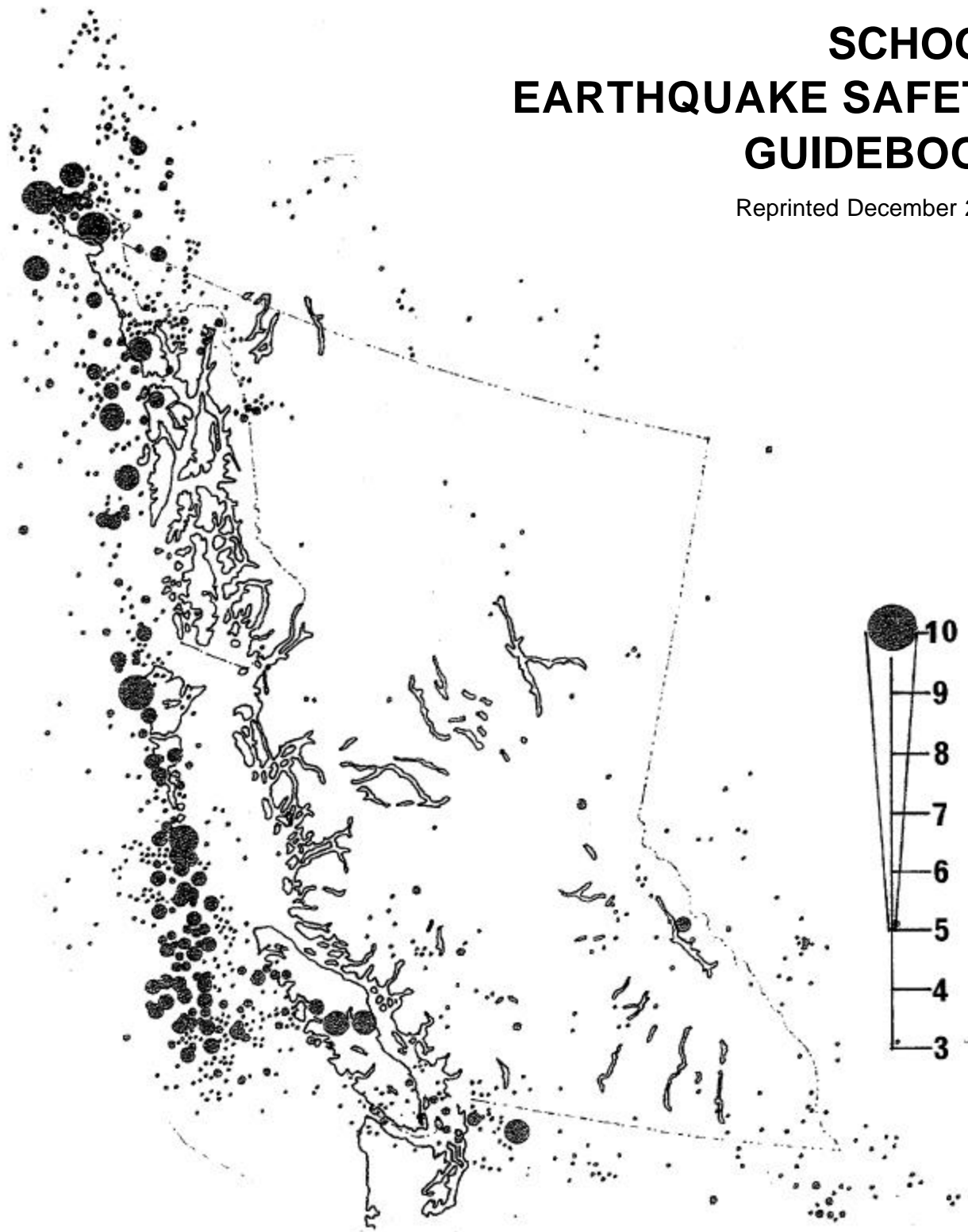


# SCHOOL EARTHQUAKE SAFETY GUIDEBOOK

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## INTRODUCTION

The first indication of an earthquake may be a sudden violent jolt and a shaking and moving of objects.

