive through flooded roadways. Road beds or bridges may be washed out under flood waters.

Never drive around the barriers that warn you the road is flooded.

Be especially cautious at night when it is harder to recognize flood dangers.

Always remember, if youre in doubt Turn Around Dont Drown.

And visit [flash.org](http://flash.org) for more information about strengthening your home and safeguarding your family from disaster.

---

## FLASH Card: Turn Around, Don't Drown

### Turn Around, Don't Drown

More deaths occur due to flooding each year than from any other thunderstorm or hurricane related hazard. Many of these casualties are a result of careless or unsuspecting motorists who attempt to navigate flooded roads. The National Weather Service now warns anyone who comes to a flooded roadway, "Turn around... don't drown!"

**Follow these safety rules:**

If flooding occurs, get to higher ground. Stay away from flood-prone areas, including dips, low spots, valleys, ditches, washes, etc.

Avoid flooded areas or those with rapid water flow. Do not attempt to cross a flowing stream. It takes only six inches of fast flowing water to sweep you off your feet.

Don't allow children to play near high water, storm drains or ditches. Hidden dangers could lie beneath the water.

Flooded roads could have significant damage hidden by floodwaters. NEVER drive through floodwaters or on flooded roads. If your vehicle stalls, leave it immediately and seek higher ground. Water only two feet deep can float away most automobiles.

Do not camp or park your vehicle along streams and washes, particularly when threatening conditions exist.

Be especially cautious at night when it is harder to recognize flood dangers.

Monitor NOAA Weather Radio or your local media for vital weather related information.

More information on flood safety is available through the National Weather Service, [www.noaa.gov/floods.htm](http://www.noaa.gov/floods.htm), or the Federal Alliance For Safe Homes, [www.flash.org](http://www.flash.org). Call our toll-free help desk at 1-877-221-SAFE or email [flash@flash.org](mailto:flash@flash.org).

## Flood Insurance -- How to Purchase

### Who Can Have Flood Insurance

Flooding causes more than 90 percent of all disaster-related property damage in the United States but most homeowner policies do not cover flood damage. Because of this, homeowners need flood insurance -- a special policy backed by the federal government, with cooperation from local communities and private insurance companies. About 200 insurance companies, possibly including the company that already handles your homeowners insurance, write and service flood insurance policies for the government, which finances the program through premiums. Although flood insurance is relatively inexpensive, most Americans neglect to purchase protection.

### National Flood Insurance Program

Only about one-quarter of the homes in areas most vulnerable are insured against flood loss, according to the Federal Insurance Administration (FIA). In those areas, flooding is 26 times more likely to occur than a fire during the course of a typical 30-year mortgage. More than 19,000 communities have agreed to stricter zoning and building measures to control floods, according to the Federal Emergency Management Agency (FEMA). Residents in these communities are entitled to purchase flood insurance through the National Flood Insurance Program (NFIP), a program FEMA oversees.

### 30-day Waiting Period

An important fact to know is that a flood insurance policy does not take effect until 30 days after you purchase it. So, if the weather forecast announces a flood alert for your area and you run to purchase coverage, it's already too late. You will not be insured if you buy a policy a few days before a flood. To see if your community participates in NFIP and for more information about federal flood insurance, visit [www.fema.gov/nfip](http://www.fema.gov/nfip).

## Hurricane Names

### Storm Names

The National Hurricane Center gives the storm a name from the list once a tropical storm reaches wind speeds of 39 mph and develops a counter-clockwise circulation.

The letters Q, U, X, Y and Z are omitted from the list because so few names begin with those letters. Names associated with storms that have caused significant death and/or damage are usually retired.

In 2005, the official list of names for storms wasn't long enough to cover all the hurricanes that developed that year. When the standard list of storm names ran out, forecasters used the letters of the Greek alphabet to name the five additional storms - Alpha, Beta, Delta, Gamma and Epsilon.

### 2005 Storm Names

Arlene  
Bret  
Cindy  
Dennis  
Emily  
Franklin  
Gert  
Harvey  
Irene  
Jose  
Katrina  
Lee  
Maria  
Nate  
Ophelia  
Philippe  
Rita  
Stan  
Tammy  
Vince  
Wilma

### 2006 Storm Names

Alberto

Beryl  
Chris  
Debby  
Ernesto  
Florence  
Gordon  
Helene  
Isaac  
Joyce  
Kirk  
Leslie  
Michael  
Nadine  
Oscar  
Patty  
Rafael  
Sandy  
Tony  
Valerie  
William

---

## Hurricane Ratings

### Hurricane Ratings

The Saffir-Simpson Hurricane Scale is used to rate a hurricane's present intensity. The scale ranges from one to five and uses sustained wind speed to estimate the potential property damage and flooding from a hurricane landfall.

#### Category One

Category One -- Wind Speed 74-95 mph.

Damage: No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery and trees; also some coastal flooding and minor pier damage.

Examples: Irene 1999, Allison 1995.

#### Category Two

Category Two. Wind Speed 96-110 mph.

Damage: Some roofing material, door and window damage to buildings; considerable damage to vegetation, mobile homes and piers. Coastal and low-lying escape routes flood in two to four hours before arrival of the center of the storm. Small craft in unprotected anchorages break moorings.

Examples: Bonnie 1998, Georges 1998 and Gloria 1985.

#### Category Three

Category Three. Wind Speed: 111-130 mph.

Damage: Some structural damage to small residences and utility buildings with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain continuously lower than five feet above sea level may be flooded inland eight miles or more.

Examples: Keith 2000, Fran 1996, Opal 1995, Alicia 1983 and Betsy 1965.

#### **Category Four**

Category Four. Wind Speed 131- 155 mph.

Damage: More extensive curtain wall failures with some complete roof structure failure on small residences; major erosion of beaches. Major damage to lower floors of structures near the shore. Terrain continuously lower than ten feet above sea level may be flooded requiring massive evacuation of residential areas as far as six miles.

Examples: Andrew 1992, Hugo 1989 and Donna 1960.

#### **Category Five**

Category Five. Wind Speed 155 + + + +

Damage: Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located 15 feet above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within five to ten miles of the shoreline may be required.

Examples: Mitch and Gilbert 1988.

## **Hurricane Watch and Warning -- The Difference**

### **Hurricane Watch**

A hurricane watch means residents in a designated coastal area could experience hurricane conditions within 36 hours. Families should enact their disaster action plan and begin to secure homes, vehicles and boats. Residents on barrier islands should consider evacuating.

### **Hurricane Warning**

A hurricane warning indicates sustained winds of at least 74 mph are predicted for a designated area of the coastline within 24 hours. Residents should complete disaster action plans and seek shelter in the safest location.

## **Hurricanes -- Know Your Risk**

### **Where Do You Stand?**

Ask your local emergency management office or American Red Cross chapter about the history of hurricanes in your area. Ask for information about protecting your family and home.

Ask your emergency management office, building department or floodplain management office to see a flood map of your community. There may be a projected flood elevation for your neighborhood.

This information will help you determine how much water is likely to come in.

## National Flood Insurance Program: Frequently Asked Questions

### Q&As On the National Flood Insurance Program

Who do I go to first for help with questions about my NFIP policy?

You should call your insurance agent or insurance company first.

Does my NFIP Policy cover all the buildings on my property?

The Standard Flood Insurance Policy provides coverage for one building per policy. The only exception is 10% coverage for a detached garage. However, the total payment for flood damage to the detached garage and the house together cannot exceed the building policy limit. For coverage to apply, the garage can only be used for parking and storage. Any other use would void this coverage, i.e. if the garage has a workshop, the coverage would not apply. All other buildings on the premises need separate coverage. Policy limits for residential properties is \$250,000 and \$500,000 for commercial properties.

Are the contents of my home covered under my NFIP Policy?

Contents are not automatically included. If contents coverage is desired a specific amount must be named and a separate premium charged, but it doesn't need to be a separate policy. Contents coverage limits are \$100,000 for residential policies and \$500,000 for commercial policies.

What is Actual Cash Value?

Actual Cash Value (ACV) is the cost to repair or replace an insured item of property at the time of the loss, less physical depreciation. The value of physical depreciation is based on the age and condition of the item. Personal property, i.e. contents, is always paid at ACV.

What is Replacement Cost Value?

Replacement Cost Value (RCV) is the cost to repair or replace an insured item of property at the time of the loss without a deduction for physical depreciation. RCV is available when the insured property is the primary residence and the amount of coverage is equal to 80% or more of the replacement cost of the building. RCV is also available for residential condominium buildings. There is no required amount of coverage, but residential condominium buildings not insured to 80% of replacement cost will experience a reduction in their claims payments.

Do I have to pay a deductible?

Yes, all policies have deductibles for both building and contents coverage (if contents coverage has been purchased).

I have a living area in my basement. Is that covered?

Strict exclusions of coverage apply in any basement. A basement is defined as any area that is below grade on all four sides. In some cases, sunken living rooms can be defined as a basement. Building coverage in basements is limited to systems that service the building, such as electrical boxes, heat pumps and air conditioners. Contents in basements are not covered with a few exceptions such as a washer, dryer, freezer and the food in it. Similar exclusions of coverage also apply in any enclosure below an elevated structure if the structure is Post-FIRM.

What does Post-FIRM mean?

FIRM stands for Flood Insurance Rate Map. Post-FIRM means built after the effective date of the initial Flood Insurance Rate Map for the community or December 31, 1974, whichever is later.

Does my NFIP Policy cover my additional living expenses when I cannot return home?

No, there is no coverage for Additional Living Expenses or Loss of Use or Business Interruption.

Does my NFIP Policy cover mold or mildew?

Damage from mold and/or mildew resulting from the after-effects of a flood is covered but each case is evaluated on an individual basis. Mold and/or mildew conditions that existed prior to a flooding event are not covered. After a flooding event, the policyholder is responsible for taking reasonable and appropriate mitigation actions to reduce and/or eliminate mold and/or mildew. Reasonable actions taken to mitigate mold and/or mildew are covered (for example, the use of responsible drying-out techniques or application of mildicide at a reasonable cost).

Does my NFIP Policy cover water backed up from the sewer?

Back up of water from sewers and drains are excluded, except when caused by a flood.

What is Increased Cost of Compliance, or ICC?

This coverage provides up to \$30,000 to comply with the community's floodplain management regulations when a building has been substantially damaged by flood and is in a designated floodplain.

Does my NFIP Policy cover landscaping or my deck?

No, there is no coverage for landscaping, trees, decks or outdoor furniture. Other exclusions are found in the Standard Flood Insurance Policy.

What is a Proof of Loss?

A Proof of Loss is a legal document that is your statement of the amount you are claiming under the policy. Under the NFIP policy, your Adjustor may prepare a proof of loss as a courtesy. However, you, the insured, are responsible for submitting either the Proof of Loss prepared by your Adjustor or, you may prepare your own. Generally, you must submit it to your insurance company within 60 days of when the damage occurred.

What do I do if I do not agree with my Adjustor?

You should work with your Adjustor as long as possible. Ask your Adjustor to work with your contractor if your disagreement involves the building claim. If you cannot agree with your Adjustor, ask for assistance from his supervisor. If you still cannot resolve your differences, contact your insurance company.

## Storm Surge

### What Is Storm Surge?

Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the average water level 15 feet or more. Storm surge is the greatest threat to property and life along the affected coast.

## An Interactive Shutter Tool

### Window & Door Protection

Protecting windows and doors is an important part of any plan to prevent or reduce wind damage. While many window and door protection product options exist, getting started can be confusing and cost comparisons can be time-consuming. The window and door tool offers homeowners two ways to calculate the approximate cost of six different product types plywood shutters, metal panels, accordion shutters, Colonial/swing shutters, electric roll down shutters or impact-resistant glass.

Homeowners can select from either the easy link or comprehensive tool to get an approximate cost. Please note that all costs are approximate, include installation charges and are based on an average price derived from three vendors. Homeowners should check with local distributors for more information.

[Click to use tool](#)

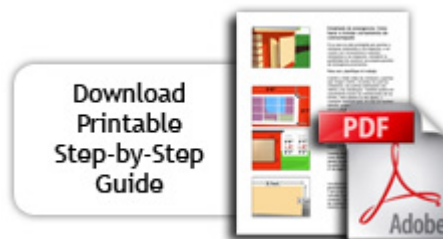
## Animated How-To: Emergency Board-Up

### Emergency Board-Up

If your home is not protected by impact-resistant windows and doors; or impact resistant shutters or panels; consider building your own temporary emergency panels.

#### Step One: Plan the Project.

Count and measure each window and door that has glass including French doors,



sliding glass doors as well as skylights. You might also want to include roof and gable end vents or any opening that if damaged would allow wind to enter your home.

Measure each opening horizontally inside the exterior trim and vertically from the sill to the bottom of the top trim.

Add eight inches to both the height and width to provide a four-inch overlap on all sides.

**When measuring a window with an extended sill measure from the top of the sill to the top of the window and add four inches instead of eight.**

Sheets of plywood are generally 4 feet by 8 feet. This will help determine how many sheets to buy. Be sure to purchase plywood that is 5/8 inch or greater, exterior grade (CDX).

### **Step Two: Assemble Your Tools and Hardware.**

You will need a circular saw, drill and drill bits, hammer and wrench, work gloves and safety goggles for this project.

You will also need an assortment of hardware including bolts, wood or masonry anchors, nuts and large washers. A range of bolts may be used because different bolts will be needed for wood frame versus masonry homes.

Wood Homes use lag screws and plastic coated permanent anchors

Masonry Homes use expansion bolts and galvanized permanent expansion anchors

### **Step Three: Get Started**

Having someone help you with this project will make things a lot easier.

First drill holes in the same diameter as the bolts or screws, 2-inches in from the edges of the plywood at each corner and at 12-inch intervals around the panel.

Next hold the plywood firmly in place over the opening to mark where to drill mounting holes.

**If the window sill is flush to the wall, secure the plywood on all four sides.**

**If the window sill extends out at the bottom, secure the plywood on the top and sides.**

For windows 3 feet by 4 feet or smaller installed on a wood frame house, use 1/4-inch lag screws and plastic coated permanent anchors.

The lag screws should penetrate the wall and frame surrounding the window at least 1 3/4 inches. For larger windows, use 3/8-inch lag screws that penetrate the wall and frame surrounding the window at least 2 1/2 inches.

For windows 3 feet by 4 feet or smaller installed on a masonry house, use 1/4 inch expansion bolts and galvanized permanent expansion anchors.

The expansion bolts should penetrate the wall at least 1 1/2 inches. For larger windows, use 3/8-inch expansion bolts that penetrate the wall at least 1 1/2 inches.

If a window or door is larger than a sheet of plywood, you will need to join the panels with 2X4 bracing along the entire seam.

Attach the 2X4s to the outside of the plywood panel with 10 gauge, 2 inch long galvanized screws (exterior deck screws) spaced every 4 inches.

Use the widest side of the 2X4 to run the length of the entire seam.

When youre done, mark each panel with the name of the opening so you will quickly know where to install it when a storm is approaching.

Store the panels, washers and nuts together in a location away from the elements. Consider waterproofing the panels with paint or a sealant.

And be sure to visit [flash.org](http://flash.org) for more information about strengthening your home and safeguarding your family from disaster.

## Animated How-To: Floods

### Animated How-To's: Floods

Floods are one of the most powerful, deadly, and destructive natural disasters.

There are a number of relatively inexpensive steps you can take to protect your home and property before a flood strikes.

If you are building or retrofitting your home consider these recommendations:

#### Elevate your home

- Consider wet flood proofing An example of wet flood proofing is installing flood vents that create permanent openings in the foundations walls so water can flow through the structure.
- Dry flood proofing prevents floodwaters from entering the building. Install new brick veneer over asphalt coating and apply polyethylene film over existing walls.
- Construct non-supporting, break-a-way walls designed to collapse under the force of water without causing damage to the house or its foundation.

#### Additional Recommendations

Here are some additional recommendations to protect your home from floods. Some are simple and inexpensive; others require a professional contractor.

- Locate the main electric panel and elevate all electric outlets, switches, light sockets, baseboard heaters and wiring at least 12" above the projected flood elevation. In areas that could get wet, connect all receptacles to a GFI circuit to avoid the risk of shock or electrocution. Have electrical wiring done by a licensed electrician.
- Elevate the furnace, water heater, washer and dryer, outside air conditioning compressor, heat pump or package unit at least 12" on a base of masonry, concrete or pressure treated lumber.
- Anchor fuel tanks securely to the floor. Make sure vents and fill line openings are above projected flood levels.
- Install a floating floor drain plug at the current drain location. If the floor drain backs up, the float will rise and plug the drain. Also have a licensed plumber install an interior or exterior backflow valve to prevent floodwater causing sewage to back up and enter your home. As a last resort, use large corks or stoppers to plug showers, tubs or basins.

