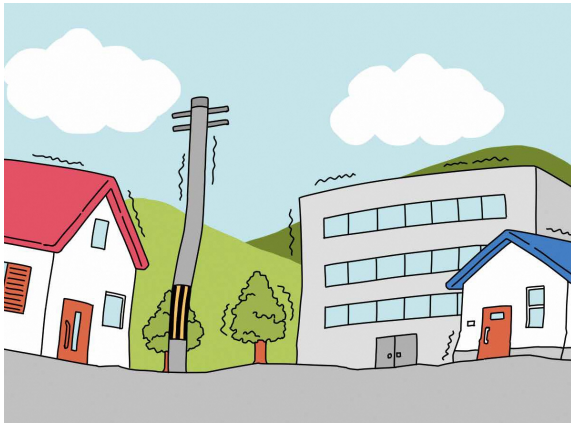


## Earthquakes

# When an earthquake occurs

**The top priority in the event of an earthquake is to protect life and limb!**



An earthquake could occur at any time. Consequently, it's important to minimize damage by inspecting your home and implementing safety measures based on the realization that you never know when an earthquake might occur.

It's also a good idea to review what you should do in the event of an earthquake to safeguard your own safety as well as that of your family members.

## Looking back on past earthquakes

### 2018 Northern Osaka Earthquake

Northern Osaka Prefecture was the epicenter of this powerful earthquake, which struck at 7:58 am on June 18. Seismic intensity readings of "weak 6," the highest ever recorded in Osaka Prefecture, were observed in Osaka's Kita Ward as well as in Hirakata, Takatsuki, Ibaraki, and Minoh. The disaster marked the first time for the Disaster Relief Act to be invoked in Hirakata City.



Hirakata City's Regional Disaster Readiness Plan triggered the automatic opening of all 53 primary shelters as well as the establishment of a Disaster Task Force chaired by the mayor. The quake displaced 273 people and damaged more than 7,000 homes.



#### Major damage in Hirakata City

Injuries.....	23 people
Damage to roads....	93 incidents
Damage to parks and greenbelts....	18 incidents
Landslides and slope collapses....	3 incidents
Fallen trees.....	1 incident
Damage to rivers.....	2 incidents
Damage to canals....	34 incidents
Damage to sewer lines and water conduits....	16 incidents
Damage to reservoirs.....	4 incidents
Damage to homes	
<small>(number of disaster certificates issued documenting damage)</small>	
Total collapse.....	1 home
Partial collapse.....	12 homes
Localized damage....	7,064 homes

# Earthquake early warnings and shaking during an earthquake

## In the event of an earthquake, authorities will issue an earthquake early warning

The Japan Meteorological Agency provides earthquake early warnings to warn of an imminent earthquake before strong shaking arrives.











These warnings are issued for earthquakes with a maximum seismic strength of at least "weak 5" to residents in regions that will experience shaking with a seismic intensity of at least 4 anywhere from several seconds to 20 seconds before strong vibrations arrive.



**Television and radio** ..... If you're watching television or listening to the radio, the warning will be accompanied by a warning tone.  
**Mobile phones and smartphones** ..... Phones receive earthquake early warnings and notify users with a warning tone.

Envision what you will do in the event of an earthquake during normal times so that you will be able to act without panicking in the event of an actual quake.

## Earthquake shaking and estimated damage

Seismic intensity of 0	Shaking is not perceptible by people.		Seismic intensity of weak 5	Most people feel afraid and instinctively try to hold on to something.	
Seismic intensity of 1	Some people can perceive slight shaking if they're in a quiet, indoor environment.		Seismic intensity of strong 5	Walking is difficult if you're not holding onto something.	
Seismic intensity of 2	Many people can perceive shaking if they're in a quiet, indoor environment.		Seismic intensity of weak 6	Wall tiles and window glass break, and doors may become unopenable.	
Seismic intensity of 3	Most people can perceive shaking if they're in an indoor environment.		Seismic intensity of strong 6	Most unsecured furniture moves, and more objects fall.	
Seismic intensity of 4	Tableware on shelves makes noise and objects that are not seated securely may fall.		Seismic intensity of 7	The number of buildings with low seismic resistance that sag or collapse increases.	

