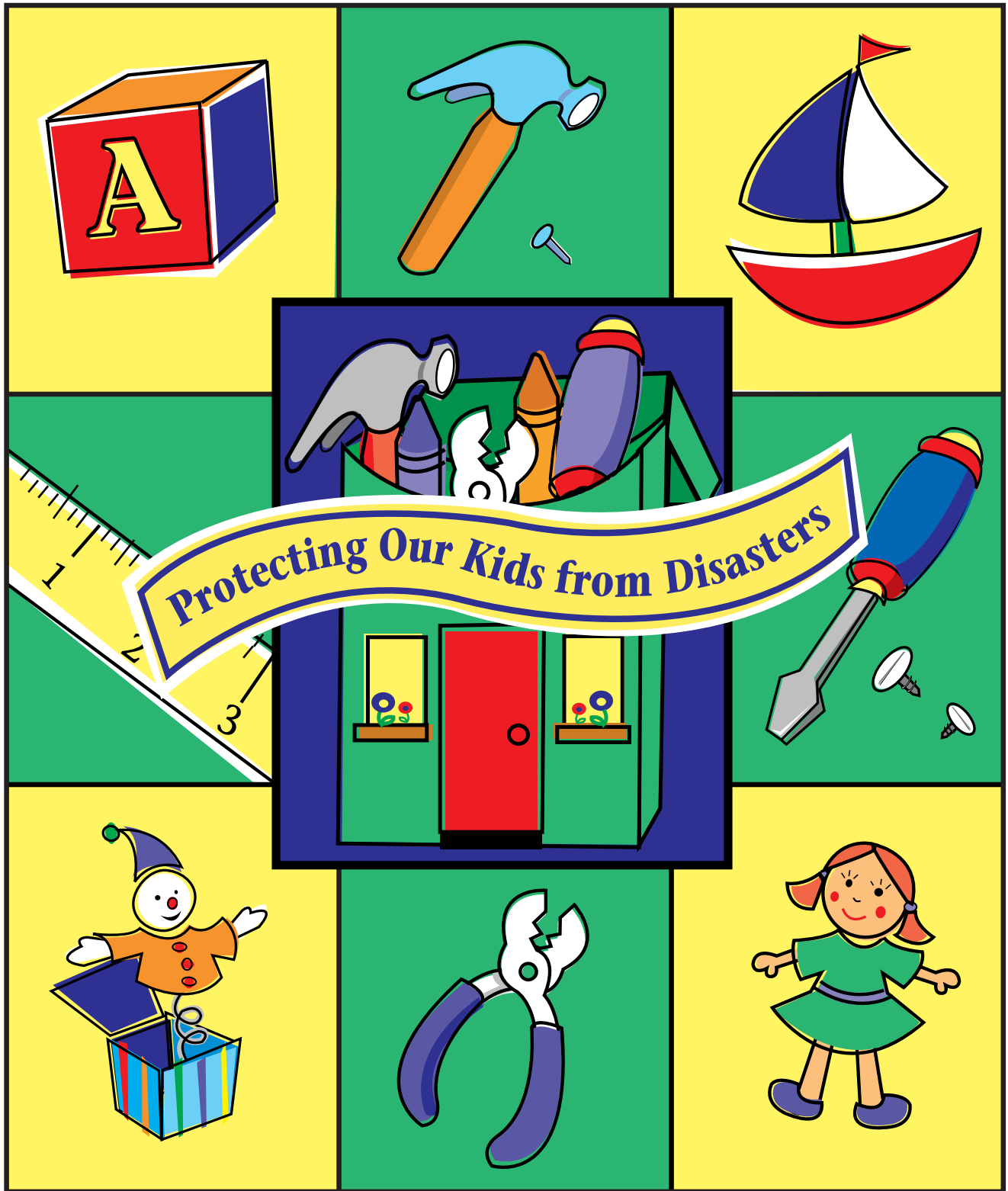


● Nonstructural Mitigation for Child Care Centers ●

Nonstructural Mitigation for Child Care Centers

Nonstructural Mitigation for Child Care Centers



● Nonstructural Mitigation for Child Care Centers ●

Protecting Our Kids from Disasters



No one knows when or where the next hurricane or earthquake will strike. But strike it will, and sooner rather than later. In fact, during the past ten years, natural disasters have occurred more frequently than ever before, putting homes, and the lives they shelter, in the gravest danger.

This means committed licensed child care centers, second homes to more than a third of all children under the age of six, must take serious precautions if they're going to be ready the next time nature lets loose.

That's why the Institute for Business & Home Safety (IBHS), whose mission is to protect families, homes and businesses from windstorms, wildfires, floods, hailstorms and earthquakes, has developed the Protecting Our Kids from Disasters kit. You can use this unique program to retrofit your child's day care center and others, better preparing them to withstand natural disasters and improving day-to-day safety, too.

The Protecting Our Kids from Disasters kit supplies everything your volunteer team will need to perform a basic, nonstructural retrofit from start to finish, including:



- A step-by-step checklist for project leaders
- Media strategy, including sample news releases
- An information video that shows examples of possible retrofits in child care centers, and how to do them
- Text that puts the how-to information into handy, easy-to-use instructions


Once upon a time, we could only do so much to prepare for natural disasters. Now we can do much more for only a small investment. After all, California doesn't get every earthquake. Tornadoes do hit New England. Wildfires can burn in the Everglades. And the next hurricane already has a name.

For more information, contact the IBHS Protecting Our Kids from Disasters coordinator toll-free at 1-877-580-8885.

Nonstructural Mitigation for Child Care Centers



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Project Leader's Checklist

Congratulations! You're about to lead a team of volunteers through a Protecting Our Kids from Disasters program designed to nonstructurally retrofit your local child care center against some of the injuries and damages caused by natural disasters. However, before you jump in and start securing cabinets and installing transparent sleeves over fluorescent lights, you should complete the tasks on this checklist. Then you'll be sure to lead an effective retrofit resulting in a safer child care center.

Getting Ready

- Talk to local building and emergency management officials to figure out which natural disasters happen where you live. Ask them what nonstructural retrofit techniques make sense for protecting against that danger.

- Meet with the owner or operator of your chosen child care center(s) and discuss:
 - The nature of the Protecting Our Kids from Disasters program.
 - Which retrofits they may need, and why.
 - What benefits all of you can get in terms of safety and peace of mind.
 - How to cover the cost of materials and supplies.

- If the center wants to participate in Protecting Our Kids from Disasters,
 - Inspect the center to find out exactly what has to be done — the Nonstructural Safety Checklist in the kit will help you determine the types of retrofits needed. In order to better organize the quantity and types of materials required for the retrofit, we recommend that you prepare “Quantity Take-Off” sheets, with blank columns dedicated to such items as location, quantity, size, material type, and needed tools. In addition, if the child care center's owner has no objection, take photos of each room as a reminder.
 - Set up a date to do the work — it usually takes less than a day for 10 to 15 volunteers.



- Plan the day, the sequence and the process required to accomplish the various aspects of the work.
- Check with local building officials to determine if permits are necessary for the work.
- Round up your volunteers from among other parents or throughout the community.
 - You might like to join forces with local companies and organizations. For example, insurance companies or banks could be eager to promote Protecting Our Kids from Disasters as a community project; hardware stores could also donate necessary building supplies.
- Gather necessary tools and materials.
 - If you are retrofitting a public, nonprofit child care center, contact the International Window Film Association at (540) 666-4932 or www.IWFA.com for a possible partnership.
- Publicize. Protecting Our Kids from Disasters is a great story, and this kit includes tips on media strategies to help you get the word out.

Okay. Now, your troops can install those fluorescent light sleeves and secure those cabinets.

After the Retrofit

- This kit holds tip sheets about protecting homes from natural disasters. Leave copies of these behind when you've finished, so the center can give them to all parents.
- Tell the IBHS coordinator that the retrofit is complete.
- Fill out the Project Wrap-up Form you'll find here in the kit, and mail it off to IBHS.
- Give your team a pat on the back, and give yourself one, too!

Nonstructural Safety Checklist

Whether through fire or flood, earthquake or tornado or hurricane, natural disasters occur everywhere. And everywhere they occur, they do unnecessary damage as a result of hazards that could have been eliminated. This checklist identifies the common nonstructural hazards for child care centers. Use the list to prepare a work order for your center.

EQUIPMENT & FURNISHINGS

YES NO

Are appliances, cabinets and shelves attached to the wall or braced by being anchored together?

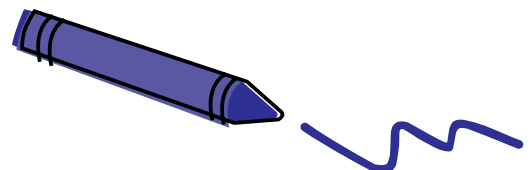
Are heavy or sharp items stored on shelves with ledge barriers?

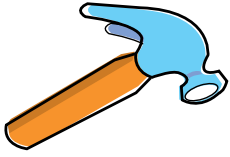
Are blocks and heavy objects stored on the lowest shelves?

Are television sets, fish bowls and similar items restrained so they won't slide off?

Are pictures and other wall hangings attached to the wall with wire and closed screw-eyes?

Are chemicals such as bleach, paint thinner and cleaners securely stored so they won't spill?





EQUIPMENT & FURNISHINGS (cont.)

YES NO

Are cribs located away from the tops of stairs and other places where rolling could endanger them or where heavy objects could fall on them?

Are tall cribs anchored against tipping over?

Are heavy furnishings or pieces of equipment latched or tethered to the wall when not in use?

Are fire extinguishers secured so they won't fall from wall brackets?

Are tall refrigerators attached to the wall or otherwise secured from tipping?

OVERHEAD ELEMENTS

Are suspended ceilings secured to structural framing?

Are suspended light fixtures attached to structural framing with safety cables?

Do fluorescent lights have transparent sleeves to keep broken glass pieces from scattering?



OVERHEAD ELEMENTS (cont.)

YES NO

Are battery-powered emergency lights secured to walls with shelves or brackets?

Are blackboards or projection screens securely mounted to the wall or hung safely from the ceiling?

MECHANICAL EQUIPMENT

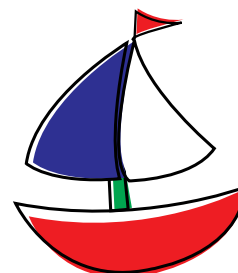
Is the water heater secured to wall studs (not just gypsum board) at the top and bottom? [Please reference the Retrofit Instructions, page 30, for correct bracing details for water heaters.]

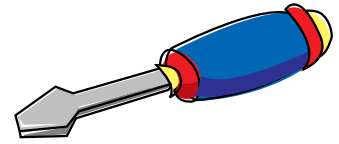
Does the water heater have flexible connectors, rather than rigid connectors?

Do large sheet-metal heating-ventilating-air conditioning ducts have diagonal bracing above or enough vertical support straps to keep any section from falling if the ductwork separates into sections?

PARTITIONS

Are lightweight panels, rather than shelving units or other tall furnishings, used to divide rooms?





PARTITIONS (cont.)

YES NO

Are heavy or tall room dividers braced by inter-connecting them in L-shapes or zigzags?

Are partitions, which extend only to the suspended ceiling, supported by the structure above, especially if they are used to anchor heavy objects in the room?

WINDOWS

Are large windowpanes safety-glazed?

Are transoms safety-glazed?

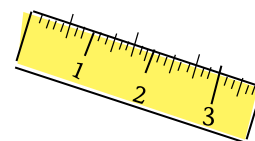
Do partitions have plastic or safety glass panels, rather than ordinary glass?

In hurricane-prone areas, have impact-resistant windows and doors been installed; or are storm shutters, made out of plywood or metal, on hand to cover large windows and doors?

EXTERIORS

Are any trees leaning or in poor health?





EXTERIORS (cont.)

YES NO

In regions that are at risk from wildfires, is the landscape suitably protected?

- Is the street number of the center clearly and legibly visible from the roadway so that emergency vehicles will be able to locate the center easily?

- Are there fuel breaks like driveways, lawns and gravel walkways?

- Is there a “defensible space” of at least 100 feet around the building?

- Are the trees pruned six to ten feet from the ground to eliminate fuel ladders?

- Is there vegetation which might serve as a link between grass and treetops?

- Are trees spaced at least ten feet apart?

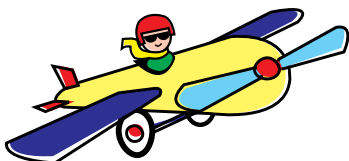


EXTERIORS (cont.)

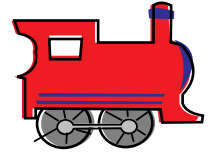
YES NO

- Are native, fire-resistant vegetation and trees planted around the facility?
- Does the center have a well-maintained irrigation system?
- Is leaf clutter removed and the lawn mowed regularly?
- Is firewood stored away from the structure?
- Are pine needles and leaves cleaned regularly from the roof and gutters?
- Are the undersides of aboveground decks enclosed with noncombustible material to prevent the buildup of leaves and debris?

This checklist has been adapted from "Checklist of Nonstructural Earthquake Hazards in Child Daycare Facilities," produced by the Reitherman Company in 1990 for the Southern California Earthquake Preparedness Project of the California Office of Emergency Services.



Publicizing Your Event



Imagine this scenario. Natural catastrophe heads our way. Our children spend their days in possible peril. You and your volunteers show how to help protect the kids. This is a great story, and you might get your local newspapers and radio and television stations to cover it. Here's how.