## Get Flood Insurance

One of the most important things you can do to protect your home and family before a flood is to purchase a federal flood insurance policy. But don't wait until a flood is coming. It normally takes 30 days after purchase for flood insurance to go into effect.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes FLASH, Inc. All rights reserved.

# Animated How-To: Foundations

## Foundations

There are several types of foundations used in residential construction but all have one important requirement, the foundation and connections to the walls and floors must be strong enough not only to support the weight of the house and its contents but to prevent the home from being blown away by high winds.

## Common Foundation Types

The two most common types of foundations are monolithic slab-on-grade and stemwall foundations.

A slab on grade foundation is a single, continuous layer of concrete that sits directly on the ground. The concrete slab is the floor system. A slab-on-grade foundation should be reinforced with welded wire fabric and have longitudinal reinforcement in the footing or turndown.

## Construction Techniques

There are many construction techniques for anchoring the exterior walls to the foundation.

For wood-framed construction, the bottom plate of the wall should be anchored into the slab with anchor bolts and washers.

The bottom plate should be securely connected to the wall studs above by using approved metal clips or straps.

For concrete masonry construction, vertical reinforcement in a continuously grouted cell should extend from the wall above and be embedded in the concrete footing below with a standard hook.

## Stemwalls

A stemwall is a concrete block or brick wall used on top of the footer for off grade houses where the ground slopes from one side to the other.

Stemwalls can support both concrete slabs and wood-framed floors.

Stemwalls should have vertical reinforcement in a continuously grouted cell extending from the concrete masonry wall and embedded in the concrete footing with a standard hook.

The concrete footing should also have longitudinal reinforcement.

Anchorage for an exterior wall to a stemwall foundation is similar to anchoring to a slab-on-grade.

Metal connectors and anchor bolts must be used to securely connect the walls to the foundation and give your home the required resistance to the forces created by extreme winds.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes FLASH, Inc. All rights reserved.

## Animated How-To: Roof Systems

### Roof Systems

The roof covering, and the deck beneath it, form one of your home's critical shields of protection from high winds and rain. Unfortunately, this shield is often the first to be lost during high winds.

Loss of the roof covering, such as shingles, tiles or metal panels makes the house more vulnerable to water damage. The loose roofing inevitably becomes wind-borne projectiles that can damage other structures.

But while the loss of roofing can make your home vulnerable to water infiltration, loss of the roof's sheathing, often referred to as decking, can result in excessive damage to your home and your possessions.

As wind blows over the roof, uplift forces pull at the roof. These uplift forces try to pull off the roof covering and the roof deck. When the roof decking is blown off, the inside of your home becomes completely exposed to the elements and trusses or rafters may become unstable and the entire roof may collapse.

The following techniques can be used during roof installation on both new and existing homes, and are best performed by a licensed, professional roofing contractor.

Install a roof deck of solid plywood, 5/8" thickness, to maximize wind and windborne debris resistance with 10d common nails spaced at 4 inches along the panel edges and every six inches in the field of the plywood panel. Make sure that the nails penetrate the decking directly into the roof framing.

In your existing home, be sure to look in the attic to confirm that the roof decking is properly nailed to the roof framing. If you can see nails along the sides of rafters or trusses, where the nail penetrates the decking, your roof deck is probably not securely attached.

Create a secondary water barrier by installing self-adhering flashing tape or modified polymer bitumen strips, commonly called "peel and seal," over the joints in your roof deck. This will help keep out the rain in the event the roof covering is damaged or destroyed by severe weather.

Install one layer of #30 underlayment, sometimes called felt paper, over the roof decking and secondary water barrier. The felt helps with drainage in the event water gets under the roof covering.

Install a roof covering that has been tested to ASTM D 3161 for wind resistance and UL 2218 for impact resistance. Be sure to

specify these standards and look for labels on the products confirming these standards because ordinary roofing materials may not look any different from the wind resistant versions.

Finally, you can significantly increase the roof's resistance to uplift from the wind by applying a bead of construction adhesive using a caulking gun along both sides of the intersection of the roof decking and the rafters or trusses. Be sure to look for an adhesive that has been tested to specific levels:

APA AFG-01  
ASTM D 3498)

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes -- FLASH, Inc. All rights reserved.

## Animated How-To: Roof Types

### Roof Types and Bracing

The type and shape of the roof on your home can help determine how well it will perform during a severe windstorm.

A hipped roof is one that slopes upward from all sides of the building. Because of its aerodynamic properties and construction techniques, most hipped roofs will perform better in windstorms than the second roof type: a gabled roof.

A gabled roof has two slopes that come together to form a ridge or a peak at the top, each end looks like the letter A. Homes with gabled roofs are more likely to suffer greater damage, such as collapse of the end wall from high winds because they are often not braced properly during construction.

If your home is built with a gabled end wall, use one of the following construction techniques.

Continuous wall construction or Balloon framing. Use full-height studs, concrete or solid masonry walls from the floor below all the way up to the roof. Balloon-framed gable end walls perform better in windstorms because they do not have the hinge that usually exists where the triangular part of the gable sits on top of the wall below.

Platform framing. Brace the intersection of the gable and the end wall. This intersection is a particularly weak point and those that are not properly braced can collapse, causing major damage to the roof, allowing wind and wind driven rain into the home.

In homes with attics, an attic floor or ceiling diaphragm with the proper bracing techniques can be used to provide the lateral support of the gable end wall if the end wall is framed full height.

Install bracing along the top and the bottom of the gable end. In addition, connect the gable end to the top of the end wall using metal hurricane connectors.

In homes with high cathedral-like ceilings, where there is no ceiling to brace the gabled end, will have to be balloon framed or will require a special design by a registered or licensed engineer.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes -- FLASH, Inc. All rights reserved.

## Animated How-To: Safe Landscaping

### Trees

Take a look around your home. The landscaping can be attractive but is it as safe as it can be in the event of a natural disaster?

Every year falling trees and limbs cause hundreds of millions of dollars in damage as well as personal injuries and deaths.

In Orlando it's estimated that more than 20,000 trees were lost in that city alone due to Hurricane Charley.

Whether it's a hurricane, tornado, ice storm or wildfire - trees that are old, weak, diseased, not properly maintained or just in the wrong place can be a dangerous hazard to your home.

But there are ways to protect your home and family from damage and injury caused by trees. Here are some suggestions.

#### 1. Choose the Right Tree

Some varieties of trees are more prone to storm damage than others. Thousands of homes have been damaged because nearby trees were wrong for the soil or region where they were planted.

A strong wind can easily topple a shallow rooted tree growing in soft soil.

City foresters, county extension offices, local nurseries and landscape firms can provide advise on tree selection for your area and soil conditions.

#### 2. Learn how to care for your trees

Regular and proper pruning can strengthen the health and vitality of your trees.

Removal of dead, diseased or damaged parts of the tree will also stop the spread of disease and harmful insects that can significantly weaken or destroy your tree.

Consider these pruning tips:

Avoid pruning branches flush to the tree. Doing so removes not only the limb but part of the trunk, opening the tree to possible decay or insect damage.

#### 3. Learn how to spot potential problems early

Homeowners are the first line of defense against problem trees - regularly check for signs of damage or disease including:

Cracks in the trunk or major limbs

Insect infestations

Trees that look one-sided or that lean significantly

Branches hanging over the house or near the roof

Limbs in contact with power lines

Mushrooms growing from the bark signaling decay

Crossing branches that rub or interfere with each other

Tree care professionals including arborists, can examine trees for more subtle signs of weakness and take care of problems including pruning limbs that may be too big or too high for a homeowner to take down safely.

#### **4. Plant with Wildfire in Mind**

In recent years, thousands of homes have been burned and lives lost because of wildfire and in many cases improper landscaping has contributed to the problem.

In areas of wildfire risk, landscaping should be considered an essential part of fire protection.

Create a defensible space around your home using this rule - clear at least 30 feet around your home, 50 feet if your are in a heavily wooded area or 100 feet if you live on a hillside.

Plant fire resistive, native vegetation.

Space trees at least 10 feet apart.

Remove dead or dying trees.

Keep trees properly pruned. Branches of mature trees should be at least 6 feet from the ground and shrubs under the trees should be no more than 18 inches high.

Trim branches so they don't extend over the roof or near the chimney.

Properly dispose of cuttings and debris.

#### **5. Plant with Crime in Mind**

Burglars enter a home in the United States every five seconds. You can avoid becoming a statistic by making sure your home doesn't look like a target of opportunity. Trim shrubs and trees back to avoid a hidden entry into your home and trim lower limbs of trees that could help a thief climb into a second story window.

And remember to visit [flash.org](http://flash.org) for more information about protecting your home and family.

---

## **Animated How-To: Safe Rooms**

### **Safe Rooms**

Every year, tornadoes, hurricanes, and other severe windstorms rip through hundreds of towns and cities across the United States, injuring and killing people and causing millions of dollars in property damage.

You can protect your family from injury caused by the high winds and flying debris of a windstorm by constructing or installing a safe room in your home.

A safe room is different from the other rooms in your home because it has been specially designed and tested to withstand wind speeds of up to 250 miles per hour and the impact of a 15 pound 2 by 4 flying at a speed of 100 miles per hour.

Typically, the safe room should be located in a central, interior, ground-floor area of the home for additional protection as well as accessibility. The basement of a home can also be used as a location for a safe room.

A safe room can be incorporated into the construction of a new home, or it can be retrofitted into an existing home. The safe room can function year-round as a usable area, such as a bathroom, closet or utility room.

Safe rooms can be constructed out of reinforced concrete, reinforced concrete masonry or combinations of wood frame and steel sheathing or concrete masonry infill.

Safe rooms can also be manufactured, assembled and installed on site.

Here are some things to consider when constructing or installing a safe room:

Safe rooms must be structurally isolated from the main structure of your home.

Safe rooms must be securely anchored to the foundation.

Safe rooms installed in or over a crawl space must have a separate foundation.

Safe rooms must have adequate ventilation.

All components of safe rooms, including walls, ceilings, and door assemblies, must be designed and tested to resist the specified wind forces and prevent perforation by windborne debris.

The Federal Emergency Management Agency has ready-to-use plans for homeowners to build a shelter in an existing house or in a new house.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes FLASH, Inc. All rights reserved.

---

## Animated How-To: Straps

## Hurricane Straps/Clips/Anchor Bolts

Your home's ability to resist the extreme force of wind is only as strong as its weakest link, so the only sure way to create a wind-resistant home is to secure all its connections: roof-to-wall, floor-to-floor and wall-to-foundation.

The roof is your home's first line of defense from a storm. To make sure the roof stays in place when severe winds blow, securely anchor roof-to-wall connections by installing hurricane straps or clips at every wall-to-rafter connection to reinforce the roof.

Even if re-roofing your existing home is years away, it is possible for roofing professionals to access and reinforce an existing home's roof-to-wall connections with hurricane straps and clips.

These connections are critical in holding the roof together and will dramatically increase the homes overall resistance to wind.

Along with roof-to-wall connections -- all joints in the structure -- floor-to-floor and wall-to-foundation -- must also be secured to create a "continuous load path" to the building's foundation.

Secure floor-to-floor connections by making sure each floor is connected to the floor below with straps or clips in addition to any other code-required nailing schedule.

Wall-to-foundation connections should be made through the use of anchor bolts or mud-sill anchors.

Be sure to install all connectors following manufacturer's specifications.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes -- FLASH, Inc. All rights reserved.

---

## Animated How-To: Wall Construction

### Wall Construction

There are three important concepts to remember for wind-resistant wall construction.

- Walls have to resist the uplift forces caused by the pull of the wind.
- Walls have to resist the shear forces that try to push the walls over.
- Walls have to resist the lateral force of the wind that tries to push the walls in and pull them away from the building

For uplift purposes, walls are the intermediate link between the roof and the foundation below.

To resist uplift forces walls have to have a continuous load path that can be achieved through the use of metal connectors for wood frame construction or a combination of metal connectors, vertical and horizontal reinforcement, and a bond beam at the top of the wall for concrete masonry construction.

### **Shearing forces**

Walls are also subjected to shearing forces that act in the direction the wind is blowing.

As wind blows on a wall, the walls perpendicular to the wall the wind is blowing on, are subjected to these shearing forces and are called shear walls. Shear walls are inherently subjected to the shearing and sliding forces.

Wood frame walls resist these shearing and sliding forces through the action of the wall studs, the wall sheathing (preferably plywood), and a specific nailing pattern.

Concrete masonry walls resist these forces through a combination of concrete masonry units, mortar, and grouted and reinforced cells.

As a result of the walls resisting the shearing forces and being fixed at the base, the walls are subjected to an overturning force, or the tendency to rotate over.

For wood frame construction, this force is resisted through the use of a holdown or tensions tied down. Vertical reinforcement and grouted cells resist the overturning forces in concrete masonry construction.

### **Wind Ready Walls**

Finally, walls have to be capable of supporting the push and pull from the wind.

For wood frame construction, studs have to be sized and spaced accordingly to resist the lateral forces, and have to be securely supported at the top and bottom plates.

Concrete masonry resists the lateral forces by using reinforcement in grouted cells.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes -- FLASH, Inc. All rights reserved.

---

## **Animated How-To: Windows and Doors**

### **Protection for Windows and Doors**

Doors and windows are vulnerable components of your homes protective shell or envelope because they are easily penetrated by wind-borne debris often generated by the high winds of storms like hurricanes.

If that envelope is breached during a storm because of the failure of windows and doors, wind, wind-driven rain and debris can enter your home causing considerable damage to its interior and your property.

A more critical issue develops when the envelope is breached -- high winds can enter your home and exert high pressure on your walls and roof. These internal pressures combined with the external pressure of wind blowing over your home can lead to catastrophic damage.

You can protect your home's openings by installing impact-resistant windows and doors or installing impact resistant coverings,

such as shutters over windows and doors.

Impact resistant glass and shutters are specifically designed to meet a combination of impact and continuous pressure from the wind. Always use products that have been tested to one of these standards and have been designated as such through a recognized product approval system or evaluation report.

### **Ratings**

SBCCI SSTD 12

ASTM E 1886 and ASTM E 1996

Miami-Dade Protocols PA 201, PA 202, and PA 203.

Impact resistant windows usually consist of a clear plastic-like film sandwiched between two specially-treated pieces of glass, giving the window greater strength than glass alone.

Equally important as the strength of the glass is the strength of the window's frame. An impact resistant window is tested as a unit that includes the glass, the frame, as well as the attachment hardware and the installation method. Impact resistant windows should always be installed following the manufacturer's recommendations.

Exterior doors should also be wind and impact resistant or protected with an impact resistant covering.

### **Garage Doors**

Garage doors are particularly vulnerable to high winds, because of the long span of opening they cover and the relatively lightweight material they are made of.

Two options are available for strengthening garage doors.

Replace the door and track with a system that is designed to withstand high winds and wind-borne debris. The second option is to protect the garage door with a tested and approved impact resistant covering.

Visit [www.flash.org](http://www.flash.org) or call toll-free (877) 221-SAFE for more information about protecting your home from disaster.

Copyright 2004 Federal Alliance for Safe Homes -- FLASH, Inc. All rights reserved.

---

## **BFE -- Know Your Base Flood Elevation**

### **Find Out the Base Flood Elevation**

The best way to prepare for a flood is in the planning stage of a new home. FLASH recommends an evaluation and inspection of your homesite and lot prior to construction to determine the flood zone and the Base Flood Elevation or BFE. The BFE refers to the elevation associated with the "100-year flood," or a flood with a 1% chance of occurrence in any given year. The "100-year flood" patterns form the basis for the National Flood Insurance Program rates and regulatory floodplain management.

---

## **Doors and Windows -- Protecting**

### **Protect Your Windows**

Protecting the home's openings from winds and wind blown objects is the single most important step a homeowner can take in protecting the structure from serious damage. If you can keep the wind outside, you and your possessions will be safe inside.

Many products and systems are available to protect your home's openings but it is critical that any product or system be both tested and approved for wind load and wind borne debris.

Unprotected standard glass windows can be penetrated easily by wind borne debris in severe windstorms allowing damaging water and wind to enter your home. Once the window glass fails, the subsequent pressurization of the structure can cause total destruction of the house.

With the exception of impact-resistant window glass, all other glass, even if it is tempered, reinforced or insulated, needs to be protected during a severe wind storm.

### **Shutter Your Windows**

Installing storm shutters is one of the best ways to protect your home. Purchase or make storm shutters for all exposed windows, glass surfaces, French doors, sliding glass doors, and skylights.

The most common device for opening protection is the hurricane shutter system. Choices include permanent or temporary shutter systems for use on windows and skylights as well as gable end vents, sliding glass doors, exterior doors, and garage doors.

There are two types of shutter systems, permanent shutters, and temporary shutters.