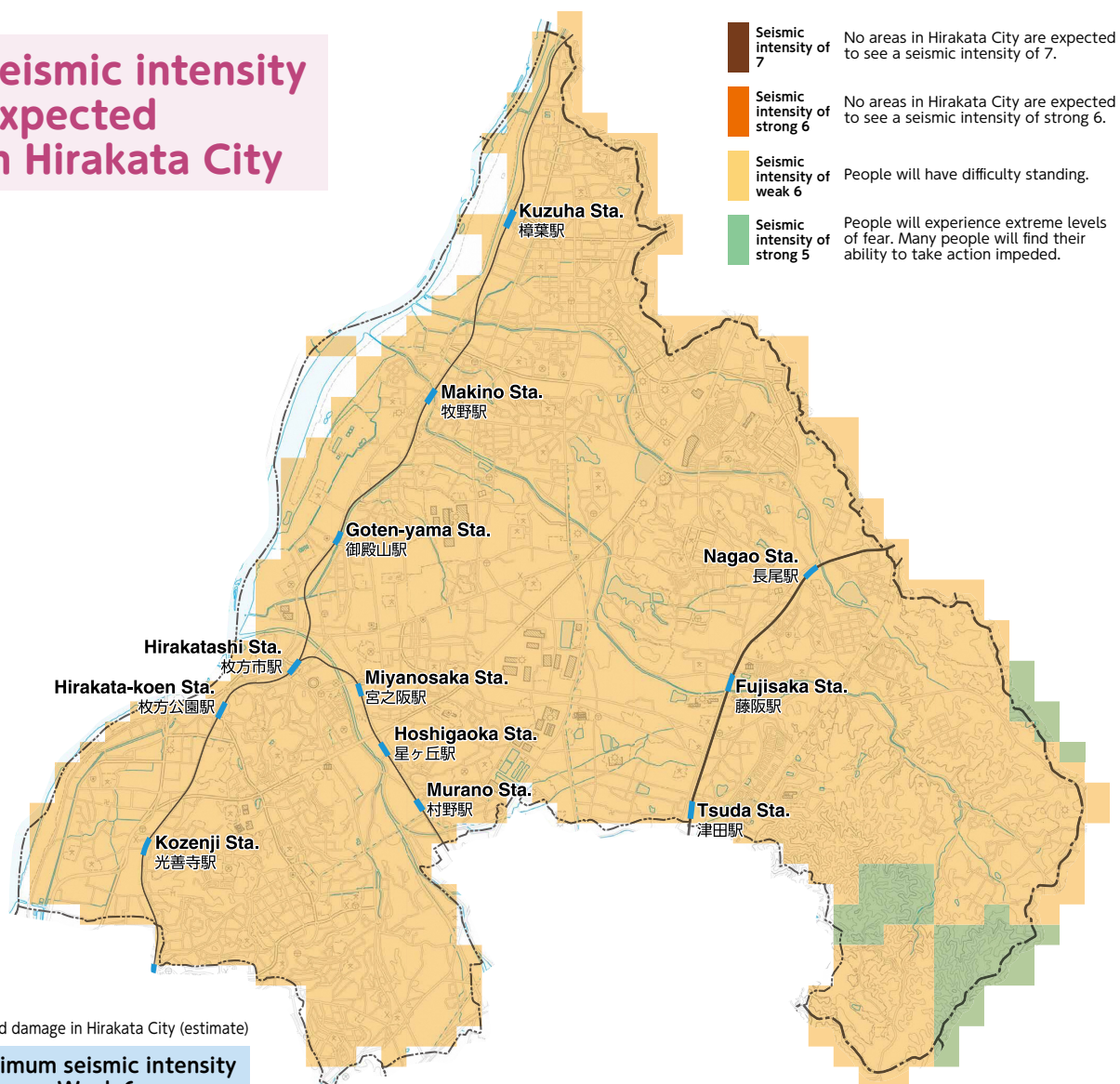
## Earthquakes

# Nankai trough megathrust earthquakes

**Hirakata City is forecast to sustain significant damage in the event of a Nankai trough megathrust earthquake**

(The chance of such an earthquake occurring in the next 30 years is considered to be 70% to 80%.)

### Seismic intensity expected in Hirakata City



Expected damage in Hirakata City (estimate)

#### Maximum seismic intensity Weak 6

Type of damage	Expected damage
Land area experiencing tsunami flooding	0.0 ha
Number of totally collapsed buildings	About 1,900
Number of partially collapsed buildings	About 12,800

Type of damage	Expected damage
Number of deaths	About 50
Number of injuries	About 1,200
Maximum number of displaced residents	About 34,100

Compiled based on the earthquake damage estimates published by the FY2013-4 Nankai Trough Megathrust Earthquake Disaster Countermeasure Study Group (Osaka Prefecture).