- ◆ First, foremost and always, have fun, be inventive and be enthusiastic. Reporters and their editors like excitement. Protecting Our Kids from Disasters has plenty.
- ◆ Get a list of addresses, fax and phone numbers for all the newspapers, radio and television stations that cover your community. Ask around to find out if anyone knows a reporter or an editor at any of the papers or stations. These are the best media connections, and they are always looking for good stories.
- ◆ Appoint a team member as media contact. Choose somebody who is full of fun, invention, enthusiasm and persistence.
- ◆ Write a media advisory that persuades news people not only to attend your retrofit project but also to interview you and your media contact beforehand.
- ◆ Fax the advisory to city editors at newspapers and assignment desks at television and radio stations five days before the event. Have your media contact call your connections at the papers and stations to put in a good word.
- ◆ On the day before the event, have your media contact call the editors to be sure they have assigned reporters to cover the retrofit. Remember, these editors are busy and working on deadlines, so they don't have much time for chat. On the other hand, they need stories. Your media contact can sell them your story.
- ◆ Your media contact is a high-energy person. If you talk to the media, you should be that sort of person, too. Give your interviews in visual, action-packed terms. You're protecting children from natural disasters, and there's no time for reticence.
- ◆ On the morning of the event, have your media contact fax out the advisory again along with a full news release on the project.
- ◆ During the retrofit, the media contact should be on hand to talk about the project to reporters and to bring over individual volunteers for interviews.
- ◆ Don't neglect your small community papers and weeklies. Sometimes the best stories take hold first at the grass roots level.



Sample Media Advisory

(Printed on Your Child Care Center/Organization Letterhead)

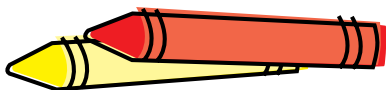
Children at (*child care center*) on (*street*) in (*your town*) are in potential danger. Even as you read this, open water currents, trade winds, air and water temperatures meet in the Caribbean for the annual ritual that spawns hurricanes. These forces could jeopardize our children's safety.

The parents of (*child care center*)'s charges are determined, however, that the first hurricane to reach (*your town*) will find the center prepared to withstand its wrath. These volunteers know what they must do to keep their children safer, and they plan to do it this Saturday from 8 a.m. to 2 p.m. on-site at the (*child care center*).

For more information on the peril and its timely remedy, or to interview one or more volunteers, contact Ceil Havey immediately at xxx-xxxx (day) or xxx-xxxx (night).

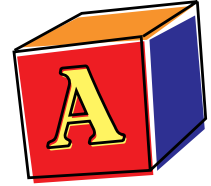
— 0 —

Change this sample to fit the natural disasters your region is prone to. Come up with your own more inventive, more local, angle to get attention and stimulate interest.



Sample News Release

(Printed on Your Child Care Center/Organization Letterhead)



FOR IMMEDIATE RELEASE

Contact: Ceil Havey

Day: xxx-xxxx

Night: xxx-xxxx

PARENTS TAKE EXTRA STEPS TO PROTECT KIDS FROM NATURAL DISASTERS

(*YOUR TOWN, Today's Date*) — This morning, the children of the (*child care center*) began the day as they have begun every day — blissfully unaware that they might be in danger. By evening, the children were safer.

A day's worth of work by fifteen parents, friends and neighbors eliminated several situations that posed the risk of harm to (*child care center*)'s 45 enrolled children. Working in concert with the Protecting Our Kids from Disasters program, these volunteers gave the center a basic, nonstructural fix-up that improves its ability to protect children when a natural catastrophe strikes and allows it to keep its doors open for business afterwards.

Protecting Our Kids from Disasters is a national disaster preparedness program of the insurance industry to reduce the human and financial impact of earthquakes, floods, hurricanes, tornadoes and wildfires.

Thomas Tiddlywink, who organized the volunteer effort, said helping retrofit the (*child care center*) is his responsibility as a dad. "My daughter spends five days a week at this center. The staff is good at what they do, but it's still up to me to make certain my child is safe. We took simple and affordable precautions here today that will give me and every other parent peace of mind that our kids are cared for in a safer environment."

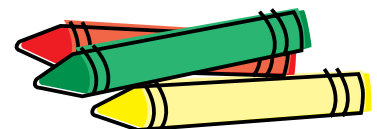


Tiddlywink and his team’s work involved simple but crucial attention to nonstructural situations that, while often overlooked, have the potential to do real damage. Bookshelves that could tip over, the team bolted to the wall. Where objects could fall from shelves, the team installed ledge barriers. The team secured a massive cabinet to a wall and added door latches to it. They secured pictures and bulletin boards and reinforced light fixtures. They added support to a false ceiling and added shatter-proofing film to window glass. They secured two water heaters and trimmed several overhanging trees. They cleared fire-prone vegetation and cleaned roofs and gutters of accumulated leaves. They also checked fire extinguishers and smoke detectors and put together an emergency disaster kit that included a three-day supply of food and water, first aid supplies, blankets, flashlights and a NOAA weather radio. Last, but not least, they provided information that all parents whose children attend the center can use to protect their homes.

As the volunteers went into action, (*child care center*) Director Sarah Childcare expressed her appreciation. “I’m thrilled that parents have stepped forward to help us make the center more secure during natural emergencies. When the next big storm hits, we’ll be ready, and now it’s far more likely that the children will have a place to come back to when everything is over.”

— 0 —

Change this sample to fit the natural disasters your region is prone to. Come up with your own more inventive, more local, angle to get attention and stimulate interest.



Project Wrap-Up Form

Once you have secured the last bookshelf and your retrofit job is done, please let us know what you think of the Protecting Our Kids from Disasters program. If you, and the other team leaders, fill out this form, we at IBHS can put your feedback to use in protecting kids that much more effectively.

Make as many copies as you need and, when they're complete, mail them back to:

Protecting Our Kids... Coordinator
Institute for Business & Home Safety
175 Federal Street, Suite 500
Boston, MA 02110-2222
Phone: 1 (877) 580-8885
Fax: (617) 292-2022



Project Wrap-Up Form

Child Care Center Information:

Name: _____

Address: _____

Phone: _____

Contact: _____

Volunteer Organization(s):

Name: _____

Team Leader:

Name: _____

Organization: _____

Phone: _____

My child attends this center: _____

Date of Retrofit:

How many volunteers participated in the retrofit?

How long did the retrofit take to complete?

Were materials donated? If so, by who?

[If you have one, attach a list of items completed in the retrofit.]

Evaluation of Retrofit Kit:

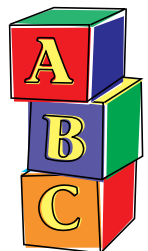
Rate the kit for effectiveness on a scale of 1 (Excellent) to 5 (Terrible)

1. Project Leader's Checklist	1	2	3	4	5
2. Nonstructural Safety Checklist	1	2	3	4	5
3. Publicizing Your Event	1	2	3	4	5
4. Retrofit Instructions	1	2	3	4	5
5. Leave-Behind Materials	1	2	3	4	5

Please write any other comments you have on the back of this sheet.

Return to:

Protecting Our Kids... Coordinator
Institute for Business & Home Safety
175 Federal Street, Suite 500
Boston, MA 02110-2222
Fax: (617) 292-2022



Retrofit Instructions

Child care facilities typically have the same nonstructural hazards as other kinds of buildings. However, these hazards should be eliminated because young children are especially vulnerable. Even a small shelf falling on a young child can do serious harm.

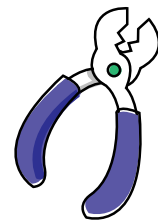
This section of Protecting Our Kids from Disasters offers detailed instructions for dealing with non-structural hazards. The instructions here, and in the accompanying video, cover these specific areas:

- **Bookcases**
- **Cabinets and Drawers**
- **Large Appliances and Vending Machines**
- **Picture Frames and Bulletin Boards**
- **Ceiling Lights, Suspended Ceilings and Hanging Fixtures**
- **Windows and Doors**
- **Water Heaters and Pipes & Ducts**
- **Landscaping**

The repairs specified in this section are based on common sense. If you notice anything else that needs attention, by all means add it to your list of tasks.



Bookcases



Perfect for storing books, toys and supplies, bookcases are an indispensable feature in any child care center. Bookcases can shake and tip, causing their contents, and sometimes the shelves themselves, to fall to the floor.

Fasten all bookcases securely to a wall.

One way to do this is by attaching either L-brackets or Z-brackets between the bookcases and the wall after predrilling holes in each. Be sure to use a bracket which can accommodate the fasteners you are using. See Figure 1 for details.

■ Attaching the bracket to the bookcase:

- For wood bookcases, attach the bracket with #8 (or larger) wood screws. The screw should be long enough to secure the bracket to the shelf without punching through and creating a sharp edge.
- For plastic and metal shelves, use #8 (or larger) machine screws with washers and nuts to ensure that the bracket will stay in place. The screw should be long enough to accommodate the bracket, shelf, washer and nut.

■ Attaching the bracket to the walls:

- For wood stud walls, use 3-inch long #8 (or larger) wood screws to attach each bracket to the wall. Place screws in the wood studs to assure that they are properly supported. Use a stud locator to find the best places.
- For stone or masonry walls, place plastic anchors in the holes before you screw in 3-inch long #8 (or larger) screws, or consider using 3/16-inch diameter (or larger) masonry screws.

Figure 1: Attachment Methods for Bookcases

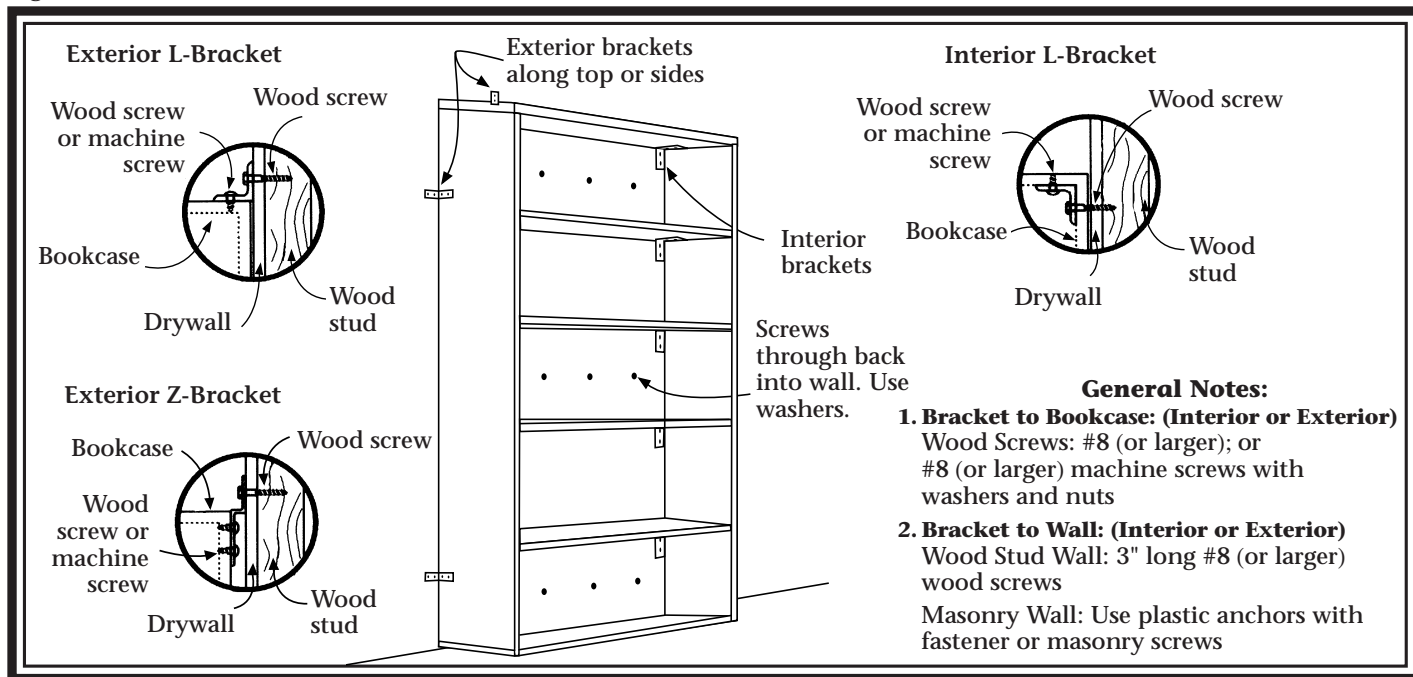
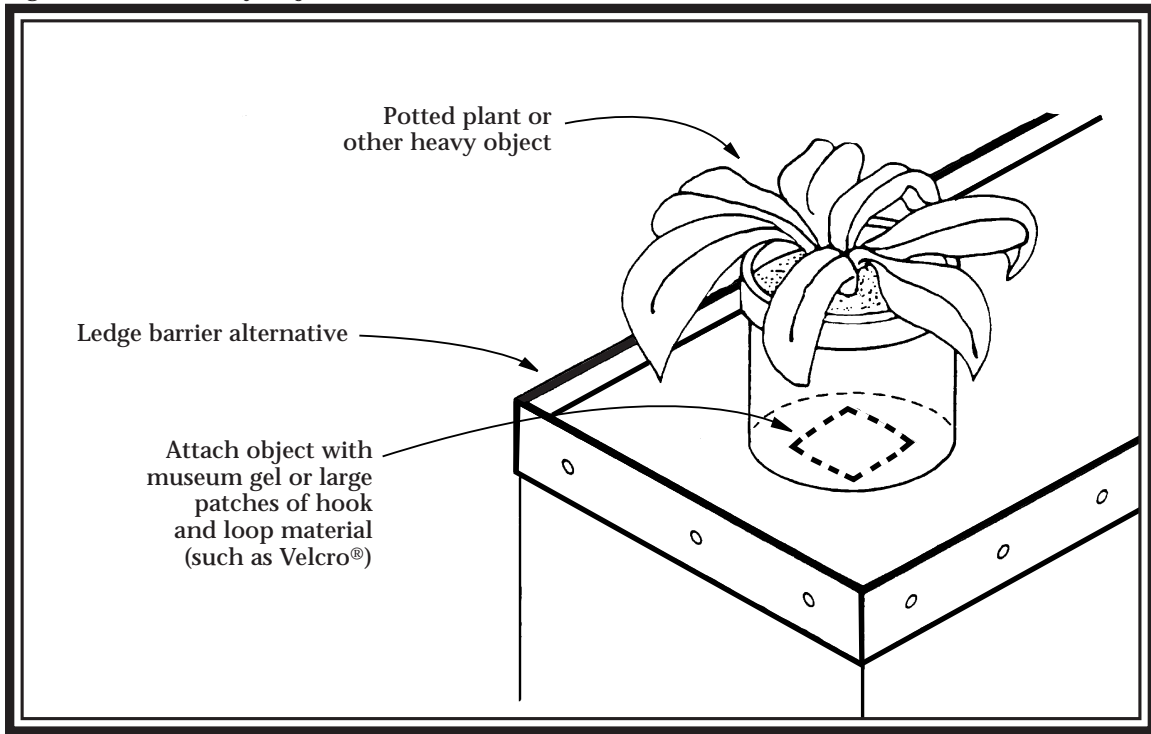


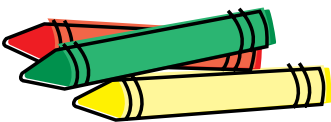
Figure 4: Secure Heavy Objects to Bookcases



- Affix large, heavy items, such as plants and aquariums, and breakables directly to the shelf to keep them from falling. Apply hook and loop material (such as Velcro®) or museum gel to secure these items. For added protection, use metal, plastic or wood ledge barriers. See Figure 4 for details.