Permanent shutters should be installed by trained individuals and according to the manufacturer's specifications to ensure the shutters will perform as designed and tested. Factors to consider when choosing a shutter system are approval status, design and test results for wind and impact resistance.

Permanent shutter types include Bahamas, roll downs, accordion, awning, and colonial hinged.

Choosing a shutter style can be based on several criteria, including the building location relative to the coast and the cost and ease of operation. Ease of operation is an important factor to consider because if shutters are too hard to close, owners may not use them. If shutters cover windows on an upper floor or hard to reach location, they should be operable from the inside. Roll-down shutters are often the easiest to operate in these conditions.

Temporary shutters are designed to withstand wind borne debris impacts and wind loads during a hurricane. They are commercially available in many types of materials including steel, aluminum, and clear plastic. Temporary shutters are typically corrugated panels that come in standard widths and can be joined to cover wider openings.

The mounting hardware for temporary shutter systems should be installed well before hurricane season by trained individuals according to the manufacturers specifications. Each panel should be clearly labeled to aid in quick installation, and should also bear approved labels.

### **Plywood Shutters the Last Resort**

Covering your windows and doors with plywood should only be a last-resort alternative to actual storm shutters. Plywood that is not properly attached to your house can rip off during high winds and become a projectile that can cause serious harm to your and your neighbor's property.

See Emergency Board Up for detailed instructions about building plywood shutters.

### **The Myth of Masking Tape**

Many people still believe they can use masking tape to protect their windows when a hurricane is on its way. This is a myth. Imagine a mail box that has been ripped from the ground, post and all, by a 120 mph wind gust. A dangerous projectile will not even slow down as it passes through masking tape. Windows are best protected with impact-resistant glass or hurricane shutters.

## **Double Entry Doors -- Securing**

### **Bolt Down One Half**

The exterior walls, doors, and windows are the protective shell of your home. If the shell is broken during a hurricane, high winds can enter the home and put pressure on the roof and walls, causing serious damage.

For each double door, at least one of the doors should be secured at both the top of the door frame and the floor with sturdy sliding bolts. Most bolts that come with double doors, however, are not strong enough to withstand high winds.

Your local hardware store can help you select the proper bolts. Some door manufacturers provide reinforcing bolt kits made specifically for their doors.

## **Drains -- Inspecting**

### **Check Drain Plug**

Install a floating floor drain plug at the current drain location. If the floor drain pipe backs up, the float will rise and plug the drain.

### **Install a Sewer Backflow Valve**

If flood waters enter the sewer system, sewage can back up and enter your home. To prevent this, have a qualified, licensed plumber install an interior or exterior backflow valve. Check with your building department for permit requirements.

If you are retrofitting a backflow valve, check with your building department for permit requirements. Be sure to talk to a professional home builder, architect, contractor or building supply retailer for other backflow mitigation tips.

## **Electrical System -- Elevate**

### **Elevate Your Electrical Panel**

The main electric panel board (electric fuses or circuit breakers) should be at least 12" above the projected flood elevation for your home. The panel board height is regulated by code. All electrical work should be done by a licensed electrician.

You may also want to elevate electric service lines (at the point they enter your home) at least 12 inches above the projected flood elevation.

### **Elevate Electrical Outlets**

Consider elevating all electric outlets, switches, light sockets, baseboard heaters and wiring at least 12" above the projected flood elevation for your home.

In areas that could get wet, connect all receptacles to a ground fault interrupter (GFI) circuit to avoid the risk of shock or electrocution. Have electrical wiring done by a licensed electrician.

---

## **Emergency Access to Your Home**

### **Emergency Access**

Identify your home with legible and clearly marked street name and house number so emergency vehicles can rapidly find the location of the emergency.

Include a driveway that is at least 12 feet wide with a vertical clearance of 15 feet -- to provide access to emergency equipment.

---

## **Emergency Board Up**

### **Building Plywood Shutters**

The following basic recommendations can be used in extreme emergencies to add temporary protection to doors and windows.

### **Count Your Windows**

Count and measure the openings to be covered on your house. Plan on making storm shutters for every opening in your home. All windows, doors, gable end vent, sky light, roof vent, or any other opening that if damaged would allow wind to enter your home.

### **Measure Each Opening**

Measure each opening, horizontally from inside to inside of the exterior trim and vertically from the sill to the bottom of the top trim. Add 8 inches to the width and 8 inches to the height measurements so that the panel will overlap the wall framing around the opening.

### **Cut to Fit**

You will need a hand or circular saw, drill and drill bits, hammer and wrench. Don't forget to wear protective eye covering and gloves on this project. Be sure to purchase 5/8" or greater exterior grade (CDX) plywood. Plywood sheets are generally 4'x8', so your local building supply retailer can help you determine how many sheets to buy using the information about the number of openings you need to cover. More than one sheet may be necessary if you have any single opening larger than one 4'x8' sheet of plywood.

### **Fastening to House**

For hardware, you'll need double-headed nails, wood screws, bolts, wood or masonry anchors, nuts and large washers. A range of types of fasteners can be used to attach a plywood shutter. The type of fastener will depend on the type of construction (wood, masonry, or concrete) and the type of exterior veneer (siding, brick or stucco.)

If the shortest dimension of the window or door is 4 feet or less, space fasteners at 6 inches on center. If the shortest dimension exceeds 4 feet, space fasteners at 3 inches on center. Mount plywood and fasten into place. Mount the plywood with 2 fasteners first (one on each corner) then install the remainder of the fasteners -- this will reduce the strain on your helper and facilitate set-up.

Remember, even the best designed shutter will fail in strong winds if not installed properly. So, try to get as tight a fit as possible on the plywood. You don't want to allow wind to get under the shutter.

### **Saving Shutters For the Next Storm**

Finally, mark and store the shutters so they can be easily installed during a hurricane watch. Keep them out of the weather and other harmful elements.

### **Important to Remember**

FLASH recommends that you install tested and certified impact resistant devices to provide the highest level of protection from wind-borne debris. However, in an extreme emergency where a temporary measure is the only option, FLASH recommends use of the following emergency board-up procedure:

Measure and cut 5/8 inch, exterior grade plywood that will overlap the wall framing and cover windows and doors.

Attach the plywood to cover the opening with 10d common nails, 12d box nails, wood screws or lag bolts. (If installed over masonry or stucco, vibration resistant anchors should be used.)

If the shortest dimension of the window or door is 4 feet or less, space fasteners at 6 inches on center. If the shortest dimension of the window or door is more than 4 feet and less than or equal to 6 feet, space fasteners at 4 inches on center.

Plywood shutters should be used where the shortest dimension of the window or door exceeds 8 feet.

Remember, even the best designed shutter will fail in strong winds if not installed properly. So, try to get as tight a fit as possible on the plywood. You don't want to allow wind to get under the shutter.

---

## **FLASH Card: Blueprint for Safety**

### **Protect your family...**

Protect your family and your home from severe weather and natural disasters with Blueprint for Safety™ the most comprehensive set of disaster-resistant building techniques available today. Blueprint for Safety™ offers code-plus guidelines for protecting both new and existing homes against flooding, wildfire, and high winds.

### **FLOOD**

- Avoid costly damage by consulting a Flood Insurance Rate Map to determine risks before you build a new home. Contact local building officials for help in determining Base Flood Elevation.
- If your existing home is in a flood zone, consider raising the structure so the lowest floor is above flood level.
- Floodproofing, levees and floodwalls are other flood prevention techniques to consider.

**WILDFIRE**

- Homes in heavily wooded, rural areas are at greater risk for damage due to wildfire.
- Maintain a dependable water source.
- Build with fire-resistant building materials.
- Create a defensible space around your home by removing firewood, trimming back trees and brush, and removing dry vegetation, such as grass and leaves, within 30 feet of the residence.

**WIND**

- In the event of a hurricane or tornado, protect all windows, doors, garage doors, and gable end vents with tested and approved coverings such as shutters or impact-resistant glass.
- Reinforce your homes roof, wall and foundation with hurricane straps, clips, and bolts.
- When installing a new roof, use a secondary water barrier and impact-resistant roof coverings.
- If a new roof is years away, reinforce the underside of the roof with construction adhesive that is APA approved. Look for AFG-01 rating.

Blueprint for Safety™ materials and technical advice for homeowners and homebuilders are available on CD-ROM, on the Web at [www.blueprintforsafety.org](http://www.blueprintforsafety.org), via e-mail at [flash@flash.org](mailto:flash@flash.org) or by calling our toll-free help desk at (877) 221-SAFE.

## FLASH Card: Bolsas de arena (Sandbags)

**Bolsas de arena**

Las bolsas de arena desviarán el agua y la basura arrastrada de las casas y otras estructuras, siempre y cuando estén llenas y mantenidas correctamente.

Llenado:

Llene las bolsas por la mitad.

Use arena si está disponible, de lo contrario use la tierra local.

Dobla la parte superior de la bolsa y apóyela sobre el lado doblado.

Colocación:

Apile las bolsas de arena con cuidado.

Limite la colocación a tres capas, salvo que se utilice un edificio como respaldo o se las coloque en forma piramidal.

Apisone cada bolsa en su lugar, completando cada capa antes de comenzar con la siguiente.

Despeje un sendero entre edificios para que la basura pueda fluir.

Coloque un folio plástico entre el edificio y las bolsas para controlar el flujo y evitar que el agua se filtre a través de las puertas deslizantes de vidrio.

Limitaciones:

Las bolsas de arena no impedirán que se filtre el agua.

Las bolsas de arena se deterioran cuando se mojan y secan continuamente durante varios meses. Si se las coloca demasiado temprano, pueden no ser eficaces cuando se las necesite.

Las bolsas de arena protegen contra pequeñas cantidades de agua hasta 60 centímetros (dos pies).

La protección contra caudales mayores exige un sistema más permanente contra inundaciones.

NOTA: Consulte a su departamento local de protección ambiental antes de decidir el uso de bolsas de arena. Si se las expone a aguas contaminadas, pueden representar un peligro ambiental y requerir de un manejo especial.

Disponemos de más información sobre prevención de inundaciones a través del programa educativo Proyecto de Seguridad. Llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE, correo electrónico [flash@flash.org](mailto:flash@flash.org) o ingrese en [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

Teléfono gratuito 1-877-221-SAFE

## **FLASH Card: Consejos de seguridad para propietarios de casas fabricadas (Manufactured Homes)**

### **Consejos de seguridad para propietarios de casas fabricadas**

Los propietarios de casas fabricadas pueden ser vulnerables a las amenazas de incendios forestales y vientos fuertes ocasionados por tempestades, tornados o un huracán. Use los siguientes consejos de seguridad para reforzar la seguridad de la casa y ayudar a resistir la amenaza de los incendios forestales y los vientos fuertes.

Considere instalar un sistema longitudinal de amarre en el frente y parte posterior de su casa. Estos sistemas se basan menos en anclajes a tierra y pueden ayudar a evitar los efectos del óxido y la corrosión en la resistencia al levantamiento debido al viento. Construya un faldón alrededor de su casa para evitar que las brasas y los materiales combustibles se metan por debajo.

Realice una revisión anual de seguridad y siga estos consejos:

Revise por ganchos de fijación sueltos.

Asegúrese que los ganchos de fijación están correctamente alineados y no en ángulo.

Asegúrese que no existen puntos de entrada para que los materiales combustibles accedan debajo de la casa.

Revise por la cantidad correcta de amarres y su instalación correcta.

Revise la instalación correcta de los anclajes a tierra y las placas estabilizadoras.

Asegúrese de que los pilares de sustentación estén en contacto con la estructura.

Reemplace los ganchos de fijación o anclajes a tierra que muestran signos de corrosión o daño.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

Teléfono gratuito 1-877-221-SAFE

## FLASH Card: Cuartos seguros (Safe Rooms)

### Cuartos seguros

Un cuarto seguro (un refugio contra las tormentas) le ofrecerá a usted y a su familia el más alto grado de protección contra la fuerza peligrosa del viento cuando éste sopla a velocidades extremas y contra el impacto de los desechos arrastrados por el viento. Tome en cuenta la siguiente información para construir o instalar un cuarto seguro en su hogar.

#### Construcción de un cuarto seguro

Los cuartos seguros pueden construirse en el sitio o prefabricarse, pudiendo instalarse en casas nuevas o preexistentes.

Los cuartos seguros levantados en el sitio pueden construirse con hormigón, con mampostería de hormigón y con distintas combinaciones de estructuras de madera con revestimiento de acero o relleno de mampostería de hormigón.

Los cuartos seguros prefabricados generalmente se construyen en una planta o se montan en el sitio.

Los puntos fundamentales en su realización incluyen los siguientes:

Los cuartos seguros deben estar estructuralmente aislados de la estructura principal de la casa.

Los cuartos seguros deben tener un anclaje seguro a los cimientos.

Los cuartos seguros instalados en un sótano poco profundo o por encima del mismo deben tener cimientos separados.

Todos los componentes de los cuartos seguros, incluidos techos, paredes y montajes de puertas, deben estar diseñados y probados para resistir las fuerzas de los vientos indicadas e impedir la perforación a causa de desechos arrastrados por el viento.

Los cuartos seguros deben tener una ventilación adecuada.

#### Ubicación

Los cuartos seguros deben estar ubicados en la planta baja de la casa, en un sótano o en el exterior.

En el caso de los refugios ubicados en el exterior, debe accederse a ellos inmediatamente después de dado el alerta de tormenta.

#### Fuerza del viento e impacto de los desechos arrastrados por el viento

Los cuartos seguros deben diseñarse para soportar una velocidad del viento de hasta 400 km por hora (250 millas por hora) y el impacto de una tabla de 2X4 con un peso de aproximadamente 7 kg (15 libras) volando a 160 km por hora (100 millas por hora).

#### Pruebas y verificación de calidad

Los cuartos seguros levantados en el sitio pueden construirse de acuerdo con los diseños normativos de la publicación 320 de la FEMA (Agencia Federal para el Manejo de Emergencias), *Taking Shelter From the Storm: Building a Safe Room Inside Your House* (Cómo construir un cuarto seguro dentro de la casa para refugiarse de las tormentas).

Los cuartos seguros que se desvían en cualquier aspecto de la publicación 320 de la FEMA y los cuartos seguros prefabricados deben someterse a pruebas en un laboratorio aprobado, como el Wind Engineering Research Center (Centro de Investigaciones en Ingeniería Eólica) de la Texas Tech University.

La verificación de cumplimiento de la calidad "Association Standard" establecida por la National Storm Shelter Association (Asociación Nacional de Refugios contra Tormentas), que se le exige a todos los miembros de esa Asociación, da la seguridad del más alto grado de calidad de refugio.

#### Equipo de provisiones para emergencias y desastres

Prepare un plan de emergencia y tenga disponible un equipo de suministros para casos de desastre en el cuarto seguro.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes (Alianza Federal para Hogares Seguros)!

Teléfono gratuito: 1-877-221-SAFE

---

## FLASH Card: Disabilities

### People with Disabilities

People with disabilities often require assistance and additional lead time in order to prepare for a disaster. The following list, while not exhaustive, provides some practical tips for those with special needs.

- Establish a personal support network. This network of friends, family and neighbors can assist in disaster preparations

and getting you to a safe place.

- Post Emergency Instructions on the refrigerator to include medication dosages, necessary equipment and emergency contacts.
- Register with local emergency management and fire departments.
- Identify multiple evacuation routes at home and at work. Ask your employer to include and test these plans.
- Carry with you at all times emergency health information and emergency contacts. A medical alert tag or bracelet to identify your disability can prove helpful.
- Have an alternate means of communication, like a dry erase board or writing tablet and markers.
- When calling 911, tap the space bar to engage the TDD system.
- Install fire safety devices in the home, such as fire extinguishers and smoke alarms with a vibrating pad or flashing light. Consider also installing an alarm with strobe light outside the home to alert neighbors. Test alarms and extinguishers regularly and replace smoke alarm batteries every six months.
- Keep a flashlight, whistle or bell handy to signal whereabouts to others.
- Stock emergency supplies, such as batteries, blankets, cash, non-perishable foods, medications, water and a weather radio.

For more information on how to prepare children with special health care needs, please visit [www.aap.org/advocacy/emergprep.htm](http://www.aap.org/advocacy/emergprep.htm).

For information on protecting your service animal in an emergency, please visit [www.disabilitycentral.com](http://www.disabilitycentral.com).