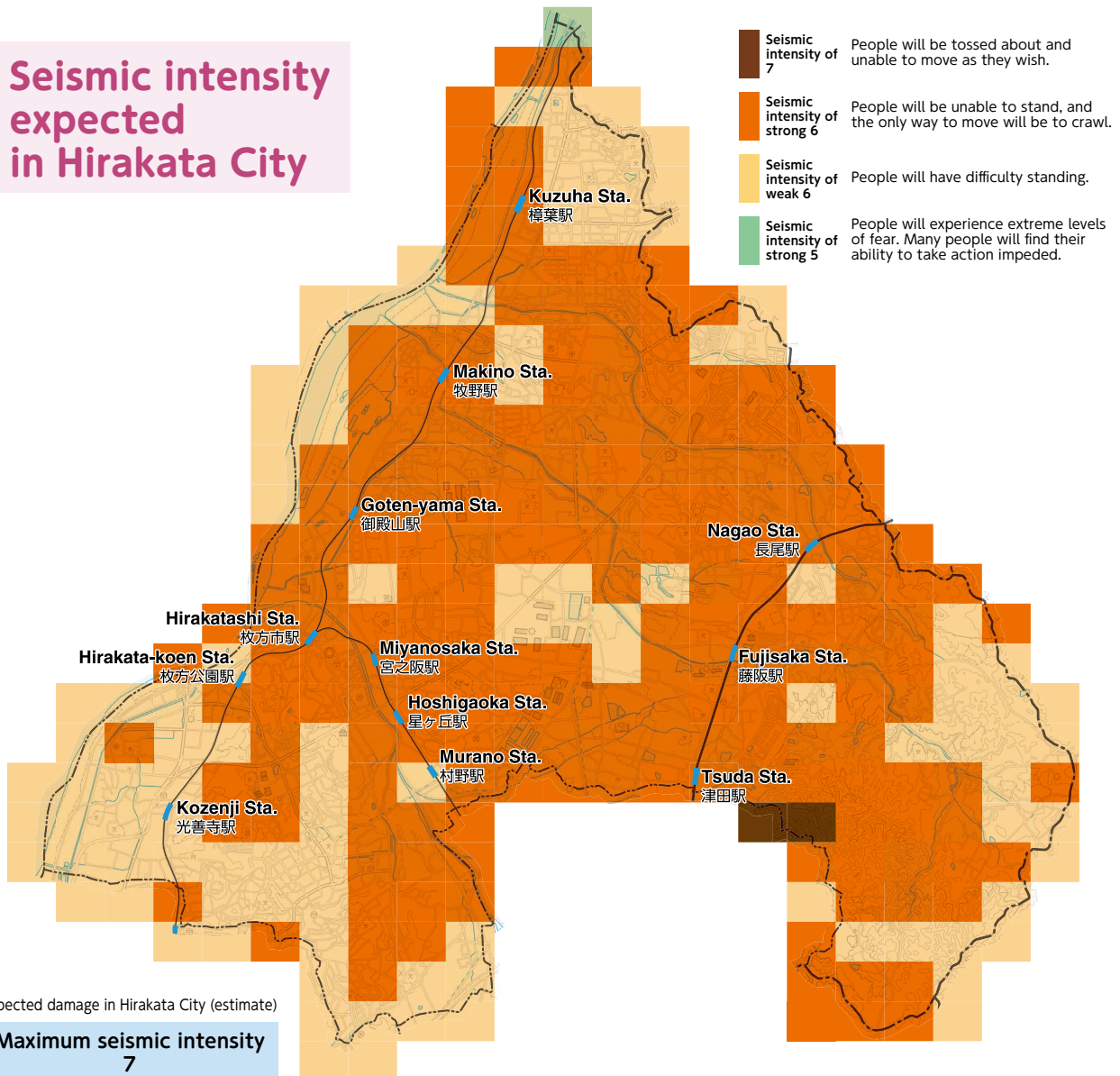
# Local earthquakes in the Ikoma fault zone

**You can review active faults in Hirakata City on the following page**

(The chance of an earthquake occurring in the Ikoma fault zone in the next 30 years is considered to be a maximum of 0.2%.)

\*Exercise caution as some faults remain undiscovered, and an earthquake could occur at any time.

## Seismic intensity expected in Hirakata City



Type of damage	Expected damage
Seismic intensity in Hirakata City	Strong 5 to 7
Number of totally collapsed buildings	About 20,800
Number of partially collapsed buildings	About 21,100

Type of damage	Expected damage
Number of deaths	About 370
Number of injuries	About 5,100
Maximum number of displaced residents	About 46,800

(Compiled based on the report of the 2007 Osaka Prefecture General Natural Disaster Readiness Countermeasure Study [expected earthquake damage].)

