

12 Month Disasters Preparedness Plan

Month #1 – Creating Family Disaster Plan

Creating a Family Disaster Plan is the first preparedness activity in our 12-Month Emergency Preparedness Plan. You can download the Disaster Preparedness forms at www.freechurchforms.com that you can use to create your Family Disaster Plan that includes the:



- Family Disaster Plan Cover Page
- Reunion Points
- Emergency Pet Care Information
- Medical Release Form for each Minor Child Floor Plan
- Important Family Records
- Family Contact
- Emergency Numbers & Information
- Emergency Medical Information for each Family Member
- Know What to do During an Earthquake
- CPR Training
- Babysitter Emergency Information

Review the forms and decide what will be of most value to you and your family. Assemble these forms in a three ring binder. At minimum, your Family Disaster Plan notebook should contain:

- Floor Plan
- Reunion Points
- Family Contact
- Emergency Numbers & Information
- Emergency Medical Information for each Family Member
- Medical Release Form for each Minor Child

We recommend that you calendar a family council meeting and complete the forms together.

- Store your Family Disaster Plan notebook near the telephone in the kitchen, or some other central location in your home.
- Make sure everyone in your family has the contents of your Family Disaster Plan as well as where to find it and how to use it in the event of an emergency.
- Review your plan periodically (every 6 months or 12 months) and update the information annually or as necessary.

Month #2 – Water Reserves

Water is essential for survival. The ground trembling and shaking caused by earthquakes can crack or break the lines that bring fresh water to your house. Stocking [water reserves](#) and learning how to purify contaminated water should be among your top priorities in preparing for a disaster. At the very minimum, you should store a [72 hour emergency supply](#) of water for each member of your family. Emergency officials estimate that you should plan on being self-sufficient for the first 72 hours following a major disaster. But, as most people know, in reality it may take your community depending on where you live weeks or months to get back to normal. Therefore, it's highly recommended that you store at least a two week supply of water for each member of your family. As we know, everyone's needs differ depending on their age, physical condition, activity, diet and climate, the amount of water you will need to store may vary from official recommendations. The fact is that an active individual needs to drink at least two quarts of water each day, and hot environments can double that amount. You will also need additional water for [food preparation](#) and hygiene purposes. As a general rule store a total of three gallons of water per person, per day.

Activities for Month #2:

- Make a family decision on how much [water reserves](#) to store for your family as well as what container you will use to store the water, then obtain it.
- Label it "drinking water" and date it.
- Store it in a cool, dark place.
- Calendar a date (6 months from now to refresh water supply that is not treated already). You can purchase [emergency water reserves](#) in Mylar bags with 5 year shelf life if desired. If not, then you will have to drain old water into the garden every 6 months, clean out your container(s) and fill with fresh water.
- Tap water (from municipal sources) does not need anything added to it before it is stored because it has already been chemically treated, but can only be stored

up to 6 months before renewing. Commercially purchased water is the same way. Keep it in its original, sealed container.

If your supplies run low, remember:

- Never ration water.
- Drink the amount you need today, and try to find more for tomorrow.
- You can minimize the amount of water your body needs by reducing activity and staying cool.

Month #3 – Home Hazards Checklist and Action List

Earthquake deaths, injuries and property damage are usually caused by falling and moving objects. There is a 70% chance that you and your family will be at home during the next earthquake. You have a choice as to how well your home will perform.

Destruction of property such as partial building collapse, flying glass, overturned bookcases, furniture, and appliances are usually the case, and even fires from broken chimneys, broken gas lines, and downed electrical lines.

A lot of this destruction can be prevented by doing a little preventative maintenance. Try to identify the potentially life threatening hazards in your home. Taking action to correct these hazards will be the focus of several succeeding month's activities.

Activities for Month #3:

- The Home Hazard Checklist and action list you can find at www.freechurchforms.com. Print both forms and add them to your Family Disaster Plan notebook for handy reference.
- Calendar a date and time to meet together as a family and conduct your Home Hazard checklist and action list together.
- When you meet, go through your home, room by room, and identify all possible interior hazards (items 1-7 on checklist).
- Then inspect your home for utility and structural hazards (items 8-10 on checklist). If you don't feel comfortable or qualified in completing the structural inspection, please contact a qualified earthquake engineer to check your house and surrounding area to see if any hazards exist.
- Record what you find on you Home Hazard Action List. Keep this information in your Family Disaster Plan notebook for the time being. You will work on these hazards in upcoming months.