## FLASH Card: Emergency Board-up

### Emergency Board-Up

FLASH, Inc. recommends that you install certified and approved shutters for the highest level of protection from windborne debris. However, the following basic recommendations can be used in extreme emergencies to add temporary protection to doors and windows:

- Count and measure the openings to be covered on your house including all windows, French doors, sliding glass doors and skylights. Measure each opening, horizontally from inside to inside of the exterior trim and vertically from the sill to the bottom of the top trim. Add 8-inches to the width and 8-inches to the height measurements so that the panel will overlap the wall framing around the opening.
- TOOLS: hand or circular saw, drill and drill bits, hammer and wrench.
- PLYWOOD: 5/8 or greater exterior grade (CDX) plywood. Plywood sheets are generally 4 x 8, so your local building supply retailer can help you determine how many sheets to buy using the information about the number of openings you need to cover.
- More than one sheet may be necessary if you have any single opening larger than one 4' x 8' sheet of plywood.
- HARDWARE: double-headed nails, wood screws, bolts, wood or masonry anchors, nuts and large washers. A range of types of fasteners can be used to attach a plywood shutter. The type of fastener required will depend on the type of construction (wood, masonry, or concrete) and the type of exterior veneer (siding, brick or stucco).
- SPACING OF FASTENERS: If the shortest dimension of the window or door is 4 feet or less, space fasteners at 6 inches on center. If the shortest dimension exceeds 4 feet, space fasteners at 3 inches on center.
- Mount plywood and fasten into place. Mounting the plywood with two fasteners (one on each corner) first then installing the remainder of fasteners will reduce the strain on helper and facilitate set-up.

- Store plywood and other materials together in a location away from weather and harmful elements.

**NOTE:** Plywood shutters do not meet the requirements of the new Florida Building Code for the High Velocity Hurricane Zone. Homeowners who live in the High Velocity Wind Zone, where winds exceed 130 mph, cannot install plywood shutters as a permanent measure.

## FLASH Card: Entablado de emergencia (Emergency Board-Up)

### Entablado de emergencia

FLASH, Inc. recomienda que instale postigos certificados y probados para el mayor grado de protección contra los desechos arrastrados por el viento. Sin embargo, se pueden usar las siguientes recomendaciones básicas en emergencias extremas para agregar protección temporal a puertas y ventanas:

Cuente y mida las aberturas a cubrir en su casa, incluyendo todas las ventanas, puertas cristaleras, puertas deslizantes con vidrios y claraboyas. Mida cada abertura horizontalmente entre los lados internos del contramarco exterior y verticalmente desde el dintel hasta la parte inferior del contramarco superior. Agregue 20 cm (8) al ancho y a la altura medidas así el panel solapará el muro alrededor de la abertura.

HERRAMIENTAS: serrucho o sierra circular, taladro y mechas, martillo y llave inglesa.

CONTRACHAPADO: contrachapado de 1,5 cm (5/8) o mayor para exteriores (CDX). Las hojas tienen por lo general 1,20m x 2,43 m (4 x 8), por lo que su proveedor local de materiales de construcción le puede ayudar a determinar cuántas hojas comprar usando la información acerca de la cantidad de aberturas que necesita cubrir.

Si tiene una abertura mayor a la medida de una hoja de contrachapado 1,20m x 2,43 m (4 x 8), necesitará más de una hoja.

ELEMENTOS DE FERRETERÍA: clavos de doble cabeza, tornillos para madera, bulones, anclajes para madera y mampostería, tuercas y arandelas grandes. Se pueden usar una variedad de elementos de fijación para adosar el cerramiento de contrachapado. El tipo de fijación requerida dependerá del tipo de construcción (madera, mampostería o concreto) y el tipo de revestimiento (forrado, ladrillo o estuco).

ESPACIO ENTRE FIJACIONES: si la menor dimensión de la ventana o puerta es igual o menor a 1,20 m (4), separe 15 cm (6) las fijaciones a partir del centro. Si, por el contrario, excede los 1,20 m (4), espacie las fijaciones a 7 cm (3) a partir del centro.

Monte el contrachapado y sujételo en su lugar. El montaje inicial del contrachapado con dos fijaciones (una en cada extremo) para luego instalar las restantes, reducirá el esfuerzo del ayudante y facilitará la instalación.

Almacene el contrachapado y los demás materiales juntos en un lugar alejado de los elementos climáticos y dañinos.

NOTA: Los cerramientos de contrachapado no cumplen con los requisitos del nuevo Florida Building Code (Código de Edificación de Florida) para la High Velocity Hurricane Zone (Zona de huracanes de alta velocidad). Los propietarios que viven en la High Velocity Wind Zone, donde los vientos exceden los 210 km/h (130 mph), no pueden instalar cerramientos de contrachapado

como medida permanente. Ingrese en [www.floridabuilding.org](http://www.floridabuilding.org) para determinar la zona de vientos de su localidad.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

Para obtener más información sobre el Programa Proyecto de Seguridad llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE, correo electrónico [flash@flash.org](mailto:flash@flash.org) o ingrese en [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

## FLASH Card: Huracanes (Hurricanes)

### Huracanes

El preparar su hogar contra un huracán puede ser tan simple como el A-B-C!

#### Anclaje

Entre todas las cosas del patio que pueden ser arrastradas por el viento pídale a los vecinos que hagan lo mismo.

Reemplace la grava/roca del material del jardín con corteza en tiras, tratada contra el fuego, para reducir el daño.

Recorte y asegure el follaje.

Asegúrese que su casa tiene una conexión de los muros a la fundación (pernos de anclaje/barras de refuerzo).

#### Asegure

Atornille todas las puertas en sus partes superior e inferior con bulones y que éstos sobresalgan como mínimo 2,5 cm (1).

Refuerce la puerta del garaje y sus guías con soportes centrales\*

Asegure toda la estructura de los extremos de hastiales con refuerzos horizontales y/o en diagonal.

\*Aproximadamente el 80% del daño residencial producido por el viento de los huracanes comienza con la entrada del viento a través de las puertas del garaje.

#### Cubra

Cubra todas las ventanales y puertas, especialmente las puertas del patio, con postigos resistentes al impacto, fijados de modo seguro con accesorios de montaje apropiados o reemplácelas, si es posible, con sistemas de ventanas y puertas laminadas resistentes al impacto.

Asegúrese de que todas las puertas y ventanas estén adecuadamente selladas y/o impermeabilizadas.

Instale cubiertas de techo aprobadas para vientos huracanados.

#### Amarre

Amarre todos los elementos sueltos en su patio.

Fije las vigas del techo a los muros con ganchos y grapas de fijación para huracanes.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

Para obtener más información sobre el Programa Proyecto de Seguridad llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE, correo electrónico [flash@flash.org](mailto:flash@flash.org) o ingrese en [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

## FLASH Card: Hurricanes

### Hurricanes

Preparing your home for a hurricane can be as easy as the A-B-Cs!

#### Anchor

- Bring anything from the yard that could become windborne inside ask neighbors to do the same.
- Replace gravel/rock-landscaping material with fire treated, shredded bark to reduce damage.
- Trim and anchor down foliage.
- Make sure your home has a wall to foundation (anchor bolts/re-bar) connection.

#### Brace

- Bolt all doors with foot and head bolts with a minimum one-inch bolt throw length.
- Reinforce the garage door and tracks with center supports\*
- Brace all gable end framing with horizontal and/or diagonal braces.

\*Approximately 80% of residential hurricane wind damage starts with wind entry through garage doors.

#### Cover

- Cover all large windows, doors, especially patio doors with securely fastened, impact-resistant shutters with proper mounting fixtures, or replace them with impact-resistant laminated window and door systems if feasible.
- Make sure all doors and windows are properly caulked and/or weather-stripped.
- Install roof covering that is rated for hurricane force winds.

#### Strap

- Harness any free-standing fixtures in your yard.
- Strap rafters/trusses to walls with hurricane straps/clips.

## FLASH Card: Inundaciones (Flood)

### Inundaciones

Las inundaciones causan más del 90 por ciento de los daños a la propiedad vinculados a desastres en los EE.UU. cada año. La clave para sobrevivir a una inundación y reducir los daños a la propiedad es la preparación

#### Seguro

La mayoría de las pólizas para propietarios no cubren los daños por inundaciones. Para determinar su riesgo de inundaciones, contacte a su departamento local de construcciones y planeamiento o visite [www.fema.gov/nfip](http://www.fema.gov/nfip).

Recuerde que existe un periodo de espera de 30 días antes de que la cobertura de la póliza por inundaciones entre en vigencia.

Realice un inventario de todos sus efectos personales (incluyendo modelos o tipos, números de serie, fotografías y descripciones). Coloque todos los documentos en una caja a prueba de agua y resistente al fuego.

Puede necesitar un seguro contra inundaciones del NFIP (Programa Nacional de Seguros contra Inundaciones) aún cuando no resida en una zona de alto riesgo de inundaciones. Contacte hoy a su agente o compañía aseguradora privada.

#### Hogar

Instale sus servicios (por ej. Tablero de energía eléctrica e interruptores, equipo de aire acondicionado, caldera, etc.) 60 a 90 cm (2 a 3) sobre el nivel de inundación de la base.\*

Si tiene un tanque de combustible, áncelo a una losa de concreto amplia, cuyo peso pueda resistir la fuerza de las aguas crecidas y la flotación.

Instale válvulas de retorno en la cloaca para impedir que las aguas servidas entren en su casa durante las inundaciones.\*

#### Seguridad

Sintonice la NOAA Weather Radio (Radio del Tiempo de la NOAA) y preste atención a las últimas informaciones cuando ocurren o están pronosticadas lluvias extraordinarias.

Preste atención a las observaciones sobre inundaciones repentinas, el caudal de los ríos y las advertencias emitidas por el National Weather Service (Servicio Nacional de Meteorología).

\*Sólo un contratista profesional matriculado debe llevar a cabo cambios que afecten la estructura de su casa o sus instalaciones eléctrica y de plomería.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

Para obtener más información sobre el Programa Proyecto de Seguridad llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE, correo electrónico [flash@flash.org](mailto:flash@flash.org) o ingrese en [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

## FLASH Card: La Radio del Tiempo de la NOAA (NOAA Weather Radio)

### La Radio del Tiempo de la NOAA (NOAA Weather Radio)

La Radio del Tiempo de la NOAA (NWR) es la Voz del National Weather Service (Servicio Nacional de Meteorología). Proporciona información crítica sobre el clima, que salva vidas, cuando está ubicada apropiadamente dentro del hogar.

#### Prestaciones de la NWR

Difunde observaciones, alertas y consejos en forma inmediata desde su oficina local del National Weather Service.

Opera sin publicidad comercial, diariamente durante las 24 horas.

Debe incluir capacidad para siete frecuencias, tecnología SAME (Specific Area Message Encoder) (Codificador de mensajes para un área específica) y respaldo por pilas.

NWR está disponible en las siguientes frecuencias en megahertz:

162.400, 162.425, 162.450, 162.475, 162.500, 162.525 y 162.550.

#### Ubicación correcta de una NWR en su casa

La mejor recepción se obtiene cuando se la ubica cerca de una ventana.

Se puede llegar a necesitar una antena exterior si usted se encuentra a más de 48 km (30 millas) del transmisor.

Se pueden conectar luces estroboscópicas, buscaperonas, computadoras e impresoras de texto para los incapacitados visuales o auditivos.

#### Sitios Web útiles

Ingrese en [www.srh.noaa.gov/ftproot/msd/nwr/srnnwr.html](http://www.srh.noaa.gov/ftproot/msd/nwr/srnnwr.html) o [www.nws.noaa.gov/nwr](http://www.nws.noaa.gov/nwr) para encontrar el transmisor NWR más próximo.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

[www.flash.org](http://www.flash.org) teléfono gratuito 1-877-221-SAFE

## FLASH Card: Manufactured Homes

### Safety Tips for Manufactured Homeowners

Manufactured homeowners can be vulnerable to the threats of wildfire and high winds from severe storms, tornadoes or a hurricane. Use the following safety tips to bolster home safety and help resist the threat of wildfires and high winds.

Consider installing a longitudinal tie-down system at the front and rear of your home. These systems rely less on ground anchors and can help avoid the effects of rust and corrosion on wind uplift resistance. Skirt your home to keep embers and combustible materials from getting underneath.

Conduct an annual safety check-up and follow these tips:

- Check for loose straps.
- Make sure straps are properly aligned and not on an angle.
- Make sure there is no entry point for combustible materials to get under the home.
- Check for the proper number of tie-downs and for proper installation.
- Check for proper installation of ground anchors and stabilizer plates.
- Make sure that support piers are in contact with the frame.
- Replace straps or ground anchors that show signs of corrosion or damage.

## FLASH Card: Personas con discapacidades (People With Disabilities)

### Personas con discapacidades

Con frecuencia, las personas con discapacidades necesitan ayuda y un poco más de tiempo que los demás para prepararse para un desastre. La siguiente lista, si bien no es exhaustiva, contiene algunos consejos prácticos para quienes tienen necesidades especiales.

Cree una red de apoyo personal. Esta red de amigos, familiares y vecinos puede ayudarlo a hacer los preparativos para casos de desastre y a llevarlo a un lugar seguro.

Adhiera al refrigerador Instrucciones para casos de Emergencia, lo que incluye dosis de medicamentos, el equipo necesario y contactos de emergencia.

Inscribese en los departamentos locales de bomberos y manejo de emergencias.

Identifique distintas rutas de evacuación en su casa y en el trabajo. Pídale a su empleador que incluya y evalúe estos planes.

Lleve consigo en todo momento información de emergencia sobre su salud y contactos para casos de emergencia. Puede resultar útil llevar un brazalete o una etiqueta de alerta médico para identificar su discapacidad.

Tenga a mano un medio alternativo de comunicación, como una pizarra blanca o un bloc de papel y marcadores.

Si llama al 911, golpee suavemente la barra espaciadora para utilizar el servicio de teléfono de texto.

Instale dispositivos de seguridad contra incendios en su casa, como extinguidores de incendios y detectores de humo con almohadilla vibratoria o luz destellante. Considere también la posibilidad de instalar una alarma con luz estroboscópica en el exterior de su casa para alertar a los vecinos. Pruebe las alarmas y los extinguidores con regularidad y reemplace las baterías de los detectores de humo cada seis meses.

Tenga a mano una linterna, un silbato o una campanilla para que los demás puedan darse cuenta de dónde está.

Abastézcase de suministros de emergencia, como pilas, frazadas, dinero en efectivo, alimentos no perecederos, medicamentos, agua y un receptor de radio para sintonizar la radio del tiempo.

Para obtener más información sobre cómo preparar a los niños con necesidades especiales de cuidado de la salud, visite [www.aap.org/advocacy/emergprep.htm](http://www.aap.org/advocacy/emergprep.htm), por favor. Para obtener información sobre cómo proteger a su animal de asistencia en una emergencia, visite [www.disabilitycentral.com](http://www.disabilitycentral.com), por favor.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes (Alianza Federal para Hogares Seguros)!  
[www.flash.org](http://www.flash.org) Teléfono gratuito: 1-877-221-SAFE

## FLASH Card: Pet Safety

### Hurricane Preparation for Pets

Hurricane season is June 1 through November 30. The Humane Society and FLASH are urging pet owners to ACT NOW to properly prepare pets in the likely case of a hurricane.

#### **Pet Owners have three options in the event of a hurricane:**

- Keep your pet with you at a secure, storm-prepared location (Red Cross shelters do not accept pets).
- Take your pet with you to a friends or family members house or to a hotel in a safe zone. This should be prearranged to avoid surprise and confusion.
- Leave your pet with a friend in a safe zone or board it at a veterinary clinic or kennel.

#### **All pet boarding facilities require up-to-date vaccinations and proper identification.**

- Update your pets vaccinations.
- Purchase tags and have your pet implanted with a microchip (tags and microchips used together are the most effective way of identifying pets).
- Carry a current picture of you with your pet and its medical records with you at all times.

#### **Following is a list of supplies to have prepared for your pet:**

- Portable carrier (large enough for the pet to stand up and turn around in)
- Extra leash and collar
- Extra identification tag
- Pet food at least a two-week supply of dry food in water-tight container or canned food (manual can opener needed)
- Water at least a two-week supply of clean water large dogs need one gallon per day
- Up-to-date health records
- Medications flea and tick preventative and two-month supply of heartworm preventative medication

- Litter/newspapers
- Toys and treats
- Towels
- First aid supplies
- Recent photo of you with your pet

## FLASH Card: Preparación de las mascotas en caso de huracán (Pet Safety)

### Preparación de las mascotas en caso de huracán

La temporada de huracanes se extiende del 1° de junio al 30 de noviembre. La Humane Society (Sociedad Humana) y FLASH recomiendan encarecidamente a los propietarios de mascotas que ACTÚEN AHORA para prepararlas adecuadamente en el probable caso de un huracán.

Los dueños de mascotas tienen tres opciones en el caso de un huracán:

Mantener a su mascota con usted en un sitio seguro, preparado para resistir tormentas (los albergues de la Cruz Roja no aceptan mascotas).

Llevar a su mascota con usted a la casa de un amigo, de un miembro de la familia o a un hotel que se encuentren en una zona segura. Esto debería arreglarse por anticipado para evitar sorpresas y confusión.