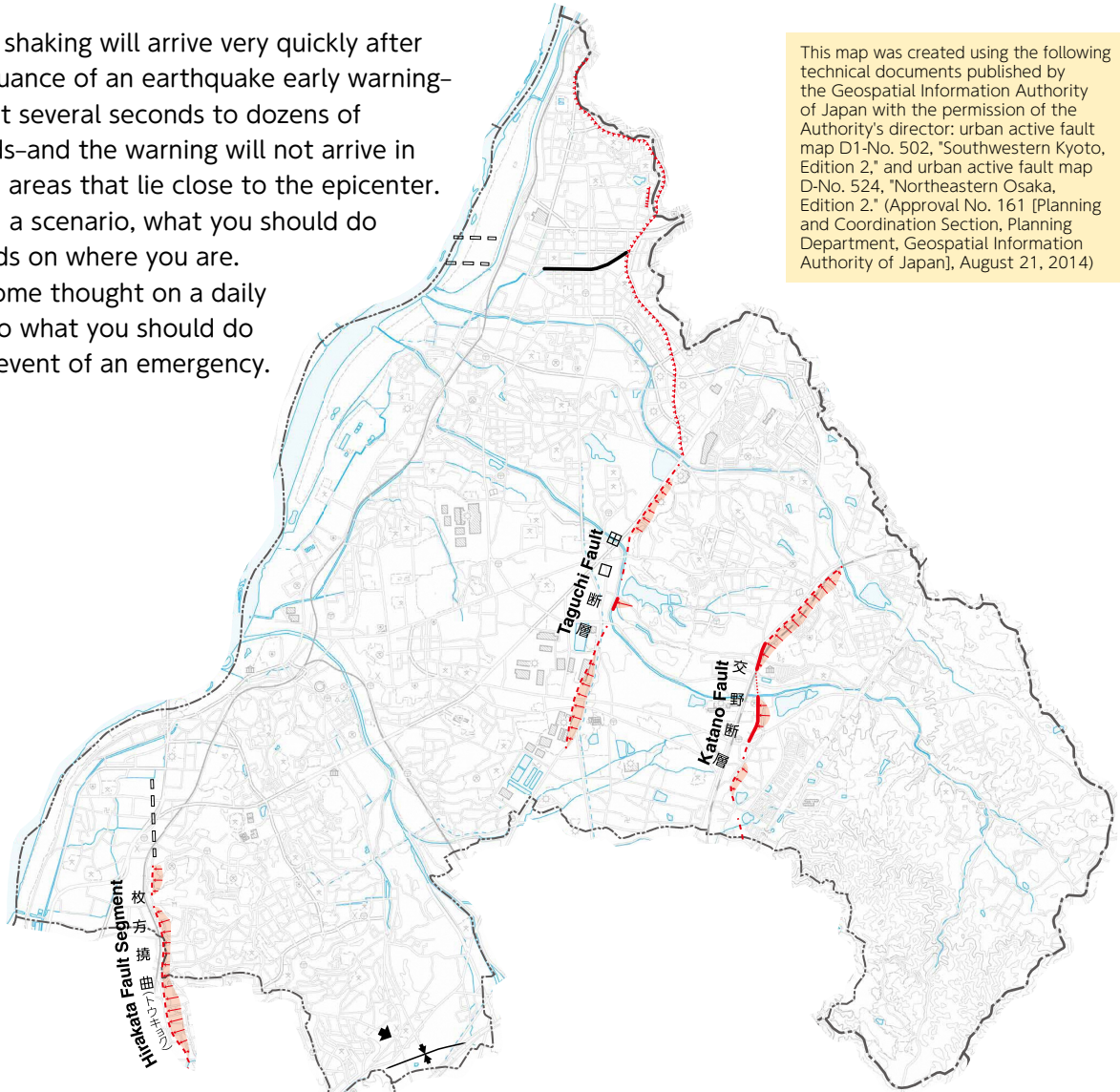


# Earthquakes

## Map of active faults in Hirakata City (Ikoma fault zone)

Strong shaking will arrive very quickly after the issuance of an earthquake early warning—at most several seconds to dozens of seconds—and the warning will not arrive in time in areas that lie close to the epicenter. In such a scenario, what you should do depends on where you are. Give some thought on a daily basis to what you should do in the event of an emergency.

This map was created using the following technical documents published by the Geospatial Information Authority of Japan with the permission of the Authority's director: urban active fault map D1-No. 502, "Southwestern Kyoto, Edition 2," and urban active fault map D-No. 524, "Northeastern Osaka, Edition 2." (Approval No. 161 [Planning and Coordination Section, Planning Department, Geospatial Information Authority of Japan], August 21, 2014)



Map of active faults in Hirakata City: Legend

Classification	Definition	Symbol	Classification	Definition	Symbol
Active faults	Active fault	An active fault whose topography bears indications of repeated movement at a cycle on the order of 1,000 years to several tens of thousands of years during the last several hundred thousand years; likely to see repeated activity in the future	Hypothetical active fault (surface)	An active fault whose existence has been inferred based on topographical characteristics but that cannot be clearly identified at the present time	
	Active fault (location somewhat unclear)	An active fault whose location cannot be pinpointed accurately because the signs of activity have been altered due to erosion, human factors, or other causes	Hypothetical active fault (subsurface)	An active fault whose existence has been inferred based on past boring or geophysical surveys but whose fault topography has not been confirmed because it is covered by one or more new strata	
	Active fault (latent area)	An active fault that does not exhibit direct topographical evidence of changes because they have been covered by one or more strata since their most recent period of activity	Active fold	Wave-shaped topography caused by fluctuations in the crust that have continued to the present day	
Dip-slip faults	Dip-slip fault (clear)	Orientation of vertical changes in an active fault	Active fault segments	An active fault in which changes have propagated within a soft stratum and manifested themselves on the surface in the form of a deflection rather than a step	
	Dip-slip fault (location somewhat unclear)	Orientation of vertical changes in an active fault (location somewhat unclear)	Inclination of geomorphic surface	A location in which the geomorphic surface is inclined as a result of fluctuations in the crust that have continued to the present day	