Earthquakes have shaken British Columbia since the time of Indian legend. Southwest B.C. is in a dynamic geological setting called a subduction zone, similar to that in western Mexico. Continuous movement of the earth's plates in this region builds up stresses that result in earthquakes. Small tremors actually occur daily, but periodically the movement becomes dangerously large. Although the risk is highest in the coastal region, earthquakes can and do occur anywhere in B.C. In 1918, a magnitude 6.0 earthquake occurred north of Revelstoke; and in 1986, a magnitude 5.5 earthquake caused minor damage in communities just east of Prince George.

Earthquakes are a particular concern for schools with their large concentrations of children in confined spaces.

In 1946, an earthquake of 7.3 magnitude caused serious damage in Courtenay on Vancouver Island. Thirty schools in Courtenay school district were damaged; fortunately, it was Sunday morning and the buildings were empty. In 1949, a magnitude 7.0 earthquake just south of the border in Seattle damaged 30 schools of which ten were afterwards condemned and closed. Again in Seattle, in 1965, a magnitude 6.5 earthquake caused damage to eight schools.

The purpose of this guidebook is to assist school district staff, teachers, parents, and students to make their schools safer, and to know what to do before and after an earthquake occurs in their area.

## **SAFETY PROGRAM**

It is recommended that an earthquake safety program be established and maintained in every school district. To organize this program, each school board should form an Earthquake Safety Committee.

Members could include:

- school principals
- district maintenance staff
- teachers
- parents (PAC)
- trustees
- senior grade students.

The committee may also recruit experts from the community, either as committee members or as resource persons; for example:

- local fire
- police and emergency officials
- Red Cross or St. John's Ambulance personnel
- geologists
- structural engineers
- geophysicists
- doctors
- municipal building inspectors
- communications experts, such as local radio or newspaper people, and ham radio operators.

The first task for the committee should be to define its main objectives; for example:

- initiating earthquake drills in the schools
- initiating hazard reduction procedures
- preparing a response plan
- establishing a communications plan.

Guidelines on how to achieve these objectives are contained in this guidebook.

After having defined its objectives, the district committee may delegate tasks to individual school principals or district staff; for example:

- implementation of earthquake drills
- introduction of staff training programs
- identification and correction of hazards
- preparation of local response plan
- preparation of local communications plan.

Local school responsibilities can either be undertaken by the principal personally, or delegated to a school working group, comprising perhaps an administrator, a teacher, a parent, and a senior grade student.

## EARTHQUAKE DRILLS

Earthquakes happen with no warning; therefore, life-protecting actions must be taken at the first indication of ground shaking. Even in the most severe earthquakes, buildings rarely collapse completely. Injury and even death are most often caused by the shattering and falling of non-structural elements, such as window glass, ceiling plaster, lighting fixtures, chimneys, roof tiles, and signs. There will be no time to think what to do; therefore, of all earthquake-preparedness measures, **EARTHQUAKE DRILLS ARE THE MOST IMPORTANT.**

Regular earthquake evacuation drills should occur separately from, but with the same frequency, as fire drills. Drills should regularly simulate emergencies such as jammed doors, and blocked hallways and stairways.

### Drills

The following are recommended drill procedures for a teacher and class of students:

- TAKE COVER under desks or tables
- FACE AWAY from windows
- ASSUME "CRASH" POSITION on knees, head down, hands clasped on back of neck or head covered with book or jacket
- COUNT ALOUD to 60 -- earthquakes rarely last longer than 60 seconds and counting is calming.

The teacher should:

- issue the "take cover" order
- also take cover for 60 seconds
- review evacuation procedures.

If the teacher is injured, two student monitors should have designated authority to give instructions.

