

Hazard Assessment for Business

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This manual is based on the Business Planning Guides produced by and copyrighted to Wellington City Council's Emergency Management Office. We endorse their work in developing and producing the "Emergency Planning Manuals", numbered 1 through 3, based on significant research and analysis both internationally and locally.

Disclaimer:

The recommendations included in this publication are intended to be used to improve emergency preparedness, and every reasonable effort has been made to ensure the accuracy of the information given. However, local authorities do not assume responsibility or liability for any injury, death or property damage that may result from a natural or technological hazard.

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Hazards and Your Business

This manual is for distribution to business owners and operators to assist in the improvement of emergency preparedness in their business. Overseas experience indicates that many businesses are ill prepared for most disasters.

Each building and type of occupancy brings with it individual conditions. Therefore, each owner or operator must tailor plans to actual needs and operating styles.

This manual is not intended to address specific sectors or industries. It is intended as a primer to assist business managers with a range of questions that will aid in the preparation of their own specific preparedness plans.

Guide One of three concentrates on the steps which can be taken by you (through a series of check lists) to identify existing and potential hazards within your businesses, as well as identifying assets/vulnerabilities and your current level of preparedness.

Why do a Hazard Assessment for a building or facility?

New Zealand, as a whole, is faced with a variety of different hazards. The community and in particular, the business community, has an obligation to prepare for these hazards, and the potential for loss of life and damage to property that they represent. This is especially true for buildings and facilities that represent an important resource before and after a disaster. In order to successfully prepare a facility it is necessary to consider two important aspects:

Hazard Identification & Assessment

- What external hazards pose a risk to the building or facility?
- Does the facility have any internal hazards?
- What can be done to reduce both internal and external hazards?

Preparedness Assessment & Planning

- What has been done, including planning, to prepare the buildings or facilities for a hazard impact?
- Can more be done to make the facilities safer?
- What resources does the facility have to offer to the community following a hazard impact?

These questions must be viewed with an “all-hazards” perspective. This involves thinking about all hazards that may affect the facilities and their occupants differently. It is necessary to appreciate how each of the eight main groups of hazards may affect your area in general and individual facilities in particular. The eight hazard groups are separated into those of natural and technological origin, though they may also be combined in one event.

Natural Hazards

Atmospheric (includes severe winds and heavy rain)

Geologic (includes earthquakes, volcano's, tsunamis and landslides)

Hydrologic (included coastal and riverine flooding)

Wildfire (bushfires or vegetation fires)

Technological Hazards

Manufacturing (with hazardous substances & processes)

Storage (of hazardous substances)

Transport (of large numbers of people and/or hazardous substances)

Waste & Contamination (due to hazardous substances)

Other on site hazards which could affect your business are listed below, while these manuals do not address these hazards, they should be taken into consideration in your Business Emergency Plan:

Electrical Malfunction

Internal Flood

Bomb Threat

Civil Disturbance

To assist you working through these questions, the following checklist style guidelines have been compiled. These cover the major external hazards to a building or facility. You should combine this process with your Occupational Safety and Health hazard audits to identify internal risks.

Hazard Assessment Checklist

If you have numerous operations or are spread over more than one location, you need to do this process for each separate site. Available from local councils are Land Information Memorandum, which contains all the information the Council has on your business site, and this would also be useful for hazard assessment.

Are strong winds a risk to this facility? Yes No

- Has this facility been damaged in the past?
Describe when, and what happened?
.....
- Is the facility exposed to strong winds (on a ridge top or on the shore)?
- Does the facility have anything that could be damaged by strong winds (such as antennas, skylights, signs, loose roofing, or drain pipes)?
Describe.....
.....
- Is there anything near the facility that could be damaged by strong winds and then cause damage to your facility (such as trees, signs, or overhead cables)?
Describe.....
.....
- Can any problems (loose roofing or rain gutters) be identified that may become worse during strong winds?
Describe.....
.....

Are heavy rains a risk to this facility?

- Has this facility been damaged by heavy rain in the past (basement flooding, roof leaks, small landslips)?
Describe.....
.....
- Does this facility have anything that could be damaged by heavy rain (electrical equipment on basement floors)?
Describe.....
.....
- Could localised flooding cause access problems (flooded parking lot, washed out entrance)?
Describe.....
.....
- Do drains and gutters require cleaning regularly?

Hazard Assessment Checklist

Is slope stability a risk to this facility?

Yes No

The immediate trigger for land slides may be heavy rain, earthquake or instability caused by the oversteepening of a slope.

- Is your facility located within 10-20 metres of a steep slope that could fail or slip?