# Conducting a safety inspection of your home (seismic resistance check)

## Checking your home's seismic resistance

In order to ensure safety in the event of an earthquake, it's important to understand your home's seismic resistance. Use "Anyone Can Do It! Checking Your Home's Seismic Resistance" to check your own home.



### "Anyone Can Do It! Checking Your Home's Seismic Resistance" checklist items

- |                                                             |                                                                           |
|-------------------------------------------------------------|---------------------------------------------------------------------------|
| <input type="checkbox"/> 1 Year of construction             | <input type="checkbox"/> 6 Presence of multi-story open spaces            |
| <input type="checkbox"/> 2 Experience of past earthquakes   | <input type="checkbox"/> 7 Use of same walls for first and second stories |
| <input type="checkbox"/> 3 Additional construction          | <input type="checkbox"/> 8 Balance of wall layout                         |
| <input type="checkbox"/> 4 Extent of damage and any repairs | <input type="checkbox"/> 9 Roofing material and number of walls           |
| <input type="checkbox"/> 5 Building profile                 | <input type="checkbox"/> 10 Type of foundation                            |



Visit the website for details.

Source: "Anyone Can Do It! Checking Your Home's Seismic Resistance" (Japan Building Disaster Prevention Association)

### Subsidies from Hirakata City for seismic resistance checks

Hirakata City offers subsidies to partially defray the cost of having buildings' seismic resistance checked. If you're considering making use of this program, be sure to consult with the Residence and Urban Planning Section before having your home checked.



#### Eligibility

Homes (including apartments and townhouses) that underwent building certification on or before May 31, 1981, as well as designated existing seismic resistance non-compliant buildings (facilities used by large numbers of people, for example hospitals, department stores, and office buildings)

Please contact the Residence and Urban Planning Section of Hirakata City's Infrastructure Department for details.

**Phone: 072-841-1478 Fax: 072-841-5101**

More information is available on the city's website.

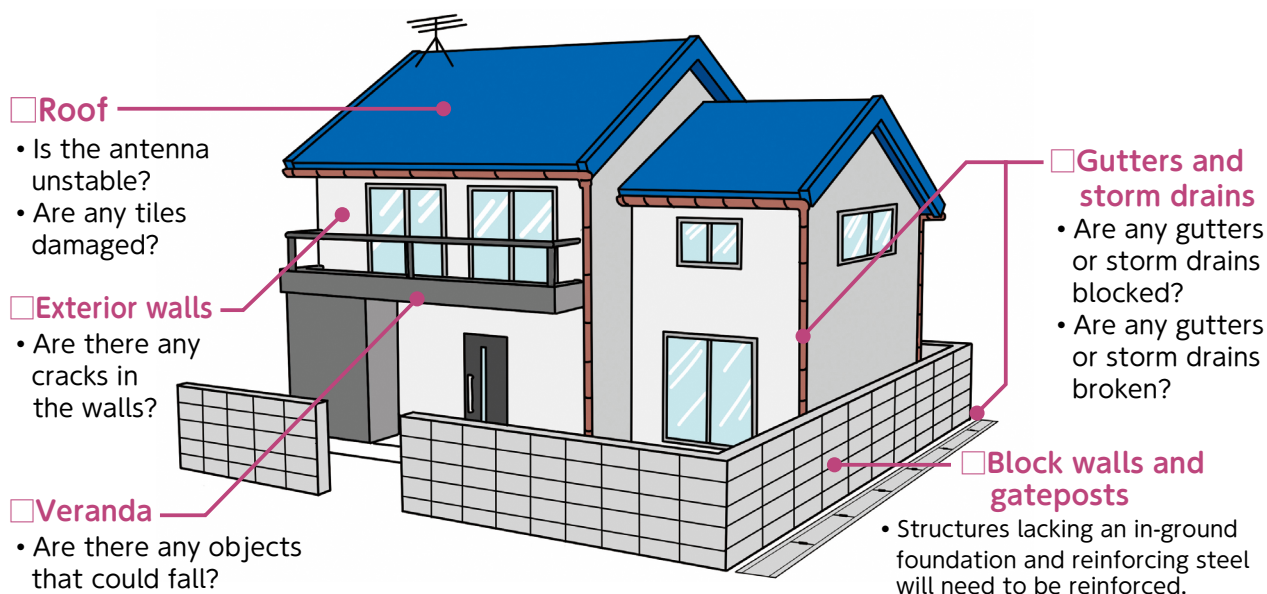
<https://www.city.hirakata.osaka.jp/0000002411.html>