In other areas of the school, at the first sign of an earthquake, occupants should:

- move away from windows, shelves and heavy objects that may fall
- take cover under a table or desk, in a corner or doorway
- in halls, stairways and other areas where no cover is available, move to an interior wall; kneel with back to wall; place head close to knees; clasp hands behind neck; and cover side of head with arms
- in the library, move away from where books and bookshelves may fall and take cover
- stay inside -- usually the most dangerous place is just outside where building debris may fall; exit only after shaking has stopped
- in science laboratories, extinguish all burners, if possible, before taking cover; stay away from hazardous chemicals that may spill
- in other areas, such as gymnasiums, auditoriums, music rooms, and industrial education shops, the district or school committee should prepare appropriate guidelines based on the above.



Simulation exercises should occur outdoors as well as inside the school. Students and teachers should move to an open space away from buildings and overhead power lines; lie down or crouch because legs will be unsteady; and look around to be aware of dangers that may require movement.

On the school bus, the driver should stop the bus away from power lines, bridges, buildings, and overpasses; occupants should remove heavy objects from overhead racks, stay in seats, and hold on to the seat in front.

Indoors or outdoors, TAKE ACTION AT THE FIRST INDICATION OF AN EARTHQUAKE. After an earthquake, building evacuation should occur as soon as possible, due to the possibility of aftershocks, building collapse, fires, and explosions.

Students should:

- EVACUATE the building in single file when instructed by the teacher or monitor
- KEEP CALM
- WEAR SHOES
- DO NOT USE an elevator.

Teachers should:

- INSTRUCT students to evacuate when all shaking has stopped
- LEAD class to the designated assembly area
- BE PREPARED to choose alternative escape route in case of fire or exit blockage
- TAKE class list, I.D. tags, first aid kit
- APPLY I.D. information to all primary and injured students
- GIVE FIRST AID, if necessary
- DO NOT RE-ENTER the building unless instructed by the principal.

Copies of the standard drill procedures should be given to each teacher to implement in the classroom. In fact, an earthquake may not occur during the childhood of the students. However, the earthquake safety lessons they learn will stay with them and be useful in adulthood, both for themselves and to pass on to their children. Handicapped students should participate.

### **Discussions and Projects**

Earthquake drills should be preceded by classroom discussions. These should be about the need for and purpose of drills. Teachers should dispel myths, such as "The earth will open up and swallow you." The contents of this guidebook may be used to explain what to expect, what to do, and why.

The noises of building movement, windows breaking, and objects falling, that accompany an earthquake, can cause emotional stress and panic. Students should be prepared for this by classroom discussion.

Students can carry out projects that are both useful and educational; for example:

- prepare an earthquake safety kit to be kept near the exit door, for which students can suggest contents, such as:
  - ♦ copy of class roll book
  - ♦ first aid supplies
  - ♦ flashlight and spare batteries
  - ♦ felt pen (for I.D. marking)
  - ♦ games
  - ♦ plastic garbage bags for emergency protection.
  - ♦ make posters describing what to do in the event of an earthquake
  - ♦ identify hazards in the classroom, school, school grounds, neighbourhood, and home
  - ♦ illustrate this guidebook.

**Evaluation**

Periodically, the district committee and principals should evaluate the effectiveness of their earthquake drills. The following checklist may be used both for evaluation and in the initial planning of the drills:

- Have complete 'quake-safe' action drills been issued to all concerned?
- Are all students and staff familiar with the "take cover" procedure?
- Have students and teachers demonstrated their ability to take cover immediately?
- Do students know what to do in areas without shelter?
- Do students stay quiet during drills?
- Are teachers able to maintain relative calm and reassure their students?
- Do students and teachers know and understand evacuation procedures?
- Does everyone know their safe evacuation assembly area?
- Do teachers remember to take their class roster and evacuation checklists to the assembly area after evacuation?
- Have other staff members practiced their roles during earthquake drills?
- Have emergency variations been practiced (e.g., exits blocked, aftershocks occurring, etc.)?
- Have students had ample opportunity to discuss their fears and concerns about earthquakes, including how they can help each other?
- Have parents been informed about the earthquake drills?
- Have the drills been extended into the family and home?

