

**PACKET 4
NONSTRUCTURAL
HAZARD
IDENTIFICATION AND
REDUCTION**

OBJECTIVE

To identify and reduce nonstructural hazards at the school site.

Nonstructural hazards are caused by the furnishings and nonstructural elements of a building. Anything that does not actually hold the building up is nonstructural, including floors, ceilings, windows, and all furnishings. In California public schools nonstructural hazards represent the greatest threat to the safety of students and staff. Eliminating these hazards can reduce injuries *significantly*.

"Based on what I saw on my visits to schools in the [epicentral] area, there would have been numerous injuries from nonstructural hazards if the Loma Prieta earthquake had occurred during school hours."

Dennis Bellet
Code/Research Structural Engineer
Office of the State Architect

KEEP IN MIND

- * **Nonstructural hazards can often be very easy and inexpensive to fix.** Positioning furniture differently in the room, bolting heavy and tall furniture to the walls, and removing dangerous and heavy items from top shelves are all possible fixes.
- * **Use one or a combination of your teams (planning committee and maintenance team) to identify and reduce or eliminate the hazards.** You might also want to consider involving a parent group. Focus on those hazards that represent the greatest life safety threat, and those that are simple to fix. Work incrementally; don't let the problem overwhelm you.
- * **One of the more expensive nonstructural hazards is windows.** Shattered glass can be a significant problem even in moderate earthquakes. The earthquake in Coalinga sent glass shards flying across a library room (fortunately unoccupied at the time). Shatter-resistant films can be put on windows to prevent broken pieces from flying anywhere. A listing of the vendors who sell these films in the Bay Area is available by calling BAREPP, (415) 540-2713. The

larger the quantity of film you buy the lower the price; consider having your district investigate buying film for all its schools. Sometimes the vendors will let you install it yourself, thus reducing the price significantly.

"We had done some preparation. We had attached all cabinets and shelves to the wall, with angle brackets into studs so most of them withstood the quake [October 17th, 1989] quite well. . . it was only the rooms where they had not been attached or they were in the center where they fell over. Any cabinets or shelves taller than about three feet fell over."

Kenneth Simpkins, Superintendent
Loma Prieta Joint Elementary
School District
Los Gatos, CA

ACTIVITIES

1. Using the *Common Earthquake Hazards* checklist, have individual staff identify existing non-structural hazards in each area/room of the school.
2. For each identified hazard, note action needed to reduce or eliminate the hazard, assign responsibility, and note and/or research the cost involved, if any. Use the suggested procedures to reduce the hazards as a guide.
3. For the hazards identified above, set priorities for reduction. Develop a time frame for completion of each item.
4. Develop a system for periodic review of potential non-structural hazards and keep the hazard reduction program current.

"We saw the following types of furnishings cause the majority of problems [in the Loma Prieta earthquake]: pendant mounted light fixtures; four-drawer file cabinets; bookcases and library shelving."

Dennis Bellet
Code/Research Structural Engineer
Office of the State Architect

Note: A more comprehensive document on nonstructural hazards has recently been prepared jointly by BAREPP and the Office of the State Architect. It is titled *Identification and Reduction of Nonstructural Earthquake Hazards in California Schools*. Single copies are available at no charge by calling BAREPP, (415) 540-2713.

COMMON EARTHQUAKE HAZARDS and HAZARD REDUCTION PROCEDURES

- Objects on high shelves, (toys, paints, potted plants) that can fall or become projectiles
Remove toys, paints and other objects from high open shelves.
- Fluorescent light fixtures without safety wires and unattached light covers that may drop on people beneath them
Put light guards on fluorescent lights attached to the fixtures and make sure the fixtures are securely fastened to the structure above.
- Free-standing cabinets, bookcases, wall shelves and their contents that can fall on children
- Library bookshelves without anchorage/bracing or content restraint
Bolt bookcases and cabinets to wall studs and provide content restraints or latches. Secure adjustable shelves to prevent them from slipping forward.
Place lighter objects on top shelves and cabinets and heavier ones on the bottom (anchor all).
- Hanging plants, mobiles or pendulum light fixtures that may drop on children or swing into windows
Keep hanging plants and other free swinging objects far enough away from windows that they cannot swing into them or provide restraining device (45° swing distance minimum).
- Glass that may shatter (windows, mirrors)
Install shatter-proof glass windows or add plastic membrane to limit movement of fragments.
Replace glass objects with non-breakable items, such as replacing glass on a desk with a pad.
- Pianos or other heavy objects on rollers
Secure pianos so that they will not slide or roll easily.
- TV monitors that may fall from platforms, computers not fastened to work stations
Place TV monitors on table or shelf. Secure monitors and computer hardware with hook and loop materials or bolt to desk/tabletop.