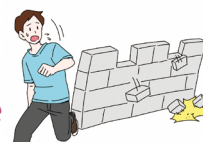
## Earthquakes

# Conducting a safety inspection of your home (single-family dwellings)

## Inspect your home to minimize damage



**Hirakata City offers subsidies to partially defray the cost of removing block walls that front roads and other public areas in order to prevent accidents caused by their collapse**



### Eligible walls (must satisfy all criteria)

- ✓ Located in Hirakata City
- ✓ Fronts a road, park, or other public area
- ✓ Is at least 80 centimeters high
- ✓ Was found to be non-compliant by a designated inspection method

### Subsidy amount (lowest of the following amounts)

- ✓ ¥150,000 (Please contact the city concerning walls at apartment buildings.)
- ✓ Cost of removing the wall
- ✓ Frontal area (height × length) [m<sup>2</sup>] of block wall eligible for subsidy × ¥15,000

### Cautions

- ✓ The city will stop accepting applications once the planned number of subsidy applications have been received for the application period.
- ✓ In principle, neither partial removal nor removal work completed by the owner is eligible for the subsidy.
- ✓ This subsidy cannot be combined with other subsidies covering block wall removal.
- ✓ If installing a fence or other new structure, please ensure that it complies with the Building Standards Act and other applicable regulations.

### To apply

Please contact the Residence and Urban Planning Section of Hirakata City's Infrastructure Department for details.

**Phone: 072-841-1478 Fax: 072-841-5101**

More information is available on the city's website.

<https://www.city.hirakata.osaka.jp/0000023322.html>

Please submit your application after the site has been inspected by the city. \*Your application will not be accepted if the removal work (the work which would be covered by the subsidy) has already been contracted (begun).





# Conducting a safety inspection of your home (apartments)

## Things to be careful about with apartments

Apartment buildings are said to have greater seismic resistance than single-family dwellings. While apartment buildings certified during or after June 1981 are widely considered to exhibit a high level of seismic resistance, strength, and fire resistance, such buildings have suffered damage in the past. Be sure to understand the kinds of damage that can occur in an apartment building.

### Swaying of high-rise structures

Building sway increases with height. The more sway, the more violent the overturning and movement of furniture. The higher the floor, the greater the need to firmly secure furniture.

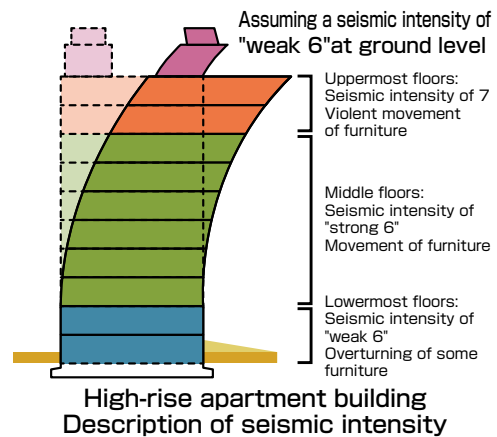
### Exercising care concerning falling objects

Falling objects can cause fatal injury depending on their weight, sharpness, and the height from which they fall. Potential falling objects include pieces of concrete and tile that become separated from walls as well as inadequately secured outdoor air-conditioning units.

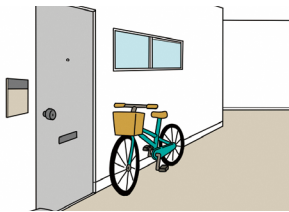
### Elevators and other equipment

In the event of an emergency, you'll need to evacuate by using an emergency staircase. Emergency lighting may not function, and you may find your escape path blocked by pieces of concrete and other materials that lie scattered about the stairs. Check escape paths and emergency equipment in the course of your everyday life.

Assume that key infrastructure will be unavailable. If you live on one of the uppermost floors, you can ease your mind by keeping large amounts of drinking water and other supplies on hand. You may not have running water until workers confirm that pipes survived the quake intact. It's also a good idea to keep an emergency toilet on hand.

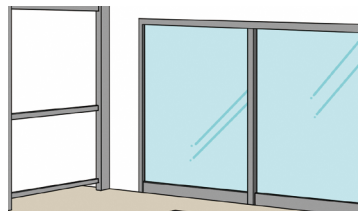


## Inspect your home to minimize damage



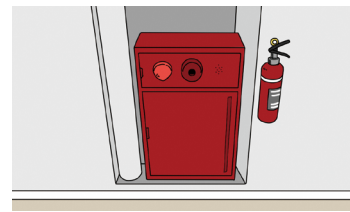
### Common areas like hallways and stair landings

Don't leave bicycles or other belongings in locations lying along your route of escape.



