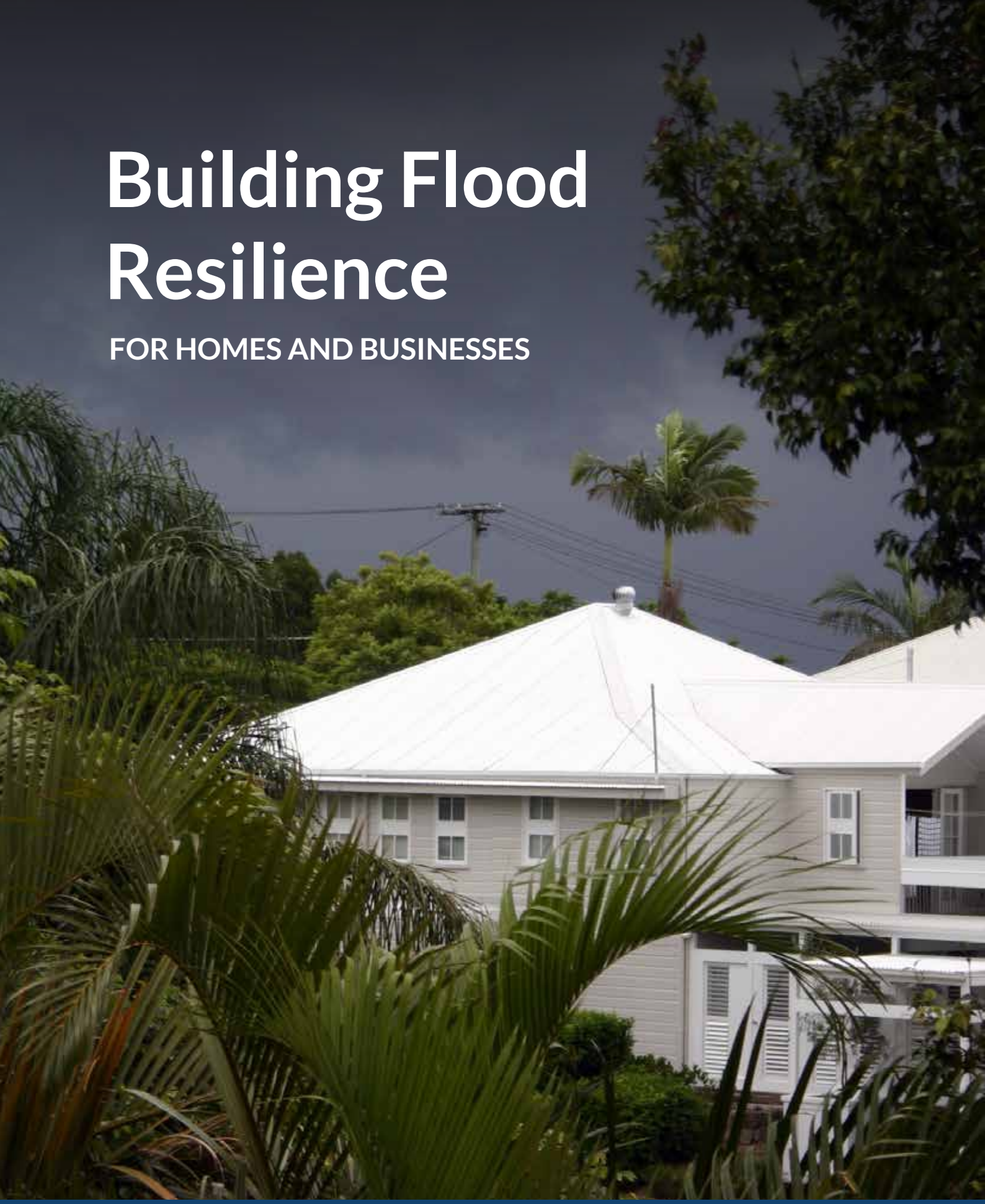

Building Flood Resilience

FOR HOMES AND BUSINESSES

Cairns REGIONAL COUNCIL

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Flood smart buildings

This guide is for anyone whose home or building was affected by flood, or is located in a flood area, and would like to adapt their home or building to be more flood resilient.