COMMON EARTHQUAKE HAZARDS (cont.)

- Cabinets without door latches or restrained shelves
- Cabinet drawers without latches
Put latches on cabinets (drawers and doors) and restraints on shelving.
- Shelving without a lip or restraining wire to prevent paint or chemicals from falling
Put lips or restraining wire on open shelving to prevent objects from falling.
- Objects that restrict people from moving to a safe place (books on the floor, broken glass, tables and desks in hallways, stored items)
Relocate objects that may restrict movement to safety, such as desks or tables stored in hallways.
- Aquariums that are not secured to the building's structure
Place aquarium on floor, if possible. Restrain tank with heavy duty angle clips bolted to the floor. If on table, restrain tank to table (as above) and bolt table to floor.
- Wall-mounted objects, such as maps, bulletin boards, clocks and chalk boards that are not securely bolted may become projectiles
Bolt maps, chalkboards, and wall decorations to wall (anchor to structure, not finishes).
- Suspended ceiling tiles and runners
Secure runners to structural ceiling with heavy gage wire attached diagonally
- Air-conditioning registers without safety wires
Attach register to building structure with safety wire
- Unbraced water heaters
Bolt water heater to floor or secure to wall structure
- Ruptured gas or water lines; downed electrical lines
Instruct staff in procedures for turning off gas, water and electricity. Put tools in a place where they will be accessible in emergencies.

OBJECTIVE

To identify and obtain the medical supplies, tools and equipment, water, and food needed in order to care for children and staff after an earthquake.

After a damaging earthquake, it may not be possible to leave your school. It also may not be possible for emergency responders to get to your building. You may spend **72 hours or longer** on the premises, without any material help from outsiders.

Stocking supplies--first aid kits, water, tools, and food--in a secure place is therefore an important part of your preparedness plan. Assuring that those supplies are fresh and up-to-date is also crucial. It is a good idea to keep inventories of supplies and written records of where they are.

It works well to assign the procurement, storage, and maintenance of specific supplies to the teams with those particular responsibilities after the earthquake. An example of such an assignment system is in this packet.

"We had no power, no water [after October 17th, 1989 earthquake]. The metal [water] storage tank rocked back and forth, broke all the fittings, ruptured; we lost our storage. Of course the pump wouldn't work because it's electric; the well wouldn't work because it's electric; we couldn't flush toilets because we didn't have any water, and we have a septic tank pump station which is electric so we couldn't pump sewage anyway. The water lines all broke, almost at every connection, the sewer lines broke, the gas lines broke. We were in big trouble."

Kenneth Simpkins, Superintendent
Loma Prieta Joint Elementary
School District
Los Gatos, CA

KEEP IN MIND

- * You don't have to get *everything*, but try for the very necessary basic supplies listed below:
 - ✓ adequate first aid supplies
 - ✓ flashlights and extra batteries
 - ✓ extra fire extinguishers
 - ✓ emergency search and rescue tools
 - ✓ battery-powered radios and extra batteries
 - ✓ enough liquids for all the people in the building
 - ✓ space blankets, heavy duty plastic bags, or regular blankets
 - ✓ sanitation supplies
 - ✓ useful non-prescription drugs
- * You don't have to get everything *at once*; try to accumulate supplies incrementally.
- * Your priorities in acquiring supplies should correspond to which ones will be most important immediately after the earthquake and as time goes on. For example, first aid is more important than water, and water is more important than food.

"I think some basic storage of emergency supplies is *absolutely* necessary, because regardless of where the school is located, things can happen. And, in addition, an auxiliary generator, flashlights, a communications system are key things."

Kenneth Simpkins, Superintendent
Loma Prieta Joint Elementary
School District
Los Gatos, CA

ACTIVITIES

1. Using the master list of *Equipment/Supplies by Committee*, determine which supplies are the most critical, decide on needed quantities, estimate costs.
2. Using *Basic School Supplies and Suggested Emergency Supplies and Equipment*, have each team meet and develop a plan for acquiring what is necessary. Assign particular procurement and storage responsibilities to team members.

