

Tropical Cyclones

Tropical cyclones are intense low pressure systems that develop over the tropical and subtropical oceans around Australia.



What's the difference between a 'tropical cyclone' and a 'cyclone'?

Tropical cyclones are a type of cyclone. They are low pressure systems that form over tropical waters and are typically the most intense type of cyclone to affect Australia.

For the purpose of this fact sheet, we are referring to 'tropical cyclones', however, it's important to note there are other types of cyclones such as East Coast Lows, monsoon lows and frontal lows.

When and where do cyclones occur?

November to late April is when Australia's tropical cyclone season generally occurs.

The regions most at risk of cyclones include the coastal regions of:

- **North-west Western Australia**
- **Northern Territory**
- **Queensland**

Wind regions across Australia

- **Region A**
Low risk of cyclone impact
- **Region B**
Moderate risk of cyclone impact
- **Region C**
Significant risk of cyclone impact
- **Region D**
Most prone to severe cyclone impact



The wind region you live in will impact the building codes for your property, which is important if you are building a new home or retrofitting an existing home. To find your wind region contact your local council or Standards Australia.

There are four different wind regions (Region A – D) across Australia that have different building code requirements. Region D is the area considered most prone to severe tropical cyclones, while Region A is considered to be at minimal risk of cyclone wind impact.

It's important to note that these broad wind regions are used to determine the minimum building standards. However, the risk of cyclones can vary across each region.

* For official wind region map see Australian Standards AS/NZS 1170:2:2002

Wind classification

In addition to wind regions, there are wind classifications that determine location-specific building requirements. This is determined for individual properties so you could have a different wind classification to your neighbour or someone who lives down the street. It's important to understand your own wind classification when considering retrofitting or building a new home.

Your wind classification

There are several different wind classifications for each individual property that take into consideration:

- **Your wind region**
- **Shielding**
Where surrounding properties or structures may shield a property.
- **Terrain**
Surrounding buildings, trees, vegetation or bodies of water near your property that may affect the flow of wind.
- **Topography**
Where a property is located. For example, a property on the top of a hill would be more exposed than one on a flat area.



Tip: A good way to assess your wind classification is by how good the views are from your windows. Do you look out from the top of a hill, or have an uninterrupted view overlooking a park or the ocean? The better your view, the more likely you are to experience higher wind speeds which may give you a higher wind classification.

To find out more: watch this [video](#) from the Cyclone Testing Station.

Examples of wind classification categories based on wind speeds

The higher the wind classification, the more at-risk a property is of higher wind speeds.

C1: Properties shielded on all sides by buildings.

C2: Properties partially shielded by other buildings.

C3: Properties near large exposed open areas (e.g. ocean, rivers, treeless plains) or on sloping sites/hills with some other buildings nearby.

C4: Properties that are very exposed to the wind (e.g. on steep hills with unobstructed views).



(List is for illustration only, for detailed definitions and selection of classification, please refer to Australian Standards AS4055)

Know your storm surge (or tide) zone

If you live within several kilometres of the coast, find out your local council's storm surge or storm tide* zones and evacuation routes.

*Local councils may use a slightly different name for their zones – it will either be called a storm surge or storm tide zone.

Australian tropical cyclone categories

Category	Strongest gust (km/h)	Typical effect (indicative only)
1	Below 125 km/h	Cyclones that cause slight damage to homes. However, there may be some damage to trees, caravans, fences, power lines and crops. Water ingress (when water from outside makes it into a building) begins at category 1, and gets progressively worse as the category increases.
2	125-169 km/h	Cyclones that generally cause minor damage to homes. However, these may cause significant damage to trees, caravans, fences, crops and stock. At category 2, there is a significant risk of power failure.
3	170-224 km/h	Severe cyclones that can damage the roofs and cause structural damage to older or poorly maintained homes. Caravans are likely to be destroyed and this category can cause significant damage to trees, crops and severe impacts to stock. At category 3, power and mobile phone failure is very likely.
4	225-280 km/h	Severe cyclones that cause significant roofing loss and structural damage to older and poorly built and maintained houses. At this stage, caravans will be destroyed or blown away. Higher wind speeds cause dangerous airborne debris. At category 4, widespread power and communication failures are common. Risks to lives increase rapidly.
5	Above 280 km/h	Category 5 cyclones lead to widespread destruction, affecting all homes, businesses and crops, posing significant risks to lives and disruption to entire communities.