- Calendar another Home Hazard meeting one year from now. It's a good idea to inspect your home once each year to find and correct potential fire and safety hazards.
- Evaluate your earthquake insurance policy if you have one. If you don't have one, you might consider the pros and cons of such a policy.

Month #4 – Emergency Survival Kits

After a disaster, local officials and relief workers will be on the scene, but they cannot reach everyone immediately. As we have discussed earlier it may take hours, days, weeks...you just don't know. Would your family be prepared to cope with the emergency until help arrives?

Coping with the impact is very stressful after a disaster. Much of the inconvenience and discomfort the disaster causes can be reduced by planning alternative ways to take care of your needs. Don't get overwhelmed by this month's preparedness activities because you'll probably find that you already have many of these items.

Activities for Month #4:

- [Emergency Survival Kits](#) and [Emergency Survival Tools](#) are a necessity to store in case of a disaster.
- The Emergency Survival Kits checklist forms for different areas such as the bedroom, auto, sanitation and sheltering you can find at www.freechurchforms.com. Keep these also in your Family Disaster Plan notebook for handy reference.
- Circle those items you don't have, but are important for the comfort of you and your family.
- Choose 2 circled items and add them to your weekly shopping list.
- Next week, choose 2 more items to add to your weekly shopping list.
- Continue adding a couple of items a week until you have acquired all the supplies you've circled.
- Afterwards, when you make your weekly shopping list, replace any items you've used up or need rotated.

Month #5 – Securing Furnishings Throughout Your Home

The forces that are created by earthquakes cause the earth literally to quake, or shake, from a few seconds to a few minutes in length as well as producing ground swells and rolls from a few inches to a few feet in height.

Tall pieces of furniture, such as bookcases, china cabinets, and TV stands are very likely to fall when the ground is rolling and shaking. You can prevent them from falling on someone you care about, and save their contents, by completing the following simple activities.

Activities for Month #5:

- The Project Instruction Sheets for securing tall furniture and their contents you can find at www.freechurchforms.com. Print out the instruction sheets and put them in your Family Disaster Plan notebook for handy reference.
- Schedule a date and time sometime this month for you and your family to secure the tall furnishings in your home.
- Take an inventory of the tall furnishings you have throughout your house.
- Purchase sufficient L-brackets or corner brackets and screws from the hardware store.
- When you get together, first locate the wall studs behind your tall furnishings using a stud finder. Then secure furnishings to the studs with the appropriate hardware.
- Place heavy and/or large items on lower shelves.
- Secure objects on shelves with Velcro, monofilament or wire guy lines, non-skid shelf liners or special quake-hold putties.

Month #6 – Securing Your Water Heater

Fresh water after a disaster may be as close as your hot water heater providing, however, that it remains standing upright. A typical hot water heater holds 30-40 gallons of water. This supply of water, however, is extremely vulnerable to the ground swells and rolls of earthquakes as well as the ground shaking, causing them to easily tip over. Protect this valuable resource by securing your water heater to the wall studs.

Because so many tanks burst through their strapping in earthquakes, experts have modified the recommended procedure for strapping water heaters. Experts now recommend these two important changes:

- Secure both the top and the bottom, rather than just the top or just the middle, of the tank.
- Use nylon strapping rather than metal plumber's tap. Many water heaters in earthquakes burst through the plumber's tape. Plumber's tape is now felt to be too brittle to be effective.

Activities for Month #6:

- The instruction sheet can be found at www.freechurchforms.com for securing your water heater. Place this information in your Family Disaster Plan notebook for handy reference.
- Calendar a date and time this month when you will secure water heater. This activity is a 1 or 2 person activity rather than a whole family activity.
- Review the instruction sheet and purchased all necessary supplies.
- There should be very little space between the water heater tank and the wall. If there is more than 1-2 inches, attach a wooden block (a length of 2x4 or 1x4 lumber) that spans the distance between the wall studs behind your water heater with long lag screws. (See project sheet) This will prevent the heater from tipping backwards.
- Wrap nylon strapping 1 ½ times around the tank. Start by placing the strapping at the back of the tank. Bring it to the front and then take it back to the wall.
- Secure this strapping to the wall studs or the wood block using several ½ inch x 3 inch or longer lag screws with oversized washers. If you are securing it directly into concrete, use ¼ inch expansion bolts in place of the screws.
- Replace all copper and metal piping with flexible natural gas and water line connectors.