Retrofit for flood resilience by:

- **RAISING**
- **REPLACING**
- **RETHINKING**

Flooding is a natural process

The Cairns region is a beautiful, tropical area that is vulnerable to natural disasters. With mountains to the west and large catchments supporting rivers, creeks and low-lying coastal areas, many residents are likely to experience flooding in their lifetime.

Each year, Cairns experiences flash flooding where water levels rise rapidly in drains, creeks, and rivers. Flooding may also be localised, where some suburbs flood while others do not.

This guide will help you make decisions as you rebuild, retrofit or design a new home or business building after flood damage. It will also provide advice for your household if you are at risk of experiencing a flood.

Cairns Regional Council wants to ensure our communities are aware, prepared for and can take steps to improve their resilience to future storm and flood events.

Increasing your flood resilience means changing the way you rebuild or retrofit to potentially decrease damage the next time it floods. While in some areas it may not be possible to completely avoid flooding, we can use flood resilient design ideas and materials to minimise life and work disruption during and after a flood event.

Don't just replace 'like for like'. A flood resilient building doesn't have to be expensive; it's all about making smart choices.

Before you build, rebuild and retrofit, it's important to check how future flood hazards may affect your building. Don't just rely on what happened last time.

Visit the Council flood information page:

www.cairns.qld.gov.au/experience-cairns/online-maps/flood-maps

This page includes:

- Predicted flood mapping for your suburb
- You can apply for a property flood assessment report to determine your 'Flood Planning Level' which will help you understand what flood height you should prepare for.

You may need to increase your floor level above the 'Flood Planning Level' to reduce your risk further. Consider engaging a surveyor for a floor level survey. Consult building professionals to understand your best options going forward, this includes Registered Architects who can help you set a budget and rebuild better.

You may also require development or building approvals, depending upon the extent of your rebuilding and the overlays and zoning of your property. You can find information on permit requirements on the Queensland Building and Construction Commission website. Contact Council or consult a Town Planner for further advice. Always make sure you work with licensed tradespeople and consult a registered engineer.

Cairns Regional Council acknowledges and pays our respects to the Traditional Custodians of our region, the Djabugay; Yirrganydji; Buluwai, Gimuy Walubara Yidinji; Mandingalbay Yidinji; Gunggandji; Dulabed and Malanbara Yidinji; Bundabarra and Wadjanbarra Yidinji; Wanyurr Majay; Mamu and NgadjonJii peoples. We extend this respect to all elders past, present and future, and other First Peoples within our region.

Your Flood Smart Building Guideline

Revision 1.0 | May 2024

The Cairns climate

Photo credit: Tourism Tropical North Queensland

Located in the Wet Tropics, Cairns experiences hot and humid summers featuring significant rain, cyclones, storm surge and flooding.

Heavy rain is more common than any other natural hazard. While we can't prevent severe weather and floods, we can prepare for them. The terrain of our region is diverse; it includes undulating mountains flanking the Atherton Tablelands to the west and is bordered by the coast to the east.

Most of the region is low-lying and encompasses tidal wetlands, freshwater lakes, mudflats, mangrove swamps, bays, rivers, estuaries, and rich coastal ecosystems.

This includes three major catchments of the Russell, Mulgrave and Barron rivers, and tidal tributaries of the Trinity Inlet.

Our environment has seen big changes which has shaped the way we live and respond to weather events today. Our climate is predicted to change into the future, with more intense and frequent severe events.

Together we can make sure our homes and communities are prepared for the changes ahead.

Flooding in the Cairns region

Cairns has a history of riverine flooding, flash flooding, storm tide inundation and overland flow flooding, which can impact your home and business.