Dejar a su mascota con un amigo en una zona segura o alojarla con un veterinario o en una perrera.

Todos los centros de alojamiento de mascotas exigen las vacunas al día y la identificación adecuada del animal.

Actualice las vacunas de su mascota.

Compre etiquetas y hágale implantar un microchip (las etiquetas y los microchips juntos son la forma más eficaz de identificar a las mascotas).

Lleve consigo en todo momento una foto actual de usted y su mascota, así como la historia clínica del animal.

A continuación le presentamos una lista de elementos que debe tener preparados para su mascota:

Transportador portátil (lo suficientemente grande para que el animal puede ponerse de pie y darse la vuelta)

Correa y collar adicionales

Etiqueta de identificación adicional

Alimento para mascotas como mínimo una provisión para dos semanas de alimento seco en un contenedor hermético o alimento enlatado (se necesita un abrelatas manual)

Agua como mínimo una provisión para dos semanas de agua limpia los perros grandes necesitan cuatro litros (un galón) por día

Historia clínica actualizada

Medicamentos pulguicida y garrapaticida y una provisión para dos meses de medicación contra los parásitos alojados en el corazón

Litera/periódicos

Juguetes y antojitos

Toallas

Elementos para primeros auxilios

Foto reciente de usted con su mascota

Sea inteligente. Asegúrese. Actúe ahora.

[www.flash.org](http://www.flash.org) teléfono gratuito 1-877-221-SAFE

## FLASH Card: Proyecto de Seguridad (Blueprint for Safety)

### Proyecto de Seguridad

Proteja a su familia y su casa del mal tiempo y los desastres naturales con el Proyecto de Seguridad, el conjunto más completo de técnicas de construcción resistentes a desastres disponibles en Florida en la actualidad. El Proyecto de seguridad ofrece pautas "código-plus" para proteger, tanto las casa nuevas como las existentes, contra inundaciones, fuego incontrolado y vientos fuertes.

#### Inundación

Evite daños costosos consultando un Mapa de porcentajes de un seguro contra inundación para determinar los riesgos antes de construir su próxima casa. Contrate a un constructor local para que le ayude a determinar la Elevación básica contra inundaciones.

Si su casa actual está en una zona anegadiza, considere la posibilidad de elevar la estructura de modo que el piso inferior quede por encima del nivel de inundación.

La "impermeabilización," los diques y malecones son otras técnicas de prevención contra inundaciones a tener en cuenta.

#### Incendio forestal

Las casas que se encuentran en zonas boscosas y rurales corren mayor riesgo de sufrir daños debido a un incendio forestal.

Mantenga una fuente de agua fiable.

Construya con materiales ignífugos.

Cree un espacio de defensa en derredor de su casa quitando la leña y cortando los árboles y arbustos que se encuentran a una distancia de 9 m (30 pies) de la residencia o menos.

Viento

En caso de un huracán o tornado, proteja todas las ventanas, puertas y ventilaciones de los techos a dos aguas con cubiertas probadas y aprobadas, tales como contrachapado o postigos.

Refuerce las uniones del techo, las paredes y de la fundación con ganchos y grapas de fijación y pernos contra huracanes.

Al instalar un techo nuevo, use una barrera hídrica secundaria y coberturas resistentes a los impactos.

Si por el momento no piensa instalar un techo nuevo, refuerce la cara oculta del que tiene con un adhesivo de construcción o una espuma estructural en aerosol.

Para obtener más información sobre el Programa proyecto de seguridad llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE, correo electrónico [flash@flash.org](mailto:flash@flash.org) o ingrese en [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

## FLASH Card: Safe Room

### Safe Room

A safe room, or storm shelter, provides the highest degree of protection for you and your family from the dangerous forces of extreme winds and debris impacts. Consider the following information for building or installing a safe room in your home.

### Safe Room Construction

- Safe rooms can be site-built or manufactured and can be installed in new or existing homes.
- Site-built safe rooms can be constructed with concrete, concrete masonry, and combinations of wood frame and steel sheathing or concrete masonry infill.
- Manufactured safe-rooms are usually built at a plant or assembled on-site.
- Issues critical to performance include:
  1. Safe rooms must be structurally isolated from the main structure of your home.
  2. Safe rooms must be securely anchored to the foundation.
  3. Safe rooms installed in or over a crawl space must have a separate foundation.
  4. All components of safe rooms, including walls, ceilings, and door assemblies, must be designed and tested to resist the specified wind forces and prevent perforation by wind-borne debris.
  5. Safe rooms must have adequate ventilation.

### Location

- Safe rooms can be located anywhere on the first floor of your home,

in a basement, or outside.

- Shelters located outside your home should be accessed immediately when a storm warning is issued.

#### **Wind Forces and Debris Impacts**

- Safe rooms must be designed for wind speeds up to 250 mph and debris impacts from a 15 lb 2x4 board traveling at 100 mph.

#### **Testing and Quality Verification**

- Site-built safe rooms can be constructed in accordance with the prescriptive designs of FEMA 320, Taking Shelter From the Storm: Building a Safe Room Inside Your House.
- Deviations from FEMA 320 and manufactured safe rooms must be tested at an approved laboratory such as the Wind Engineering Research Center at Texas Tech University.
- Verification of compliance with National Storm Shelter Associations Association Standard, required for membership in the Association, provides the highest level of shelter quality.

#### **Emergency and Disaster Supply Kit**

- Prepare an emergency plan and have a disaster supply kit available in your safe room.

---

## **FLASH Card: Sandbags**

### **Sandbags**

Sandbags will redirect storm water and debris flows away from homes and other structures, provided the sandbags are properly filled and maintained. Sandbags usually last for only one year.

#### **Filling:**

- Fill sandbags one-half full.
- Use sand if readily available, otherwise, use local soil.
- Fold top of sandbag down and rest bag on its folded top.

#### **Placing:**

- Take care in stacking sandbags.

- Limit placement to three layers, unless a building is used as a backing or sandbags are placed in a pyramid.
- Tamp each sandbag into place, completing each layer prior to starting the next layer.
- Clear a path between buildings for debris flow.
- Lay a plastic sheet in between the building and the bags to control the flow and prevent water from seeping into sliding glass doors.

**Limitations:**

- Sandbags will not seal out water.
- Sandbags deteriorate when exposed to continued wetting and drying for several months. If bags are placed too early, they may not be effective when needed.
- Sandbags are for small water flow protection up to two feet. Protection from larger flow requires a more permanent flood prevention system.

NOTE: Consult your local environmental protection department before disposing of used sandbags. Sandbags exposed to contaminated floodwaters may pose an environmental hazard and require special handling.

More information on flood prevention is available through the Blueprint for Safety educational program. Call our toll-free help desk at 1-877-221-SAFE, email [flash@flash.org](mailto:flash@flash.org) or log on to [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

## FLASH Card: Seguridad en caso de inundación (Flood Safety)

### Seguridad en caso de inundación

Cada año se producen más muertes debido a inundaciones que a cualesquier otro peligro relacionado con temporales o huracanes. Muchas de estas víctimas son conductores descuidados o confiados que intentan pasar por calles anegadas. El National Weather Service (Servicio Nacional de Meteorología) advierte ahora a cualquiera que se acerque a una carretera inundada, Turn around& dont drown!TM (¡Dé la vuelta... no se ahogue!TM)

Siga estas reglas de seguridad:

Si se produce una inundación, dirijase a un terreno elevado. Manténgase alejado de zonas anegadizas, incluyendo depresiones, puntos bajos, valles, canaletas, desagües, etc.

Evite las zonas inundadas o aquellas con corrientes de agua rápidas. No intente cruzar las corrientes de agua. Sólo son necesarios 15 cm (6 pulgadas) de aguas rápidas para hacerle perder contacto con el suelo.

No permita que los niños jueguen cerca de aguas profundas, bocas de tormenta o desagües. El agua puede ocultar peligros.

En las calles inundadas, el agua puede esconder importantes daños, NUNCA conduzca a través de zonas o calles anegadas. Si su vehículo se detiene, abandónelo de inmediato y busque un terreno más elevado. Sesenta centímetros (dos pies) de agua son suficientes para llevarse a la mayoría de los automóviles.

No acampe ni estacione su vehículo junto a corrientes de agua y desagües, especialmente cuando existen condiciones de peligro.

Sea especialmente cauto de noche, cuando es más difícil reconocer los peligros de inundación.

Sintonice la NOAA Weather Radio (Radio del Tiempo de la NOAA) o su medio local para escuchar información vital sobre el tiempo.

Se puede obtener más información sobre seguridad en caso de inundación a través del National Weather Service, [www.noaa.gov/floods.htm](http://www.noaa.gov/floods.htm), o la Federal Alliance For Safe Homes (Alianza Federal para Hogares Seguros), [www.flash.org](http://www.flash.org).

Llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE o envíe un correo electrónico a [flash@flash.org](mailto:flash@flash.org).

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes!

Para obtener más información sobre el Programa Proyecto de Seguridad llame a nuestra mesa de ayuda gratuita al 1-877-221-SAFE, correo electrónico [flash@flash.org](mailto:flash@flash.org) o ingrese en [www.blueprintforsafety.org](http://www.blueprintforsafety.org).

## FLASH Card: Severe Winds

### Severe Winds

Follow tips from both the Severe Winds and Hurricane cards to create a plan today to help your family prepare for strong winds from a tornado or severe storm. Prior to a tornado, concentrate on the following areas along with the hurricane FLASH card to protect your home.

### Roof

To strengthen against uplift forces:

- Make sure the roof deck is properly attached to truss/rafters with roof-wall (hurricane straps/clips) connection hardware.
- Using a caulking gun, apply a 1/4 inch bead of APA AFG-01 certified wood adhesive along an intersection of the roof deck and roof support element (rafter or truss chord) on both sides of the beam. This technique can increase the wind uplift resistance by up to 3x more than nail-secured sheathing, but should only be used on roofs one year old or greater.
- Attach quarter-round wood pieces with adhesive in the corners of the roof support elements where access is limited to one side.

### Porches

Check to see if the exterior walls are connected to the foundation

properly.

- Ensure that the porch is properly attached with tie downs. The tie down is an internal rod within the porch column, which better connects the porch roof to the foundation, so it cannot be lifted out of place by the wind.

#### **Manufactured Homes**

- Anchor mobile homes with tie downs and inspect them annually.
- Avoid staying inside a manufactured home to ride out a storm. Always evacuate to a nearby, designated storm shelter.

## **FLASH Card: Vientos intensos (Severe Winds)**

### **Vientos intensos**

Siga los consejos de las tarjetas Vientos intensos y Huracanes para crear hoy un plan que le ayude a su familia a prepararse para los intensos vientos de un tornado o una tempestad. Antes de un tornado, concéntrese en las siguientes áreas junto con la tarjeta FLASH sobre huracanes para proteger su casa.

#### **Techo**

Para reforzarlo contra las fuerzas de elevación:

Asegúrese de que la cubierta del techo esté correctamente unida a las cerchas/vigas con elementos de unión para techos y paredes (ganchos y grapas de fijación para huracanes).

Con una pistola de calafateado aplique un reborde de 0,6 cm (1/4 de pulgada) de adhesivo para madera certificado APA AFG-01 a lo largo de la intersección entre la cubierta del techo y el elemento de soporte (cordón de la cercha o la viga) a ambos lados de la viga. Esta técnica puede aumentar la resistencia a la elevación debido al viento hasta 3 veces más que un revestimiento asegurado con clavos, pero sólo debe ser usada en techos de un año de antigüedad o más.

Adose con adhesivo contrafuertes redondos de madera a los ángulos de los elementos de soporte del techo allí donde el acceso está limitado a un solo lado.

#### **Pórticos**

Verifique si las paredes exteriores están unidas correctamente a la fundación.

Asegúrese de que el pórtico esté correctamente fijado con amarras. La amarra es una vara interna dentro de la columna del pórtico, que conecta mejor el techo con la fundación de modo que no pueda ser levantado por el viento.

#### **Casas fabricadas**

Ancle las casas móviles con amarras e inspecciónelas manualmente.

Evite permanecer adentro de una casa fabricada para salir ileso de una tempestad. Evacue siempre a un albergue contra tormentas cercano.

¡Proteja su hogar en un FLASH con la Federal Alliance for Safe Homes! (Alianza Federal para Hogares Seguros)

Teléfono gratuito 1-877-221-SAFE

---

## FLASH Card: Weather Radio

### NOAA Weather Radio

NOAA Weather Radio (NWR) is the Voice of the National Weather Service. It provides critical life-saving weather information when properly placed within your home.

### NWR Capabilities

- Broadcasts watches, warnings, and advisories immediately from your local National Weather Service office.
- Operates commercial-free, 24-hours daily.
- Should include seven frequency capability, Specific Area Message Encoder (SAME) technology and battery backup.

### NWR Frequencies in Florida

- NWR is available on the following megahertz frequencies:  
162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and  
162.550.

### Properly Placing a NWR in Your Home

- Reception is usually best if placed near a window.
- External antenna may be needed if you are located more than 30 miles from the transmitter.
- Strobe lights, pagers, computers and text printers can be connected for the visually and hearing impaired.

### Helpful Web Sites

- Go to <http://www.srh.noaa.gov/ftproot/msd/nwr/srnwr.html> or <http://www.nws.noaa.gov/nwr> to find the nearest NWR transmitter.

## Flood Barrier Levee -- How to Build One

### Barriers Against Floodwaters

More extensive flood prevention means constructing barriers to prevent floodwaters from entering your home. This process involves building a levee out of compacted earthen structure or engineering a structure out of concrete or masonry.

### The Advantages of a Levee or Floodwall

The advantages of a flood barrier include:

No significant changes to your home.

The home can be occupied during construction.

Levees or floodwalls reduce the risk of flood damage to your home.

## Flood Map -- How to Get One

### How Do I Find Them?

Flood maps are usually kept on file at your local county courthouse, municipal office or library. Once you have located the maps for your area, be sure to record the panel number on each map should you need to obtain additional information from the Federal Emergency Management Agency (FEMA).

FEMA provides copies of flood maps for a nominal fee. To obtain a copy of the current flood map for a specific community, community status book and the Flood Insurance Manual, you can call FEMA's Map Service Center toll free at 1-800-358-9616 or write:

Map Service Center (MSC)

PO Box 1038

Jessup, MD 20794-1038

If you cannot locate flood maps in your area or you are having difficulty determining which maps to order, contact the Map Service Center for a flood map index.

## Flood Risk -- How to Determine

### Do You Know Your Flood Risk?

Call your local emergency management office, building department or floodplain management office for information about flooding. Ask to see a flood map of your community. There may be a projected flood elevation for your neighborhood. This information will help you determine how much water is likely to come in.

FEMA ([www.fema.gov/nfip](http://www.fema.gov/nfip)) provides copies of flood maps for a nominal fee. Flood maps are also kept on file at your local courthouse, municipal office or library.

A Flood Insurance Rate Map can also be especially useful in helping you identify existing flood hazards and the risks associated with those hazards. They can help homeowners and homebuilders determine the flood zone and Base Flood Elevation of an area. Flood Insurance Rate Maps may be available at your local municipal offices, libraries, or insurance agents.

### **Your Odds of Experiencing a Flood**

The odds may seem like a million to one you'll ever experience serious flooding. But it happens more than you'd think. In fact, 90% of all presidentially-declared natural disasters involve flooding. Even minor flooding can mean major financial difficulties. Imagine just a few inches of floodwater invading your home. That's more than enough to destroy floors, damage walls, and ruin appliances - costing you thousands. Live in a high-risk area? You've got a 1 in 4 chance of flooding during the life of your 30-year mortgage. You're also five times more likely to experience flooding than fire. And you don't have to live in a high-risk zone to be a victim. Almost 25% of all flood claims come from low- to moderate-risk areas.

## **Flood Zone -- Which One Are You In?**

### **Flood Zoning**

The Federal Emergency Management Agency (FEMA) has placed more than 19,000 communities in the United States into a category of flood zones. Each community is able to participate in the agency's National Flood Insurance Program (NFIP), with premium rates determined by the risks of flooding. To indicate the risks in different parts of the country, FEMA has assigned a character from the alphabet to each zone. The most hazardous flood zones are V (usually first-row, beach-front properties) and A (usually, but not always, properties near water).

### **V Zones**

According to FEMA and the National Flood Insurance Program, any building located in an A or V zone is considered to be in a Special Flood Hazard Area, and is lower than the Base Flood Elevation. V zones are the most hazardous of the Special Flood Hazard Areas. V zones generally include the first row of beachfront properties. The hazards in these areas are increased because of wave velocity - hence the V designation. Flood insurance is mandatory in V zone areas.

### **Living In a V Zone**

If your home is in a "V" zone (this includes VE and V-1-V-30), adhere to the following recommendations:

The bottom of the lowest horizontal structural member of the lowest floor elevation must be at or above the Base Flood Elevation (BFE).