Month #7 – Utility Safety

Water

Water quickly becomes a precious resource following many disasters. It's vital that everyone in your household learns how to shut off the water at the main valve for two reasons:

- Cracked water lines may pollute the water supply to your house. It is wise to shut off your water until you hear from the authorities that it is safe for drinking.
- The effects of gravity may drain the water in your hot water heater and toilet tanks unless you trap it in your house by shutting of the main water valve.

Electricity

Electrical sparks have the potential of igniting natural gas if it is leaking. It is wise to teach all responsible family members where and how to shut off the electricity.

Natural Gas

Natural gas leaks and explosions are responsible for a significant number of fires following any major earthquake. It is vital that everyone in your family knows how to shut off the natural gas supply and has been instructed as to the following:

- Shut off the gas immediately only if you smell the characteristic warning odor of gas and/or you notice a large consumption of gas being registered on the gas meter.
- **Do Not** use matches, lighters, open flame appliances or operate any electrical switches until you are sure that no gas leaks exist. Sparks from electrical switches could ignite the gas and cause an explosion.
- If you smell natural gas, immediately get everyone out of and away from your house. Open the windows and doors to provide ventilation. Shut off the gas at the meter and warn neighbors close by.

Activities for Month #7:

- The detailed information on how to shut off a gas meter, the water main and water meter, and the power supply to your house can be found at www.freechurchforms.com. Print these information sheets and add them to your Family Disaster Plan notebook for handy reference.
- Calendar date and time for meeting this month to get together as a family and review this information as well as practice shut-off procedures.
- First, locate the shut-off valve for the water line that enters your house.
 - Make sure this valve can be completely shut off. If your valve is rusted open or only partially closes, replace it.
 - Label this valve with a tag that says, "water main", or use a permanent marker to write the word, "water main", on the pipe.
 - If your house doesn't have a water main valve, you will have to turn off your water supply at the meter.
 - Locate the concrete meter box for your house. If it's located near a neighbor's water meter, put your house number on the lid with a permanent marker.
 - Follow the directions on the Information Sheet.
- Second, locate your electricity circuit box.
 - Follow directions on the Information Sheet for shutting off the power to your house.
- Third, locate the gas meter for your house if you have natural gas service.

- Make sure that the on/off valve will turn. It only takes ¼ turn in either direction to shut off the gas, so be careful. Moving it about 1/8 of a turn is all that is needed to assure yourself that it can be turned off.
- If your valve is rusted open, try soaking it with a WD-40 type product for a few days.
- If you accidentally turn the gas off while practicing, you MUST call a qualified gas representative to come and turn it on for you. Turning it on yourself will create a gas leak in your home.
- Attach a wrench to the meter or to the wall directly behind the meter.

Month #8 – Fire Safety

Be wise when it comes to fire! If a fire starts in your home that is too big for you to handle, get out of the house immediately. Don't stop to get anything or do anything. Once you are outside, stay there. Intense heat and toxic fumes can kill you in seconds.

Activities for Month #8:

- The activities for Month #1 included selecting a family reunion point outside your home in case you need to evacuate your home after an earthquake or during a fire. You also drew the floor plan of your home, identified safe spots, danger spots and exit routes. Review these things with your family this month and make sure everyone knows at least 2 ways to exit each room in the house and where to meet outside.
- Calendar a date and time for a fire drill this month and another one in 6 months from now. During one of these fire drills, give everyone a blindfold and practice crawling your exit routes to simulate getting out of a smoke-filled house.
- If you don't have any fire extinguishers in your home, get some this month. You should have one in the kitchen, one in the garage, one on every level if your home has multiple floors. A:B:C extinguishers are recommended:
 - "A" fires – ordinary combustibles such as wood, paper, cloth and many plastics.
 - "B" fires – flammable liquids such as gasoline, paints, kitchen grease, and oils.
 - "C" fires – electrical equipment, such as fires in wiring, motors and appliances.

- Locate your fire extinguishers with care. Ready access to them is critical. Fire moves quickly so quick access to your extinguishers can be the difference between putting a small fire out or suffering much damage.
- Calendar a date and time next year to check your extinguishers to ensure they are properly charged.
- See Fire Safety Procedures at www.freechurchforms.com for form to download and print for your Family Disaster Plan Notebook for handy reference.

Month #9 – First Aid Supplies

Water, food and shelter may be the first three items on your emergency list, but medical care should be number four.

No single [First Aid Kit](#) is right for everyone. Familiarity with the equipment and your family's unique needs should determine the contents of your kit. We recommend that you have at least three kits on hand:

- A small, basic kit for your car
- An intermediate kit for home and traveling
- An extensive advanced kit stored with your survival gear. This kit would be used when going to a regular doctor or hospital is not an option.