3. Develop a schedule for each team to follow in a) acquiring the supplies, b) finding appropriate storage space for them, c) checking and replenishing them periodically.

4. Using the recommendations in *Storing Foods*, have every student bring in his or her own earthquake kit containing such foods as fruit leathers, granola bars, and canned juices. These kits can be stored in each classroom and could come in handy after an earthquake when organized food provision has not yet gotten underway.

EQUIPMENT/SUPPLIES BY COMMITTEE

A. Planning Committee:

- Emergency Preparedness Plan
- Evacuation Plan
- Supply Storage Map

- Crowbars and fire axes
- Shovels and ropes
- Gloves, goggles, and face masks
- Hard hats

B. Administrator/EOC:

- Roster of students & employees
- Emergency assignment list
- Map of facility/school
- Evacuation Plan
- Clipboard
- Walkie-talkie
- Bullhorn
- Battery-operated radio and batteries
- Paper and writing implements

F. Site Security Team:

- Map of facility/school
- Evacuation Plan
- Master keys
- Walkie-talkies
- Signs to post and writing implements
- Identification badge or armband

C. Teachers:

- Class roster--up to date
- Emergency kit--complete

G. Fire Safety Team:

- Fire extinguishers (CO2, water, and A,B,C type)
- Gloves
- Shovels and axes
- Walkie-talkie

D. First Aid Team:

- Health cards on each student & employee
- Emergency cards
- First aid supplies
- First aid equipment (blankets, stretchers)
- Flashlights
- Paper and writing implements
- Clipboard
- Evacuation Plan
- Identification badge or armband

H. Evacuation Team:

- Master keys
- Evacuation Plan
- Map of facility
- Employee/student roster
- Bullhorns
- Walkie-talkie
- Signs to post and writing implements

E. Search and Rescue Team:

- Roster of employees/students
- Map of facility/school
- Fire extinguishers
- Flashlights
- Walkie-talkies
- Master keys and bolt cutters

I. Maintenance Team:

- Facility map--showing utility connections
- Tools for shutoff of utilities
- Fire extinguishers
- Evacuation Plan
- Supply storage map
- Sanitation supplies
- Paper and writing implements
- Food and water

adapted from Los Angeles Unified School District Emergency Organization Plan, 1986.

SUGGESTED EMERGENCY SUPPLIES AND EQUIPMENT

First Aid Supplies:

Each school site should provide all supplies included in the recommended list of first aid supplies. There should be a first aid kit for each classroom that can be used for day-to-day needs as well as earthquake emergencies.

Disaster Medical Supplies:

Additional medical supplies should be provided for use in disasters only. Disaster medical supplies can be specially packaged in units to be used when necessary in an emergency. The earthquake supplies should **not** be used for day-to-day needs. The disaster supplies should be packaged in units to serve students as follows:

Enrollment: 1-750	1 kit
Enrollment: 751-1500	2 kits

Non-Medical Emergency Supplies and Equipment:

In addition to medical supplies, schools should also have available a number of other tools, supplies, and equipment (see list).

CLASSROOM EMERGENCY KITS (one per room)

- Class roster--updated each semester and as needed
- List of disaster procedures
- Pen, small notebook, and marker pens
- Adhesive tape
- Non-aspirin tablets and chewables
- Liquid and waterless soap
- Band-aids
- Compresses--sanitary pads, diapers
- Gauze pads, bandages--including one triangle bandage
- Pre-moistened towelettes or baby wipes
- Safety pins
- Tissues
- Scissors
- Tweezers
- Space blanket
- Light stick or flashlight with batteries
- Quart of water in plastic container (three drops of clorox)

adapted from San Francisco Unified School District, Emergency Operations Plan, 1988.