Enclosed areas below the lowest floor cannot be used for living space.

The building must be elevated on piles, piers, posts or column foundation.

Electrical, heating ventilation, plumbing, air conditioning equipment and other service facilities must be elevated to or above the BFE.

### **A Zones**

A zones - the next most volatile of the Special Flood Hazard Areas - are subject to rising waters and are usually near a lake, river, stream or other body of water. Flood insurance is mandatory in all A zones because of the high potential of flooding. A-zone maps also include AE, AH, AO, AR, and A99 designations, all having the same rates. The different A zones are named depending on the way in which they might be flooded.

### **Living in an A Zone**

If your home is in an A zone (includes AE, A1-A30, AH, AO, AR) follow these important recommendations:

The lowest floor elevation must be at or above the Base Flood Elevation (BFE).

Enclosed areas below the lowest floor cannot be used for living space.

Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities must be elevated to or above the BFE.

### **Other Zones**

X zones are minimal-risk areas where flood insurance is not mandatory. D zones are areas that have not been studied, but where flooding is possible. Flood insurance is available in participating communities.

### **Finding Your Zone Information**

There are several ways to find out which zone applies to you. You can go to your town hall or city hall, where employees responsible for issuing building permits in your area have access to flood zone maps. If you are buying a home, your Realtor and your insurance agent should be able to help you. Also, you can order a flood map from the FEMA's Map Service Center for a nominal charge by calling (800) 358-9616 or by visiting the FEMA Web site at [www.fema.gov](http://www.fema.gov).

---

## **Floodproofing -- Dry**

### **What Is Dry Floodproofing?**

Dry flood proofing prevents floodwaters from entering the building.

This can be achieved by installing new brick veneer over asphalt coating or by applying polyethylene film over existing walls.

Construct non-supporting, break-a-way walls designed to collapse under the force of water without causing damage to the house or its foundation.

Detailed information about flood resistant construction techniques is available from the Federal Emergency Management Agency (FEMA) publication #312 Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding and Publication #55 Coastal Construction Manual --both available at [www.fema.gov](http://www.fema.gov).

---

## **Floodproofing -- Wet**

### **What Is Wet Floodproofing?**

This procedure makes uninhabited parts of your home resistant to flood damage when water is allowed to enter during flooding. An example of wet floodproofing is to install flood vents, creating permanent openings in the foundation walls.

This retrofit requires at least two vents on different walls. The size of the vents must be 1 square inch per square feet of enclosed floor area. For example, a 1,000 square foot house would require 7 square feet of flood vents.

The advantage of wet floodproofing are that it is less costly than other retrofits, no additional land is required and it does not affect the appearance of the house.

### **Get More Information**

Detailed information about flood resistant construction techniques is available from FLASH, Inc. at [BlueprintforSafety.org](http://BlueprintforSafety.org).

Additional information is available from the Federal Emergency Management Agency's (FEMA) publication #312 Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding and Publication #55 Coastal Construction Manual --both available at [www.fema.gov](http://www.fema.gov).

## **Fuel Tank -- Anchoring**

### **Anchor Your Fuel Tank**

A fuel tank can tip over or float in a flood, causing fuel to spill or catch fire. Cleaning up a house that has been inundated with flood waters containing fuel oil can be extremely difficult and costly.

Fuel tanks should be securely anchored to the floor. Make sure vents and fill line openings are above projected flood levels.

Propane tanks are the property of the propane company. You will need written permission to anchor them. Ask whether the company can do it first.

Make sure all work conforms to state and local building codes.

## **Garage Door -- Securing**

### **Secure Your Garage Door**

The most important step you can take in preparing for a windstorm is to make sure that your "building envelope" is sealed. That means tightly covering all windows and doors to prevent wind from entering. If you can keep the wind outside, you and your possessions will be safe inside.

Garage doors are the most vulnerable to hurricane force winds for two reasons, first the relatively long span of opening that they cover, and second, the weak materials they are built with.

Many garage doors are constructed of lightweight materials to conserve weight and expense. Although their lighter weight makes them easier to raise and lower, it also makes them less resistant to the wind and impact forces of a hurricane.

### **Reinforce or Replace**

Approximately 80% of residential hurricane damage starts with wind entry through garage doors. Ideally, garage doors should be equipped with steel bracing.

Be sure to follow manufacturer's specifications when using or installing wind resistant and impact resistant products. Improper installation may cause a voided warranty or worse, a product failure that presents a threat to life and property.

## Major Appliances -- Elevating

### Elevate Washer and Dryer

For protection against shallow flood waters, the washer and dryer can sometimes be elevated on masonry or pressure-treated lumber at least 12" above the projected flood elevation. Other options are moving the washer and dryer to a higher floor, or building a floodwall around the appliances.

### Elevate the Furnace, Water Heater and AC

The furnace and water heater can be placed on masonry blocks or concrete at least 12 above the projected flood elevation, moved to inside a floodwall or moved to a higher floor.

Furnaces that operate horizontally can be suspended from ceiling joists if the joists are strong enough to hold the weight. Installing a draft-down furnace in the attic may be an option if allowed by local codes. Some heating vents can be located above the projected flood elevation.

### Outside equipment

Outside air conditioning compressors, heat pumps or package units (single units that include a furnace and air conditioner) can be placed on a base of masonry, concrete or pressure-treated lumber. All work must conform to state and local building codes.

## Outdoor Items -- Securing

### Bring Outdoor Items In

If you have furniture and other outdoor equipment on your patio or deck, bring them inside when strong weather threatens. Don't forget trash cans, grills, toys, and potted plants. Keep them from becoming flying objects that can cause additional injury or damage during storms with high winds.

## Potential Hazards -- Inspecting Your Home

### Interior Items

During a disaster, ordinary objects in your home can cause injury or damage. Anything that can move, fall, break, or cause a fire is a home hazard. For example a bookcase can fall and cause serious injury. Inspect your home at least once a year and fix potential hazards.

## Power Outage -- Prepare For

### Before a Blackout Happens

Assemble essential supplies, including:

- Flashlight
- Batteries

Portable radio

At least one gallon of water

A small supply of food.

Due to the extreme risk of fire, do not use candles during a power outage.

If you have space in your refrigerator or freezer, consider filling plastic containers with water, leaving about an inch of space inside each one. (Remember, water expands as it freezes, so it is important to leave room in the container for the expanded water). Place the containers in the refrigerator and freezer. This chilled or frozen water will help keep food cold if the power goes out, by displacing air that can warm up quickly with water or ice that keeps cold for several hours without additional refrigeration.

If you use medication that requires refrigeration, most can be kept in a closed refrigerator for several hours without a problem. If unsure, check with your physician or pharmacist.

If you use a computer, keep files and operating systems backed up regularly. Consider buying extra batteries and a power converter if you use a laptop computer. A power converter allows most laptops (12 volts or less) to be operated from the cigarette lighter of a vehicle. Also, turn off all computers, monitors, printers, copiers, scanners, and other devices when they're not being used. That way, if the power goes out, this equipment will have already been safely shut down. Get a high quality surge protector for all of your computer equipment. If you use the computer a lot, such as for a home business, consider purchasing and installing an uninterruptable power supply (UPS). Consult with your local computer equipment dealer about available equipment and costs.

If you have an electric garage door opener, find out where the manual release lever is located and learn how to operate it. Sometimes garage doors can be heavy, so get help to lift it. If you regularly use the garage as the primary means of entering your home upon return from work, be sure to keep a key to your house with you, in case the garage door will not open.

If you have a telephone instrument or system at home or at work that requires electricity to work (such as a cordless phone or answering machine), plan for alternate communication, including having a standard telephone handset, cellular telephone, radio, or pager. Remember, too, that some voice mail systems and remote dial-up servers for computer networks may not operate when the power is out where these systems are located. So even if you have power, your access to remote technology may be interrupted if the power that serves those areas is disrupted. Check with remote service providers to see if they have backup power systems, and how long those systems will operate.

Keep your car fuel tank at least half full because gas stations rely on electricity to power their pumps.

Follow energy conservation measures to keep the use of electricity as low as possible, which can help power companies avoid imposing rolling blackouts.

---

## Roof -- Protecting

### The most important asset

The roof covering, and the deck beneath it, form one of your home's critical shields of protection from high winds and rain. Unfortunately, this shield is often the first to be lost during high winds.

Loss of the roof covering, such as shingles, tiles or metal panels makes the house more vulnerable to water damage. The loose

roofing inevitably becomes wind-borne projectiles that can damage other structures.

But while the loss of roofing can make your home vulnerable to water infiltration, loss of the roof's sheathing, often referred to as decking, can result in excessive damage to your home and your possessions.

As wind blows over the roof, uplift forces pull at the roof. These uplift forces try to pull off the roof covering and the roof deck. When the roof decking is blown off, the inside of your home becomes completely exposed to the elements and trusses or rafters may become unstable and the entire roof may collapse.

### **Tips for new and existing roofs**

The following techniques can be used during roof installation on both new and existing homes, and are best performed by a licensed, professional roofing contractor.

Install a roof deck of solid plywood 5/8 thickness to maximize wind and windborne debris resistance with 10d common nails spaced at 4 inches along the panel edges and every six inches in the field of the plywood panel. Make sure that the nails penetrate the decking directly into the roof framing.

In your existing home, be sure to look in the attic to confirm that the roof decking is properly nailed to the roof framing. If you can see nails along the sides of rafters or trusses, where the nail penetrates the decking, your roof deck is probably not securely attached.

Create a secondary water barrier by installing self-adhering flashing tape or modified polymer bitumen strips, commonly called peel and seal, over the joints in your roof deck. This will help keep out the rain in the event the roof covering is damaged or destroyed by severe weather.

Install one layer of #30 underlayment sometimes called felt paper -- over the roof decking and secondary water barrier. The felt helps with drainage in the event water gets under the roof covering.

Install a roof covering that has been tested to ASTM D 3161 for wind resistance and UL 2218 for impact resistance. Be sure to specify these standards and look for labels on the products confirming these standards because ordinary roofing materials may not look any different from the wind resistant versions.

Finally, you can significantly increase the roofs resistance to uplift from the wind by applying a bead of construction adhesive using a caulking gun along both sides of the intersection of the roof decking and the rafters or trusses. Be sure to look for an adhesive that has been tested to specific levels.

---

## **Safe Rooms**

### **Safe Rooms: The Ultimate Protection from High Winds**

A safe room, or storm shelter, provides the ultimate in life safety protection for you and your family from the dangerous forces of severe winds produced by hurricanes and tornadoes. Consider the following information for building or installing a safe room in your home:

Safe rooms can be site-built or manufactured and can be installed in new or existing homes.

Safe rooms can be located anywhere on the first floor of your home, in a basement, or outside.

Safe rooms must be designed for wind speeds up to 250 mph and debris impacts from a 15 lb 2x4 board traveling at 100 mph.

Issues critical to performance include:

1. Safe rooms must be structurally isolated from the main structure of your home.
2. Safe rooms must be securely anchored to the foundation.
3. Safe rooms installed in or over a crawl space must have a separate foundation.
4. All components of safe rooms, including walls, ceilings, and door assemblies, must be designed and tested to resist the specified wind forces and prevent perforation by wind-borne debris.
5. Safe rooms must have adequate ventilation.

Site-built safe rooms can be constructed in accordance with the prescriptive designs of the FEMA 320 Publication, Taking Shelter From the Storm: Building a Safe Room Inside Your House. Deviations from FEMA 320 and manufactured safe rooms must be tested at an approved laboratory such as the Wind Science and Engineering Research Center at Texas Tech University.

Verification of compliance with National Storm Shelter Association's Association Standard provides the highest level of shelter quality.

FEMA has published prescriptive designs for residential storm shelters in FEMA 321, Taking Shelter From the Storm and has published guidelines for community shelters in FEMA 361, Design and Construction Guidance for Community Shelters. The National Storm Shelter Association (NSSA) developed the industry standard and the process for quality verification, both available on the web at [www.NSSA.cc](http://www.NSSA.cc).

The producer should be familiar with the applicable guide to quality and take responsibility to comply with it.

---

## Sandbags -- Making and Using Them

### **Making a Sand-Bag Barrier**

Sandbags can be useful in redirecting storm water and debris flows away from your home. But be sure that the sandbags are properly filled and maintained.

Here's how: Fill sandbags one-half full. Use sand if readily available, otherwise use soil. Fold the top of sandbag down and rest the bag on its folded top. Take care in stacking the sandbags. Limit placement to three layers, unless a building is used as a backing or sandbags are placed in a pyramid. Tamp each sandbag into place, completing each layer before you begin a new layer. Clear a path between buildings for debris flow. Lay a plastic sheet in between the building and the bags to control the flow and prevent water from seeping into sliding glass doors.

### **What to Expect**

There are limits to what sandbags can do, so remember: Sandbags will not seal out water. Sandbags deteriorate when exposed

to continued wetting and drying for several months. If bags are placed too early, they may not be effective when needed. Sandbags are for small water flow protection -- up to two feet. Protection from larger flow requires a more permanent flood prevention system. Be sure to consult with your local environmental protection department before disposing of used sandbags. Sandbags that are exposed to contaminated floodwaters may pose an environmental hazard and require special handling.

## Basic Flood Safety Rules

### Get to High Ground

If flooding occurs, get to higher ground. Stay away from flood-prone areas, including dips, low spots, valleys, ditches, washes, etc.

If the waters start to rise in your home, retreat to the second floor, the attic and if necessary, the roof. Take dry clothing, a flashlight and a portable radio with you. Then wait for help.

### Avoid Flooded Areas

Avoid flooded areas or those with rapid water flow. Do not attempt to cross a flowing stream. It takes only six inches of fast flowing water to sweep you off your feet.

### Keep Children Safe

Don't allow children to play near high water, storm drains or ditches. Hidden dangers could lie beneath the water.

### Beware of Flooded Roads

Flooded roads could have significant damage hidden by floodwaters. NEVER drive through floodwaters or on flooded roads. If your vehicle stalls, leave it immediately and seek higher ground. Water only two feet deep can float away most automobiles.

Do not camp or park your vehicle along streams or washes, particularly when threatening weather conditions exist.

Be especially cautious at night when it is harder to recognize flood dangers.

## Disaster Kit -- Assembling

### What To Plan For

You'll need to plan for two situations: Remaining in your home after a disaster or evacuating to a safer location.

Keep enough supplies at home for at least three days. Have a three-day supply of food and water on hand -- plan for one gallon of water per person per day and food that won't spoil. Don't forget a can opener (not an electric one) and emergency tools including a fire extinguisher, battery powered radio, flashlight, and plenty of batteries.

### Disaster Supply Checklist

Be sure to gather the following items to ensure your family's basic comfort and well-being in case of evacuation.

Cash -- Banks and ATMs may not be open or available for extended periods.

Water -- at least one gallon per person for three to seven days.

Food -- at least enough for three to seven days, including: Non-perishable packaged or canned food and juices, food for infants or the elderly, snack food, non-electric can opener, vitamins, paper plates, plastic utensils.

Radio -- battery powered and NOAA weather radio.

Blankets, pillows etc.

Clothing -- seasonal, rain gear/ sturdy shoes.

First Aid Kit -- medicines, prescription drugs.

Special items -- for babies and the elderly.

Toiletries -- hygiene items, moisture wipes.

Flashlight and batteries.

Keys.

Toys, books, games.

Store important documents in a waterproof container: insurance papers, medical records, bank account numbers, Social Security cards.

Tools.

Vehicle with full tank of gas.

Pet care items: Proper identification, immunization records, ample food and water, medicine, a carrier or cage, leash.

### **Keep Your Kit Fresh**

Remember to replace stored food and water every six months. Also keep a supply of fresh batteries on hand. Remember to keep your most important up-to-date family papers in a fire and water proof container. These should include Social Security cards, deeds or mortgages, insurance policies, birth and marriage certificates, stocks, bonds, wills and recent tax returns.

### **The Importance of Water**

Stocking an emergency water supply should be one of your top priorities. During an emergency drinking water should not be rationed, that's why it's critical to have enough water on hand for yourself and your family.

While individual needs will vary depending on age, physical condition, activity, diet, and climate, a normally active person needs at least two quarts of drinking water daily. Children, nursing mothers, and people who are ill need more water. Very hot temperatures can also double the amount of water needed.

Because you will also need water for sanitary purposes, and possibly for cooking, you should store at least one gallon of water per person per day.

When storing water, use thoroughly washed plastic, fiberglass, or enamel-lined containers. Don't use containers that can break, such as glass bottles. Never use a container that has held toxic substances. Plastic containers, like soda bottles, are best.

Seal your water containers tightly, label them and store them in a cool, dark place.

It is important to change stored water every six months.

## Disaster Safety for People with Disabilities

### Safety Tips for People with Disabilities

If you have a disability or special need, you may have to take additional steps to protect yourself in an emergency. If you have family, friends or neighbors with special needs, help them with these extra precautions.