## SEISMIC HAZARD REDUCTION

### **Provincial Seismic Mitigation Program**

The Seismic Mitigation Branch, Ministry of Finance and Corporate Relations, was created in 1999 to administer the pilot Seismic Mitigation Program. The Program's mandate is to significantly reduce the risk to life and personal safety of occupants of provincially-owned or funded buildings during an earthquake. The buildings themselves, and their contents, must also be protected as much as is financially practical.

The Seismic Mitigation Program's funding will be used to promote both the structural and non-structural seismic upgrade of schools, post-secondary facilities, hospitals and post-disaster facilities in the areas of the province most likely to experience a severe earthquake. The effectiveness of this program will determine how future seismic mitigation programs are designed.

Initially, this pilot program will emphasize non-structural mitigation, as a better return is realized by doing so. Case studies of severe earthquakes in other industrialized countries have shown that death, injury and damage result primarily from unsecured non-structural elements. Particular attention will be focused on exits and exit corridors. There are instances where exits were blocked by dislodged items located along the exit corridors or by a collapsed canopy over an exterior door.

The Seismic Mitigation Branch has produced provincial standards in the form of two guidelines -- one for structural and the other for non-structural mitigation -- to help administrators, teachers, custodians, facilities managers and parents identify what needs to be done and how to do it. These handbooks are posted on the Internet along with other valuable information and reference material. Protecting physical safety and safeguarding the Province's public resources are ongoing priorities. Further information is available on the Seismic Mitigation Program webpage:

[www.fin.gov.bc.ca/cd/seismic.htm](http://www.fin.gov.bc.ca/cd/seismic.htm)

## NON-STRUCTURAL DAMAGE EXPERIENCE IN CALIFORNIA

The following is from a report on the non-structural damage that occurred to five schools shaken by an earthquake in California:

- Windows** The 31 year-old junior high library had eight-by-ten foot double-height glass windows on the north and south walls. All windows imploded and littered the room. There were dagger-shaped pieces everywhere. The floor tile and wooden furniture were gouged with flying glass. The school superintendent believes that, had school been in session, death and serious injury would have occurred in the library. The glass in the library windows was not tempered.
- Lights** Approximately 1,000 fluorescent bulbs fell from their fixtures and broke. Many fixtures also came down. There were no safety chains on the fixtures. Although hanging fixtures suffered much more damage than recessed fixtures, glass in the older recessed fixtures was shaken out and broke. The elementary school library lost all its fixtures.
- Chemicals** In the second-floor high school chemistry lab, sulphuric acid and other chemicals stored in glass containers in open cabinets overturned and broke. Acid burned through to the first floor. Cupboard doors sprang open and glass cabinet doors broke, allowing chemicals to fall. The lack of electric ventilation caused toxic fumes to permeate the building.
- Basements** Where water pipes entered through concrete walls, they were severed by the movement of the walls. Basements were flooded to five feet. All electrical supply and switching mechanisms were in the basement; all were destroyed by water.
- Equipment** File cabinets flew across the room; bookcases fell over; free-standing cupboards, cabinets and shelving fell. Machine shop lathes and presses fell over.

## **Seismic Hazards**

Seismic hazards can be considered in three categories:

1. Classroom hazards that can be corrected by students and teachers;
2. Maintenance hazards that require special skills for correction; and
3. Neighbourhood hazards that possibly cannot be corrected, but can be taken into account in the response plan.

The following are suggestions on how to eliminate seismic hazards:

### **1. Classroom Hazards**

- heavy loose objects that could cause injury should not be stored on shelves or hanging where they can fall more than one meter above the floor
- hazardous materials such as may be found in science laboratories and industrial education shops must be stored in an approved cabinet or a designated storage room
- aquariums should be located away from seating areas.