Necessary Tools and Materials

- L- or Z-brackets _____(quantity)
- Fasteners _____
- Plastic anchors for masonry walls _____
- Variable speed drill and bits _____
- Screwdriver _____
- Stud locator _____
- Wood, plastic or metal strips _____
- Paint or wood finish _____
- Hook and loop material, or museum gel _____



- To prevent cabinet doors from swinging open and spilling their contents, install mechanical or self-locking latches. A variety of types are available at your local hardware store. See Figures 6 & 7 for details.

Figure 6: Secure Cabinet Doors and Drawers

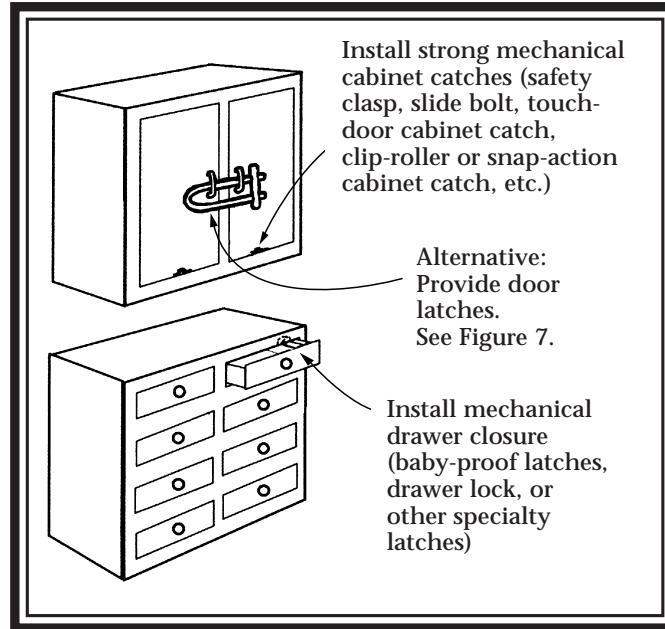
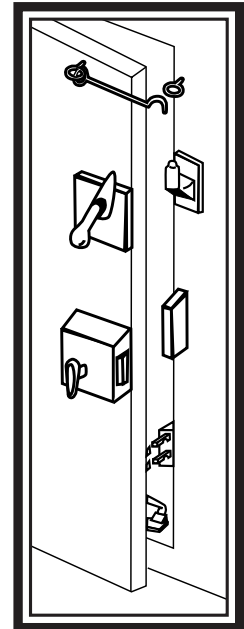
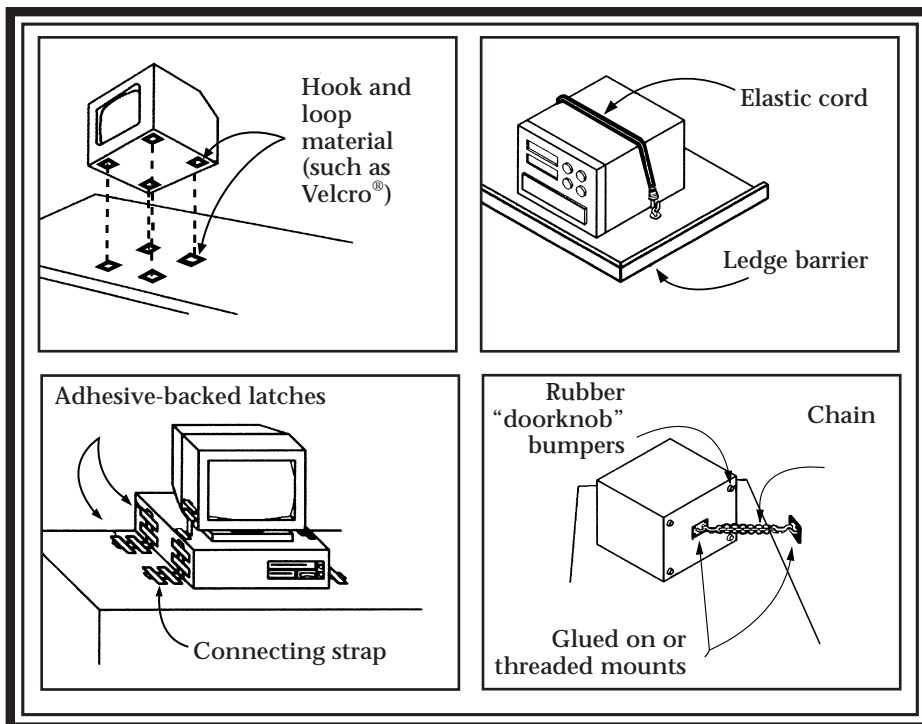


Figure 7: Close-up of Door Latches



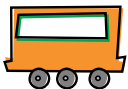
- Heavy objects such as televisions, computers and stereos are usually placed on top of cabinets, bookcases and tables. Fasten these items so they will not slide off during an earthquake or hurricane. Several methods of attachment are shown in Figure 8.

Figure 8: Secure Heavy Objects to Shelves



Necessary Tools and Materials

- L- or Z-bracket or metal angles _____
- Fasteners _____
- Door or drawer latches _____
- Plastic anchors for masonry walls _____
- Variable speed drill and bits _____
- Screwdriver _____
- Stud locator _____



Large Appliances and Vending Machines

Large appliances and vending machines can slide as well as fall over from the force of an earthquake or windstorm. Furthermore, heavy objects on wheels can roll if brakes are not provided and locked.

- Anchor large appliances and vending machines to walls using safety cables or straps. The restraint should be located in the mid- to upper-portion of the appliance. Be sure to choose screw-eyes which are sized appropriately for the appliance. Use one of the following methods:

Method 1:

- For wood stud walls, use a stud locator to find the best wall location to install screw-eyes.
- Connect coated wire cable to the screw-eye at one end and to a snap-hook fastener at the other end.
- Attach the safety cable to the appliance with the snap-hook fastener.

Method 2:

- For wood stud walls, use a stud locator to find the best wall location to install two screw-eyes on either side of the appliance. For stone or masonry walls, place plastic anchors in the predrilled holes before you install the screw-eyes.
- Wrap coated wire cable around the appliance, connecting it with snap-hook fasteners to the two screw-eyes secured into the wall.

- Replace rigid water or gas connections on large appliances with listed or approved flexible connectors.
 - Check local building codes to see if flexible connectors must be installed by a professional.
- Always lock the rollers of any large appliances or pieces of furniture (e.g., pianos).

Necessary Tools and Materials

- Coated wire cable _____(quantity)
or other strapping system
- Variable speed drill and bits _____
- Screwdriver _____
- Screw-eyes _____
- Hook fasteners _____
- Flexible connectors _____
- Stud locator _____
- Plastic anchors _____

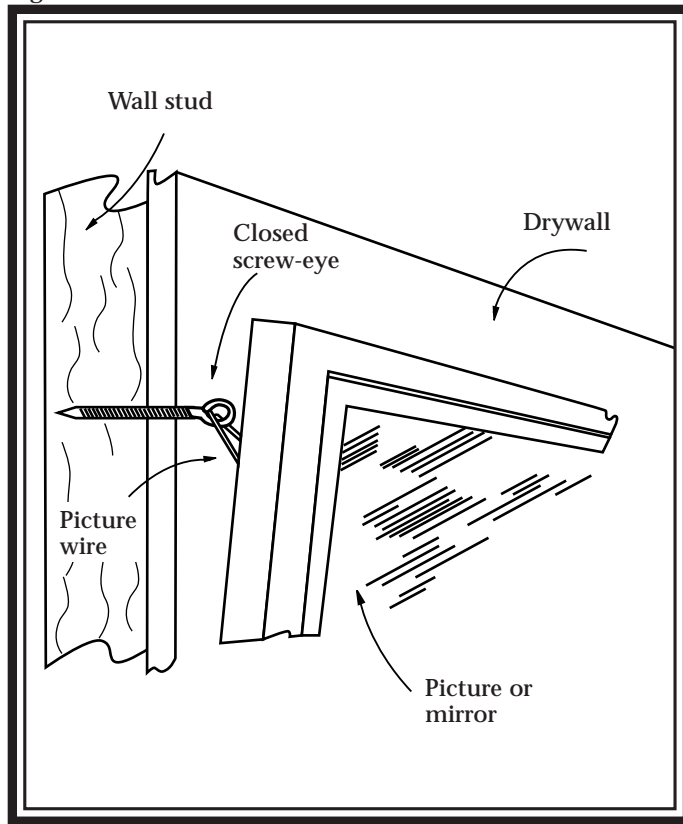


Picture Frames and Bulletin Boards

Pictures and bulletin boards play essential roles in the spirit and function of a child care center, but both will fall during a violent storm or earthquake if they are not securely fastened to the wall.

- Use closed screw-eyes, instead of traditional picture hangers, for securing picture frames, bulletin boards and mirrors.
 - Depending on the weight of the object and the screw-eye's maximum weight limit, screw one or more closed screw-eyes into wall stud(s). Use a stud finder to determine the appropriate location for the screw(s).
 - Attach picture wire to one side of the frame. Then thread the wire through the closed screw-eye, fastening it securely to the other side of the frame. See Figure 9.

Figure 9: Secure Picture Frames to Wall



→ An alternate plan involves using an open screw-eye instead of a closed screw-eye. The hook should be closed with pliers once the picture has been hung.

- Always mount heavy or sharp wall hangings away from places where they could fall on children.

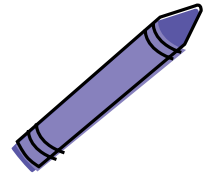
Necessary Tools and Materials

- Stud locator _____ (quantity)
- Screwdriver _____
- Variable speed drill and bits _____
- Screw-eye(s) _____
- Heavy picture wire _____
- Pliers _____



Ceiling Lights, Suspended Ceilings and Hanging Fixtures

If not well attached and supported, ceiling lights, suspended ceilings and hanging fixtures can fall down in a natural disaster, with serious consequences for the children below.



■ Secure ceiling lights to supports using safety cables.

- Use a chain strap or a minimum 14-gauge wire to attach each of the light fixture's four corners to a nearby ceiling support. Locate the support visually or use a stud locator. Be sure to leave the safety cables slack; they should not support the weight of the lights under normal circumstances. See Figure 10 for details.
- If the ceiling light has a cover, keep it from falling during an earthquake or windstorm by fastening it to the fixture itself or to the permanent structure.
- Pay special attention to the fluorescent lights. Installing plastic sleeves over the fluorescent light tubes will keep the glass from scattering if they break. As an alternative, consider using Teflon fluorescent lights, which are shatter resistant.