Activities for Month #9:

- Print the information above and put it in your Family Disaster Plan notebook for handy reference.
- Decide what items your family needs to have in each kit and make a list. Inventory your own supplies to determine what you already have on hand and check them off your list.
- Chances are your list will contain a lot of stuff to get and may seem overwhelming! To help make it easier to acquire these essential items, choose just one or two items to add to your weekly shopping list. Do this until you have purchased everything your family needs. You can also purchase the [First Aid Kits](#) already assembled.
- Plan to use the items in your kits for your routine first aid needs. Replace items as you use them up. This will help to keep the items in your kits fresh.

- Store your first aid supplies in a cosmetic case, a fishing tackle or tool box.
- Tape a list of the contents of each kit to the inside of the container so you can quickly inventory your supplies.
- Protect copies of critical medical information from fire and earthquake damage. If you don't have a safe deposit box or fireproof box for your important documents, put them in water-tight zip lock bags and store them in the refrigerator or freezer.
- If your family has not yet taken a basic first aid course or received CPR training, then they need to contact their local city hall or hospital and ask how they can get their CPR training. Or, contact your local chapter of the American Red Cross for information on first aid training classes as well as CPR (cardiopulmonary resuscitation) training.

Remember, first aid is not a substitute for professional medical care. Call EMS (Emergency Medical Services) or dial 911 immediately if you or anyone in your family has serious injuries.

Month #10 – Cabinet and Wall Safety

The ground swells and rolls of major earthquakes can easily knock heavy pictures and mirrors off the walls. This can be especially dangerous in the night if these items are located close to your bed, or during the day if they are located close to your favorite chair or sofa.

Broken glass from spilled kitchen cupboard and cabinet contents is also an immediate hazard created by many earthquakes. To prevent drawers and cabinet doors from flying open, install safety latches.

Activities for Month #10:

- The information sheet on how to secure mirrors to walls, hanging plants, cabinet doors and drawers is found at www.freechurchforms.com. Print the sheet out and put it in your Family Disaster Plan notebook for handy reference.
- Review the instruction sheet and decide what type of hardware you'll use throughout your house to secure pictures, hanging objects, cabinets and drawers.
- Go through your house room by room and make a list of how many latches and other hardware items to purchase.
- Calendar a date and time for meeting this month for your family to help secure hanging objects, cabinets, drawers and framed art or mirrors.

- Secure your pictures and mirrors by using special hooks, security clips with keys or screw angles (see instruction sheet for details).
- Velcro-type products may also be used to help secure pictures, etc. to the wall in addition to the above mentioned hardware.
- Carefully check the location of all hanging plants and other hanging objects.
- Secure these objects by closing the opening in their hook. Make sure the hook is screwed directly into a ceiling stud.
- Secure cabinets and drawers with safety latches.

Month #11 – 72-Hour Emergency Supplies Kit

When the shaking from a major earthquake stops, you will get dressed, grab your [Emergency Survival Kit](#) or [Survival Backpack Kit](#) from under your bed and head for your family's reunion point outside your home. If the earthquake was severe enough to overwhelm emergency services and response teams, it will be declared a "disaster".

Chances are, you and your family will need to rely upon the supplies you have at home for the next 72 hours. To make yourselves as comfortable as possible, store at least a 3-day supply of water, non-perishable foods, and emergency first aid supplies.

If you find that your house has been damaged during the earthquake, or feel safer staying outside, you will also want to have some basic sheltering tools and supplies on hand. We recommend that you store all of your [72 Hour Emergency Supplies Kit](#) and sheltering equipment in a safe place outside your house so that you can access them easily, quickly and safely.

The information on how you can store your 72 Hour Emergency Supplies in a 33 gallon trash can with a tight fitting lid is found at www.freechurchforms.com. Since the emergency food supplies for a family of 6 will pretty much fill a 33 gallon trash can in and of itself, you may want to get one can for food supplies and another can for other supplies.

Activities for Month #11:

This month's activities include collecting supplies from the following 6 categories and storing them in a safe place outside your home:

- **Personal Gear**
 - Your emergency survival kits under your bed contains a minimum of essential personal items. Upgrade your kit this month for each member to

include the Sanitation and Shelter supply kits and store these items with your 72 Hour Emergency Kit supplies in the 33 gallon trash can. In the event of a fire or rapid evacuation, you will appreciate having more than the clothes on your back.