Most urban areas typically experience flash flooding or overland flow flooding, which occurs as a result of very heavy rainfall over a relatively short period of time.

The narrow nature of coastal floodplains mean that widespread flooding can occur quickly after heavy sustained rain, while it will usually recede within 1-2 days of eased or no rainfall.

King tides can also cause flooding in coastal areas and worsen inland flooding by disrupting river and creek outflows. While rainfall and flooding can be widespread, the intensity and severity varies across the region. No floods are ever the same, making it hard to plan for and predict future floods.

As the climate changes, we expect to see more flooding, including more intense downpours and flash flooding in our region.

Council implements a range of actions to respond to flood risk including emergency management, land use planning, flood warning, community awareness and education, nature-based responses, structural mitigation and smart building design.

All of these measures work together to improve our region's response to flood risk.

Inside your building

Use flood resilient strategies inside your home or building to adapt to flooding, so that you spend less time cleaning up, have less damage and less long-term costs.

Raise electrical outlets

Replace plasterboard with flood-resilient options like fibre-cement

Replace carpet with easy to clean surfaces

RAISE

1 Electrical outlets

Raise all of your electrical and data points above your building's flood planning level. This will avoid needing to replace these in future flood events. Talk to a licensed electrician.

2 Appliances

Raise your washing machine, dryer and shelves above your building's flood planning level.

REPLACE

3 Plasterboard

Replace your plasterboard with flood-resilient fibre-cement and your wall framing with hardwood or metal, especially in the lower levels of your home or business.

4 Wall cavities

Try to avoid water getting into your wall cavities or design your home so that there are no cavities at all. If you have to keep the cavity, make sure the wall is moisture-sealed on both sides well above your flood planning level. If you have pine stud walls, consider sealing them with a mould-resistant paint for further protection.

REPLACE

5 Flooring

Replace your carpet with flood-resilient flooring like polished concrete, so that it's easy to clean after a flood. Use flood-resilient sealant to minimise the chance of mould and damage.

6 Kitchen cabinets

Replace your kitchen cabinets with water-resistant materials like compact laminate cabinetry or stainless steel. Raise your cabinets up on legs or use removable kick-boards to make it easier to clean out underneath.

7 Doors

Replace your hollow doors with solid, aluminium or glass doors to reduce the chance that your door will swell and warp.

RETHINK

8 Entries

Rethink any small steps or level changes at or near your doors, especially any entry doors. It helps if door sills are the same level as the floor or "flush" with the floor, this can mean it's easier to sweep out water without having small amounts remaining inside your house or business.

9 Two-storey homes

Rethink your two-storey home so that the upper level has all the survival essentials such as food storage and water supply.

Removable cabinets under standalone benchtop

Polished concrete is a good flooring solution

Ask your builder to:

10 Replace insulation

Replace your insulation with suitable closed-cell insulation and install resilient wall lining.

Photo contribution JDA Co.

Outside your building

Use flood resilient strategies on the outside of your home or building to help prevent water from entering, or minimise damage.

Raise power boxes and other services

Make sure exterior doors are hardwood or solid core timber, or aluminium.

SMART IDEA

Do some research on your insurance company before starting building work. Some insurers reward Flood Smart work through reduced premiums.

RAISE

1 Your building

Raise your living areas (if possible) above the flood planning level; if your home is already on stumps, raise it further. Before building in under your home or lower level, consider what property could be damaged in a flood.

2 Services

Raise your air-conditioning units, battery storage, electrical meter board and hot water unit above the level that the flood waters reached. This may avoid needing to replace these in future flood events. Talk to a licensed electrician or plumber.

Photo contribution JDA Co.

REPLACE

3 External materials

Replace your external cladding and doors with water-resilient materials or consider replacing the walls with a non-cavity alternative.

4 Metal fixtures

Replace your door handles with water-resistant products so that they don't corrode.