Figure 10: Secure Ceiling Lights to Supports with Safety Cables

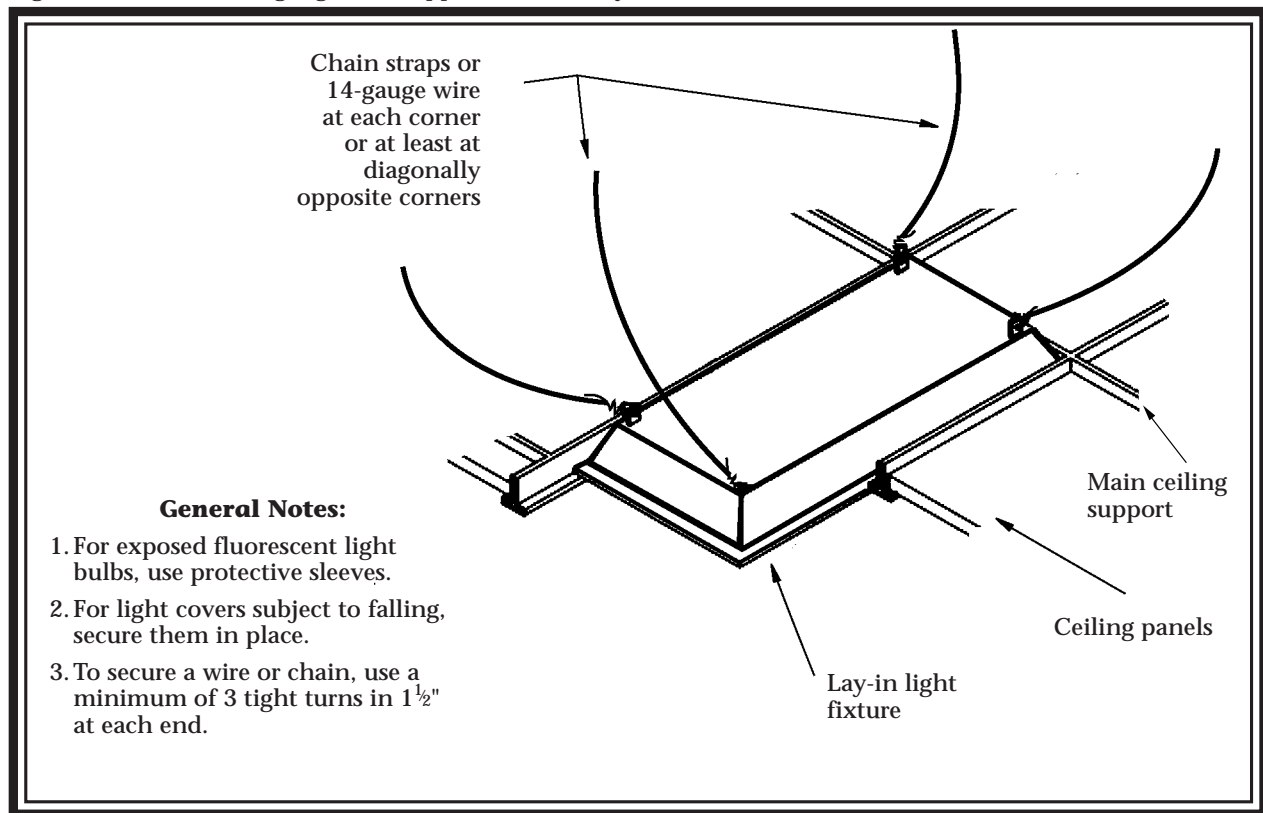
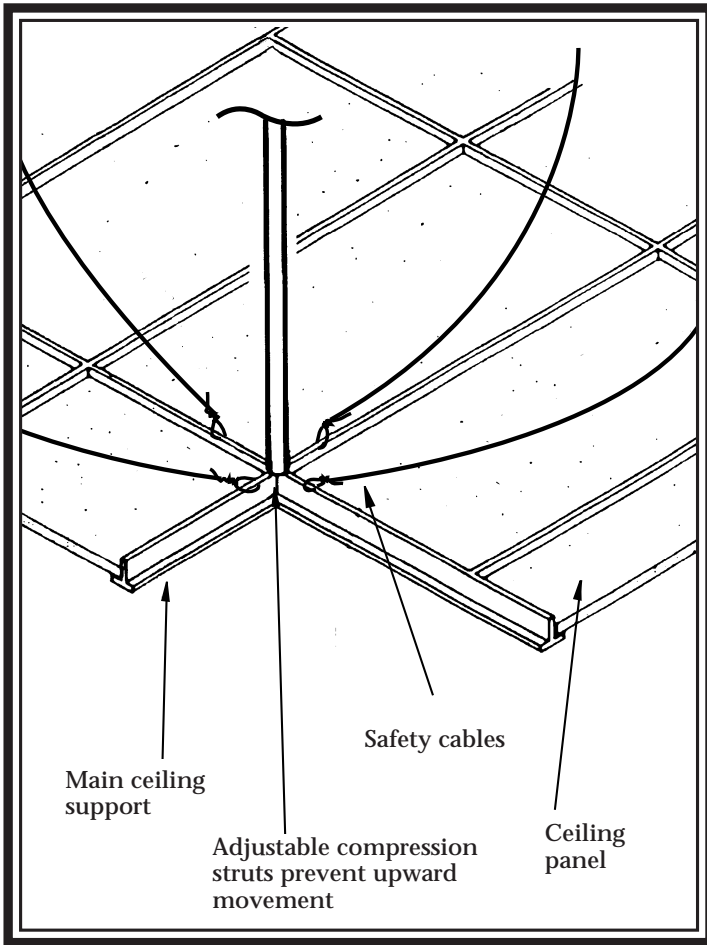
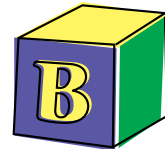


Figure 11: Attach Ceiling Safety Cables



- Using safety cables, attach suspended or false ceilings to permanent structural members every few feet.
 - Use chain straps, plumber's strapping or heavy wire (minimum 14-gauge) to secure suspended or false ceilings. See Figure 11.
 - Screws, bolts or other appropriate fasteners should be used to attach the safety cables to both the suspended ceiling and the permanent structural members.
 - In order to prevent upward movement, adjustable compression struts can be installed.



- Make sure ceiling fans, plants and other suspended fixtures are safely secured to permanent structural members.
 - All items suspended from the ceiling need a safety cable to connect the fixture to a strong support. The safety cable should not support the weight of the item under normal circumstances. Instead, it should remain slack.
 - Keep in mind that hanging items may sway easily. Make sure these objects will not collide with anything if they should begin to swing.

Necessary Tools and Materials

- Safety cables, chain straps, heavy wire or plumber's strapping _____(quantity)
- Fasteners _____
- Screwdriver _____
- Plastic sleeves for fluorescent lights _____
- Light covers _____
- Stud locator _____
- Variable speed drill and bits _____



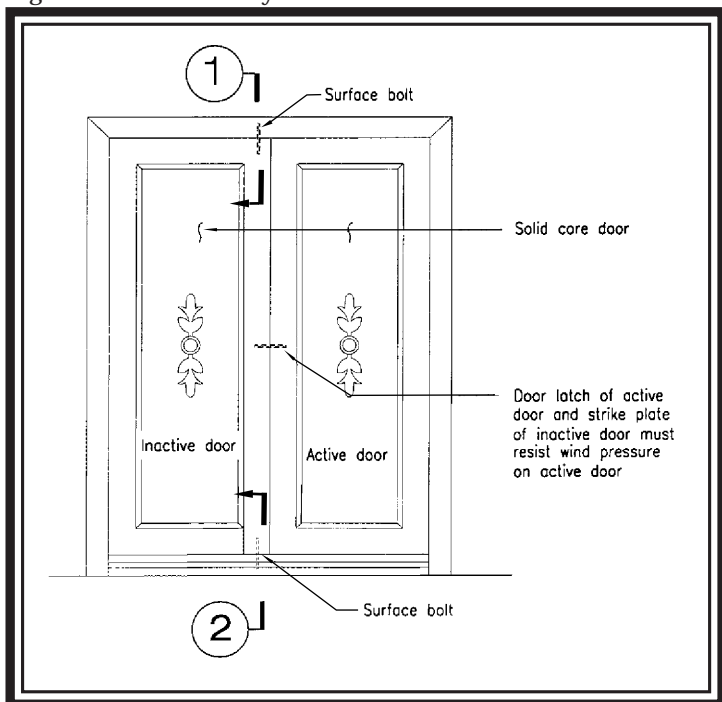


Windows and Doors

Windows and glass doors are a normal and brightening part of life in any child care center, but in a natural disaster glass can break, sometimes explosively, putting children in danger not only from the flying glass but also from exposure to the violence of the elements outside the building.

- Child care centers have either double or single entry doors. If they are solid wood or hollow metal, they probably can resist wind pressures and hurricane debris. Nonetheless, the following precautions should be taken to ensure that the doors do not fly open during a disaster and expose the center to additional damage:

Figure 12: Double Entry Door Elevation



- Install head and foot bolts on the inactive door of double entry doors.
- Make sure the doors have at least three hinges and a dead bolt security lock which has a minimum one-inch bolt throw length.
- Since double entry doors fail when their surface bolts break at the header trim or threshold, check the connections at both places. Be sure the surface bolt extends into the door header and through the threshold into the subfloor. See Figure 12 for information.

Figure 12a: Header Detail

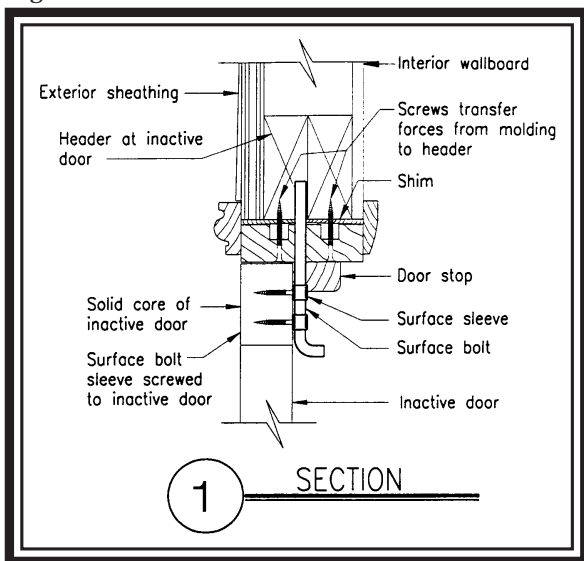
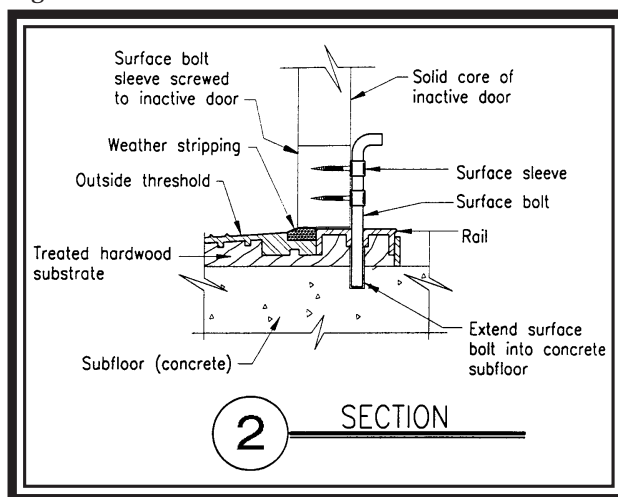


Figure 12b: Footer Detail



- Apply a protective safety film to windows and glass doors to make them safer.

→ A protective film (minimum thickness of 4 mils) can be used on all types of glass including tempered glass and annealed glass. It comes in rolls and is available at local hardware and home improvement stores. Install the film according to the manufacturer's instructions. The installation process usually includes the following steps:

- ① Precut the film to a size slightly larger than the windowpane to which it will be applied.
- ② Clean the glass.
- ③ Moisten the glass with water from a spray bottle.
- ④ Peel off the removable backing and apply the film to the glass.
- ⑤ Use soapy water and a squeegee to smooth the film and remove air bubbles.
- ⑥ Cut away any excess film with a utility knife. Be careful not to score the glass.

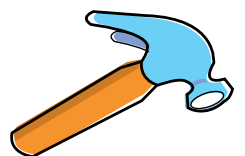
→ As an alternative, consider professional installation.

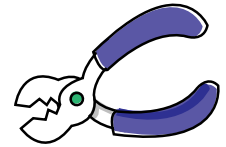
- In areas of the country where hurricanes pose a substantial threat, stronger protection is required. Shutters provide a good method of safeguarding windows and glass doors against wind-borne debris. In addition, they can reduce damage caused by sudden pressure changes when a window or door is broken. Many different designs of shutters are available, including temporary and permanent systems.

→ Temporary Shutter Systems

The easiest designs are those which simply cover the opening with a structural panel such as plywood. **In past hurricanes, however, temporary plywood shutters have blown off because they were not adequately fastened.** Be sure the center's owners and employees know how to properly attach the panels over the openings before a hurricane approaches. It is a good idea to have these temporary shutters stored on-site and ready to use for the next hurricane warning. If the center is made with concrete blocks, the anchoring devices for the shutters should be installed as part of the nonstructural retrofit.

The APA — The Engineered Wood Association offers a series of hurricane shutter designs which meet all necessary standards for resisting wind forces and wind-borne debris. Each design is available from APA, phone (253) 620-7400 or <http://www.apawood.org>.





They include:

Design 1: Shutters for Wood-Frame Buildings

Design 2: Shutters for Masonry Block Structures, *Barrel Bolt Latch Supports*

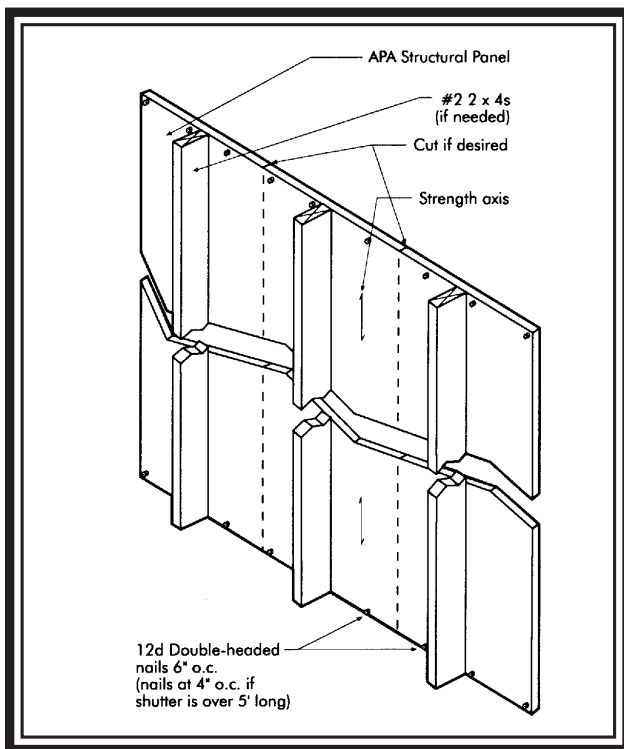
Design 3: Shutters for Masonry Block Structures, *Steel or Aluminum Angle and Screw Supports*

Design 4: Shutters for Masonry Block Structures, *Shutters Attached to Outside Wall with Permanently Mounted Brackets*

Design 5: Shutters for Masonry Block Structures, *For Openings Wider than Eight Feet*

The detail diagrams shown in Figures 13 and 14 illustrate how shutters can be installed in a wood-frame structure (APA Design 1).