People with disabilities often require assistance and additional lead time in order to prepare for a disaster. The following list, while not exhaustive, provides some practical tips for those with special needs.

Establish a personal support network. This network of friends, family, and neighbors can assist in disaster preparations and getting you to a safe place.

Post Emergency Instructions on the refrigerator to include medication dosages, necessary equipment, and emergency contacts.

Register with local emergency management and fire departments.

Identify multiple evacuation routes at home and at work. Ask your employer to include and test these plans.

Carry with you at all times emergency health information and emergency contacts. A medical alert tag or bracelet to identify your disability can prove helpful.

Have an alternate means of communication, like a dry erase board or writing tablet and markers.

When calling 911, tap the space bar to engage the TDD system.

If you are mobility impaired and live or work in a high-rise building, have an escape chair.

If you live in an apartment building, ask the management to mark accessible exits clearly.

Keep extra wheelchair batteries, oxygen, catheters, medication, food for guide or hearing-ear dogs, or other items you might need. Also keep a list of the type and serial numbers of medical devices you need.

Stock additional emergency supplies, such as batteries, blankets, cash, medications, non-perishable foods, water and a weather radio.

Install fire safety devices in the home, such as fire extinguishers and smoke alarms with a vibrating pad or flashing light.

Consider also installing an alarm with strobe light outside the home to alert neighbors. Test alarms and extinguishers regularly and replace smoke alarm batteries every six months.

Keep a flashlight, whistle, or bell handy to signal your whereabouts to others.

For more information on how to prepare children with special health care needs, visit [www.aap.org/advocacy/emergprep.htm](http://www.aap.org/advocacy/emergprep.htm).

For information on protecting your service animal in an emergency, visit [www.disabilitycentral.com](http://www.disabilitycentral.com).

---

## Energy Conservation

### Conserving Power

To conserve power to help avoid a blackout, the power industry recommends:

In heating season, set the furnace thermostat at 68 degrees or lower. In cooling season, set the thermostat at 78 degrees or higher. Consider installing a programmable thermostat that you can set to have the furnace or air conditioning run only when you are at home. Most power is used by heating and cooling, so adjusting the temperatures on your thermostat is the biggest energy conservation measure you can take.

Turn off lights and computers when not in use. This is especially true about computer monitors - avoid using a "screen saver" and just simply turn the monitor off when you won't be using the computer for a while. Turn the computer off completely each evening. It is no longer true that computer equipment is damaged from turning it off and on.

Close windows when the heating or cooling system is on.

Caulk windows and doors to keep air from leaking, and replace old windows with new, energy-efficient windows.

Clean or replace furnace and air-conditioner filters regularly.

When buying new appliances be sure to purchase energy-efficient models.

Wrap the water heater with an insulation jacket, available at most building supplies retailers.

If you have to wash clothes, wash only full loads and clean the dryer's lint trap after each use.

When using a dishwasher, wash full loads and use the "light" cycle. If possible, use the "rinse only" cycle and turn off the "high temperature" rinse option. When the regular wash cycle is done, just open the dishwasher door to allow the dishes to air dry.

Replace incandescent light bulbs with energy-efficient compact fluorescent lights.

Use one large light bulb rather than several smaller ones.

If you would like more information about rolling blackouts and how to deal with them, contact the power company that serves your area.

---

## Evacuation -- Be Prepared

### Have An Evacuation Plan

Discuss what to do in an evacuation with everyone in your family. Know where you will go if an evacuation is called. Review at least two exit routes from your home or neighborhood to a designated meeting place for your family. Don't forget about your pets. Pets are not allowed at most public shelters.

### **Pack Your Bags**

After a disaster, you may not be able to return to your home for some time. Assemble everything your family will need in advance if you must evacuate your home. Pack one change of clothes and shoes per person as well as one blanket or sleeping bag per person. Write down the name of your insurance company, policy number, and telephone number and keep it in a safe place. Include an extra set of car keys, your credit cards, cash, and/or traveler's checks. Don't forget your important emergency contact numbers.

### **Don't Forget Personal Items**

Create a first aid kit that includes your family's prescription medications. Pack sanitation supplies and special items for babies, senior citizens, or disabled family members. Bring extra eyeglasses and a favorite family board game to help pass the time away from home.

---

## **Evacuation -- If You Must Evacuate**

### **Evacuate Immediately**

Evacuate immediately if authorities tell you to do so. Listen to your battery-powered radio and follow the instructions of local emergency officials. Wear warm, dry clothing and sturdy shoes. Be sure to take your disaster supplies kit with you to a shelter or safe location. Use travel routes specified by local authorities -- don't use shortcuts.

### **Before You Go**

If you have the time: Turn off water, gas and electricity before leaving. Post a note telling when you left and where you are going. Don't forget about your pets and be sure to lock your home.

---

## **Flood Warnings -- Understand Them**

### **Flood Watch**

Flash flooding or flooding is possible within the designated WATCH area. Be alert.

### **Flood Warning**

Flash flooding or flooding has been reported or is imminent. Take necessary precautions at once.

### **Stream Advisory**

Flooding of small streams, streets, and low-lying areas, such as railroad underpasses and urban storm drains, is occurring.

### **Flood Statement**

Follow-up information regarding a flash flood/flood event.

## Mobile and Manufactured Homes -- Safety Tips

### Safety Tips for Manufactured Homeowners

Manufactured homeowners can be vulnerable to the threats of high winds from severe storms, tornadoes or a hurricane. Use the following safety tips to bolster home safety and help resist the threat of high winds.

Consider installing a longitudinal tie-down system at the front and rear of your home. These systems rely less on ground anchors and can help avoid the effects of rust and corrosion on wind uplift resistance.

Conduct an annual safety check-up and follow these tips:

Check for loose straps.

Make sure straps are properly aligned and not on an angle.

Check for proper number of tie-downs and for proper installation.

Check for proper installation of ground anchors and stabilizer plates.

Make sure that support piers are in contact with the frame.

Replace straps or ground anchors that show signs of corrosion or damage.

Have a plan where to go during a tornado threat -- a nearby pre-identified safe structure within walking distance.

### Get Together With Neighbors

If you live in a mobile or manufactured home park and severe weather threatens, get together with other residents and the park owner/manager to designate safe shelter areas in the park or community.

## NOAA Weather Radio

### What is NOAA weather radio

Quickly changing weather demands careful attention. Keep your family safe by staying tuned to NOAA weather radio -- it provides critical life-saving weather information when placed properly in your home.

NOAA Weather Radio (NWR) is the "Voice of the National Weather Service," a nationwide network of radio stations broadcasting continuous weather information direct from a nearby National Weather Service office.

NWR broadcasts National Weather Service warnings, watches, forecasts, and other hazard information 24 hours a day commercial free.

### Types of Information on NWR

Working with the Federal Communication Commission's (FCC) Emergency Alert System, NWR is an "all hazards" radio network, making it your single source for comprehensive weather and emergency information. NWR also broadcasts warning and post-event information for all types of hazards--both natural, (such as earthquakes and volcanic activity) and environmental, (such as chemical releases or oil spills).

### Getting Better Reception

Reminders: Reception is usually best if placed near a window. An external antenna may be needed if you are located more than 30 miles from the transmitter. Strobe lights, pagers, computers, and text printers can be connected for the visually and hearing

impaired. Remember power outages can occur at any time, so be sure to keep a battery-powered radio handy. Go to [www.nws.noaa.gov/nwr](http://www.nws.noaa.gov/nwr) to find the nearest NWR transmitter.

---

## People With Disabilities: Power Outage

### Safety in a Power Outage

If you use a battery-operated wheelchair, life-support system, or other power-dependent equipment, call your power company before rolling blackouts happen. Many utility companies keep a list and map of the locations of power-dependent customers in case of an emergency. Ask them what alternatives are available in your area. Contact the customer service department of your local utility company(ies) to learn if this service is available in your community.

If you use a motorized wheelchair or scooter, have an extra battery. A car battery also can be used with a wheelchair but will not last as long as a wheelchair's deep-cycle battery. If available, store a lightweight manual wheelchair for backup.

If you are Blind or have a visual disability, store a talking or Braille clock or large-print timepiece with extra batteries.

If you are Deaf or have a hearing loss, consider getting a small portable battery-operated television set. Emergency broadcasts may give information in American Sign Language (ASL) or open captioning.

---

## Pets -- Preparing and Protecting

### Protect Your Pet

Pets need to be included in your family's disaster planning since they depend on you for their safety and well-being. It is important to consider and prepare for your pets before disaster strikes. Consider the following important steps:

Keep your pet with you at a secure, storm-prepared location. If you must evacuate, do not leave your pets behind. There is a chance they may not survive, or get lost before you return.

Find out before a disaster strikes which local hotels and motels allow pets and where pet boarding facilities are located.

With the exception of service animals like seeing eye dogs, pets are typically not permitted in emergency shelters.

Take your pet with you to a hotel, friend's or family member's house, veterinary clinic or kennel in a safe zone. This should be prearranged to avoid surprise and confusion.

Remember that most boarding facilities will require up-to-date vaccinations and proper identification.

Purchase tags or have your pet implanted with a microchip (tags and microchips used together are the most effective way of identifying pets).

Carry a current picture of you with your pet and its medical records with you at all times.

Following is a list of supplies to have prepared for your pet:

Portable carrier (large enough for the pet to stand up and turn around in)

Extra leash and collar

Extra identification tag

Pet food - at least a two-week supply of dry food in water-tight container or canned food (non-electric can opener needed)

Water - at least a two-week supply of clean water -- large dogs need one gallon per day

Up-to-date health records

Medications - flea and tick preventative and two-month supply of heartworm preventative medication

Litter/newspapers

Toys and treats

Towels

First aid supplies

---

## Safety Tips During a Power Outage

### Family Safety During a Power Outage

Only use a flashlight for emergency lighting. Never use candles.

Turn off electrical equipment you were using when the power went out.

Turn off or disconnect any appliances, equipment, (like air conditioners) or electronics you were using when the power went out.

When power comes back on, it may come back with momentary, "surges" or "spikes" that can damage equipment such as computers and motors in appliances like the air conditioner, refrigerator, washer, or furnace.

Leave one light turned on so you'll know when your power returns.

Avoid opening the refrigerator and freezer.

Leave the doors of your refrigerator and freezer closed to keep your food as fresh as possible. If you must eat food that was refrigerated or frozen, check it carefully for signs of spoilage.

Use the phone for emergencies only. Listening to a portable radio can provide the latest information. Do not call 9-1-1 for information -- only call to report a life-threatening emergency.

Do not run a generator inside a home or garage.

If you use a generator, connect the equipment you want to power directly to the outlets on the generator. Do not connect a

generator to a home's electrical system.

Eliminate unnecessary travel, especially by car. Traffic signals will stop working during an outage, creating traffic congestion.

Remember that equipment such as automated teller machines, (ATMs) and elevators may not work during a power outage.

If it is hot outside, take steps to remain cool. Move to the lowest level of your home, as cool air falls. Wear lightweight, light-colored clothing. Drink plenty of water, even if you do not feel thirsty. If the heat is intense and the power may be off for a long time, consider going to a movie theater, shopping mall, or, "cooling shelter" that may be opened in your community. Listen to local radio or television for more information. Get more tips on the preparing for a heat wave.

Remember to provide plenty of fresh, cool water for your pets.

If it is cold outside, put on layers of warm clothing. Never burn charcoal for heating or cooking indoors. Never use your oven as a source of heat. If the power may be out for a prolonged period, plan to go to another location (relative, friend, or public facility) that has heat to keep warm.

Listen to local radio and television for updated information.

---

## Turn Around Don't Drown

### Turn Around Don't Drown

More deaths occur due to flooding each year than from any other thunderstorm or hurricane related hazard. Many of these deaths are a result of careless or unsuspecting motorists who attempt to drive through flooded roads. FLASH and the National Weather Service warn anyone who comes to a flooded road to "Turn around ... don't drown!"

### Avoid Flooded Roads

Flooded roads could have significant damage hidden by floodwaters. Never drive through floodwaters or on flooded roads. If your vehicle stalls, leave it immediately and seek higher ground. Water only two feet deep can sweep away most automobiles.

For more information about the "Turn around... don't drown" program visit [www.srh.noaa.gov/srh/tadd/](http://www.srh.noaa.gov/srh/tadd/)

---

## Using a Generator

### Safe Use of a Generator

If you are considering obtaining a generator, get advice from a licensed professional, such as an electrician.

Make sure the generator is listed with Underwriter's Laboratories or a similar organization. Some municipalities, Air Quality Districts, or states have "air quality permit" requirements. A licensed electrician will be able to give you more information on these matters.

Always plan to keep the generator outdoors -- never operate it inside, including the basement or garage. Do not hook up a generator directly to your home's wiring.

The safest thing to do is to connect the equipment you want to power directly to the outlets on the generator. Connecting a cord from the generator to a point on the permanent wiring system and backfeeding power to your home is an unsafe method to supply a building during a power outage.

## After a Storm -- Important Tips

### Important Tips After a Storm

Be careful to take certain precautions after the storm has passed. Damage to your home can have a dramatic emotional impact, and it's best to have a plan before the storm strikes for how to reenter your home. Having a plan, and being aware of certain risks, will minimize the threat of harm to you or your family.

Keep these tips in mind:

Stay tuned to local news organizations, such as a radio or television station, for important announcements, bulletins, and instructions concerning the storm area, medical aid and other forms of assistance, such as food, water, and shelter.

Remember that you may not have immediate access to your home. Emergency rescue crews, power crews, and other personnel may be attending to special needs. Roads could be blocked, power lines could be down, and people may be trapped and in need of assistance.

Make sure that you have current identification. You may have to pass through identification check points before being allowed access to your home/neighborhood.

Avoid driving, as roads may be blocked. Avoid sight-seeing, or entering a storm ravaged area unnecessarily. You could be mistaken for a looter.

Avoid downed power lines, even if they look harmless. Avoid metal fences and other metal objects near downed lines.

DO NOT use matches in a storm ravaged area until all gas lines are checked for leaks. (Keep flashlights and plenty of batteries at hand.)

Avoid turning the power on at your home if there is flooding present. Have a professional conduct a thorough inspection first.

Consider having professionals/licensed contractors inspect your home for damage and help in repairs. This includes electricians, as well as professionals to inspect gas lines, remove uprooted trees, and check plumbing. Remember that downed or damaged trees can contain power lines that can be a hazard.

Use a camera or camcorder to record thoroughly any damage done to your home, before any repairs are attempted.

In certain areas, the flooding rains that accompany a storm can create pest problems. Be aware of potential pest problems in your area, such as mice, rats, insects or snakes, that may have "come with the storm".

Telephone lines will likely be busy in the area; use a phone only for emergencies.

Flooding brings with it the risk of waterborne bacterial contaminations. You should assume that the water is not safe and use properly stored water, or boil your tap water.

These are just a few ideas to be thinking about before and after a severe storm hits. Remember to keep your radio tuned to a station issuing emergency bulletins and updates with the latest information.

## After the Storm - Returning Home A Checklist

### After the Storm: Returning Home A Checklist

Hurricanes bring wind and water, often in the shape of floodwaters that overtake homes and damage property. It's critical to remove, dry, or replace wet building materials immediately.

Below is a simple checklist to help you get started on assessing damage in your home after the flood and begin taking charge of the cleanup.

Check for building stability before entry - sticking doors at the top may indicate a ceiling at risk of collapse.

Take pictures of damage throughout the building and around the property.

Assess stability of plaster and drywall - any bulging or swelling ceilings indicate damage that should be removed.

Press upward on drywall ceilings. If nail heads appear, drywall will need to be renailed but can be saved.

Clean and disinfect hot air, air conditioning, and ventilation ducts before use to avoid spread of airborne germs and mold spores.

Check appliance wires for missing or disintegrated wire insulation.

Ground all appliances with a three-pronged plugs.

Dry and oil all appliance motors.

Two weeks after flood water subsides, drain wells, sanitize well and water lines, and test water.

Check foundation for any loose or missing blocks, bricks, stones, or mortar.

Empty basement water 1/3 per day to avoid structural damage to foundation by rapid pressure change.

Test water before using.

Remove wet drywall and insulation to well above the high water mark. Clean, disinfect, and dry all wall cavities that came into contact with floodwater.

Use fans and sunlight to dry out interior spaces.

Remove all wet carpets, curtains, and fabrics. Allow to air dry completely.

Wash and disinfect all surfaces, including cupboard interiors, with a solution of 1/2 cup bleach to 2 gallons of water.

Clean and disinfect concrete surfaces using a mixture of TSP (trisodium phosphate) and water. Mix according to manufacturer's directions and apply to entire surface.

Control standing water and mosquitoes by applying a larvae control product to standing water or a film of vegetable oil to the surface.