MEDICAL SUPPLY KIT (for 750 people)

- 3 Alcohol Pre. Pads
- 25 Alcohol, Iso Rubbing, pt.
- 1 Ammonia Inhalant 10s
- 1 Applicator, Sterile, 3"
- 1 Baking Soda
- 1 Bandage Scissors, 7-1/4"
- 1 Bandages, Adhesive, asstd.
- 1 Bandages, Elastic, 3"
- 10 Bandages, Elastic, 6"
- ~~10 Bandages, Four-Tail~~
- 10 Bandages, Triangular
- 3 Chlorinating Agent, 100s
- 1 Diapers--disposable, package
- 10 Eye Droppers
- 3 Eye Patches, Sterile
- 20 Facial Tissue--packets
- 1 Flashlights w/Batteries
- 20 Gauze Pads, Sterile, 4" X 4"
- 10 Gauze, Improved, 1"
- 2 Gauze, Improved, 4"
- 1 Non-aspirin tablets and chewables
- 1 Paper Towels--package
- 1 Plastic Bags--package
- 20 Plastic Wrap--lg. roll
- 1 Resuscitubes, 1-Adult, 1-Child
- 2 Safety Pins--packages
- 1 Salt, 1 lb.
- 2 Sanitary Napkins--boxes
- 1 Sheets
- 1 Soap--liquid and waterless
- 10 Splints, Cardboard, 18"
- 3 Splints, Cardboard, 24"
- 1 Stretchers
- 24 Tape, Paper Adhesive, 1" X 10 yds.
- 1 Tape, Paper Adhesive, 1/2" X 10 yds.
- 2 Tape, Paper Adhesive, 2" X 10 yds.
- 1 Tongue Depressors
- 10 Tweezers, Sq. Tip
- 1 Vaseline--jar
- 1 Water, Sterile, 5 gal. plastic

*See
changes
in TR*

keep fresh

* Inventory and Replace Missing Items Every 6 Months *

adapted from San Francisco Unified School District, Emergency Operations Plan, 1988.

NON-MEDICAL EMERGENCY SUPPLIES AND EQUIPMENT
(school-wide)

- Axes
- Space blankets
- Bullhorn, battery operated, extra batteries
- Can Opener, manual
- Coleman lantern and fuel
- Crowbars
- Cups, paper or plastic
- Fire extinguishers
- Flashlights with extra batteries
- Hammers
- Hardhats
- Hoses for fire-fighting and siphoning
- Knives, heavy duty
- Light sticks
- Masking tape
- Matches with wax-protected tips
- Pails
- Picks
- Plastic garbage bags--heavy duty (2 per child for warmth or rain protection, and sanitation)
- Plastic sheeting, black, 4 foot wide x 100 ft. long agricultural quality (for rain protection or privacy screening)
- Plastic water containers--four 55-gallon
- Rope, nylon
- Saws, hand
- Screwdrivers
- Shovels
- Stretcher
- String
- Tarps, drop cloths
- Toilet paper
- Transistor radio, AM-FM, battery operated, extra batteries
- Walkie-talkies, hand-held with extra batteries
- Window poles for stretchers and sanitary facility screen holders
- Wire
- Wire cutters
- Wrenches

adapted from San Francisco Unified School District, Emergency Operations Plan, 1988.

BASIC SUPPLIES TO STORE

I. Essential Shelter Supplies

- ◆ First aid kits, first aid textbooks
- ◆ Battery-powered flashlights (lanterns) and radios
- ◆ Emergency generator(s)
- ◆ Sanitary supplies--waterproof plastic bags and ties for when toilets are inoperable, toilet paper, feminine hygiene supplies
- ◆ Blankets--space or regular
- ◆ Cots or alternatives such as mats, rugs, inflatable mattresses
- ◆ Cleaning equipment such as brooms, trash cans, large & small plastic bags, soap, paper towels, buckets, disinfectant
- ◆ Shelter identification--so it can be recognized and used

II. Water for Three Days (minimum)

One-gallon bottles filled to the top with fresh water and eight drops of chlorine disinfectant (sold commercially), or five-gallon sterile, sealed containers.

Needs: 1 quart drinking water per person per day
 5 gallons all-purpose water per person per day

Note: Hot water tanks and toilet tanks contain some emergency water.

III. Food Supplies for Three Days (minimum)

A. Suggested canned foods:

Luncheon meat, ham, nuts, fruits, fruit juices, vegetables, refried beans, date-nut rolls, soft drinks, .

B. Suggested dry foods:

Cereals, peanut butter, crackers, freeze-dried foods, granola or energy bars, dehydrated potatoes, instant coffee, tea, milk powder, sugar, candy, powdered fruit juice mixes, soup and boullion mixes.