### **2. Maintenance Hazards**

- all industrial education machine tools and equipment must be securely fastened to the floor or wall
- all kitchen equipment in teaching kitchens and home economics rooms must be secured against rolling or overturning
- exhaust hoods should be secured to structure
- lockers, shelves, cupboards, bookcases, filing cabinets, storage racks, pianos, etc., exceeding one meter above the floor should be secured to structural member(s) of a wall or partition
- clocks, projection screens, TV monitors, heavy pictures, light fixtures, and similar appendages should be secured to a structural member of a wall or partition
- unreinforced masonry chimneys should be removed, if possible, and replaced with a metal flue secured to the structure; alternatively, the chimney may be braced to the roof structure with metal reinforcing angles and straps; unreinforced masonry of any kind should be removed, if possible, or braced
- covered play areas and other free-standing structures may be braced at low cost, in consultation with a structural engineer
- appendages over access doors or footpaths should be removed, if practical; alternatively, check the support and possibly provide additional fixing to structure
- slate and tile roofs should be checked, and loose pieces refixed; a restraining board may be fitted at the eaves; in the long-term, replace with metal roofing or asphalt shingles
- tee bar and other ceiling spaces should be checked to ensure that all components are firmly secured to the floor or roof structure above glass lighting fixtures should be replaced with plastic
- plain glazing in hazardous locations should be replaced with tempered glass, wired glass, or polycarbonate sheets
- old slate chalkboards or marble toilet partitions should be replaced with modern fixtures
- heavy gymnasium equipment should be secured to the structure or braced against overturning.

It is recommended that, prior to assessing hazards throughout the school, a plan(s) of the school and grounds are prepared. Such a plan(s) will:

- enable the location of all hazards to be shown
- assist in the preparation of emergency response procedures
- enable evacuation routes to be shown
- identify the location of safe assembly areas
- enable the location of the following items to be shown:
  - ♦ power line routes (overhead and underground)
  - ♦ gas, water and sewer lines
  - ♦ outside faucets
  - ♦ mains switches and shut-off valves
  - ♦ mechanical equipment
  - ♦ hazardous materials storage
  - ♦ fire extinguishers
  - ♦ first aid equipment

### **3. Neighbourhood Hazards**

The purpose of identifying neighbourhood hazards is to assist in the planning of post-earthquake procedures such as the designating of assembly areas. It may be impossible to reduce such hazards, but to know what can happen is the basis of a good earthquake safety program.

This list may be compiled with assistance from the local municipal police or fire authorities, utility companies, and federal or provincial emergency program personnel:

- facilities containing hazardous materials (e.g., gas stations)
- high-voltage power lines
- major traffic routes (e.g., freeways and railway lines)
- major oil and natural gas pipelines
- transformers and underground utility vaults
- multi-storey buildings vulnerable to collapse
- water towers
- landslide areas
- flooding from collapsed dams, or dykes
- exposure to tsunamis (i.e., seismic sea waves).

## RESPONSE PLAN

A response plan should provide short-term shelter (i.e., one -- two hours) for the entire school population and long-term shelter (i.e., up to 24 hours) for students whose parents have been unable to collect them. The long-term plan must take into account the fact that an earthquake can occur at any time during the day and in the middle of winter; that the building may be unsafe for re-entering; and that all services, including telephones, may be disrupted.

### **The First Two Hours**

During the first two hours after an earthquake, adults in a school must cope with many tasks, such as:

- organizing building evacuation and security
- providing first aid to injured persons
- checking and accounting for all those who were in the school
- providing all students with identification tags indicating name, age, address, phone, parents' names, work address and phone, any medical problems
- organizing search and rescue teams to locate missing persons
- extinguishing small fires
- checking damage to utilities; if necessary shutting off main power, gas and water
- sealing off areas where hazardous materials have been spilled
- calming and reassuring frightened persons
- authorizing release of students to parents; keeping records of such releases
- establishing communication with emergency assistance and other schools in the district
- handling the traffic in and out of the school grounds
- distributing emergency supplies and equipment
- preparing for long-term care and shelter.