Wash down and disinfect all doors. To avoid warping, dry all wood doors by removing from hinges, laying flat with wood shims between, and allowing to air dry completely. Remove all knobs and hardware first and disinfect.

Clean and disinfect windows, sills, and tracks.

Remove sliding doors and windows before cleaning and disinfecting the sliders and the tracks.

Remove wallpaper and coverings that came into contact with floodwaters. Don't repaint or repair until drying is complete and humidity levels in the home have dropped.

---

## Destroyed Items -- Disposing Properly

### Dispose of Wet Household Goods

Always dispose of any food that has come into direct contact with floodwaters. Although a few agencies will advise that some canned foods may be salvageable, if they appear dented or damaged, don't take chances - throw them away.

Attempting to dry out the contents of your home can take several weeks, and as long as the humidity remains high, microorganisms may continue to grow. If the house and its contents are not properly dried out, you may have problems with musty odors.

### Sentimental Items

Although it may be difficult to throw certain items away, especially those with sentimental value, experts recommend that if you can't clean it, you should dispose of it, especially if it has come into contact with water that may contain sewage.

---

## FLASH Card: Staying Safe After a Storm

### Staying Safe After a Storm

As homeowners return to areas affected by hurricanes, the risk of fatal injury increases. The Federal Alliance for Safe Homes (FLASH) offers important tips to ensure homeowner safety.

Stay tuned to local news organizations for important announcements, bulletins, and instructions.

You may not have immediate access to your home. Roads could be blocked, power lines could be down, and people may be trapped and in need of assistance.

Make sure that you have current identification. You may have to pass through identification checkpoints before being allowed access to your home/neighborhood.

Avoid driving, as roads may be blocked. Avoid sight-seeing, or entering a storm ravaged area unnecessarily. You could be mistaken for a looter.

If driving cannot be avoided, do not attempt to drive through floodwaters. Remember the slogan, Turn Around Dont Drown, as there could be unseen dangers, such as downed power lines, debris or a washed out roadway.

Avoid downed power lines, even if they look harmless. Avoid metal fences and other metal objects near downed lines.

DO NOT use matches in a storm ravaged area until all gas lines are checked for leaks. (Keep flashlights and plenty of batteries at hand.)

Avoid turning the power on at your home if there is flooding present. Have a professional conduct a thorough inspection first.

When using a generator, make sure to operate it outdoors and away from openings in the home, including air-conditioning units.

Consider having professionals/licensed contractors inspect your home for damage and help in repairs. This includes electricians, as well as professionals to inspect gas lines, remove uprooted trees, and check plumbing. Downed or damaged trees can contain power lines that pose an electrocution threat.

Use a camera or camcorder to record thoroughly any damage done to your home, before any repairs are attempted.

In certain areas, the flooding rains that accompany a storm can create pest problems. Be aware of potential pest problems in your area, such as mice, rats, insects or snakes that may have "come with the storm".

Telephone lines will likely be busy in the area; use a phone only for emergencies.

Flooding brings with it the risk of waterborne bacterial contaminations. You should assume that the water is not safe and use properly stored water, or boil your tap water.

Do not eat any perishable food that has not been refrigerated.

---

## Flood Damage -- Cleaning Up

### Safe Cleanup After a Flood

When you are preparing to clean after a flood, start with safety.

First make sure your building is safe to enter in regard to gas, electricity and building structure. Take extensive photos and video for insurance claims. Also, wear rubber boots, a safety mask and water proof gloves to handle contaminated items while photographing and cleaning. Wash your hands and face often - with soap and drinking-quality water.

### Using Cleaning Products

Before using any product, read the label. It's important to understand that cleaners remove dirt, and disinfectants stop growth of disease causing germs. NEVER mix chlorine bleach with ammonia. Together they make toxic fumes. Experts suggest combining chlorine bleach at a ratio of 1 part bleach to 10 parts water to disinfect furniture and rugs. Trisodium phosphate

cleans hard surfaces, walls, woodwork, linoleum floors and tiles. Liquid cleaners can remove mud, silt and greasy deposits. Liquid detergents work on washable textiles. Use diluted bleach if item is safe for bleach.

### **Clean Up Your Home**

Once you have cleared the standing water and removed the wet materials for further cleaning or disposal, you can begin the cleanup of the building itself.

Walls, floors, doors, closets, and shelves should all be thoroughly washed and disinfected. Many common household cleaners and disinfectants can be used for this process. In addition, if your ductwork has also been in contact with floodwaters, FEMA recommends that you also disinfectant and sanitize them as well.

Keep in mind that many household cleaning products contain substances that can either irritate some individuals or actually be toxic if used improperly. Make sure to always read and follow the manufacturer's instructions carefully. You can provide fresh air by opening windows and doors.

### **Remove Standing Water**

Standing water is a perfect breeding ground for many microorganisms, including bacteria, viruses, and molds. They can cause disease or trigger allergic reactions in many individuals. Problems with infectious diseases can also occur if the floodwaters contain or have been contaminated with sewage. In addition, the longer the building materials stand in contact with water, the more structural damage that can potentially occur. Therefore, it is important to remove all standing water from the home as quickly as possible after a flood. Even when the flooding is due to a fairly clean source, such as rain water, the growth of these microorganisms can cause allergic reactions in sensitive individuals.

### **Protect Against Mold**

#### Things You Can Do to Prevent Mold Growth

Maintain your AC system. Regular maintenance, such as making sure your drain lines are clear, is essential. If you notice condensation, your system may not be dehumidifying adequately, and you should consult a repair professional.

Don't turn off that AC! You're leaving town for a few weeks, so turn the AC off and save some money, right? In warm and humid environments, the AC does more than cool things down, it de-humidifies. In humid periods this is critical. Turn it up, but not off, and keep the fan on at all times. Mold does not like dry air that circulates! The relative humidity in your home should be between 30% and 50% at all times.

Check for leaks. Water can get into your home in a variety of ways-cracks in walls, gaps in window flashings, leaky roofs (especially around chimneys and vents), and of course, all of your plumbing systems. Inspect and repair these problems when they are first detected.

Act quickly. If you have a water leak, promptly shut off the water source and remove standing water and all moist materials. Consider contacting an emergency water removal company right away if you believe the amount of water may warrant expert attention. Remember to promptly report damage to your insurance company.

Ventilate. Mold may grow fast in humid air. Ventilate rooms with a fan, particularly bathrooms and kitchens, or crack open a window.

Check your washing machine hoses. Every day there are stressed, cracked washing machine hoses that fail and flood homes. Replace them if signs of wear are showing.

Replace that worn out water heater. These are infamous for flooding the inside of homes when a little rust on the side turns into a big leak. Replace it now if it is showing signs of deterioration. A drain pan will help properly dispose of any water from a leaky water heater.

Open the blinds. Mold likes dark, damp areas. Open the blinds and expose all of your rooms to sunlight periodically.

Close the shower curtain. A wet, bunched up curtain traps moisture. Building codes require fans in bathrooms for a reason; turn them on during and after bathing or showering.

Keep all clothing dry. A common mistake is to toss wet clothes in a hamper. Air-dry them first or wash right away.

Clean up and kill the mold. When it starts to grow, kill the mold immediately. Consult the EPA Mold Remediation guidelines.

Board up after wind damage. If your home sustains wind or other external damage from a storm, board it up promptly, especially during the rainy season. There are many emergency services that will do this for you. Materials such as plastic tarpaulins and plywood can be obtained at any local home improvement store.

Eliminate standing water. Adequate drainage outside, adjacent to, and especially under your home is essential. Standing water under a home can cause high humidity levels inside and cause floors to warp and buckle.

Moisture control is the key to mold control, according to the EPA. The EPA recommends keeping your household relative humidity between 30% and 50%, and points out that you can monitor this with a moisture or humidity meter, a small, inexpensive (\$10-\$50) instrument available at any home improvement stores.

### **Dry Everything**

Drying everything in a home after a flood is imperative. Excess moisture in the home poses an indoor air quality concern for the following reasons: Areas with this high level humidity and moist materials provide an ideal environment for the growth of microorganisms, which could result in additional health hazards such as allergic reactions. Coming into contact with air or water that contains these microorganisms can make a person sick. Long-term high levels of humidity can foster growth of dust mites, which are a major trigger of allergic reactions and asthma. Although the drying process can take a long time, homeowners should be patient because it is necessary to keep a home's air quality healthy. Some household items may take longer than others to dry, such as upholstered furniture and carpets. To avoid growth of microorganisms, however, household items should be dried completely before they are brought back in the house.

---

## **Flood Damage -- Inspect Your Home**

### **Inspecting Your Home**

Experts from the Federal Emergency Management Agency (FEMA) advise homeowners to use caution when re-entering their homes and to do so only after floodwaters have receded. They recommend that you visually inspect your home for any damage that could make it unsafe to enter.

### **What to Watch Out For:**

Inspect your home's foundation for cracks or other damage. Look for broken or leaking gas lines, flooded electrical circuits, or submerged furnaces or electrical appliances that may be fire hazards.

FEMA advises that fire is the most frequent hazard following floods. Check the electrical system for broken or frayed wires. If you see sparks or smell burning insulation, turn off the electricity at the main fuse box or circuit breaker.

Do not attempt to get to the circuit breaker or fuse box if you have to step in water. Call an electrician for assistance. Electrical equipment should be checked and dried before being returned to service.

---

## Home Damage -- What to Do

### If Your Home is Damaged or Destroyed

Homeowners should contact their insurance carrier as soon as possible to begin the claims process; however standard homeowner policies do not cover flood damage.

### Housing Assistance

FEMA provides housing assistance for qualifying disaster victims. Homeowners within a designated federal disaster area may call toll-free 1-800-621-FEMA (3362) to register for assistance. Applicants should be prepared to describe losses and provide their Social Security number, financial information, and directions to the damaged property.

---

## Keeping Food Safe After a Power Outage

### Keeping Food Safe

It's important to be aware that food that has not been refrigerated can cause severe health problems.

Remember that:

Items in a full freezer will stay frozen for about two days with the door kept closed; in a half-full freezer, for about one day.

Refrigerated foods can keep for up to four hours.

Discard any perishable refrigerated foods that have been above 40 degrees F for more than two hours.

Discard any food with an unusual odor, color or texture. Remember: "When in doubt, throw it out."

For additional information about food safety during power outages, call the toll-free USDA Meat and Poultry Hotline at 1-800-535-4555.

---

## Mold -- Protecting Against

### Things You Can Do to Prevent Mold Growth

Maintain your AC system. Regular maintenance, such as making sure your drain lines are clear, is essential. If you notice condensation, your system may not be dehumidifying adequately, and you should consult a repair professional.

Don't turn off that AC! You're leaving town for a few weeks, so turn the AC off and save some money, right? In warm and humid environments, the AC does more than cool things down, it de-humidifies. In humid periods this is critical. Turn it up, but not off, and keep the fan on at all times. Mold does not like dry air that circulates! The relative humidity in your home should be between 30% and 50% at all times.

Check for leaks. Water can get into your home in a variety of ways-cracks in walls, gaps in window flashings, leaky roofs (especially around chimneys and vents), and of course, all of your plumbing systems. Inspect and repair these problems when they are first detected.

Act quickly. If you have a water leak, promptly shut off the water source and remove standing water and all moist materials. Consider contacting an emergency water removal company right away if you believe the amount of water may warrant expert attention. Remember to promptly report damage to your insurance company.

Ventilate. Mold may grow fast in humid air. Ventilate rooms with a fan, particularly bathrooms and kitchens, or crack open a window.

Check your washing machine hoses. Every day there are stressed or cracked washing machine hoses that fail and flood homes. Replace them if signs of wear are showing.

Replace that worn out water heater. These are infamous for flooding the inside of homes when a little rust on the side turns into a big leak. Replace it now if it is showing signs of deterioration. A drain pan will help properly dispose of any water from a leaky water heater.

Open the blinds. Mold likes dark, damp areas. Open the blinds and expose all of your rooms to sunlight periodically.

Close the shower curtain. A wet, bunched up curtain traps moisture. Building codes require fans in bathrooms for a reason; turn them on during and after bathing or showering.

Keep all clothing dry. A common mistake is to toss wet clothes in a hamper. Air-dry them first or wash right away.

Clean up and kill the mold. When it starts to grow, kill the mold immediately. Consult the EPA Mold Remediation guidelines.

Board up after wind damage. If your home sustains wind or other external damage from a storm, board it up promptly, especially during the rainy season. There are many emergency services that will do this for you. Materials such as plastic tarpaulins and plywood can be obtained at any local home improvement store.

Eliminate standing water. Adequate drainage outside, adjacent to, and especially under your home is essential. Standing water under a home can cause high humidity levels inside and cause floors to warp and buckle.

"Moisture control is the key to mold control" according to the EPA. The EPA recommends keeping your household relative humidity between 30% and 50%, and points out that you can monitor this with a moisture or humidity meter, a small, inexpensive (\$10-\$50) instrument available at any home improvement stores.

---

## Mold -- Safe Clean Up

### Safe Mold Clean Up

Mold growth is likely to occur in homes after flooding.

It's very important to clean and thoroughly dry any areas of the home that have gotten wet from floodwaters.

#### Mold - What Is It?

Molds are simple microscopic organisms found virtually everywhere, indoors and outdoors. When molds are present in large quantities they can cause allergic symptoms similar to those caused by plant pollen.

#### What Can I Save? What Should I Toss?

Porous materials can trap mold. Items such as paper, rags, wallboard, and rotten wood should be thrown out. Harder materials such as glass, plastic and metal can be kept after they are cleaned and disinfected.

#### Removing Moldy Materials

Wear a filter mask and gloves to avoid contact with the mold.

Remove porous materials (ex: ceiling tiles, Sheet-rock, carpeting, wood products.)

Carpeting can be a difficult problem - drying does not remove the dead spores. If there is heavy mold, disposal of the carpet should be considered.

Allow areas to dry 2 to 3 days before replacing damaged materials

If Sheet-rock, or wallboard, is flooded, remove all Sheet-rock to at least 12 inches above the high water mark.

#### General Mold Clean-Up Procedures

Identify and correct the moisture source. Remove all water and fix any leaks before cleaning.

Clean, disinfect, and dry the moldy area.

Bag and dispose of any material that has moldy residue, such as rags, paper, leaves or debris.

#### Soap Cleanup

Wear protective gloves and a filter mask.

Use non-ammonia soap or detergent, or a commercial cleaner in hot water. Scrub the entire area affected by the mold.

Use a stiff brush or cleaning pad.

Rinse with clean water.

#### Disinfect Surfaces

Wear a filter mask and protective gloves when using disinfectants.

After thorough cleaning and rinsing, disinfect the area with a solution of 10% household bleach (1/4 cup bleach per gallon of

water).

Never mix bleach with ammonia - the fumes are toxic!

Let disinfected areas dry naturally overnight to kill all the mold.

Be aware that exposure to mold can occur during cleanup.

To minimize exposure, consider using a breathing mask or respirator, wear rubber gloves and take breaks in a well-ventilated area.

---

## Power Outage -- Safety Tips

### Safety Tips During a Power Outage

Whether a power outage in your home is caused by grid failure or severe weather, you can take the following steps to prepare and respond.

Include power outages in your family disaster plan, identifying alternate means of transportation and routes to home, school, or work.

Keep extra cash on hand since an extended power outage may prevent you from withdrawing money from automatic teller machines or banks.

Keep a supply of non-perishable foods, medicine, baby supplies, and pet food as appropriate on hand. Also be sure to have at least one gallon of water per person per day on hand.

Avoid opening the fridge or freezer. Food should be safe as long as the outage lasts no more than 4-6 hours.

Have one or more coolers for cold food storage, in case power outage is prolonged. Perishable foods should not be stored for more than two hours above 40 degrees Fahrenheit.

Have an emergency power supply for anyone dependent on medical equipment requiring electricity.

Keep a supply of flashlights, batteries, and a battery-powered radio on hand. Do not use candles as they pose a fire hazard.

Connect only individual appliances to portable generators and never plug a generator into wall outlets.

Use gas-powered generators only in well-ventilated areas.

When driving, be careful at intersections - traffic lights may be out, creating a dangerous situation.

Turn off any electrical equipment that was in use prior to the power.

Turn off all lights but one, to alert you when power resumes.

Check on elderly neighbors, friends, or relatives who may need assistance if weather is severe during the outage.

During a power outage, resist the temptation to call 9-1-1 for information --that's what your battery-powered radio is for.

Don't plug emergency generators into electric outlets or hook them directly to your home's electrical system - as they can feed electricity back into the power lines, putting you and line workers in danger.

Keep your car fuel tank at least half-full, gas stations rely on electricity to power their pumps.

When power is restored, wait a few minutes before turning on major appliances to help eliminate further problems caused by a sharp increase in demand.