Impacts of tropical cyclones



Destructive winds can cause direct damage to buildings, as well as indirect damage through water ingress (when water comes into buildings), which can result in water damage and lead to recurring problems like mould and electrical issues.



Storm surge, which is the rapid rise of sea level over and above the predicted tide, can cause significant flooding of coastal areas and extend for hundreds of kilometres.



Storm tide which is the surge plus the tide, raises the tide above usual high-tide levels and can also lead to flooding many kilometres inland.



Airborne debris propelled by destructive winds can cause damage to property and endanger people.



Severe river flooding and flash flooding



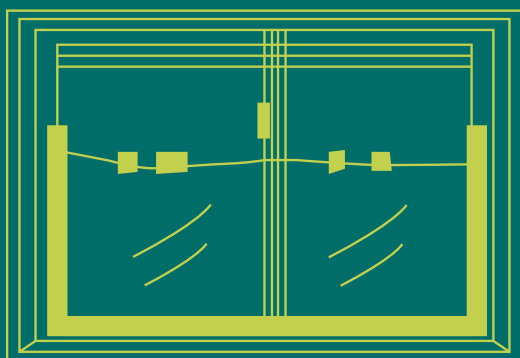
Coastal erosion and damage



Did you know?

Cyclones can also lead to damage in regions – sometimes thousands of kilometres away – other than those they directly impact. For example, while Cyclone Debbie made landfall near Airlie Beach, the impacts of the tropical low continued to travel south causing significant damage and flooding to other parts of South East Queensland and northern NSW, some 1,300 kms away.

Preparing for a cyclone



How to tape up your windows with a plastic waterproof sheet

The plastic sheet should be completely taped down across the bottom of the window and the sides to prevent water from entering your home. The top of the plastic sheet doesn't need to be completely taped down but should be held in place with a few sections of tape.

- Regularly check the weather during cyclone season.
- Have an emergency plan.
- Have an emergency kit and make sure your family members know where it's located.
- If a cyclone is on its way, tie down or pack away any loose items on your property as these can be picked up by the wind and cause damage to properties and endanger people.
- Use plastic tarps or waterproof sheets to cover windows and tape up the bottom of glass doors to reduce wind driven rain ingress into your home.
- Place temporary shutters over windows and other openings if they are likely to be exposed to flying debris.
- Place sandbags along the external door entrances if there is a flash or river flooding risk.
- Ensure vehicles, caravans and boats are secured as much as possible.

Making your home more resilient to cyclones

Maintenance

Maintaining your home or property is one of the best ways to protect it before a cyclone hits.

Wind and rain will find the weakest links, so all parts of the building (roof cladding, fascias, gutters, window seals, skylights, whirly birds and roof-to-wall connections) need to be checked regularly for loose or missing fittings, rust, rot, UV damage and insect attack.

If there is weakness in any of these parts of your home, particularly your roof, then your property may be more vulnerable to damage when a cyclone strikes.

Other ways to improve the resilience of a building include:

- installing additional bolts on windows and doors to reduce the likelihood of them bursting open during a cyclone
- installing window shutters or debris screens
- if you are in an older home (pre-1980s) consider a structural roof upgrade.

Retrofitting older homes

Homes built before the early 1980s may not have been built to the current stronger wind load requirements.

If you do live in an older home, you may want to organise an inspection with a certified building inspector to check the key fixtures of your home including your:

- roofing and roof structure
- garage doors
- windows
- doors.

Retrofitting a roof can be one of the best ways to improve the resilience of older homes built before the code.

(Watch this [video](#) from the Cyclone Testing Station to find out more about replacing a roof.)

Building to the code

If you are building a new property, ensure that your builder is meeting all the requirements based on the wind classification of your property.