- **72-Hour Water Storage**
 - Keep at least a 3-day supply of water for each person in your household
- **72-Hour Emergency Food Supplies**
 - Plan a 3 day menu of non-perishable foods. Select foods that require no refrigeration or cooking, and little or no water.
 - Choose the [non-perishable foods](#) at DisastersPreparedness.com if possible and/or canned meats, fruits and vegetables; canned juices and soups; high energy foods such as peanut butter, granola bars, trail mix, and beef jerky; and don't forget the comfort foods (cookies, hard candy, favorite beverages, etc.)
 - Date all food items and keep an inventory list in the container with your food supplies. Note shelf life or expiration date of each item.
 - Every 6 months, review the list and replace those items whose shelf life has expired.
 - Click here for more information on the shelf life of foods as well as storage tips.
- **Emergency First Aid Supplies**
 - If you completed, or are still working on the activities for Month #9 you should have a good start on your first aid supply.
 - Most of the injuries that occur during or after a major earthquake are minor (cuts, bruises, scrapes, burns, etc.) Decide whether you want to assign a family member to grab your household first aid kit on their way out of the house to your family reunion point, or if you want to have a set of emergency first aid supplies stored with your 72-Hour Emergency Kit in the 33 gallon trash can outside.
- **Emergency Supplies (Month #4)**
 - Paper cups, plates and plastic utensils (if you don't already have a mess kit for each member of your family in your Emergency Survival Kit)
 - Battery operated AM radio
 - Extra batteries
 - Flashlights with extra bulbs and batteries
 - Non-electric can opener
 - ABC fire extinguisher
 - Whistle (if not already in your Emergency Survival Kit)

- Toilet paper and towelettes (if not already among your emergency sanitation supplies)
- Liquid soap
- Feminine supplies
- **Special Items**
 - Extra eyeglasses, reading glasses, contact lenses and care solutions
 - Prescription drugs and medications
 - Baby diapers, foods and formula
 - A family picture
 - Games and books
 - Insurance policies
 - Bank account information
 - Inventory of valuables
 - Family records
- **Sheltering Equipment (Month #4)**
 - Tent(s) or tarp(s), twine or rope for shelter construction
 - Lantern, extra mantles and fuel
 - Camp stove, extra fuel
 - Cooking pots and utensils
 - Sleeping bags or emergency blankets
 - Sleeping pads
 - Pillows

Calendar a date and time for meeting this month when you can review this information with your family. If you have been completing, or are still working on, the activities each month, you will notice that you already have many of these things on hand. This month's activity day should focus on storing these items in a safe location outside your home.

If you are still in the process of acquiring some of these items, keep up the good work. Preparing for disasters is a long term goal. To make the whole project manageable, we recommend that you keep on adding 1 or 2 small, relatively inexpensive items to your weekly shopping list and purchase 1 or 2 larger, more expensive items each month.

Plan to rotate items in your 72-hour emergency supplies kit every six months unless you purchased kits from DisastersPreparedness.com – the supplies there have a 5 to 25 year shelf life or more. This includes making sure the clothes you stored still fit. Calendar a day six months from now to review your inventory and rotate supplies.

Food Storage and Rotation Tips

Here are some things to keep in mind as you plan your food storage rotation:

- **Store wisely** – Store items that will keep for a long time. This will greatly reduce the food rotation burden.
- **Put a date on everything!** – Whether you buy it from the store, online store or you can it yourself, date it! Knowing when something was put away is essential to knowing when it needs to be consumed. Even if you can't determine when a store bought product was canned, just writing the purchase date on the can will help.
- **Establish a method** – If you stock a pantry with canned goods, put new purchases in the back and withdraw older cans from the front. Sloped shelves can be constructed that let newer cans roll forward as the oldest can are taken. If you have a separate cold storage, establish regular times for withdrawing foods. Or establish a schedule for restocking your pantry from a longer-term storage area.
- **Make your food storage easy to get to** – This may sound trivial, but when it comes to food storage: out of sight is definitely out of mind. And, when it's easier to drive down to the grocery store than to get to your stored food, guess where you'll head most of the time!
- **Estimate a rate of consumption** – Keep in mind that each year you will need to consume one half of anything with a two-year shelf life. Likewise, you will need to consume one third of anything with a three-year shelf life, and so on.
- **Learn from your experience** – Letting your family sample what you have stored will help you determine what to store in the future. Let's face it, if all those dried lima beans haven't moved after two years, they probably won't make anyone really happy during an emergency either.
- **Grow your own** – Consider providing for at least part of your needs from your garden. That way, if you ever do have to live from your stored food, you can supplement with fresh produce from the garden.