The following planning decisions should be made in preparation for the first two hours:

- who will give instructions to evacuate the building
- how will this be done if the P.A. system is damaged
- what should be done if an aftershock occurs during evacuation
- have evacuation routes and assembly areas been established; are they the same as fire escape routes and areas; if not, why not and could this cause confusion
- are there any potential hazards along the evacuation routes
- what emergencies could occur and what should be done (e.g., power fails, exit door jams, debris blocks exit, fire breaks out, students are injured and should not be moved)
- under the worst weather conditions possible, where will the school population find short-term shelter
- how will all persons be identified and kept track of
- how will the arrival of parents and the handover of their children be processed
- what steps can be taken to reduce anxiety and fear among students and adults
- if it is necessary to evacuate the school grounds, how will this be accomplished and how will parents be informed of the new location



In addition, the following information should be established:

- chain of command for decisions after an earthquake
- list of emergency response agencies (e.g., fire, police, gas utility, electricity utility)
- procedures to provide for first aid, search and rescue, communication, building damage assessment, and student security
- location(s) of outdoor assembly areas, first aid stations, command and communication stations, student release station
- list of persons responsible for various actions and/or with required skills
- inventory of supplies and a plan of the school.

Expert judgment may be needed to determine whether buildings are safe for re-entry. The emergency response plan should contain names of local engineers and other experts who can assess the following:

- structural and non-structural damage
- damage to utilities
- the likelihood of fire
- hazardous material spills.

### **Care and Shelter**

Within two hours after a major earthquake, most parents will come to collect their children. However, some parents may be unable to reach the school, either because of transportation difficulties or because they are casualties themselves. Obviously, young children must not be released to go home alone.

General care and shelter guidelines should be included in a district response plan. However, each school will have individual problems and solutions that will need to be addressed locally, such as:

- based on an analysis of the number of parents working, single parents, locations of home and workplace, what is a reasonable estimate of the numbers and ages of children that may require long-term care and shelter
- what is the likelihood of the building surviving a major earthquake; if unlikely, what alternative shelter arrangements can be made and if long-term care and shelter has to be provided
- what supplies are needed
- have any individual special medication needs been identified
- which adults will undertake the long-term care.

Answers to some of these questions should take into account that shelter plans may be influenced by the type of construction of the school building. Pre-planning advice from architects, engineers, and other experts may determine the likelihood of a building being able to survive an earthquake and, therefore, provide shelter.

For example, an old three-storey masonry building should not be relied on for shelter, whereas a single-storey masonry building built to current standards probably will remain intact. Arrangements might be made for local experts to visit each school within a few hours after any serious earthquake to give advice on re-entry.

Outdoor shelter plans may use the practical knowledge of local organizations, such as "outdoors" clubs and scout groups.

The district may allocate specific "safe" schools for the provision of long-term care and shelter. St. John's Ambulance and Red Cross guidelines may be used for the equipping of these schools. The following items might be included:

- first aid supplies
- soap, towels, cleaning and sanitation, supplies
- food and cooking equipment
- potable water
- bedding.

Except for basic supplies, it is not practical for a school to store large quantities of these items. Arrangements for storage and delivery by parents and neighbours can be made.

In addition to the physical needs of students and staff, anxiety and fear are to be expected after a major earthquake. Young students particularly should be encouraged to express their concerns, while at the same time be continually reassured about things like:

- the likelihood that parents may be delayed because of traffic disruption
- reminders that parents have been told that students are being cared for.

To keep students occupied, they can:

- be encouraged to express their feelings through drama, art and writing
- be encouraged to comfort each other; physical contact can reduce feelings of separation, loneliness and fear
- discuss the chores that will face everyone at home; emphasizing their role in restoring order
- review the actions that would be necessary if there was an aftershock.

### **Training**

To improve the quality of the potential response of staff, teachers, and students following an earthquake the district committee should:

- keep an up-to-date list of teachers and staff members trained in first aid or CPR
- provide regular training and refresher courses in first aid or CPR by association with the local St. John's Ambulance or Red Cross organizations
- consider providing first aid training for students.  
(this has wider benefits than just for earthquake response)
- consider training of staff and teachers in:
  - ♦ fire detection and abatement
  - ♦ how and when to turn off utilities
  - ♦ search and rescue techniques
  - ♦ mental trauma alleviation.

These subjects should be discussed with local fire department and ambulance personnel who may provide recommendations for contact with other sources of related skills.