Figure 13a: Shutter Attachment — View From Outside



Shutter details courtesy of APA — The Engineered Wood Association

Figure 13b: Shutter Stiffener Attachment — If Required

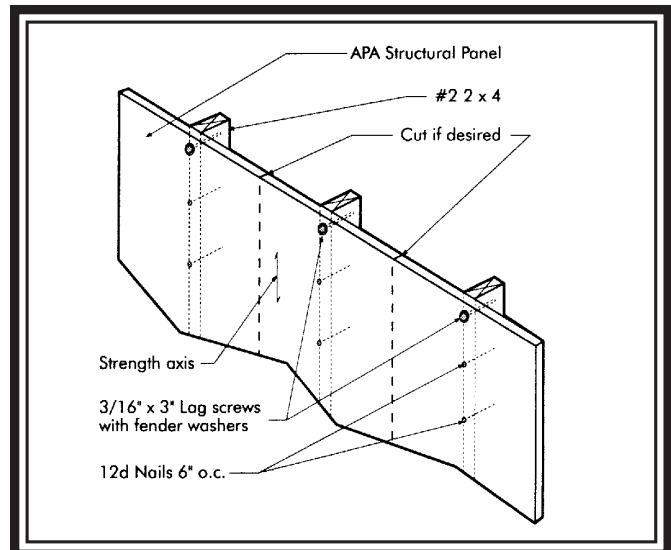


Figure 14a: Shutter Attachment — Top

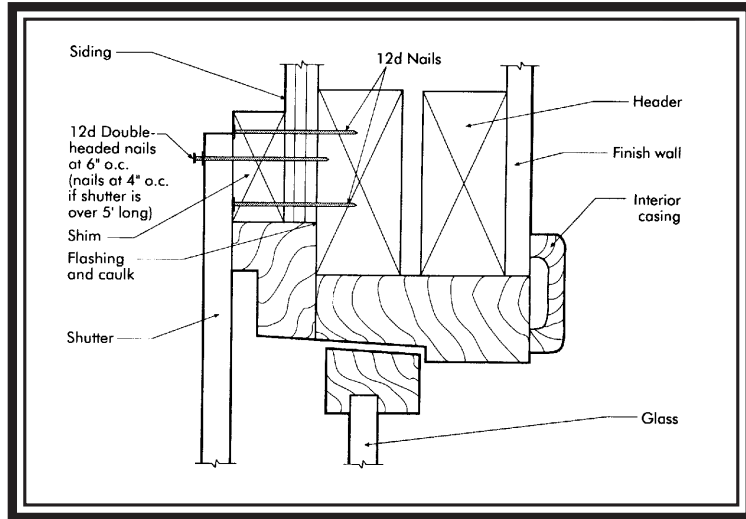
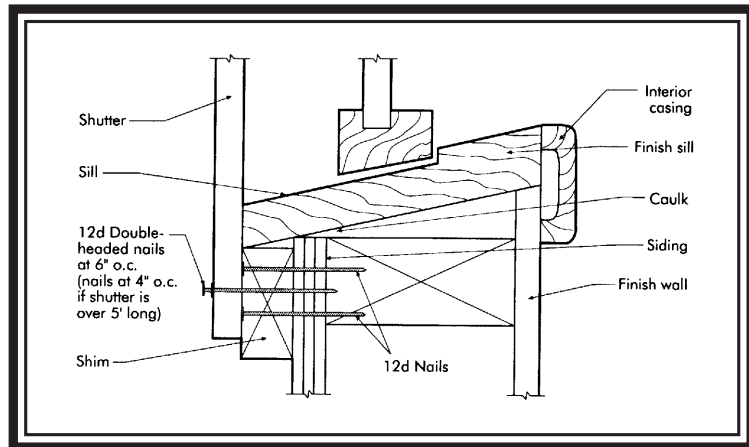


Figure 14b: Shutter Attachment — Bottom



→ **Permanent Shutter Systems**

- Existing Systems

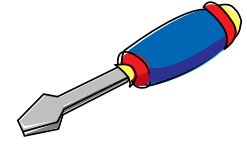
Some centers may have permanent shutters. While it takes very little time and effort to evaluate shutter effectiveness, the benefits of properly protected doors and windows are substantial. The nonstructural retrofit presents an ideal time to inspect the shutters.

- To determine whether a shutter can resist the impact of a rigid piece of debris, gently lean against it and see if it yields. A very flexible shutter may bend and break if struck by debris.
- Also examine the shutters to see if they are properly attached to the structure and will not fly off during a storm. Focus on inspecting the shutter connectors for obvious excessive wear or missing connectors.

Notify the center’s owner/director if there are any obvious problems. They should then work with the shutter’s manufacturer to improve the overall safety of the shutter system.



Water Heaters and Pipes & Ducts



Even if children do not have immediate access to them, water heaters can tip over in a disaster and spill dangerously hot water into a building. If the heaters run on flammable gas and the gas line breaks, the situation becomes far more serious. Similar problems afflict overhead pipes and ducts.

In many areas of the country where earthquakes are common, local building codes may require that water heaters are laterally braced or strapped to resist horizontal seismic forces. Most hardware stores sell retrofit kits for different sized water heaters. In addition, several generic restraint systems are available. Before you decide on a retrofit, check with the local building department and make sure that it is approved for use in the area.

- Secure water heaters (up to 50 gallons) to stud walls using the simple, generic method detailed in Figures 15 through 17.
 - You can anchor the water heater using items that are readily available from the local hardware store, including:
 - Heavy-duty shelving brackets;
 - $\frac{3}{4}$ -inch plumber's strapping (metal strapping with perforated holes);
 - 2 X 4 wood blocking; and
 - Various fasteners.
 - To begin: fasten two 2 x 4 wood blocking strips to the nearby wall – one at a height within the upper one-third ($\frac{1}{3}$) of the water heater and the other within the lower one-third ($\frac{1}{3}$) of the water heater. The lower 2 x 4 should be at least four (4) inches above the water heater control. If you are working with a wood or metal stud wall, attach the blocking directly to the studs. Use a stud locator to find the studs.
 - Fasten heavy-duty shelving brackets to the wood blocking. These brackets should fit snugly against the water heater.
 - Wrap plumber's strapping around the heater and secure it to the brackets.
- Use flexible connectors for all utility connections instead of rigid connectors.
 - Be sure to check with local building code officials to see if a licensed plumber is required to install flexible connections.
 - Try to get a local plumber to volunteer services and join your team.
- Make certain everyone on the center's staff knows where to locate the gas shut-off valve, and how to operate it.
- Secure pipes and ducts to permanent structural members using a combination of angle braces and plumber's strapping or safety cable.



Figure 16: Straight Wall Configuration

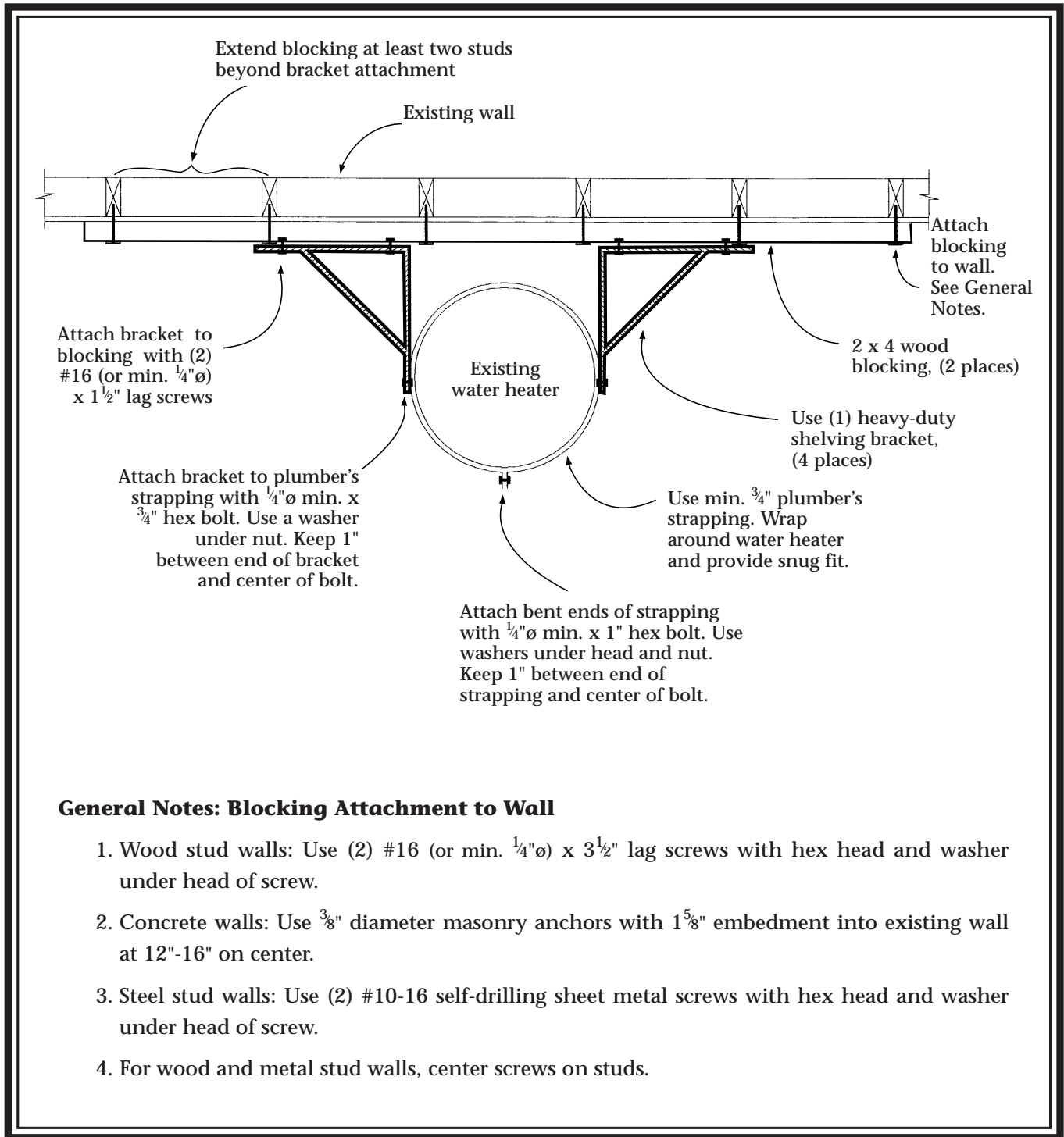
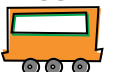
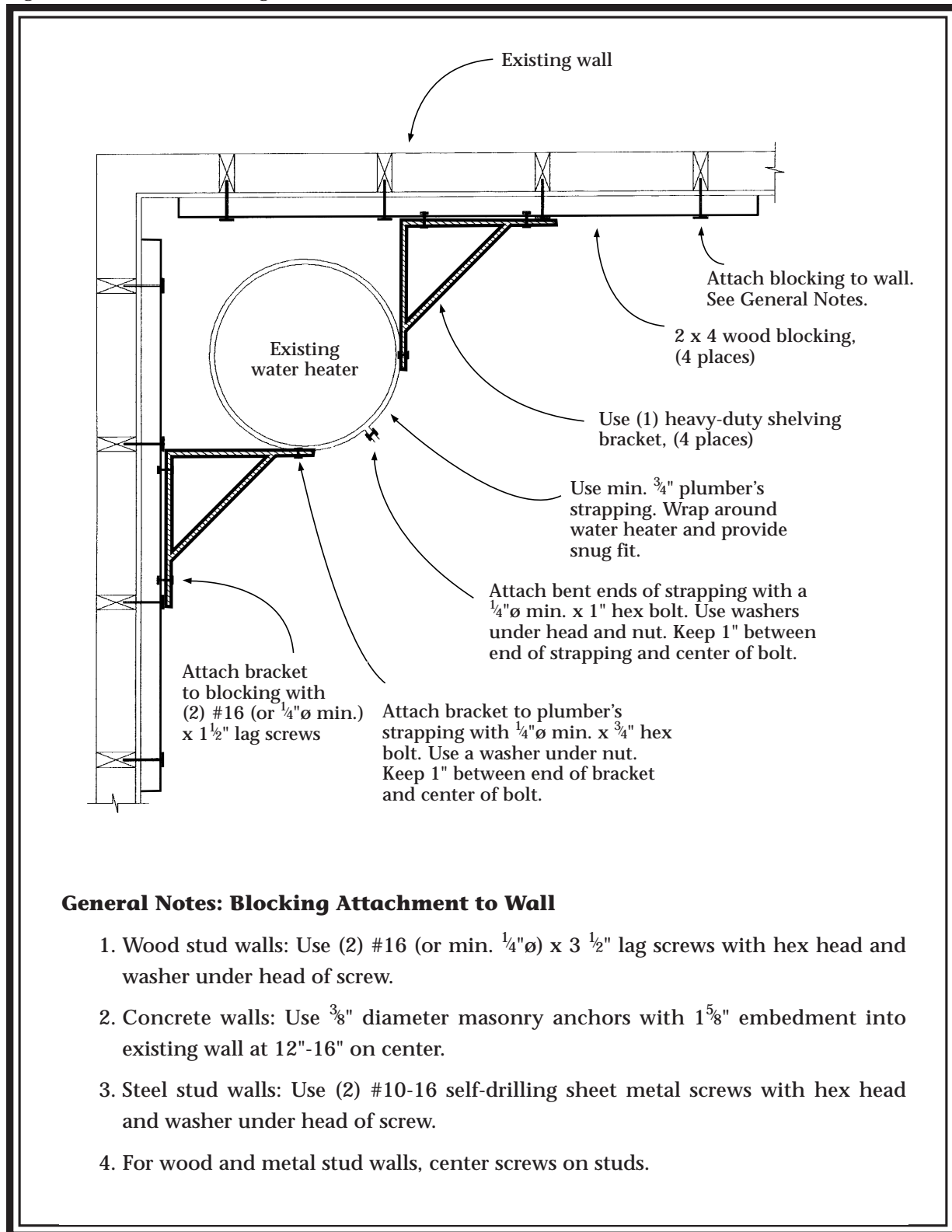


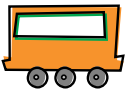
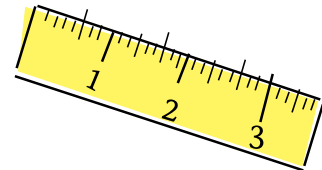
Figure 17: Corner Wall Configuration





Necessary Tools and Materials

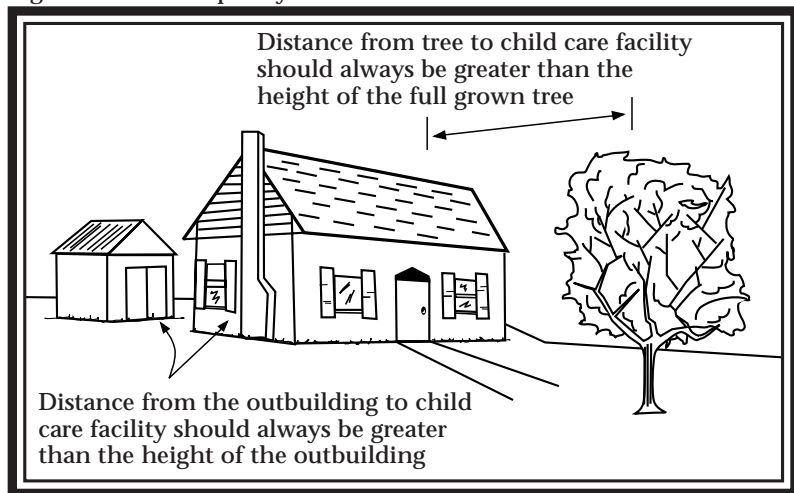
- 2 x 4s _____(quantity)
- Stud locator _____
- Screwdriver _____
- Variable speed drill and bits _____
- Various fasteners _____
- Heavy-duty shelving brackets _____
- Plumber's strapping _____
- Screws _____
- Slotted angles or L-brackets _____
- Flexible connector _____



Landscaping

A yard has to be maintained for safety as well as beauty. Unkempt brush and dry lawns can catch fire; so can sheds and woodpiles. Overhanging tree limbs, and entire diseased trees, can fall through a roof.