### Veranda

- Check how to use the emergency escape.
- Don't leave objects on or near the emergency escape.



### Fire safety and firefighting equipment

Check the locations of fire extinguishers, fire alarms, indoor fire hydrants, and other equipment and how to use them.

## Earthquakes

# Safety measures at home

**It's important to take steps to protect yourself from overturning furniture and falling objects at home, too**

In local earthquakes, overturning furniture and falling objects are responsible for many injuries. Take steps to ensure your safety, for example by securing furniture so that the swaying motion of an earthquake won't cause it to overturn. To minimize the chances of damage and injury, you should also check your home for potential hazards while referring to the "Safety checklist" below.

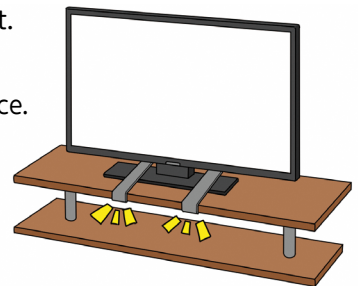
### Safety checklist (example)

#### [Entryway]

- ☐ To ensure you can evacuate your home safely, don't block the exit.

#### [Living room, dining room, and kitchen]

- ☐ Place your television in as low a location as possible and secure it in place.
- ☐ Affix latches to keep cupboards and refrigerators from opening.
- ☐ Apply shatter-proof film to glass on cupboards.



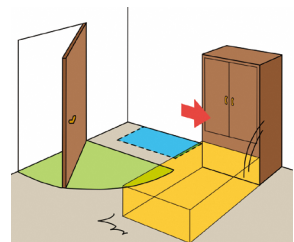
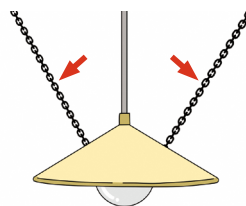
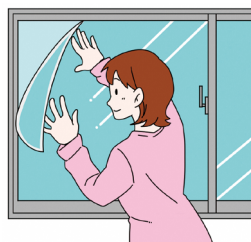
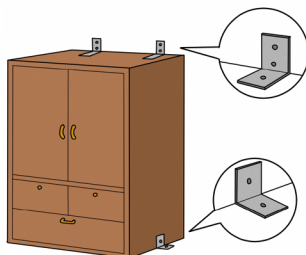
#### [Bedrooms and children's rooms]

- ☐ Don't place furniture in bedrooms. If placing furniture in a bedroom, position it so that it won't fall where someone is sleeping.
- ☐ Don't leave heavy objects in high places.
- ☐ Leave a pair of slippers in the room.



#### [Overall]

- ☐ Position furniture and other objects so that doors can be opened, even if they overturn.
- ☐ Apply shatter-proof film to windows.
- ☐ Secure hanging light fixtures.
- ☐ Secure furniture equipped with caster wheels, for example by locking the wheels.

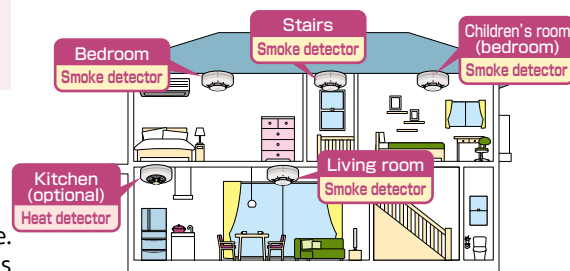


# Preparing for a fire at home and how to put out a fire

## Take steps to prevent a house fire

### Installing residential fire alarms and verifying that they work

By automatically detecting the smoke or heat from a fire and sounding an alarm, or playing an audio message, smoke alarms let you start fighting the fire and call the fire department sooner, helping to minimize damage. Residential fire alarms should be regularly inspected to ensure that they'll work in the event of a fire. (Fire alarms should be inspected about once a month. Devices should be replaced about once every 10 years.)



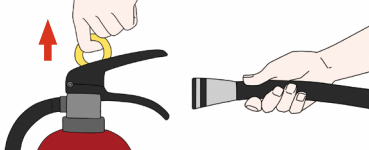
Example locations of residential fire alarms

## The important thing after an earthquake is to put out fires and stop their spread

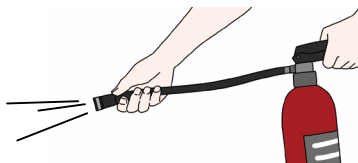
If you discover a fire, the first step is to stay calm and summon help while warning others of the fire in a loud voice. If the fire has not yet reached the ceiling, start trying to put it out. However, if you feel yourself to be in danger, evacuate the area.