C. Suggested equipment and supplies for food service:

Can openers (non-electric)
 Pots, pans, serving utensils
 Coffee pots
 Paper cups, plates, bowls, napkins, towels
 Plastic utensils
 Serving trays
 Camp stoves or hibachis, *and* fuel*
 Matches

*Refer to your *Fire Code* on fuel storage. Provide adequate ventilation with any barbeque or hibachi fire.

STORING FOODS AND WATER

WATER

Water for drinking is the most important. Cooking, bathing, and washing take additional water.

You already have some water stored. The hot water heaters are full of water. Ice cubes can be melted. If your toilets have holding tanks, and there are no chemicals in them, there are a few gallons of water that can be used. Do not flush toilets until you know the state of the sewers and the water availability.

Water can be safely stored in one-gallon plastic jugs. Use bleach containers as they are emptied. Don't rinse them out since the remaining bleach acts as a purifier. Change this water every six months and date the bottles. You can also purchase five-gallon, sterile and sealed containers.

If you have water pressure after a quake, start running some water into additional containers. It can be stored and used for bathing and washing. It should be purified for drinking because the water from taps after a quake may be contaminated.

■ How To Purify Water:

Boiling: Boil vigorously for 1 to 3 minutes. To improve taste, pour from one container to another several times.

Purification Tablets: Available at any drug store. Follow directions on package.

Bleach Purification: Liquid household bleach can also be used. It must contain hypochlorite, preferably 5.25%. Add according to table below then stir and mix.

Amount of Water	Clear Water	Cloudy Water
1 quart	2 drops	4 drops
1 gallon	8 drops	16 drops
5 gallons	1/2 tsp.	1 tsp.

FOOD

■ If you do *not* have a cafeteria in your school:

Have each student bring an earthquake kit to their classroom. Each kit should have such things as granola bars, cans of juice, packages of dried fruit--items that have a long storage life and are not easily squished. The amount of food should be sufficient to quell their hunger pains for 72 hours. These kits can all be stored in a big plastic trash can in the classroom. At the

end of the school year, throw a party to celebrate no earthquakes and let the students eat what was in their kits.

■ **If you *do* have a cafeteria:**

Make sure you date and rotate your food supplies so that they do not get old.

After an earthquake, use the food in the refrigerator and freezer first. Although the quake itself may not interrupt power, aftershocks or fires or shortages elsewhere could cause loss of electric current.

When opening cans of fruits or vegetables, do not throw away the liquid in which they are packed. This is another source of liquid if there is a water shortage.

Do not drink or eat anything from open containers near shattered glass. Strain suspected liquids through a clean handkerchief.

■ **Food types already on hand that can be used:**

★ see *Basic Supplies to Store* list

adapted from American Red Cross, Safety and Survival in an Earthquake, 1986.

OBJECTIVE

To train students and staff, and to test the various elements of your response plan in order to evaluate it and revise it.

During a damaging earthquake, life-protecting actions must be taken immediately. There will not be time to decide what to do next; everyone **must already know** how to react appropriately. After an earthquake, further life-protecting actions such as emergency evacuation or first aid administration may be necessary; well-trained staff and students will guarantee that these crucial steps are taken as quickly as possible.

Earthquake drills and exercises are an extremely important part of your preparedness plan because they 1) **teach** students, staff, and parents how to respond to the complications of an actual earthquake, and 2) help you **evaluate** how well all parts of your emergency plan work together, and how well your staff and students have been trained.

"I think drills are one of the most important parts of an earthquake plan. They allow you to see how well things operate and to correct any problems. When an earthquake happens it is too late to discover that parts of your plan may not work."

Ron Staley
Earthquake Preparedness Program Coordinator
Pajaro Valley Unified School District
Watsonville, CA

KEEP IN MIND

- ❁ Plans are of **ABSOLUTELY NO USE** if they aren't **known** to everyone: students, staff, parents.

- * Plans **must be exercised** periodically to refresh memories and educate newcomers.
- * The preliminaries to, and components of, earthquake drills are:
 - Understanding of earthquake dynamics and potential damages-- Pictures and tapes illustrating damages are useful in educating students and staff; both structural and nonstructural (glass, bookcases, ceiling tiles, light fixtures) damages should be discussed
 - Demonstrations of ways to:
 - duck, cover and hold
 - protect head and body if no cover available
 - deal with resultant hazards (fire, injuries)
 - evacuate the building
 - Discussions of response plan goals and design-- If all students and staff know why they are taking a particular step, they are more apt to do it with speed and commitment
 - Tests of parts of the plan--duck and cover drills, for example
 - Full-scale earthquake response exercise--once or twice a year
 - Evaluation of the drills and exercises--you will learn something from every drill or exercise, so make sure your plans get changed to reflect the wisdom of experience
- * You must construct your own drills to take into account the **particular** circumstances in your school, with your students and personnel.