## **Communications**

After an earthquake, the following may occur:

- loss of electrical power and telephone lines may disrupt communication systems for a long period
- the telephone switchboard may be swamped by incoming calls if it is working
- traffic may jam-up around the school
- unauthorized persons may volunteer to take students home.

The response plan should contain a communication plan prepared in association with local fire, police, and hospital, local emergency planning program office, and local media (radio and TV stations). That plan should provide for alternative ways to convey and receive messages.

Reporting procedures should be developed; for example:

- to whom reports should be given
- how to report, in the absence of telephone and power
- the use of portable two-way radios
- the use of local radio and TV stations
- the identification and use of amateur radio "hams"
- what information should be given (e.g., condition of buildings and occupants, emergency situations)
- do not contribute more than necessary to the overloading of emergency systems (e.g., in the first hour use telephones only to report life threatening situations)
- when using radio communication to emergency services, keep messages clear and brief
- if there is no way to report to the outside authorities, pre-planning may assume helicopter and/or ground reconnaissance
- visual signal system for air/ground reconnaissance using coloured flags or canvas panels to communicate prearranged messages, such as "medical help needed" or "we are OK"; do not place signals on a roof in case of unperceived structural damage or aftershocks.

Copies of the district communications plan should be retained in every school and also by all the local emergency organizations.

Periodically, simulation exercises should be carried out to test the effectiveness of the plan, assuming a variety of scenarios.

The following equipment items are suggested for each school to facilitate communications. Such items can also have application in other more normal situations:

- public address system installation can be linked to an emergency power system such as that provided for the normal emergency lighting
- battery-powered megaphone
- battery-powered walkie-talkies and portable two-way radios
- coloured flags or canvas panels for isolated schools to communicate prearranged signals to air or ground reconnaissance.

### **Parent Awareness**

The most important feature of a communications plan is the means for communicating with parents. It is imperative that parents are aware of the plan; otherwise, they may risk their own safety and also impede the organized procedures to retrieve their children.

The policies and rules that parents should follow must be clearly stated at parent meetings and in letters to parents. At least one such letter per year should be sent. It would be most effective to also send a letter immediately after public news of an earthquake elsewhere.

The following is a sample letter:

*Dear Parent:*

*Because our school is located in an earthquake-prone area, we want to remind you that, in the event of an earthquake occurring, the following procedures will be followed:*

*No student will be dismissed from school unless a parent (or guardian designated by a parent) comes for him/her.*

*No child will be allowed to leave with another person, even a relative or babysitter, unless we have written permission to that effect or that particular person is listed on the student's emergency card in our files. With this in mind, if your child's card is not up-to-date, please request a new card from our office.*

*All parents or designated guardians who come for students must sign them out at the office or at the alternative Student Release Station at the entrance to the school yard. Signs will be posted (indicate where) if this alternative location is being used.*

*We are prepared to care for children in the event of a critical situation or if parents are not able to reach the school. We have a number of people with first aid certificates and will be in communication with local emergency services. We do ask for your help in the following areas:*

- please do not call the school; we must have the lines open for emergency calls*
- following an earthquake or other emergency, do not immediately drive to the school
  - streets and access to our school may be cluttered with debris; the school access route and street entrance areas must remain clear for emergency vehicles**
- do turn your radio to \_\_\_\_\_ or \_\_\_\_\_ on the AM dial; information and directions will be given over the radio.*

## **INDIVIDUAL CHECKLISTS**

Checklists should be prepared summarizing what each person should do before, during, and after an earthquake. The following pages provide samples that can be adapted to individual situations. For example, students' and teachers' checklists can be made into wall posters for the classroom.

## STUDENT

### Before

- learn what to expect and what to do during an earthquake
- identify hazards in the classroom, school, home
- participate in earthquake drills
- know the name and address of your guardian, if designated by your parent(s).

### During

- follow teacher's instructions
- TAKE COVER under a desk or table
- ASSUME "CRASH" POSITION
- COUNT to 60
- if out of the classroom, take cover in a doorway in the "CRASH" position; count to 60; join the nearest class when shaking stops.