### Using a fire extinguisher

- 1 Pull out the safety pin.
- 2 Remove the hose and point it at the base of the fire.



- 3 Strongly squeeze the lever to spray the extinguishing agent.



### Watch out for fires when power is restored

Wet household appliances and other products can catch on fire when power is restored following an outage after a disaster. If you find yourself in the middle of an ongoing power outage, turn off and unplug electrical equipment. If you're going to be away from home, turn off circuit breakers to prevent a fire when power is restored following an outage.

### How to fight a fire without a fire extinguisher (example)

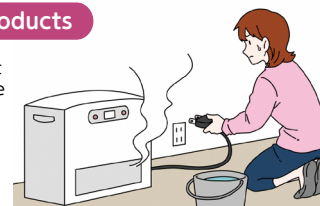
#### Frying oil

Don't spray water on the fire. Wet a blanket or large towel and cut off the supply of oxygen by covering the fire, starting with the flames nearest you.



#### Electrical products

Unplug the product so you don't receive an electric shock and spray water on the product.



#### Clothing

Drop and roll to put out the fire. If your hair catches fire, cover it with a towel or other cloth.



#### Curtains and sliding doors

First, spray with water. If you don't have access to water, pull down the curtains or overturn the sliding door and stamp out the fire.



### Obtaining earthquake insurance

Fire insurance does not cover fire, collapse, or other damage caused by earthquakes, but earthquake insurance provides coverage for earthquakes and volcanic eruptions as well as home and property damage caused by them (fires and damage, including if your home is buried in debris or washed away). It's a good idea to prepare for disaster by obtaining such insurance. Insurance premiums are determined based on the area where you live (prefecture) and the structure of your home.



## Earthquakes








# In the event of an earthquake

In the event of a large earthquake, first ensure your own safety. Regardless of the time or place, find a safe location and stay calm while you deal with the disaster.

### Earthquake occurrence

#### Earthquake early warning

Shaking will arrive anywhere from several seconds to dozens of seconds after the warning.

Your location	What to do to ensure safety (example)	
At home	<ul style="list-style-type: none"> <li>• Get under a desk or table that won't move due to the shaking.</li> <li>• Protect your head with a blanket or pillow.</li> <li>• Get away from glass and furniture.</li> </ul>	
At school or in the office	<ul style="list-style-type: none"> <li>• Get away from bookshelves, lockers, and windows.</li> <li>• Get under a desk or table.</li> </ul>	
In an elevator	<ul style="list-style-type: none"> <li>• Press the button for each floor and get off as soon as the elevator stops.</li> <li>• If you find yourself stuck in an elevator, press the emergency button to summon help.</li> </ul>	
At a train station or on a train	<ul style="list-style-type: none"> <li>• Grip a leather strap or rail.</li> <li>• Crouch down so you aren't thrown from the train.</li> </ul>	
Driving a car	<ul style="list-style-type: none"> <li>• Stop your car on the left side of the road.</li> <li>• Turn off the engine and wait for the shaking to subside.</li> </ul>	
Shopping	<ul style="list-style-type: none"> <li>• Immediately move away from any display cases or glass cases.</li> <li>• Follow clerks' instructions and do not rush for an exit.</li> </ul>	
In an urban area or residential neighborhood	<ul style="list-style-type: none"> <li>• Get away from block walls, vending machines, and other similar objects.</li> <li>• Protect your head with a bag or other object while exercising care concerning glass fragments and falling objects.</li> </ul>	



# Exercise caution and avoid letting down your guard just because the shaking subsides

Exercise care with regard to secondary disasters like fires and ensure that any sources of flame have been taken care of.

1 to 2 min.	After 5 to 10 min.	10+ min. after
<p><b>Checking the safety of family members</b></p> <p>Once the shaking has subsided, check on the safety of family members and other nearby people. Check sources of fire.</p>  <p>Put on slippers or shoes to protect your feet from broken glass and other debris.</p>  <p>Secure an exit.</p>  <p>Turn off the gas valve. Shut off electric circuit breakers.</p> 	<p><b>Obtaining accurate information</b></p> <p>After a large earthquake, exercise care concerning continued shaking. Check media outlets like television and radio for accurate information.</p>  <p>See how things look in the area around your house.</p>  <p>Contact family members who aren't at home to check on their safety. *If you can't make contact by phone, try a text message or other means of communication.</p> 	<p><b>Dealing with the situation</b></p> <p>Cooperate with neighbors. Get in touch with neighbors to check on their safety.</p>  <p>Cooperate with your neighborhood association and other entities to verify safety.</p>  <p>If your house is at risk of collapsing, evacuate.</p>  <p>You may experience strong aftershocks. Don't let your guard down, and stay prepared for aftershocks at all times.</p>