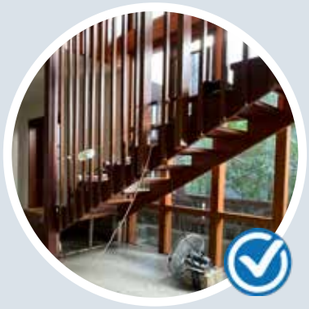
5 Solid garages

Replace solid garages and carport walls with openings, gaps or air vents to allow water to flow through and to help the area to quickly dry out after a flood event.

RETHINK

6 Stairs

Rethink stairs that have voids/cavities with stairs that are open with no risers (or backs) so that water isn't trapped behind your stairs. This also applies to your indoor stairs.



7 Structural footings

Rethink your structural post footings. Consider pouring a blinding concrete slab to minimise erosion and allow for easy wash out after a flood event. This is important to consider for sloping blocks where your structural posts may experience higher levels of scouring.

Photo contribution JDA Co.

Ask your electrician to:

8 Re-design electrical circuits

Re-plan your electrical circuits so that the lower level is on a different circuit to your upper level. This may minimise disruption to your power supply during a flood event and after the power comes back on.

SMART IDEA

Take note and measure the level of where the flood water reached on your home or building.

Your yard

Use flood resilient strategies in your yard to help prevent water from entering, to minimise damage.

Plants help stabilise the ground and soil

Add drains in low areas

Porous ground cover

SMART IDEA

Rainwater tanks are important for storing water and can be emptied prior to rain events so that it can store water from your roof and not overflow into your yard and driveway.

RAISE

1 Pumps

Raise your pool filter and pumps, and rainwater tank pumps above your building's flood planning level. This may avoid having to replace these in future flood events.

REPLACE

2 Driveways

Replace hard surfaces like concrete driveways with paving that 'absorbs' water (known as 'permeable paving' and 'porous surfaces').

3 Hard surfaces

Replace hard surfaces like concrete areas with grass, planting with mulch, gravel and stones to absorb water. However, avoid planting and adding gravel right next to your house, which can affect your footings and slab and encourage termites.

4 Solid fencing

Replace your solid fencing to fencing with gaps and made from flood-resilient materials like hardwood timber, composite timber, PVC or metal, to help prevent water building up against a solid fence.

RETHINK

5 Water flow

Rethink your yard based on how water pools and flows during rain events and floods. Use swales, surface drains, spoon drains, channels and mounds to lawfullly redirect water to the street or away from your home and your neighbour's property.

6 Neighbours

Rethink the way that water flows on to your neighbour's property and redirect it to the street. Talk to your neighbours if you have any water flow issues. Note that Council cannot intervene in discussions or decisions between neighbours on overland flow issues.

7 Ground materials

Rethink your yard to minimise soil and silt run-off, especially on sloped land, by planting native groundcover species that stabilise the soil. Soil and silt can clog drains and contribute to increased flood levels.

8 Yard layout

Rethink the locations of sheds, structures and rainwater tanks if they cause issues with the way water moves on your block. Consider how changes in your yard can improve directing water away from your house and your neighbours property. Direct flows towards your lawful point of discharge.

9 Sewerage

During a severe storm or flood, make sure you put sand bags in your toilet, floor waste drains and bath/shower drain to stop sewer water backing up into your house.

10 Ask your structural engineer to:

Look at your retaining walls to check water doesn't build up inside them. They may need drainage elements to relieve future water pressure.

11 Ask your landscape architect/designer to:

Slow down the water on your block with swales and rain gardens. Rain gardens are areas planted with water-loving plants that help slow, filter and collect flood water.

12 Ask your plumber to:

Advise if installing a reflux device on your sewerage drain could help prevent waste from backing up into your house. A plumber will be able to recommend if this is suitable for your system and location.

Want more tips?

1 Queensland Government Flood Resilient Building Guidance for Queensland Homes

Visit the Queensland Government Queensland Reconstruction Authority website for information about improving the flood resilience of new and existing Queensland homes. It includes guidance on flood resilient design principles, strategies, construction details, materials and the expected benefits and costs of flood resilient design.