Prudent methods of food storage are learned over many years. Taking time to learn good methods and plan your storage will pay off in the long run. Learning how to use food storage items in your daily diet is part of this learning process. A more self-sufficient lifestyle results when we learn to properly produce, process, store and use food.

Food Rotation Planner

There are many ways to track the rotation of your emergency food and water supplies as well as your [long term food storage supplies](#). The forms listed below are just one method. As you try different methods, you will find or develop the method that works best for you and your family. Once you have found that method, use it consistently.

To use these planners, print them out and store them in your Family Disaster Plan notebook for handy reference. You will need the Shelf Life Chart that is listed below. As you purchase food supplies, date them and then enter them on the planner that corresponds to their shelf life. Make a note of when the item needs to be rotated, or used, and enter the storage location of the item.

You will need to review these planners on a monthly basis and look for those items that need to be used and rotated. Be sure you replace these items with new products and begin the rotation cycle all over.

Month #12 – Structural Preparations

There is a 70% chance that you and your family will be at home during the next earthquake. You have a choice as to how well your home will perform. Next to loss of life, the loss of your home will be the greatest catastrophe to occur in an earthquake.

The basic rectangular, single-story, wood frame house is one of the safest types of structures in an earthquake. Most people will be safe at home if they live in a well-braced wood-frame building of one or two stories. These buildings are unlikely to collapse completely during earthquakes. Common damage in these structures is light cracking of interior walls or cracking of brick.

The key to a well-designed building is its ability to withstand an earthquake as a single unit. The shaking and lateral forces of an earthquake will separate building components at their weakest points. Therefore, all structural elements must be securely tied together:

- The structure must be tied to the foundation with anchor bolts to keep it from sliding
- The wall studs must be sheathed (tied) with plywood or some other material to reduce deflection and provide strength
- The floors and roof must be fastened securely to the walls to tie the structure together.

Activities for Month #12:

- The Preparedness Project sheets for Adding Foundation Bolts, Sheathing Cripple Walls, Strengthening Posts and Beams, and Bracing Outdoor Structures are below. Print these project sheets out and add them to your Family Disaster Plan notebook for handy reference.
- Calendar date and time for meeting this month to inspect your home and create a “To-Do” List for strengthening the structural components of your home.
 - If you are uncomfortable performing this inspection yourself, contact an engineer experienced in seismic strengthening. You can find them in the yellow pages of the phone book.
- Check your house and garage for foundation bolts. These bolts secure the wood structure to concrete foundation. They should be a minimum of six feet apart along the sill plate.
 - For more information on securing your house to the foundation, follow the forms above.
- Inspect the vertical studs that extend from the foundation to the first floor of your home. These are common in crawl space areas and are called cripple walls. If they are exposed (for example, without sheathing) on the inside, they could buckle in the ground motion that accompanies many large earthquakes.
 - For more information on strengthening and bracing cripple walls, follow the forms above.
- Inspect all exposed framing in garages, basements, porches and patio covers where beams, posts, walls, floors and ceilings come together. All these components need to be connected with metal connectors.
- Check all brick, masonry and stone facades to make sure they are securely attached to your home. Consult a structural engineer for advice on how to do this.
- Check the chimney for loose tiles and bricks.
 - Check the ceiling in the attic surrounding the chimney. It should be reinforced with $\frac{3}{4}$ inch plywood nailed to the beams to provide protection from falling bricks that might break through the roof.
 - If your chimney is old and extends more than five feet above the roof, consider bracing it. Consult a seismic engineer.
 - For more information specific to masonry chimneys, follow the forms above.
- Inspect all large plate glass windows to make sure they are safety glass.
 - Consider adding a safety film to all windows. This does not prevent the window from breaking, but it does keep the glass from falling and injuring loved ones.

If you live in a mobile home, follow the information below specific to mobile homes.

Building Codes

What about Building Codes?

America's first line of defense against earthquakes has historically been the construction of buildings that can withstand severe shaking. Cities and counties rely on the seismic design provisions in building codes to ensure that structures can resist earthquakes. The variations in the seismic threat across the country are depicted on maps in building codes as zones of different risk levels. These building-code maps are based on more detailed shaking-hazard maps prepared by U.S. Government scientists.