Is flooding a risk to this facility?

- Is your facility located within 10-20 metres of the waterfront, or on a low-lying area near a stream, reservoir or any other body of water?
- Has the facility been damaged by flooding in the past?
(Note: consider flooding due to broken water pipes as part of the earthquake risk.)

Is wildfire a risk to this facility?

- Is the facility within 100 metres of bush, especially gorse, or greenbelt areas?

Is a Tsunami (seismic sea wave) a risk to this facility?

- Is the facility built on low lying ground near the coast (such as a tidal basin, river or waterfront)?

Is ground shaking caused by an earthquake a risk to this facility?

In all parts of New Zealand, from the Building Act 1991 Section 66, a building is earthquake prone if it is made either wholly or substantially of reinforced concrete or masonry, or will have its ultimate load capacity exceeded in a moderate earthquake and is therefore likely to collapse causing injury or death to the building's occupants. Is your building earthquake prone? A qualified professional may be needed to help determine your risk.

- Does your building have unbraced external fittings such as chimneys' awnings, signs?
- Has your building been strengthened for existing regulations?
(A qualified professional will be needed to check this.)
Contact your council, as they hold records on existing buildings.

Parts of New Zealand will experience ground shaking during an earthquake. Your regional council should be able to provide maps showing vulnerable ground shaking zones.

- Is the facility located in a high ground shaking zone?

HAZARD ASSESSMENT CHECKLIST

- | | Yes | No |
|--|--------------------------|--------------------------|
| <ul style="list-style-type: none">Does the facility have anything that could be damaged by strong ground shaking (large water tanks, unsecured equipment or furniture, lifts, suspended ceilings or lights, signs)?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |
| <ul style="list-style-type: none">Is there anything near the facility that could be damaged by strong ground shaking and then cause damage to the facility (older buildings, signs, overhead cables, hazardous substances, underground pipes)?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |

Is liquefaction a risk to this facility?

When water saturated sediment is subjected to shaking it may temporarily lose its strength and behave as a liquid. This is called liquefaction. When this occurs buildings may sink into the ground or tilt causing structural damage.

- | | | |
|---|--------------------------|--------------------------|
| <ul style="list-style-type: none">Is your facility located within the ground shaking zone or on reclaimed land? (Liquefaction is closely associated with both). | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|

Is post earthquake ground rupture a risk to this facility?

- | | | |
|--|--------------------------|--------------------------|
| <ul style="list-style-type: none">Is the facility located within a fault line zone (consult regional map)? | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|

Are hazardous substances a risk to this facility?

- | | | |
|--|--------------------------|--------------------------|
| <ul style="list-style-type: none">Is the facility within 200 metres of any hazardous substances storage (petrol, LPG, or other fuel tanks, or any other chemical storage)?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |
| <ul style="list-style-type: none">Is the facility within 200 metres of any other building or facility that uses, sells, stores, or disposes of hazardous substances (including paints, fuels, solvents, dry cleaners, petrol stations, compressed gas or any other dangerous goods)?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |
| <ul style="list-style-type: none">Does your facility use or store hazardous substances (such as chlorine, petrol, or LPG)?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |

Hazard Assessment Checklist

- | | Yes | No |
|---|--------------------------|--------------------------|
| • Are they properly stored (according to law or codes of practice)? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Is the facility within 200 metres of a major transportation route (rail line, roadway used frequently by heavy trucks and tankers, major pipeline)?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |
| • Is the facility within 200 metres of the waterfront, airport, train yards, or any other transport terminal?
Describe.....
..... | <input type="checkbox"/> | <input type="checkbox"/> |

Internal Hazards

Earthquake Hazards

Does your business have any of these internal hazards also known as non-structural hazards, that are commonly found in most businesses:

- | | | |
|---|--------------------------|--------------------------|
| • glass that shatters or “flies” inside rooms, hallways or stairways | <input type="checkbox"/> | <input type="checkbox"/> |
| • objects that restrict movement to a safe place (books on floor, overturned equipment/furniture, broken glass) | <input type="checkbox"/> | <input type="checkbox"/> |
| • objects set on wheels | <input type="checkbox"/> | <input type="checkbox"/> |
| • objects stored above head level | <input type="checkbox"/> | <input type="checkbox"/> |
| • open shelving without restraining straps or lips | <input type="checkbox"/> | <input type="checkbox"/> |
| • cabinets without latches | <input type="checkbox"/> | <input type="checkbox"/> |
| • free standing cabinets | <input type="checkbox"/> | <input type="checkbox"/> |
| • blocked exits | <input type="checkbox"/> | <input type="checkbox"/> |
| • equipment and furniture in hallways that may impede movement | <input type="checkbox"/> | <input type="checkbox"/> |
| • the location of people with respect to emergency hazards | <input type="checkbox"/> | <input type="checkbox"/> |
| • (staff sitting near large windows under resource equipment, or near cabinets) | <input type="checkbox"/> | <input type="checkbox"/> |

