Scarborough

DRAFT Local Resilience Plan

October 2025



Jamieson Park Sunset. Image credit: Jenny Don

moretonbay.qld.gov.au

CITY OF MORETON BAY

Acknowledgment of Traditional Custodians

City of Moreton Bay acknowledges the Jinibara, Kabi Kabi and Turrbal peoples and pays respects to Elders, past, present and emerging. Council recognises that the Moreton Bay region has always been a place of cultural, spiritual, social and economic significance to its Traditional Custodians. Council is committed to reconciliation and working in partnership with Traditional Custodians and Aboriginal and Torres Strait Islander communities to shape a shared future for the benefit of all communities within the City of Moreton Bay and beyond.



Disclaimer

City of Moreton Bay and its officers accept no liability for decisions made based on information, expressed or implied, in this document. Nothing in this document should be taken as legal advice.

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About the Local Resilience Plan program

The foundation of our resilience planning process

In City of Moreton Bay, Local Resilience Plans (LRPs) identify the resilience needs of at-risk communities and embed them in our Local Resilience Action Plan (LRAP) and long-term council planning. LRAPs help councils identify and communicate their resilience needs to secure external funding for ongoing improvements.

The Queensland Reconstruction Authority (QRA) coordinated a locally-led resilience action plan program (Local Resilience Action Plans) with councils across Queensland, resulting in over 4,400 actions to boost disaster resilience. These plans help prioritise and integrate disaster risk reduction into State level decision making and investment.



How Local Resilience Plans fit with other council planning processes

What is a Local Resilience Plan?

A Local Resilience Plan is a targeted strategy to strengthen community resilience against natural hazards including flooding, sea level rises, heatwaves and drought conditions. These hazards are made worse by the combined impacts of climate change and urbanisation, which will cause increased stormwater run-off during higher frequency, higher intensity rainfall events. These plans help communities identify their needs, guide proactive actions, and support alignment with the City of Moreton Bay's LRAP and funding opportunities.

There are many actions Council and the State Government can take to reduce the impact of natural hazards on the community, but we will achieve the best results by partnering with residents to achieve long-term resilience. Council is undertaking local planning and identifying improvements to public infrastructure, while residents are encouraged to take property-scale actions to improve the resilience of their homes for the future.

The Local Resilience Plan is a living document, with this version serving as the starting point. It will continue to evolve through ongoing implementation support and regular updates over time. This will include updates on infrastructure planning as it progresses, and updates to climate modelling and projected impacts.

The Local Resilience Plan connects directly with the work Council is undertaking on public infrastructure, as well as with community support, which provides information and guidance on property-scale actions that households can take to strengthen resilience.

In addition, a dedicated Local Resilience Plan website for the Scarborough community has been established. This site will share more frequent updates and resources, and can be accessed here.

Council's Commitment to Local Resilience Planning

To demonstrate our ownership of actions from the Local Resilience Plan, Council will:

- **Embed community proposals** for capital infrastructure improvements into the City's Local Resilience Action Plan, held by the Queensland Reconstruction Authority.
- **Incorporate community-led insights** into Council's forward planning for infrastructure development and hazard mitigation.
- **Support funding pathways** by aligning proposed infrastructure improvements with Council priorities – enabling feasibility studies, design, and construction through Council budgets and external grants.
- **Improve transparency to ensure continuity** by integrating community recommendations into planning and long-term resilience strategies to protect lifestyle and liveability in hazard-prone areas.

Scarborough risks and impacts

Scarborough spans either side of the northern Reef Point. To the west is Jamieson Park and Scarborough Boat Harbour. Jamieson Park is a low energy, red sandy gravel beach, fronted by a 300m wide tidal flat and backed by a seawall. Residents have a very strong connection to place and a desire to protect and preserve their community. This includes adapting to natural hazards and climate change through Council infrastructure improvements and property scale resilience actions.