Disasters such as fires, earthquakes and windstorms often prompt upgrades in building codes as people become more aware of the dangers posed by Mother Nature. But the reality is that even the most up-to-date building codes can still fall short of protecting your home against major catastrophes. The situation is even worse for older homes, which were often built before engineers and builders paid much attention to strengthening homes against disasters.

But the bottom line is: The fate of your home and your family may depend on a few simple methods of strengthening its structure against winds, fire quakes and other ravages of Mother Nature.

Mobile Homes

Special considerations are needed for mobile homes and modular buildings not attached to permanent foundations. These structures can slide off their foundation if not properly secured to resist horizontal motion.

Special earthquake stabilizing devices for mobile homes are available. Check with earthquake retrofit specialists in your area. These devices have proved to be effective in preventing or minimizing damage in several recent earthquakes.

Structural engineers advise that these four precautions will improve the earthquake readiness of a mobile home:

- Keep the axle, wheels, and inflated tires on the unit.
- Reduce interior hazards in the same way as for conventional housing.
- Install an earthquake safety device to keep the unit from falling off its supports.
- Install an automatic gas shut-off valve.

Retrofitting costs vary a great deal depending on what needs to be done. However, the expense of retrofitting is nothing compared to repairing or replacing your house. One estimate is that the cost of picking up a house and setting it back on its foundation will be 23 times greater than the cost of preventative retrofitting!

The most important things you can do to mitigate the effects of an earthquake are:

- Maintain your home and ensure its structural integrity by having regular inspections for pests and decay.
- Improve the building's resistance to earthquake damage by keeping the retrofitting up with seismic standards.

Foundation

Adding Foundation Bolts & Bracing Cripple Walls

Your house should be securely fastened to the foundation with expansion bolts. If your home was built before 1950, it probably does not have bolts securing the wood structure to the concrete foundation. There should be a bolt at each end of a section of mudsill and one every four feet in between.

Modifications to the foundation of your house must be done by a licensed contractor, who will ensure that the work is done correctly and according to all applicable codes. This is important for your safety.

Foundation Bolts

- Hire a contractor or inspector to inspect your foundation for soundness.
- Check to see that the mudsill is not rotted.
- Install foundation bolts if your house is not bolted securely to the foundation.

Brace Cripple Walls

- Check with your local building officials to see whether you need a permit to do this work.
- Make sure that the sill plate below the cripple wall is bolted or otherwise anchored to the top of the foundation.
- Add blocking between vertical studs.
- Apply plywood or OSB to the interior face of cripple wall.

- Add nails through the existing blocking between floor joists to ensure that the floor is securely attached to the cripple wall.
- If cost is a factor, install shear wall panels at the corners of your house first (8 feet from each corner in a one story house, 16 feet in each direction in a two story house). Fill in as your budget allows to secure the entire perimeter of your house.

Bracing a 2-foot high cripple wall will cost you about \$1.50 per linear foot of wall. For example, a house measuring 60 feet by 30 feet will have a perimeter of 180 feet. So the cost for that house would be about \$270. This figure covers only the materials you will have to buy and excludes the cost of any tools you use, building permit fees, and the value of your time. This figure also excludes the cost of having a contractor anchor your sill plates. Also, bracing higher cripple walls may require more lumber therefore may be more expensive.

Chimneys

Masonry Chimneys

In past earthquakes, masonry chimneys have proved to be one of the most damage-prone and hazardous features of a house. Taller chimneys tend to be more susceptible to damage than are shorter chimneys. It's important for your family to understand the hazard that the chimney represents and to stay away from it during an earthquake.

Unreinforced masonry chimneys frequently topple in earthquakes, with the portion projection above the roof line being the most susceptible to damage. The safest thing to do with an unreinforced masonry chimney is to remove it and replace it with a prefabricated metal flue system with a wood enclosure.

In any event, the chimney should be inspected for cracks or weak mortar by a qualified contractor as a minimum. Weathering is typically most severe at the top, which is not visible without close inspection.

- Hire a contractor or structural engineer to check your chimney.
- Reinforce the ceiling surrounding the chimney with $\frac{3}{4}$ inch plywood nailed to ceiling joists.
- Be sure to have the chimney checked, and repaired, if needed, before using it after an earthquake.
- A structural engineer will be able to tell you if you need to do additional structural work to protect your house (blocking between joists, additional hold-downs on corners of the house, etc.)

Structural Preparations

Strengthen Posts and Beams

- Provide post anchors at bottom of posts in crawl spaces rather than just resting on concrete pad (i.e., patio decks, stairs). Use metal connectors at post and beam connections in garages, decks, porches and basements.