ACTIVITIES

1. Teachers--Plan and carry out drills in your own classroom. Those presented in *Duck and Cover Scenario* and *Suggested Activities and Drills* are good examples of the kinds of activities that are helpful.
2. Administrators--Use the suggestions in *Drill Preparations* and *Checklist for Developing an Evacuation Plan* to determine what steps need to be taken and in what order.

3. Following the suggestions in *Drill Preparations*, develop a scenario that will test the various parts of your response plan. Utilize aspects presented in the attached *Duck and Cover Scenario, Suggested Activities and Drills*, and the *Evacuation Checklist*.
4. Test the total emergency response plan as a "walk through" exercise, with each team discussing its individual responsibilities. Use the *Team Tasks Checklist* and *Drill Evaluation Form* to assess the drill and adjust it.
5. Test your plan in a total simulation drill using the scenario you have developed. Request evaluation assistance from your local fire department, office of emergency services, or school district office.

"We had many parents tell us afterwards [after October 17, 1989], that their children were telling them what to do--get under a table, duck and cover, stay down. The children were actually able to reassure the parents because they had been trained. In fact the children had been trained well enough that they knew it was important to turn off the gas, water and electricity, and they were telling their parents to do so."

Ron Staley
Earthquake Preparedness Program Coordinator
Pajaro Valley Unified School District
Watsonville, CA

DRILL PREPARATIONS FOR PLANNERS AND/OR ADMINISTRATORS

- 1) After constituting special teams to deal with emergency response and preparations (see Packet 3), hold a special meeting with each team to discuss its responsibilities and recommended preparations:
 - Planning--oversee whole process
 - Administrator/EOC--coordinate response
 - Teachers--deal with students (determine which teachers, if any, will be relieved of classroom duties to serve on other teams)
 - First Aid--maintaining medical kits and knowing procedures
 - Search and Rescue--maintaining tools and knowing procedures
 - Site Security--direct police, medical, and fire personnel to places within building; close off building if necessary
 - Fire Safety--special fire patrol; gas shutoff; maintain equipment
 - Evacuation--assess situation in evacuation area and organize evacuation to it
 - Maintenance--maintain food and water supplies, sanitation supplies, shelter provisions
 - Other special teams--for example, bus drivers or counselors

- 2) Discuss with all teams the plan's overall goals and purposes:
 - a) Let the purpose of each part of the emergency plan (preparedness, emergency response, evacuation) determine what a specific drill's goals should be
 - b) Decide which kinds of drills can best test the goals
 - c) List five main objectives of each drill (for ex: reaction time, coordination, communication, training)
 - d) Decide criteria for success and/or revision of plan's parts

- 3) Explain the different kinds of drills and their goals:
 - a) Duck, cover and hold--in which *everybody* gets under a desk or table for 60 seconds and holds on to it
 - b) Evacuation--in which only that response is tested
 - c) "Walk through"--in which actions and responsibilities of each team are discussed by all and coordinated
 - d) "Shock"--in which first aid response to injuries is tested
 - e) Full-Scale--actual field test of a complete plan during a simulated earthquake

- 4) Discuss and determine procedures for evacuating building:
 - ❑ see the ***Checklist for Developing and Evaluating an Evacuation Plan*** (next page)

- 5) Plan for the unexpected--generate alternative procedures for each of your steps:
 - ❖ Key personnel get injured or killed
 - ❖ Power fails
 - ❖ Water pumps stop or water lines break
 - ❖ Evacuation routes get blocked
 - ❖ Aftershocks further damage precarious structures or nonstructural elements
 - ❖ There could be fire
 - ❖ Injured people can't move
 - ❖ Communications equipment doesn't work
 - ❖ The earthquake hits while students are on buses

- 6) Build evaluation into your procedures. Specify all the goals you want to accomplish and then give yourself a checklist (or use the ***Team Tasks Checklist***) so you can assess the drill and change areas that need improvement