### After

- follow evacuation instructions from teacher or designated monitor
- wear shoes
- put on identification tag
- comfort and reassure other students
- DO NOT use an elevator
- DO NOT re-enter school without permission
- DO NOT go home without permission; be aware that your parent/guardian may be delayed in coming for you
- talk about what has happened.

## TEACHER

### Before

- hold classroom discussions
- practice drills
- hold hazard hunts, correct hazards where possible
- appoint two student monitors in case you are injured
- prepare class lists and identification tags with name, address, phone number, age and medic alert information.

### During

- issue the TAKE COVER order at first sign of tremor
- assume "CRASH" position for 60 seconds
- talk calmly to reassure students
- review evacuation procedures.

### After

- instruct students to evacuate lead class to the designated assembly area
- be prepared to choose alternative escape route in case of fire or exit blockage
- take class list, I.D. tags, and first aid kit
- administer first aid, if necessary
- do not re-enter the building unless instructed by the principal
- write I.D. information on foreheads of primary and injured children, if tags not available
- reassure students
- remind students that parents may be delayed in calling for them
- encourage students to talk about their fears and anxieties.

## **PRINCIPAL**

### **Before**

- set up a chain of command, and define staff roles and responsibilities (first aid, roll call, search and rescue, etc.)
- establish earthquake and evacuation drills for all staff and students
- in large schools, decentralize first aid equipment, student lists, and instructions for turning off gas, electricity, water, etc.
- be aware of your area's lines of communication, disaster planning, emergency channels, etc.
- obtain battery-operated CB radio and learn local emergency radio frequencies
- designate an outdoor evacuation assembly area
- ensure staff knowledge of industrial first aid.

### **During**

- take cover and assume "CRASH" position.

### **After**

- stay calm: your attitude will act as a role model for everyone
- ensure that all power, fuel, and water mains have been shut off
- account for all staff and students
- in a major quake, await instructions from emergency officials over battery-operated or car radio
- oversee conservation and distribution of uncontaminated water, as well as preparation of emergency facilities
- allow dismissal of students only when it is safe to travel and a designated adult comes for him/her; keep accurate records of students released.



## **PARENT/GUARDIAN**

### **Before**

- be aware of school's earthquake policy and procedures
- provide school with the name of an alternative guardian.

### **During**

- take cover under table, bed, or in doorway away from windows in "CRASH" position.

### **After**

- do not phone the school -- they may be trying to reach you or emergency response services
- when safe to travel, go to the school to collect your child -- your child will NOT be released otherwise
- if you are unable to reach the school, contact the designated guardian to collect your child.

## MAINTENANCE STAFF

### Before

- coordinate with principal to identify and eliminate, if possible, potential interior and exterior earthquake hazards; inspect chemical storage areas regularly
- establish earthquake drill with responsibilities for shutting off power, fuel, and water mains clearly described
- establish procedure for setting up emergency toilets, uncontaminated water supplies, and first aid centres
- know location and use of fire fighting equipment.

### During

- stay calm and take cover in "CRASH" position.

### After

- immediately carry out pre-arranged duties (e.g., shutting off gas main, fire fighting, water supply control, etc.)
- report to principal and assist in search and rescue, if necessary
- with supervisor, determine safety of building for possible re-entry
- assist in setting up emergency facilities, if necessary.

## **BUS DRIVER**

### **Before**

- be acquainted with school earthquake procedures
- obtain radio phone or CB radio for bus.

### **During**

- stop bus away from power lines, overpasses, bridges, etc.; pull into side road or driveway, if possible
- stay in the bus
- with students, assume "CRASH" position between seats or in aisles and count aloud to 60.

### **After**

- if roads are passable, proceed with caution
- if bus is immobilized in an unsafe position, evacuate to an open area because of danger of aftershocks
- administer first aid, if necessary
- when safe to do so, proceed with students on foot to nearest undamaged shelter
- contact supervisor, school, police, or other emergency authority by any means possible without leaving students unattended
- stay with the students until help arrives or until instructed to move.