Internal Hazards

Yes No

Fire Hazards

Fire presents a special hazard to businesses. The New Zealand Fire Service is able to offer the best advice on fire safety. As an introduction, however, check for the following common fire hazards:

- chimneys and flues
- open fires and heating appliances
- misuse of electrical installations and appliances/poor maintenance

Internal Hazards Survey

Beginning the inspection process:

As a key administrator, start the inspection process in your office. Then take a walking tour of the corridors to get a general impression of how your building sizes up in terms of emergency safety. Think about the movement of people through these corridors during and immediately following an emergency. Try to imagine problems people will encounter.

Checklists in this section cover how to identify potential emergency hazards in:

- offices
- buildings
- building evacuation routes

Internal Hazard Checklist

Yes No

The checklists below will help you identify common emergency hazards that can be reduced or eliminated at little or no cost. Much of this assessment may be covered under your Health and Safety in Employment responsibilities. You may wish to liaise with your safety officer if appropriate. The checklist can be used to:

- determine the scope of potential hazards throughout the building
- develop plans to reduce these hazards

Common Natural Hazards

- Are heavy objects removed from high shelves?
- Are aquariums and other potentially hazardous displays located away from seating areas?
- Is heavy equipment secured against rolling during an earthquake?
- Are wall-mounted objects (clocks, maps) secured against falling?
- Are hanging plants secured to prevent them from swinging free or breaking windows during an earthquake/ strong winds?
- Are free-standing cabinets, bookcases and wall shelves, secured to a structural support?
- Are TV or computer monitors securely fastened to a well-anchored platform, or a portable (rolling) cart with lockable wheels?
- Are all heating units firmly secured in each room?
- Do all exposed heating appliances have a close-mesh guard (or similar) securely fixed to the front?
- Are hazardous materials (flammable goods, cleaning products) stored away from heaters, or any area where they could cause a fire? (Spontaneous combustion can occur when flammable products are mixed or when cleaning rags containing linseed oil or turpentine are stored or discarded)
- Are all electrical outlets being appropriately used (i.e. correctly wired and not overloaded)?
- Are light fittings kept well away from softboard ceilings?

Encourage staff participation in this hazard assessment, so they will be more familiar with the hazards and will be more receptive to mitigation measures.

Internal Hazard Checklist

Yes No

Common Technological Hazards

- Are toxic, corrosive, and flammable materials securely stored to withstand falling and breaking? Yes No
- Are dangerous chemicals stored above levels where they are likely to be reached by flood waters, in waterproof containers? Yes No
- Are outdoor furniture, rubbish bins and other equipment secured in case of storm winds? Yes No
- Are warning signs posted in areas housing hazardous materials? Yes No
- Are appliances (e.g. water or space heaters) securely anchored? Yes No
- Are fire extinguishers secured against falling? Yes No
- Are office file cabinets secured against falling; do file drawers have adequate latches to prevent contents from spilling? Yes No
- Are light fixtures adequately supported? Yes No
- Are windows near exits made of safety glass? Yes No
- Are "portable" buildings properly secured to foundations? Yes No
- Are automatic gas shut-off valves installed? Yes No
- Are water tanks secure? Yes No

Internal Hazard Checklists

Yes No

Evacuation Route Hazards

The key to developing procedures for a quick and orderly evacuation is a thorough assessment of the hazards likely to be encountered en route from offices and other activity rooms to safe, open-space areas. Help with this assessment and subsequent planning steps may be obtained from the New Zealand Fire Service.