Figure 18: Landscape Layout



- Make sure that the street number of the center is clear and legible from the street. This will ensure that emergency vehicles do not have trouble locating the center.
- A well-maintained yard is the key to preventing damage from fires and other disasters. See Figure 18 for details.

- Position trees at least 10 feet apart and at least 100 feet from the child care center.
- Remove any dead trees or trees that pose a threat of falling on the child care center.
- Prune trees up to six feet from the ground and trim branches that extend over the roofs of buildings.
- Clean pine needles, leaves and other debris from roofs and gutters often.
- Mow the lawn and remove leaf clutter regularly.
- Be sure to irrigate the yard periodically.
- Enclose the undersides of aboveground decks with noncombustible materials, such as wire mesh, in order to prevent the buildup of leaves and other debris.

- For landscaping, plant native, fire-resistant vegetation, and avoid vines or climbing plants which may serve as a link between grass and treetops or roofs during a fire.
- Store firewood 50 feet away from the building, so as not to provide fuel for a fire.

Necessary Tools and Materials

- | | | | |
|-----------------------------|------------------|-------------------------------------|-------|
| ■ Handsaw | _____ (quantity) | ■ Irrigation system | _____ |
| ■ Lawn mower | _____ | ■ Native, fire-resistant vegetation | _____ |
| ■ Rake | _____ | ■ Containers for debris | _____ |
| ■ Pruning shears or loppers | _____ | | |



Technical References

“Identification and Reduction of Nonstructural Earthquake Hazards in Schools.”

Federal Emergency Management Agency. July 1993.

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Mroz, M.P., and T.T. Soong. Fire Hazards and Mitigation Measures Associated with Seismic Damage of Water Heaters. NIST. Gaithersburg, MD. 1997.

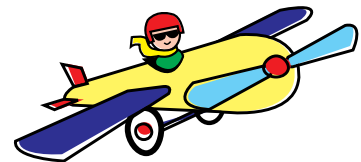
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Taite, Morris. Hurricane Survival Made Easy. Wisdom Market Press. North Miami Beach, Florida. 1993.

“Techniques for Mitigating Earthquake Hazards.” *Association for Bay Area Governments.*

4/1/97. [Http://www.abag.ca.gov/bayarea/eqmaps/fixit/fixit.html](http://www.abag.ca.gov/bayarea/eqmaps/fixit/fixit.html). 1/28/98.





Leave-Behind Materials for Child Care Centers and Parents

After retrofitting your child's day care center, you can continue to protect the children by leaving additional safety tips with the center's owners and operators. IBHS has prepared a piece titled "Being Prepared Before a Disaster Strikes." In this handout, we recommend such commonsense measures as preparing a disaster kit, disposing of paint cans and keeping poison control information on hand.

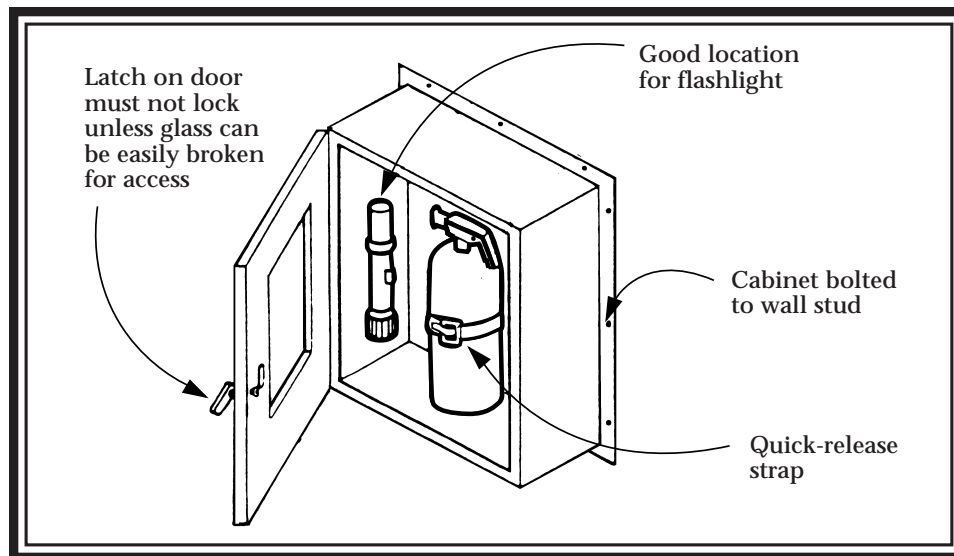
In addition, this section also includes IBHS's "Protecting Your Home..." series. These handouts allow you to take the next step in fostering natural disaster mitigation—protecting the families at home. The guides offer parents techniques they can implement to make their homes more resilient against windstorms, earthquakes, floods, wildfires and hailstorms. They also include additional sources for information. Pick out the hazards which affect the local community and encourage your child care center to send the handouts home with the children.



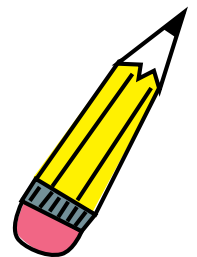
Being Prepared Before a Disaster Strikes

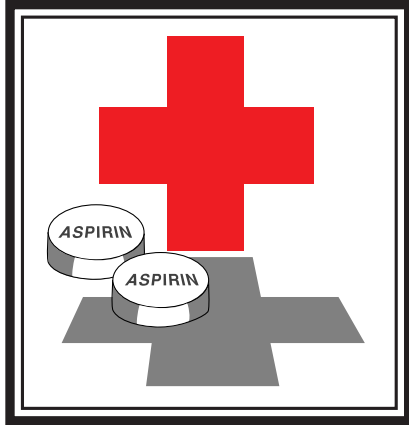
The work that volunteers completed today has made your child care center a safer place. But keeping bookcases upright and glass in its frame is just the beginning. Take these extra precautions to protect your charges as fully as possible.

- Make certain your building has smoke detectors on each floor. Check them monthly.
- If your facility has gas, oil or wood heat, install a carbon monoxide detector in each separate area.
- Train all of your employees in what to do during an emergency. Make certain all staff members know where the extinguisher is located and how to use it.



- Know where utility connections are located. Learn how and when to turn them off. Don't try to turn them back on yourself, however. Have the fire department or gas and electric companies turn the utilities back on when the area is secure.
- Dispose of paint cans, caustic substances and chemicals, or store them in a safe place away from children. Be sure all of these substances have current and accurate labels. Keep basic information, including poison control information, on hand for each substance.
- Reinspect your facility on a regular basis to ensure continued adherence to these recommendations.





- Prepare a disaster kit that includes the following:
 - A first aid kit
 - A portable NOAA weather radio with batteries
 - A flashlight with batteries
 - Waterproof plastic bags
 - Extra batteries
 - Three-day supplies of:
 - Water
 - Baby formula
 - Food requiring no refrigeration or cooking
 - Diapers

→ Check your disaster kit two times a year (when the clocks change is a good time) to replace old batteries and change the water and food supplies.

Necessary Tools and Materials

- Smoke detectors _____(quantity)
- Fire extinguishers _____
- Portable NOAA weather radio _____
- Carbon monoxide detectors _____
- Disaster kit materials _____

This information is provided through Protecting Our Kids from Disasters, a national disaster preparedness program of the Institute for Business & Home Safety (IBHS). IBHS is an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.



Against Everyday Disasters

Seemingly innocent items like the teddy bear in the toy box or a child's winter coat can actually be just as hazardous to your charges as unsecured cabinets or falling light fixtures. Cords on mini-blinds can cause a child to strangle or suffocate. Hard playground surfaces can cause head injuries in a fall. Follow these recommendations from the U.S. Consumer Product Safety Commission to be certain your child care setting is as safe as possible every day.

- **CRIBS:** Make sure cribs are in good condition and meet current national safety standards (look for a certification safety seal). Avoid older cribs, which may not meet current standards. Make certain crib slats are no more than $2\frac{3}{8}$ -inch apart and that mattresses fit snugly.
 - **SOFT BEDDING:** Avoid using pillows, soft bedding or comforters when putting babies to sleep. Put babies down on their backs in a crib with a firm, flat mattress.
 - **PLAYGROUNDS:** Look for safe surfacing on outdoor playgrounds: at least 12 inches of wood chips, mulch, sand or pea gravel, or mats made of safety-tested rubber or rubberlike materials.

Check playground surfacing and equipment regularly to make sure they are maintained in good condition.
 - **SAFETY GATES:** Use safety gates to keep children away from potentially dangerous areas, especially stairs.
 - **WINDOW BLIND AND CURTAIN CORDS:** Be sure mini-blinds and venetian blinds do not have looped cords. Confirm that vertical blinds, continuous loop blinds and drapery cords have tension or tie-down devices to hold the cords tight.
 - **CLOTHING DRAWSTRINGS:** Be sure there are no drawstrings around the hood and neck of children's clothing. Use other types of clothing fasteners, like snaps, zippers or hook and loop fasteners.
 - **RECALLED PRODUCTS:** Check that you have no recalled toys or products. Keep a current list of recalled children's products readily visible.
-

For more information about general children's safety and recalls of children's toys and products, contact:

U.S. Consumer Product Safety Commission

Washington, D.C. 20207

Toll-free hotline: 1-800-638-2772

<http://www.cpsc.gov>

ATTENTION CHILD CARE CENTER OWNER/OPERATOR: *This information is also important for parents. Please share it with your students' parents so they can make their homes safer as well.*

This information is provided through Protecting Our Kids from Disasters, a national disaster preparedness program of the Institute for Business & Home Safety (IBHS). IBHS is an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.



Against Earthquake Damage

California may think it owns earthquakes, but if you live anywhere west or just east of the Rockies, you live in an earthquake zone. If you live along the Mississippi River in the New Madrid region, well, that's an earthquake zone, too. And the southern Appalachians? Yes. New England? Yes. Alaska? Absolutely.

You don't have to lose your home and possessions to nature's shake, rattle and roll. It's never too early to prepare and you can take several basic steps right now to protect your family and your home from disaster.

If you're handy with a hammer and screwdriver, you can secure appliances, furniture and keepsakes yourself. Work involving your home's structure tends to be quite complex, however, and generally requires the expertise of a registered design professional such as an architect or engineer, or a licensed building contractor.

Before making any structural changes to your home, check with your local building officials to be sure what you're doing complies with local building codes. Experts agree that structures built to meet or exceed current model building codes have a much better chance of surviving an earthquake.

INSIDE YOUR HOUSE

- Anchor bookcases and filing cabinets to nearby walls.
 - Install latches on drawers and cabinet doors to keep contents from spilling.
 - Install ledge barriers on shelves, place heavy items on lower shelves, and secure large, heavy items and breakables directly to shelves to keep them from falling.
 - Use closed screw-eyes and wire to securely attach framed pictures and mirrors to the walls.
 - Attach computers and small appliances to desks, tables or countertops.
 - Secure ceiling lights, suspended ceilings and other hanging items such as chandeliers and plants to the permanent structure of your house.
 - Apply safety film to windows and glass doors.
 - Anchor large appliances to walls using safety cables or straps. Lock the rollers of any large appliances or pieces of furniture.
 - Secure water heater(s) to nearby walls.
-

- Fit all gas appliances with flexible connections and/or a breakaway gas shut-off device, or install a main gas shut-off device. (Check your local building codes to determine whether you may install flexible connectors yourself or whether a professional must install them.)

THE HOUSE ITSELF

An earthquake puts your home's structure to the test: it must absorb the earthquake's energy and provide a stable path to transfer these forces back into the ground. Your home is more likely to pass this test when it is properly tied together. That is, when the roof is attached tightly to the walls, the walls are fastened to each other and, finally, when the walls are braced and anchored to a strong foundation.

If the structural elements of your home need reinforcing, some of the most important and common retrofits include:

- Adding anchor bolts or steel plates between your home and its foundation.
- Bracing the inside of your home's cripple wall - the short wood-stud wall between the top of the foundation wall and the first floor - with sheathing.
- Bracing unreinforced chimneys, masonry and concrete walls and foundations.