Bracing Outdoor Structures

- Strengthen rafter joists of lighter roofs (asphalt, shingles, wood shakes and light weight metal roofs) with straps. Provide extra bracing and stiff diaphragm for concrete or clay tile roofs.
- Cross brace in both directions between support posts of decks built on hillsides. Avoid standing on or near decks during or after an earthquake.
- Provide extra bracing (steel) in high chimneys but do not tie house structure to chimney.
- Inspect all brick above roof line every 6 months for mortar disintegration and cracks.
- Avoid building home adjacent to tall trees as well as newly cleared areas with spindly trees. These will be more susceptible to falling over during strong winds or an earthquake.
- Some trees, like mature pines, have very shallow root balls. But these root balls, when interfaced with neighboring trees' root balls, form a very strong root network that creates stability. Be careful when clearing these trees from your property. Two or three trees left to stand along are more apt to topple over during a wind storm or earthquake than a group of several trees.

Adding Foundation Bolts

- **Structural Stability**
- Structural stability begins with the site and soil. Risk increases if a building is on or near an active fault, on land fill, loose, water saturated soil or in a land slide prone area. A foundation or soil engineer or a geologist can advise you on site problems.
- If your home is of conventional wood frame construction (including stucco), it will probably be relatively resistant to earthquake damage, particularly if a single story. However, there are some important structural features that will ensure greater stability.

- ❑ Check for foundation bolts. Your home may or may not have bolts securing the wood frame structure to the concrete foundation. Your home can be strengthened by adding expansion bolts at the foundation.
- ❑ Determine if the vertical studs that extend from the foundation up to the first floor are exposed on the inside. This construction method produces a weak link in the house structure and is particularly dangerous in multi-story buildings. Nail plywood sheathing onto the vertical studs to strengthen these cripple walls.
- ❑ Metal connectors strengthen areas where posts and beams join. Nail and lag screw them on exposed framing in garages, basements, porches and patio covers.

Single Story House

When retrofitting, use at least ½ inch diameter bolts of such length (8 ½ inches is a good general size) as to result in an imbed of at least 6 inches in the concrete, and place them 4 to 6 feet (maximum) apart. For best results, place them 4 feet apart on center, and within 12 inches of the end of any sill plate section. Any single section of sill plate needs at least 2 bolts.

Two-Story House

When retrofitting, use at least 5/8 inch diameter bolts of such length (8 ½ inches is a good general size) as to result in an imbed of at least 6 inches in the concrete. The house size and weight dictate the bolt size. If in doubt, consult a professional engineer. For best results, place them 4 feet apart on center, and within 12 inches of the end of any sill plate section. Any single section of sill plate needs at least 2 bolts.

1. Layout bolt locations. For the typical one story house, use ½ inch diameter bolts at 4-6 feet on center.
2. Drill holes through existing sill into the concrete foundation for 8 ½ inch long expansion bolts, using carbide drill bits.
3. Use right angle drill for tight access places where the crawl space is low.
4. Blow all the dust out of the drilled holes using a rubber tube. Wear goggles and dust mask or respirator.
5. Insert expansion bolt with the washer and nut attached. Leave nut at top of bolt when tapping the bolt in place to protect the threads.

6. After tapping bolt in place, tighten the bolt by turning the nut. Do not over tighten or bolt will be damaged.

Mobile Homes

- Foundations need to be reinforced and the undercarriage of the home tied securely to the foundation. If not, the mobile home will be thrown off its foundation even during small tremors.
- Double wide mobile homes should be tied together. As the two units are of different weight, they will react differently and tend to pull apart.
- Add additional plywood to all pony/stem (cripple) walls in crawl space under house. Before installing plywood, check to be sure there are foundation bolts to secure the sill plate to the concrete foundation.
- If you can't afford to do all walls at one time, start with corners first, then do tallest (those with biggest dimension between foundation and floor joists) next. Do short sections last.

You can find all the forms for your Family Disaster Plan at www.freechurchforms.com to print and include in your notebook for handy reference.

You can find a great selection of [Emergency Survival Kits](#), [Emergency First Aid Kits](#), [Emergency Tools](#), [Non Hybrid Seeds Storage](#), and [Long Term Food Storage](#) at DisastersPreparedness.com.

If you can start this 12 Month Disasters Preparedness Plan today it will give you and your family a peace of mind knowing that you are working on getting prepared because you care.