CHECKLIST FOR DEVELOPING AND EVALUATING AN EVACUATION PLAN

- A. **Organization**--provision is made, and responsibility assigned, for the following functions:
- Determining optimum evacuation routes--*can* be the same as fire route, but need not be
 - Informing everyone in the building about the evacuation routes and area
 - Assessing the safety of the emergency assembly area
 - Clearing the evacuation route or designating another
 - Ordering evacuation
 - Communicating order to others
 - Assisting in evacuation
 - Helping disabled persons
 - Accounting for all students and staff
 - Shutting down utilities and equipment
 - Securing the facility and presiding over the release of students
 - Keeping records of decisions made and students released
 - Announcing facility reentry or another plan
- B. **Emergency Situation**--during an earthquake, everybody does only one thing:
DUCK, COVER AND HOLD
- C. **Evacuation Orders**--consideration must be given to the following:
- Evacuation should *never* be automatic
 - You should draw up criteria to help determine when *not* to evacuate
 - There are degrees of evacuation--know when each is called for:
 - ___partial
 - ___complete
 - Procedures for communicating the order should be clear to everyone
 - Ways to communicate other information back to EOC should also be clear
- D. **Evacuation Process**--the following must be done:
- All areas searched and all people accounted for
 - Evacuation route and area checked out
 - Determination made that evacuation is definitely indicated
 - Evacuation instructions developed and communicated
 - All able-bodied students and staff evacuated

- All disabled students and staff helped by someone

E. Assembly and Accountability--you must have a system and team to:

- Account for everyone
- Report roll call results to EOC
- Determine who is in most need of medical aid
- Communicate first aid and rescue needs to internal and external medical and rescue crews

F. Securing the Facility--there should be a system and team for:

- Checking the safety of the facility
- Reporting all findings to EOC
- Closing all but one door of the school
- Monitoring release of students to parents or others
- Liaison with outside helping agencies

G. Conclusion of Evacuation--you must have system for deciding to:

- Terminate the evacuation order
- Coordinate a return to the facility **OR**
- Issue an order to release all the children as soon as possible (or transfer them to an alternative site and leave the grounds completely)

DUCK, COVER, AND HOLD SCENARIO

To set the scene for a duck and cover drill, the teacher reads this to the class. The class members do what is called for by the teacher as he or she reads. The class knows how to take cover because they have seen the illustrated directions.

Imagine that you hear a low, rumbling or roaring sound. The noise builds, getting louder and louder, for about ten seconds. Then WHAM! there's a terrific jolt. You feel like someone suddenly slammed on the brakes in the car, or like a truck just rammed into the side of the building.

You hear someone say, "EARTHQUAKE, DROP AND COVER!" The floor seems to be moving beneath you. It's hard to stand up, or even stay in your seat.

You take cover under your desk as quickly and quietly as possible. You listen very carefully to what the teacher is saying.

The shaking and commotion can last as long as 60 seconds. We'll have a timer person count off the seconds for as long as the earthquake shaking lasts [*The timer begins counting softly*].

The building is creaking and rattling. Books are falling from the bookcase. Hanging light fixtures and plants are swaying. Suddenly a pot falls to the floor and smashes. A windowpane shatters and glass flies to the floor. Your desk begins to slide a little too.

Be sure to stay in the covered position under your desk and hold on to the legs so that the desk cannot slide away from you.

You hear noises outside. Dogs are barking, cats are meowing, a baby is crying. People are shouting and screaming. The shaking is making some distant church bells ring. You hear crashing sounds from brick chimneys and other loose building parts falling to the ground. Trees are swaying and scraping against each other or buildings.

Back inside the room pictures are swaying on their nails and crashing to the floor. Drawers in filing cabinets and desks are sliding open and flying across the room. The light fixtures have just crashed to the floor.

The door is swinging back and forth on its hinges. BANG! it slams shut. Then there's silence. The shaking stops and the room grows quiet [*The timer can stop counting now*].

"Please, everyone, GET BACK IN YOUR SEATS." It is important to sit quietly now and wait for instructions about what to do next. If it is safe to leave the building and evacuation is ordered by the principal, I will lead you outside to a safe space. Prepare to take cover again at any second if an aftershock strikes and the shaking starts again.

Look around and see if everyone around you is OK or if anyone seems to be hurt. Tell me if anyone is hurt.

adapted from Environmental Volunteers, Hands-On Learning Package, 1983.