- Are signs posted near elevators prohibiting their use in emergencies? (Elevators are extremely vulnerable to damage from earthquakes. Ground shaking may cause counterweights and other components to be torn from their connections, causing extensive damage to elevator cabs and operating mechanisms). Yes No
- Are lockers, bookshelves, and other storage units which may line hallways fitted with secure latches? Yes No
- Are freestanding storage units secured to prevent falling? Yes No
- Are glass panels in hallways and/or doors made of safety (wired) glass? Yes No
- Have staff been warned that following an earthquake, hallways may be cluttered with debris from ceilings, fallen light fixtures, broken glass, and toppled storage units? Yes No
- Is lighting dependent on electricity rather than sunlight? (If the lighting system fails in enclosed hallways or stairways, resulting darkness will make it difficult to navigate safely). Yes No
- If emergency (battery-powered) lights are available, are they secured against falling? Yes No
- Do building exit routes pass through arcades, canopies, or porch-like structures? (Columns supporting arcades or porches may fail and roof overhangs may sag or fall). Yes No
- Are there clay or slate tiles on the roofs of your building, or is the building faced with parapets, balconies or cornices? (Roof tiles, parapets, balconies, cornices and other facades and decorations may fall during an earthquake, or storm). Yes No
- Have staff been instructed to move quickly past building exits? (Danger of injury is high in these hazardous areas). Yes No
- Are gas, sewer and power lines near outdoor assembly area? Yes No

Vulnerability

Yes No

Does this facility have a vulnerable population?

- Is the facility occupied 24 hours a day? Yes No
- Does the facility have a resident (live-in) population? Yes No
- Is the population transient (are new people using the facility, what is your worker turnover rate)? Yes No
- Do people with special needs use the facility (elderly, children, people with disabilities, non-English speaking people, new arrivals to the area)? Yes No
- Is the facility used at maximum capacity (full occupancy)? Yes No
- Does the facility rely on electrical power (heating, cooking, light)? Yes No
- Does the facility rely on gas (heating, cooking)? Yes No
- Does the facility rely on any special equipment (pumps, forced air ventilation, exhaust fans)? Yes No
- Do the occupants rely on lifts to leave higher floors? Yes No

Preparedness and Planning

- | | Yes | No |
|---|--------------------------|--------------------------|
| • Does the facility have an emergency plan (other than the basic fire evacuation plan) that outlines how the facility will cope following an emergency? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Are building evacuation and other public safety plans prominently displayed in the facility? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Is the facility plan reviewed regularly and when changes occur at the facility? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Do new staff receive a comprehensive briefing of their role in an emergency? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Do you work with your neighbours (both resident and other businesses) in developing your own contingency plan? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Do the residents/users receive a regular briefing of their role in an emergency? | <input type="checkbox"/> | <input type="checkbox"/> |
| • Does the facility maintain suitable emergency equipment (battery radio & torches) that is easy for staff and/or visitors to find? | <input type="checkbox"/> | <input type="checkbox"/> |
| • In residential facilities, are the tenants encouraged to prepare their own flats with emergency plans? | <input type="checkbox"/> | <input type="checkbox"/> |

Evaluation

What do these check lists tell us about the facility?

- If you have answered **yes** to any of the **Hazard Assessment** questions you need to consider what actions can be taken to reduce the harmful impact of that hazard on the facility.
- If you have answered **yes** to any of the **Vulnerability questions** you need to consider what special preparedness actions can be taken to make the facility safer.
- If you have answered **no** to any of the **Preparedness and Planning** questions you need to begin preparing the facility for emergencies and disasters.

What happens next?

- **Now that you have identified existing and potential hazards within your business, you should move on to the Planning and Preparedness Manual, Manual Two, which will take you through another series of check lists. These will give you a good idea of which preparedness measures will still need to be taken.**
- This assessment is the start of a planning and preparedness process. If there are changes to the facility, to the programmes it offers, or the people who use it you will need to reevaluate the hazards, vulnerability and preparedness. The checklists within the Emergency Management Audit Manual (Manual Three) are designed to be an internal audit of existing planning and preparedness processes. The audit should be carried out on a regular basis to ensure it is accurate and up to date.
- Keep the hazard assessment with the facilities emergency plan. Show them both to new staff so they can understand the hazards facing the facility and the preparedness steps that they need to know.
- More information regarding hazards and preparedness can be obtained by contacting the office of your local Emergency Management/Civil Defence organization

FIRE SAFETY & EVACUATIONS of BUILDINGS REGULATIONS 1992

Who needs an evacuation scheme?

Buildings where:

- 100 or more people gather in a common venue or place of assembly, whether for commercial, social, cultural, religious, or any other purpose, or
- facilities for employment are provided for more than 10 people, or
- accommodation is provided for more than 5 people, or
- whole or part of the building is used for storage or processing of hazardous substances, or
- specialized nursing, medical or geriatric care is provided, or
- early child care facilities are provided, or
- people in lawful detention are accommodated

Who needs an evacuation procedure?

- The majority of commercial and industrial buildings in New Zealand require an evacuation “procedure”, which differs from an evacuation “scheme”.

See the fire management checklist in this manual and contact your nearest New Zealand Fire Service Office