BEFORE AN EARTHQUAKE STRIKES

You can improve the odds of your home surviving an earthquake by taking these precautions, but you won't make it quake-proof. Nor do these measures guarantee your safety. Earthquakes strike with no warning, so take these additional steps to protect yourself and your family as fully as possible:

- Teach everyone to "duck" or drop to the floor, take "cover" under a desk or table and "hold" on to it when an earthquake strikes. Remember the phrase: "Duck, cover and hold."
- Become familiar with your community's disaster preparedness plans and create a family plan. Identify escape routes from your home and neighborhood and designate an emergency meeting place for the family to reunite if you become separated. Also establish a contact point to communicate with concerned relatives.
- Make certain all adult and teenage members of the family know where your gas, electric and water main shutoff controls are and how to turn them off if there is a leak or electrical short; keep necessary wrenches close by.
- Put together an emergency kit that includes a three-day supply of drinking water and food you don't have to refrigerate or cook; first aid supplies; a portable NOAA weather radio; a wrench and other basic tools; a flashlight; work gloves; emergency cooking equipment; portable lanterns; fresh batteries for each piece of equipment; clothing; blankets; baby items; prescription medications; extra car and house keys; extra eyeglasses; credit cards and cash; important documents, including insurance policies.

WHEN AN EARTHQUAKE STRIKES

- If you are indoors when an earthquake strikes, stay there. Move away from windows, skylights, doors and things that can fall. “Duck, cover and hold” until the shaking stops.
- If you are outdoors, move quickly and safely into the open, away from electrical lines, trees and buildings. Drop to the ground and wait for the shaking to stop.
- If you are driving, carefully and slowly bring your vehicle to a stop at the side of the road away from traffic. Do not stop on or under bridges, under power lines or near roadway signs that might fall. Once the shaking has stopped you can continue driving, but watch carefully for possible damage to the roadway.

AFTER AN EARTHQUAKE STRIKES

- Check for gas or water leaks and electrical shorts, and turn off damaged utilities. Don't try to turn them back on yourself, however. Have the fire department or gas and electric companies turn the utilities back on when the area is secured.
- Obey evacuation orders from local authorities.
- Be prepared for aftershocks

For more information about protecting your family and home from earthquakes, check this source:

Institute for Business & Home Safety. Boston.

Toll-free: 1-877-580-8885. Web site: <http://www.ibhs.org>.

Publication: **Is Your Home Protected From Earthquake Disaster?**
A Homeowner's Guide to Earthquake Retrofit.

This information is provided through Protecting Our Kids from Disasters, a national disaster preparedness program of the Institute for Business & Home Safety (IBHS). IBHS is an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.



Against Flood Damage

Rain. Tides. Levee failure. Ice jam. Snow melt. Floods happen, and they happen beside rivers, on the coast, in deserts and on city streets. You don't have to lose your home and possessions to rampaging waters, however. It's never too early to prepare and you can take several basic steps right now to protect your family and your home from disaster.

FIRST THINGS FIRST

1. Check with your city or county building authority, your insurance agent or your mortgage lender to find out if your community participates in the National Flood Insurance Program (NFIP). If your house is in a participating community, you live in a flood zone. Period.
2. Consult the same sources to determine if your home is in a Special Flood Hazard Area, which has at least a one-percent chance of being flooded in any given year. Perhaps you live in an "A" zone, generally near a lake, river or stream and subject to rising water. Or you may live in a "V" zone, an area that involves beachfront homes and is susceptible to wind-driven waves as well as rising water.

KNOW YOUR BFE

Whether you live near a river or on the ocean's shore, you should know the expected flooding level in your area. The base flood elevation (BFE), in other words. Consult your local building authority for the base flood elevation in your immediate area.

Also check building department records or your property survey for the elevation of your home's lowest floor. This is the lowest enclosed area in your home, including any area - your basement, for instance - that is below ground level on all sides. If you are unable to determine your house's lowest floor elevation, hire a licensed surveyor to do it.

IF YOU LIVE IN AN "A" ZONE

If your home is in an "A" zone and the lowest floor is below the base flood elevation, the best way to protect it against flood damage is to elevate your entire house so the lowest floor is at or above the base flood elevation. Keep in mind that you must use design standards that meet the minimum requirements of your community's local floodplain management building ordinance for new construction and substantially improved structures.

You can also take the following measures to avoid flood damage in an “A” zone:

- Use water-resistant building materials in areas below the base flood elevation.
- Leave the basement or lower floors unfinished if they’re below the base flood elevation.
- Prevent sewer lines from backing up by installing backflow valves or standpipes.
- Raise your washer and dryer and other equipment such as the water heater, oil tanks, furnace and electrical wiring on concrete blocks, above the base flood elevation level. If you are unable to raise a particular item, consider anchoring it and protecting it with a floodwall or shield.
- Install flood shields or built-up barriers for basement windows and doors. The tops of shields and barriers should extend above the base flood elevation.
- Install and maintain a sump pump system if you have below-grade floors.
- Landscape with native plants and vegetation that resist soil erosion.

IF YOU LIVE IN A “V” ZONE

Homes in “V” zones are threatened not only by rising water, but by wave action as well. The answer in this case: relocate your home. If relocating isn’t an option, however, elevate your house on piles or piers. Here, too, you must use design standards that meet the minimum requirements of your community’s local floodplain management building ordinance for new construction and substantially improved structures. Be sure to have an architect or engineer evaluate your elevation plans.

WHEN A FLOOD THREATENS

You can improve the odds of your home surviving a flood by taking these precautions, but you won’t make it flood-proof. Nor do these measures guarantee your safety. Take these additional steps to protect yourself and your family as fully as possible:

- Become familiar with your community’s disaster preparedness plans and create a family plan. Identify escape routes from your home and neighborhood and designate an emergency meeting place for your family to reunite if you become separated. Also establish a contact point to communicate with concerned relatives.
 - Put together an emergency kit that includes a three-day supply of drinking water and food you don’t have to refrigerate or cook; first aid supplies; a portable NOAA weather radio; a wrench and other basic tools; a flashlight; work gloves; emergency cooking equipment; portable lanterns; fresh batteries for each piece of equipment; clothing; blankets; baby items; prescription medications; extra car and house keys; extra eyeglasses; credit cards and cash; important documents, including insurance policies.
 - If flooding threatens, follow weather and news reports so you know how much danger you’re facing. Obey evacuation orders from local authorities.
-

For more information about protecting your home and family from floods, check this source:

National Flood Insurance Program

Federal Emergency Management Agency

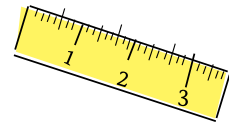
Federal Insurance Administration

500 C Street, S.W.

Washington, D.C. 20472

1-800-427-4661

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



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Against Hail Damage

Hail can occur in any strong thunderstorm, which means hail is a threat everywhere. When it hits, it can shred roof coverings and lead to water damage to your ceilings, walls, floors, appliances and personal possessions. Knowing which roof coverings resist impact well can save you lots of trouble and money.

Keep in mind, however, that most roofing jobs are not for the do-it-yourselfer. Unless you have lots of experience in replacing roof coverings, hire a professional roofing contractor to handle this job. And before you reroof, check with your local building officials to be sure what you're doing complies with local building codes.

WHEN YOU REPLACE YOUR ROOF COVERING

- If you are replacing your old, worn out roof covering with new asphalt shingles, make sure they have a Class 4 rating under Underwriters Laboratories' (UL) 2218 standard. A Class 4 rating tells you a sample of the product did not crack when hit twice in the same area by a two-inch steel ball.
- The UL 2218 standard is a useful method for testing impact resistance, but it isn't perfect and works better for some roof coverings than for others. The UL standard measures whether a product cracks under impact. Some roof coverings, particularly some made of metal, may resist cracking but can be dented and dimple. So, while these roof coverings may test well, they may perform poorly in practice. Keep this in mind when using the UL standard to gauge the quality of a roof covering.

For more information about protecting your home from hail damage, check this source:

Institute for Business & Home Safety. Boston.

Toll-free: 1-877-580-8885. Web site: <http://www.ibhs.org>.

Publication: **Is Your Home Protected From Hail Damage?**

A Homeowner's Guide to Roofing and Hail.

This information is provided through Protecting Our Kids from Disasters, a national disaster preparedness program of the Institute for Business & Home Safety (IBHS). IBHS is an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.



Against Damage From Freezing Weather

As if slippery sidewalks and snow-covered cars aren't bad enough during the winter, you face another potential headache: ruined carpets and water damage to your ceilings and walls from leaks caused by ice dams or bursting pipes. You can avoid the resulting aggravation and expense by taking several basic steps right now to prevent this kind of damage.

If you're handy with a hammer and screwdriver, you can do much of the work yourself. Work involving your home's structure may require a building contractor, however, or even a registered design professional such as an architect or engineer.

Before making any structural changes to your home, check with your local building officials to be sure what you're doing complies with local building codes.

ICE DAMS

An ice dam is an accumulation of ice at the lower edge of a sloped roof, usually at the gutter. When interior heat melts the snow on the roof, the water will run down and refreeze at the roof's edge, where temperatures are much cooler. Eventually, the ice builds up and blocks water from draining off the roof. This, in turn, forces the water under the roof covering and into your attic or down the inside walls of your house.

Once an ice dam forms the potential damage can be serious. Take these steps now to avoid trouble later:

- Keep the attic well ventilated. The colder the attic, the less melting and refreezing on the roof.
- Keep the attic floor well insulated to minimize the amount of heat rising through the attic from within the house.

This two-step approach decreases the likelihood that ice dams will form or, at least, reduces their size.

As an extra precaution against roof leaks in case ice dams do form, install a water-repellent membrane under your roof covering. Talk with your local building official about minimum code requirements for ice dam protection.

Unfortunately, ice dams may be unavoidable if your home has recessed lighting near the roof. Heat generated from these lights melts the snow, which then contributes to ice dam buildup. The only sure way to avoid this problem is to eliminate recessed light fixtures near the roof.

FREEZING PIPES

Frozen water in pipes can cause water pressure buildup between the ice blockage and the closed faucet at the end of the pipe, which leads to pipes bursting at their weakest point. Pipes in attics, crawl spaces and outside walls are particularly vulnerable to freezing in extremely cold weather, where holes in your home's outside wall for television, cable or telephone lines allow cold air to reach them.

To keep water in pipes from freezing, take the following steps:

- Fit exposed pipes with insulation sleeves or wrapping to slow the heat transfer. The more insulation, the better.
- Seal cracks and holes in outside walls and foundations near water pipes with caulking.
- Keep cabinet doors open during cold spells to allow warm air to circulate around pipes (particularly in the kitchen and bathroom).
- Keep a slow trickle of water flowing through faucets connected to pipes that run through an unheated or unprotected space. Or drain the water system, especially if your house will be unattended during cold periods.

For more information about protecting your home from damage in freezing weather, check this source:

Institute for Business & Home Safety. Boston.

Toll-free: 1-877-580-8885. Web site: <http://www.ibhs.org>.

Publications: **Natural Hazard Mitigation INSIGHTS: Ice Dams**

Natural Hazard Mitigation INSIGHTS: Freezing and Bursting Pipes

This information is provided through Protecting Our Kids from Disasters, a national disaster preparedness program of the Institute for Business & Home Safety (IBHS). IBHS is an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.



Against Hurricane Damage

Hurricanes are like no other storms on earth. From Maine to Texas, and in Hawaii, these ferocious weather systems bring torrential rain, flooding, storm surges and devastating winds that damage homes, destroy treasured keepsakes and disrupt family life.

You don't have to be blown away when nature lets loose. It's never too early to prepare and you can take several basic steps right now to protect your family and your home from disaster.

Find out if your home meets current model building code requirements for high-wind regions (for example, the Standard Building Code, which is promulgated by the Southern Building Code Congress International, Inc.). Experts agree that structures built to meet or exceed current model building codes' high-wind provisions have a much better chance of surviving violent windstorms.

If you're handy with a hammer and saw, you can do much of the work yourself. Work involving your home's structure may require a building contractor, however, or even a registered design professional such as an architect or engineer.

WHEN WORKING OUTSIDE

- Replace gravel/rock landscaping material with shredded bark.
- Keep trees and shrubbery trimmed. Cut weak branches and trees that could fall on your house.

WHEN BUILDING OR REMODELING

- **Windows:** If you are replacing your existing windows, install impact-resistant window systems, which are more likely to stand up to wind-borne debris. As an alternative to new window systems, install impact-resistant shutters that close over the window openings to prevent flying debris from breaking windowpanes.
 - **Entry Doors:** Make certain your doors have at least three hinges and a dead bolt security lock with a bolt at least one inch long. Anchor door frames securely to wall framing.
 - **Patio Doors:** Sliding glass doors are more vulnerable to wind damage than most other doors. If you are replacing your patio doors or building a new home, consider installing impact-resistant door systems made of laminated glass, plastic glazing or a combination of plastic and glass. When a hurricane threatens, an easy, temporary and effective step is to cover the entire patio door with shutters made of plywood or oriented strand board (OSB).
 - **Garage Doors:** Because of their size, garage doors are highly susceptible to wind damage. A qualified inspector can determine if both the door and the track system can resist high winds and, if necessary, replace them with a stronger system.
-

Garage doors more than eight feet wide are most vulnerable. Install permanent wood or metal stiffeners. Or contact the door manufacturer's technical staff for recommendations about temporary center supports that you can attach and remove easily when severe weather threatens.

● **Roofs:** If you are replacing your roof, take steps to ensure that both the new roof covering and the sheathing it attaches to will resist high winds. Your roofing contractor should:

- Remove old coverings down to the bare wood sheathing.
- Remove enough sheathing to confirm that rafters and trusses are securely connected to the walls.
- Replace damaged sheathing.
- Refasten existing sheathing according to the proper fastening schedule outlined in the current model building code for high-wind regions.
- Install a roof covering that is designed to resist high winds. Also consider using a double-layer application of heavier felt roofing paper, secured with sufficient tin tabs, to avoid water damage.

If you want to give your roof sheathing added protection, but it's not time to reroof, glue the sheathing to the rafters and trusses. Use an adhesive that conforms to Performance Specification AFG-01 developed by APA – The Engineered Wood Association, which you can find at any hardware store or home improvement center.

● **Gables:** Make certain the end wall of a gable roof is braced properly to resist high winds. Check the current model building code for high-wind regions for appropriate guidance, or consult a qualified architect or engineer.

● **Connections:** The points where the roof and the foundation meet the walls of your house are extremely important if your house is to resist high winds and the pressures they place on the entire structure.