Visit www.qra.qld.gov.au/resilient-homes/flood-resilient-building-guidance-Queensland-homes

2 Queensland Building and Construction Commission

For handy hints of practical steps to take to rebuild after a flood and a register of licensed tradies visit www.qbcc.qld.gov.au/repair-rebuild-after-flood-storm-damage

For information about permit requirements. View the Permit requirements for rebuilding and repairing after a natural disaster (PDF)

3 National Construction Code (NCC)

Visit the Australian Building Codes Board website for the Flood Standard and the Flood Handbook. These cover the design and construction of new buildings in flood hazard areas.

Visit www.abcb.gov.au/resource/standard/construction-buildings-flood-hazard-areas-standard

Know your risk

1 Flood and storm surge

Flooding is common in Cairns due to our high annual rainfall, geography and large river systems. Most flooding is minor and causes inconvenience such as closed roads and bridges.

Flooding is sometimes confused with storm surge. Flooding is fresh water, caused by heavy rainfall. Storm surge is sea water pushed onto land during a cyclone. However, not all cyclones will generate storm surge.

If storm surge or flooding is predicted, people in at-risk areas may be advised to evacuate.

2 Know your flood risk

Flood maps show what's known as a one-in-100-year flood – an extreme weather event generating very high rainfall over a short or sustained period of time.

Find the flood maps for your place here: www.cairns.qld.gov.au/community-environment/natural-disasters/flooding

3 Property flood assessment

You can request an individual property assessment by contacting Council for a Flood Zone and Storm Tide Information Search. The search typically provides the following information:

- An indicative ground level height of your site
- Storm tide levels from either Council or State Government
- Information to assist with determining the height of habitable floor levels to reduce flood risk.

This information can assist in understanding what height a flood may come to at your place and what height to prepare for.

To request a flood search visit: www.cairns.qld.gov.au/facilities-sport-leisure/online-maps/flood-maps

4 Know your storm surge risk

Storm surge can travel a significant distance in land, especially along tidal creeks. It's therefore very important to 'know your zone'.

You can find your zone and understand the risk at your place by entering your address here: www.cairns.qld.gov.au/community-environment/natural-disasters/storm-surge

5 Stay informed

For the latest weather warnings, advice and information, visit the Cairns Disaster Dashboard.
Visit www.disaster.cairns.qld.gov.au

The dashboard contains latest updates on:

- Road conditions
- Power outages
- Weather warnings
- Flood cameras
- Other emergency information

6 Cairns Alert message service

During an emergency the Cairns Disaster Group can send critical emergency information to your mobile phone via text message through the Cairns Alert messaging service.

Cairns Alert is an opt-in service. You can register at: www.cairns.qld.gov.au/community-environment/natural-disasters/cairns-alert

7 Emergency planning

The Household Emergency Plan template will help prepare your household for emergency scenarios including flood, visit: www.cairns.qld.gov.au/community-environment/natural-disasters/household-emergency-plan

For tips on what to have in your Household Emergency Kit ahead of natural disasters visit: www.cairns.qld.gov.au/community-environment/natural-disasters/household-emergency-kit

8 Copperlode Falls Dam Emergency Action Plan

In the extremely unlikely event that Copperlode Falls Dam fails, it is important that people living in the Redlynch Valley and surrounding areas know what to do.

To understand your risk visit: www.cairns.qld.gov.au/community-environment/natural-disasters/copperlode-emergency-action-plan

For more information please contact Council

Visit	www.cairns.qld.gov.au
Email	council@cairns.qld.gov.au
Call	1300 692 247
Write to	Cairns Regional Council PO Box 359 Cairns QLD 4870

Thankyou to City of Moreton Bay and JDA Co. for providing the content featured in this document

Cairns REGIONAL COUNCIL