



**Taking it one step
at a time.**

Non-Structural Mitigation

**Reducing the risks of damage
and injuries caused by
earthquakes**



Over 90% of post-earthquake damage is of a non-structural nature.

The greatest number of injuries during an earthquake are caused by falling objects.

Non-structural: Those portions of a building or facility and all their contents with the exception of those items that are part of the physical structure. In other words, everything except the columns, floors, beams, load-bearing walls, etc. Typical examples of non-structural elements of a building are: suspended ceilings, light fixtures, windows, doors, furniture, kitchen cabinets, computers, appliances, TVs, stereos, display cabinets, bookshelves, interior or exterior ornamentation, heating and air-conditioning equipment, electrical systems, etc.

Mitigation: Actions carried out before, during, and after an emergency or disaster which are intended to reduce or eliminate the degree of risk or vulnerability to hazards present in the area.

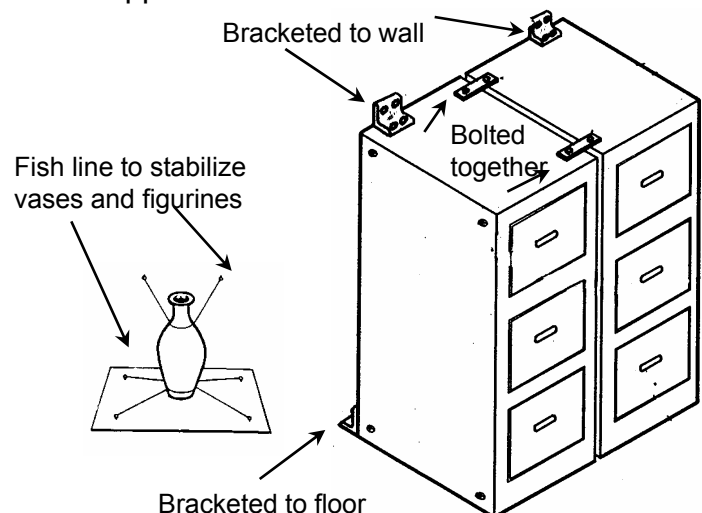
STEP 1 - Identify the Hazards: The first step in reducing the risk of non-structural damage is to do a hazard assessment. To do this, you need to determine which non-structural risks are present in your home or workplace and assess the threat those risks pose.

At home:

- Are there heavy and/or tall items in your home that may move or fall over during an earthquake?
 - ◆ If these items moved or fell, would they block exit routes out of a room or out of your house?
 - ◆ Can these items be secured to structural support (i.e., wall studs)?
- Are hanging plants and light fixtures secured to prevent them from swinging free, breaking against walls or furniture, or breaking windows?
- Are gas appliances securely fastened in place (e.g., water heater and clothes dryer) so they won't pull the gas line connections apart?
- Are wall-mounted objects (clocks, pictures, mirrors, etc.) secured against falling?
- Are items on shelves and in display cabinets secured to prevent them from falling out?
- Is your house securely fastened to its foundation?

At work:

- Are items on shelves and in cabinets secured to prevent them from falling out?
- Are there items that no longer serve a useful function that can be removed?
- Are there incompatible chemicals stored together that should be moved to prevent mixing if the containers should break?
- Are free-standing file cabinets, bookcases, and other tall pieces of furniture secured to structural support?

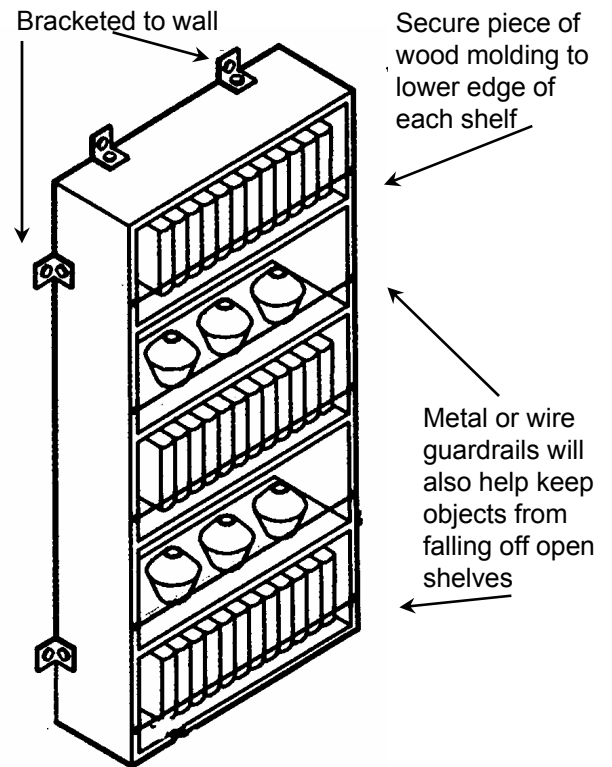


STEP 2 - Once you've identified the hazards...Make your plan.

- Identify which mitigation activities will reduce the risks of damage and injury the most.
- Determine which activities can be accomplished at little or no cost (i.e., securing bookcases to walls, closed hooks for pictures and mirrors)
- Determine the best method for correcting larger problems (retrofit, remodel, or incremental upgrades).
- In the future consider purchasing only items that are considered "seismic-resistant." For example, file cabinets with strong latches on the drawers and wall or floor attachments.
- Routinely check any protective measures you have already taken to see that they are still effective.

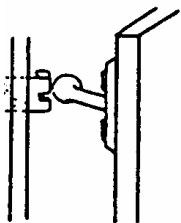
Mitigation Activities:

- Bolt heavy, tall, upright furniture to wall studs.
- Lock or remove rollers on beds, furniture, and appliances.
- Secure hanging plants and light fixtures with one or more guy wires to prevent swinging into walls or windows and breaking.
- Locate beds away from windows and heavy wall-mounted objects.
- Secure kitchen and bathroom cabinets with "positive" (self-closing) latches.
- Secure items on shelves with quake mats, Velcro™, low shelf barriers, or other restraining devices.
- Store heavy and/or breakable items on lower shelves.
- Strap water heater and all gas appliances to wall studs.
- Use flexible gas connections on gas appliances.
- Check chimney for loose bricks and repair as needed.
- Check foundation for cracks and repair as needed.
- Bolt home to foundation to prevent shifting during an earthquake.
- Secure mirrors and pictures to the walls or hang them with heavy wire looped through eye screws or tongue-in-groove hangers.
- For additional information on non-structural mitigation activities, contact your local Emergency Management Office.

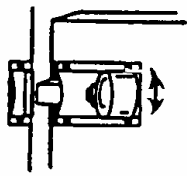


Types of positive catching latches for cabinets

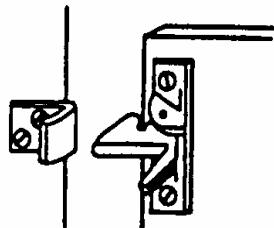
Child-proof
(out of sight,
inexpensive and
easy to install)



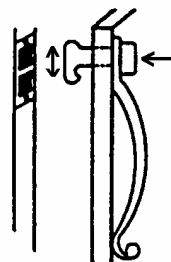
Decorative
(turn knob to
open)



Decorative
(pull back handle
to open)



Decorative
(press knob
to open)



Hook and Eye
(Suitable for Garage Cabinets)

Mirrors and Pictures

Closed hook/loop

mirror/
picture



2"X4"
wall stud

Sheetrock

For more information call (503) 649-8577 or visit our web site at www.tvfr.com