You may also want to speak to your builder about building above minimum standards*, including choosing different materials and fixtures that may be more resilient and worthwhile for your home in the unfortunate event you experience a flood or water damage during a cyclone. Building to a higher wind region or higher wind classification is an example of building above minimum standards.

Going above a minimum standard can also potentially reduce the financial impact if your home is in the path of a damaging weather event.

There are many online resources that provide examples of resilient materials. For example, the [Queensland Reconstruction Authority](#) provides a number of guides on building homes that are more resilient to cyclones and floods.

*A 'minimum standard' is the minimum necessary requirement for a building. It is generally designed to focus on 'life safety', i.e. keeping you safe. Minimum standards do not take into account the potential financial implications (cost of repairs) if your property is significantly damaged during an event.



Ballpark costs for retrofitting a home

The cost for retrofitting can vary, however, approximate costs are listed below.

Item	Approximate cost*	Benefit
Roof replacement for houses built before code changes in the early 1980s	Starting from \$20,000 - \$30,000 for a 2-3 bedroom single-storey house	A stronger roof is less likely to be damaged during a cyclone which prevents damage to the entire home.
Shutters / window screens	\$5,000 for a small house	Shutters can reduce wind impact, protect your home from flying debris, and prevent water ingress (wind-driven rain) from damaging the inside of properties.
Garage door replacement (for a single door without a motor)	Starting from \$1,000 - \$5,000 including installation	A strong garage door can prevent significant damage from wind and water entering the house through the garage.

*The cost greatly depends on factors like location, size, number of stories, and the age of the property. We recommend speaking to a certified builder for an accurate estimate based on your property and to understand the benefits it may deliver.

Insurance tips

- Check that you have home building and contents insurance and that your policy is up to date. Check your policy includes cover for water damage and accounts for any other structures on your property such as sheds.
- Check that you have appropriate insurance for any vehicles, boats or caravans that may be on your property.
- Use an online insurance calculator as a guide to help you decide how much to insure your house.
- If you live in an older building, especially if it was built before 1980, ensure that you have factored in any additional costs associated with complying to building or repairing your home to the current building codes.
- Check whether you are adequately covered for 'removal of debris' (clean-up costs after a cyclone).
- Check that your insurance policy covers you for temporary accommodation in case you can't live in your home due to a cyclone.
- If you're a small business, check if you are covered for the costs of interruption to your business if there is a cyclone that affects your property.



Clean up costs

The costs of demolition and clean up should be included in your sum insured, or the terms of your policy. It is important to consider these costs when deciding how much it will cost to rebuild if your home is destroyed by a cyclone.

If asbestos is present on your property, a licensed asbestos removalist must be engaged to do the clean-up work. If you are insured, your home insurer may organise and assist in cleaning up, securing your home and removal of debris.

How much do clean-ups cost?

If a home is significantly damaged or destroyed completely, clean-up costs can reach tens of thousands of dollars.



\$46,000
is the average cost for debris removal*



\$68,000
is the average cost for debris removal for properties with asbestos

* Debris removal refers to debris from the property itself such as damaged parts of the building or trees that were already on the property.

Source: IAG data from debris removals after the 2019-20 Christmas period fires.



Information

For more practical information on how to prepare and act if your home is threatened by a cyclone visit the relevant emergency services organisation in your state or territory:

Queensland
QLD Fire and Emergency Services
qfes.qld.gov.au

Northern Territory
NT Police and Emergency Services
pfes.nt.gov.au

Western Australia
Department of Fire & Emergency Services
dfes.wa.gov.au

New South Wales
Resilience NSW
emergency.nsw.gov.au

Other useful websites:

Cyclone Testing Station, James Cook University
jcu.edu.au/cts

Queensland Reconstruction Authority guidelines
qra.qld.gov.au/resilient-homes

Bureau of Meteorology
bom.gov.au/cyclone/tropical-cyclone-knowledge-centre/understanding/

Red Cross Get Prepared App
redcross.org.au/get-help/emergencies/preparing-for-emergencies/get-prepared-app

Bushfire & Natural Hazards CRC
bnhrcr.com.au