SUGGESTED ACTIVITIES AND DRILLS FOR TEACHERS

I. Drop and Cover Drill

Review classroom earthquake drill procedures with students, and have them practice the drop, cover and hold routine illustrated in the reproducible master. You may do the drill with or without the simulation script.

II. Evacuation Drill

Walk the class through the regular fire drill route to an open area outdoors. Ask students to make mental notes, as they go along, of things that might become hazards during an earthquake. When you reach the designated site, talk about what they noticed or hazards they thought of. A list of such hazards is below:

- ◆ power failure (is there emergency lighting?)
- ◆ halls or stairways cluttered with debris--ceiling tiles or plaster from walls
- ◆ halls blocked by fallen lockers or trophy cabinets
- ◆ smoke in the hallway
- ◆ exit doors and windows that jam and will not open
- ◆ aftershocks could hit while they're evacuating (in which case, students drop and cover where they are)
- ◆ bricks, glass, and debris piled up outside electrical wires on the ground

When you return to the classroom, discuss with the students how the hazards could be reduced, and/or how they could cope with them if they happened.

III. Safety Considerations

Explain to the class that if there is a strong earthquake, each student's first responsibility is for her or his personal safety. Every student should learn, however, how to help someone else who is injured. Present some "what if" questions to provoke discussion.

- ◆ What if the teacher is injured?
- ◆ What if a student is cut by shattered glass and is bleeding?
- ◆ What if someone is hit by a falling light fixture or heavy object and knocked out?
- ◆ What if a student is very upset by the earthquake?

IV. Emotional Considerations

Lead a discussion with the students about the reactions they may have to an earthquake. Mention that it is normal to feel very frightened, worried, or even physically sick. Some people respond to the fear by crying, and some by laughing. Have the students talk about what they can do after an earthquake to help themselves and their classmates feel less scared and worried.

It may take a long time for parents or caretakers to get to the school, so everyone should be prepared to wait patiently. Students may be very concerned about their parents or siblings; they may in fact be "worried sick." Have students discuss what they can do to help each other pass the time and not worry so much. Point out that if their family has made an earthquake plan, they will have a better idea of what to expect from each family member.

V. Teacher Reminders

A. Duck and Cover

- take cover yourself
- talk calmly to the students
- stay covered at least 60 seconds
- give instructions for what to do after the shaking stops

B. When No Cover is Available

- Move to an inside wall
- Kneel next to wall, facing away from windows
- Cover head and neck with hands and elbows; if coats are available, cover heads with them to protect from glass

C. When Outside

- stay outside
- take cover in an open area away from falling hazards
- talk calmly and give instructions

D. If in Bus or Car

- Driver should stop as quickly as possible
- Park away from buildings, highway overpasses, power poles, trees
- Passengers should stay in vehicle and duck and cover as well as possible there

adapted from Federal Emergency Management Agency, Tremor Troop: Earthquakes, October 1988.

F. Site Security Team

- were all equipment and records ready and easily located?
- were all external gates and doors locked?
- was one team member stationed at the main gate/
front door to deal with parents/community?
- were fire, police, medical, and rescue sent to
areas where they were needed?
- was the EOC constantly informed about what was going on?
- were children released only to approved parties?

G. Fire Safety

- was equipment ready and easily located?
- was a systematic search for fires undertaken?
- were fires reported to EOC and Site Security?
- were all fires controlled?
- were staff or students at risk rescued?
- were dangerous areas secured?

H. Evacuation Team

- plans for designated emergency assembly area were current?
- emergency assembly was checked to determine its safety?
- were findings communicated to the EOC?
- were necessary supplies up to date and easily located?
- assisted in evacuation process?
- took roll call and reported status of all groups to EOC?
- supervised group in the assembly area for the duration?

I. Maintenance Staff

- was all equipment complete and easily located?
- checked utilities immediately and minimized any danger?
- checked sanitation system and determined damages
- reported all findings to the EOC?
- inventoried supplies available to feed students and staff?
- took whatever steps necessary to establish alternate sanitation
provisions?

J. Special Teams

- did bus drivers follow correct procedures if they had children
on the bus?
- did counselors begin quickly to calm any distressed students
and/or staff?

*adapted from City of San Jose, Office of Emergency Services, Facility Evacuation Plan for
Business and Industry, n.d.*