- Anchor the roof to the walls with metal clips and straps (most easily added when you replace your roof).
 - Make certain the walls are properly anchored to the foundation. A registered design professional can determine if these joints need retrofitting, and a qualified contractor can perform the work the design professional identifies.
 - If your house has more than one story, make certain the upper story wall framing is firmly connected to the lower framing. The best time to do this is when you remodel.
-

WHEN A HURRICANE THREATENS

You can improve the odds of your home surviving high winds by taking these precautions, but you won't make it hurricane-proof. Nor do these measures guarantee your safety. Take these additional steps to protect yourself and your family as fully as possible:

- Become familiar with your community's disaster preparedness plans and create a family plan. Identify escape routes from your home and neighborhood and designate an emergency meeting place for your family to reunite if you become separated. Also establish a contact point to communicate with concerned relatives.
- Put together an emergency kit that includes a three-day supply of drinking water and food you don't have to refrigerate or cook; first aid supplies; a portable NOAA weather radio; a wrench and other basic tools; a flashlight; work gloves; emergency cooking equipment; portable lanterns; fresh batteries for each piece of equipment; clothing; blankets; baby items; prescription medications; extra car and house keys; extra eyeglasses; credit cards and cash; important documents, including insurance policies.
- Move anything in your yard that can become flying debris inside your house or garage before a storm strikes.
- If a hurricane threatens, follow weather and news reports so you know how much danger you're facing. Obey evacuation orders from local authorities.

For more information about protecting your home and family from hurricanes, check this source:

Institute for Business & Home Safety. Boston.

Toll-free: 1-877-580-8885. Web site: <http://www.ibhs.org>.

Publications: **Is Your Home Protected From Hurricane Disaster?**

A Homeowner's Guide to Hurricane Retrofit.

Hold On To Your Roof. Tips for holding your roof sheathing in place with adhesive.

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Against Tornado Damage

Even if you live outside “Tornado Alley”, the area of the country that runs north from Texas through eastern Nebraska and northeast to Indiana, you are still vulnerable to tornadoes. Kansas, Oklahoma and Texas may see more of these unpredictable and dangerous storms than other states, but the rest of the country also gets its share of twisters.

You don’t have to be blown away when nature lets loose. It’s never too early to prepare and you can take several basic steps right now to protect your family and your home from disaster.

Structures built to meet or exceed current model building codes for high-wind regions have a much better chance of surviving violent windstorms. The Standard Building Code, promulgated by the Southern Building Code Congress International, Inc., is one source for guidance on fortifying your home against fierce winds. Although no home can withstand a direct hit from a severe tornado, good construction will help your home survive if it's to the side of the tornado’s path.

If you’re handy with a hammer and saw, you can do much of the work yourself. Work involving your home’s structure may require a building contractor, however, or even a registered design professional such as an architect or engineer.

WHEN WORKING OUTSIDE

- Replace gravel/rock landscaping material with shredded bark.
- Keep trees and shrubbery trimmed. Cut weak branches and trees that could fall on your house.

WHEN BUILDING OR REMODELING

- **Windows:** If you are replacing your existing windows, install impact-resistant window systems, which are more likely to stand up to wind-borne debris. These window systems are commonly available in hurricane-prone areas. If you are unable to find them locally, you can order them from manufacturers or home improvement stores in coastal areas.
 - **Entry Doors:** Make certain your doors have at least three hinges and a dead bolt security lock with a bolt at least one inch long. Anchor door frames securely to wall framing.
 - **Patio Doors:** Sliding glass doors are more vulnerable to wind damage than most other doors. If you are replacing your patio doors or building a new home, consider installing impact-resistant door systems made of laminated glass, plastic glazing or a combination of plastic and glass.
-

- **Garage Doors:** Because of their size and construction, garage doors are highly susceptible to wind damage. A qualified inspector can determine if both the door and the track system can resist high winds and, if necessary, replace them with a stronger system.

Garage doors more than eight feet wide are most vulnerable. Install permanent wood or metal stiffeners. Or contact the door manufacturer's technical staff for recommendations about temporary center supports that you can attach and remove easily when severe weather threatens.

- **Roofs:** If you are replacing your roof, take steps to ensure that both the new roof covering and the sheathing it attaches to will resist high winds. Your roofing contractor should:

- Remove old coverings down to the bare wood sheathing.
- Remove enough sheathing to confirm that rafters and trusses are securely connected to the walls.
- Replace damaged sheathing.
- Refasten existing sheathing according to the proper fastening schedule outlined in the current model building code for high-wind regions.
- Install a roof covering that is designed to resist high winds. Also consider using a double-layer application of heavier felt roofing paper, secured with sufficient tin tabs, to avoid water damage.

If you want to give your roof sheathing added protection, but it's not time to reroof, glue the sheathing to the rafters and trusses. Use an adhesive that conforms to Performance Specification AFG-01 developed by APA – The Engineered Wood Association, which you can find at any hardware store or home improvement center.

- **Gables:** Brace the end wall of a gable roof properly to resist high winds. Check the current model building code for high-wind regions for appropriate guidance, or consult a qualified engineer or architect.

- **Connections:** The points where the roof and the foundation meet the walls of your house are extremely important if your home is to resist high winds and the pressures they place on the entire structure.

- Anchor the roof to the walls with metal clips and straps (most easily added when you replace your roof).
 - Make certain the walls are properly anchored to the foundation. A registered design professional can determine if these joints need retrofitting, and a qualified contractor can perform the work the design professional identifies.
 - If your house has more than one story, make certain the upper story wall framing is firmly connected to the lower framing. The best time to do this is when you remodel.
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WHEN A TORNADO THREATENS

You can improve the odds of your home surviving high winds by taking these precautions, but you won't make it tornado-proof. Nor do these measures guarantee your safety. Take these additional steps to protect yourself and your family as fully as possible:

- Decide in advance where you will take shelter (a local community shelter, perhaps, or your own underground storm cellar or in-residence "safe" room). When a tornado approaches, go there immediately. If your home has no storm cellar or in-residence "safe" room and you have no time to get to a community shelter, head to the centermost part of your basement or home – away from windows and preferably under something sturdy like a workbench or staircase. The more walls between you and the outside, the better.
 - Become familiar with your community's severe weather warning system and make certain every adult and teenager in your family knows what to do when a tornado "watch" or "warning" sounds. Learn about your workplace's disaster safety plans and similar measures at your children's schools or day care centers.
 - Study your community's disaster preparedness plans and create a family plan in case you are able to move to a community shelter. Identify escape routes from your home and neighborhood and designate an emergency meeting place for the family to reunite if you become separated. Also establish a contact point to communicate with concerned relatives.
 - Put together an emergency kit that includes a three-day supply of drinking water and food you don't have to refrigerate or cook; first aid supplies; a portable NOAA weather radio; a wrench and other basic tools; a flashlight; work gloves; emergency cooking equipment; portable lanterns; fresh batteries for each piece of equipment; clothing; blankets; baby items; prescription medications; extra car and house keys; extra eyeglasses; credit cards and cash; important documents, including insurance policies.
 - Move anything in your yard that can become flying debris inside your house or garage before a storm strikes. Do this only if authorities have announced a tornado "watch", however. If authorities have announced a tornado "warning", leave it all alone.
 - Don't open your windows. You won't save the house, as once thought, and you may actually make things worse by giving wind and rain a chance to get inside.
 - Don't try to ride out a tornado in a manufactured home. Even manufactured homes with tie-downs overturn in these storms because they have light frames and offer the wind a large surface area to push against. In addition, their exteriors are vulnerable to high winds and wind-borne debris.
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For more information about protecting your family and home from tornadoes and other windstorms such as hurricanes and nor'easters, check this source:

Institute for Business & Home Safety. Boston.

Toll-free: 1-877-580-8885. Web site: <http://www.ibhs.org>.

Publications: **Is Your Home Protected From Hurricane Disaster?**

A Homeowner's Guide to Hurricane (windstorm) Retrofit.

Hold On To Your Roof. Tips for holding your roof sheathing in place with adhesive.

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Against Wildfire Damage

Few people realize that when they move out toward the edges of wilderness, they move into the domain of wildfires. Even though you may live in a thoroughly contemporary suburb, if you can look away into open country, brush or deep woods, you are vulnerable during hot and dry seasons.

You don't have to lose your home and possessions to nature's burning rage. It's never too early to prepare and you can take several basic steps right now to protect your family and your home from disaster.

If you're handy with a hammer and saw, you can do much of the work yourself. Work involving your home's structure may require a building contractor, however, or even a registered design professional such as an architect or engineer.

Before making any structural changes to your home, check with your local building officials to be sure what you're doing complies with local building codes. Experts agree that structures built to meet or exceed current model building codes have a much better chance of surviving a wildfire.

WHEN WORKING OUTSIDE

- Make sure the street number of your house is clearly visible and legible from the road.
 - Create a "defensible space" by removing all dry grass, brush, trees and dead leaves WITHIN AT LEAST 100 FEET from your home.
 - Plant native, fire-resistive vegetation whenever possible.
 - Space trees and shrubs at least 10 feet apart. Reduce the number of trees in heavily wooded areas.
 - For trees taller than 18 feet, prune lower branches within six feet of the ground to keep ground fires from spreading into treetops.
 - Remove all dead branches overhanging your roof and all branches within 10 feet of chimneys.
 - Enclose the underside of balconies and aboveground decks with fire-resistive or noncombustible materials.
 - Cover chimneys serving fireplaces with noncombustible screening with a mesh size no greater than $\frac{1}{4}$ -inch.
 - Store firewood at least 50 feet from any structure.
 - Clearly mark all emergency water sources and maintain easy access.
 - Maintain an emergency water supply within 1,000 feet of your home. Check with your local fire department to learn what standards you must meet.
-

WHEN BUILDING OR REMODELING

- Cover attic and sub-floor vents with noncombustible screening with a mesh size no greater than ¼-inch.
- Your roof is the most vulnerable part of your home because it can easily catch fire from wind-blown sparks. If you are building a new home or reroofing your existing house, use roof covering material with a Class A fire-resistive rating.
- Limit the size and number of windows that face large areas of vegetation. The heat from a wildfire can ignite the furnishings inside your home through these windows.
- Install tempered glass or multilayered glazed panels in exterior windows, glass doors and skylights. Or, install solid, exterior shutters.

WHEN A WILDFIRE THREATENS

You can improve the odds of your home surviving a wildfire by taking these precautions, but you won't make it fireproof. Nor do these measures guarantee your safety. Take these additional steps to protect yourself and your family as fully as possible:

- Become familiar with your community's disaster preparedness plans and create a family plan. Identify escape routes from your home and neighborhood and designate an emergency meeting place for the family to reunite if you become separated. Also establish a contact point to communicate with concerned relatives.
- Put together an emergency kit that includes a three-day supply of drinking water and food you don't have to refrigerate or cook; first aid supplies; a portable NOAA weather radio; a wrench and other basic tools; a flashlight; work gloves; emergency cooking equipment; portable lanterns; fresh batteries for each piece of equipment; clothing; blankets; baby items; prescription medications; extra car and house keys; extra eyeglasses; credit cards and cash; important documents, including insurance policies.
- If a wildfire threatens, follow news reports so you know how much danger you're facing. Obey evacuation orders from local authorities.

For more information about protecting your family and home from wildfires, check this source:

National Fire Protection Association

One Batterymarch Park
Quincy, MA 02269-9101
Phone: 617-770-3000
<http://www.nfpa.org>

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With Insurance

Natural catastrophes can strike with little or no warning. So can man-made disasters. You can improve the odds of your home surviving an earthquake or an accidental fire by taking certain precautions, but you won't make it disaster-proof. To protect the investment you've made in your home as fully as possible, review your homeowners insurance policy periodically with your insurance agent or company. Make certain you have all of the necessary protection for the threats you face. And check the dollar limits to be sure you have enough coverage to rebuild your home and your life should misfortune occur.

WHAT YOUR INSURANCE POLICY COVERS

Most homeowners insurance policies cover damage from the following natural events:

- Freezing Weather (leading to bursting pipes and ice dams)
- Hail
- Hurricanes
- Tornadoes
- Wildfires

Your policy does not cover earthquake damage, however, or damage caused by floods.

EARTHQUAKE COVERAGE

Earthquake protection is sold as extra coverage to your homeowners policy. Talk to your insurance agent or company representative to determine whether you should purchase this insurance. In earthquake-prone areas, the price is relatively high. In other areas, it is relatively inexpensive.

FLOOD INSURANCE

The federal government provides flood insurance through the National Flood Insurance Program. Keep in mind that 25 to 30 percent of all flood claims are paid for homes outside of special flood hazard areas. So, if your community participates in the National Flood Insurance Program, contact your insurance agent or company representative about purchasing this coverage.

AFTER DISASTER STRIKES

If your home is damaged in either a natural disaster or a man-made one, report it immediately to your insurance agent or company representative and make temporary repairs to prevent further damage. For information about filing an insurance claim after disaster strikes, contact:

Your insurance agent or insurance company

Insurance Information Institute

110 William Street
New York, NY 20038
Phone: (212) 669-9200
Fax: (212) 791-1807
<http://www.iii.org>

For information about protecting your home from earthquakes, floods, freezing weather, hail, hurricanes, tornadoes and wildfires, contact :

Institute for Business & Home Safety

4775 East Fowler Ave.
Tampa, FL 33617
Toll-Free: 1 (866) 657-4247
Fax: (813) 675-9960
<http://www.ibhs.org>

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Prepared by the Institute for Business & Home Safety (IBHS), an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters. IBHS is a nonprofit research and communications organization committed to institutionalizing natural disaster protection as a public value.

DISCLAIMER

The purpose of this document is to provide the general public with guidance on ways to retrofit child care centers in order to reduce the vulnerability of these facilities to earthquakes, floods, wildfires and windstorms. It contains suggestions and recommendations based on professional judgment, experience and research and is intended to serve only as a guide. The publisher disclaims all warranties and guarantees with respect to the information in the document and assumes no liability or responsibility with respect to the information.