The northeastern most section of shoreline is home to the area's iconic red cliffs which in recent times have undergone stabilisation after erosion events. Scarborough Beach is contained at both ends by groynes and is backed by a large, grassy foreshore with toilets, a picnic area and a playground. Flinders Parade beachfront has benefited from significant amounts of sand brought in to stabilise and beautify the beach.

During significant storms or heavy local rainfall, local stormwater systems (designed and built for a lower density of housing) cannot carry the run-off, resulting in overland flow and localised flooding.

Scarborough has experienced flooding events in the past. In 2022, the worst flooding seen by current residents was experience in the lowest parts of the Avenues and some parts of Reef Point Esplanade, due to the pooling of storm water run-off from streets behind Fifth Avenue.

Other natural hazard impacts can include damage to property, disruption to lifestyle, and limiting access to resources.

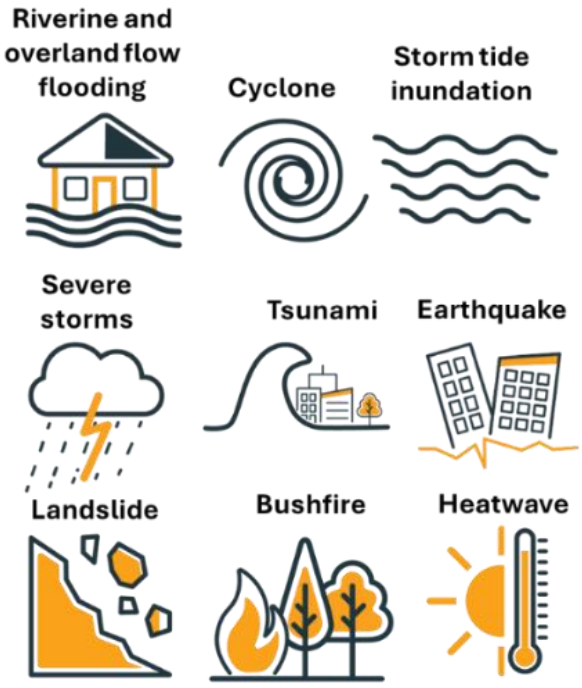
The Scarborough community is already experiencing impacts from the increased intensity and frequency of natural hazards due to climate change, some of which are described in this Plan. City of Moreton Bay is keen to work with community to develop plans and, where possible, solutions to mitigate these impacts. Residents who have not been impacted before may be affected in the future.

Understanding these risks helps us plan, prepare and respond together, so we can better protect our people, property and environment.



Scarborough in the wet, circa 1950. From the Atkinson family collection.

Scarborough Natural Hazards



Erosion

The Scarborough community is semi-sheltered in Moreton Bay and therefore is not exposed to open-coast erosion. However, erosion can still occur (and has occurred) at Scarborough Beach due to wind-driven waves and tidal currents across the Bay.

Due to past erosion at Scarborough Beach, erosion control measures have been implemented to hold the shoreline position and mitigate erosion. This includes groynes, sea walls, and cliff stabilisation works.

In terms of erosion, the Scarborough community is vulnerable to erosion in the present day, with areas such as the private properties which front the ocean on Fortune Street potentially at risk from erosion. The risk of erosion may increase further by 2050 and 2100.

Tidal inundation

Tidal inundation is regular flooding from the tidal cycle, including up to the Highest Astronomical Tide (HAT).

Scarborough is susceptible to tidal influences due to its location within Moreton Bay. Some parts of the Scarborough community may be vulnerable to tidal inundation in the present day. This is limited to the Scarborough foreshore.

By 2050[1], tidal inundation may extend further inland, potentially affecting more of the Scarborough foreshore and a limited number of private properties on Reef Point Esplanade.

By 2100[1], all of Jamieson Park, Tingira Park and many of the private properties on Second Avenue, Third Avenue and Reef Point Esplanade may be exposed to tidal inundation. In addition, some of the private properties on Fourth Avenue and Fortune Street may be exposed to tidal inundation.



Cliff stabilisation works on the eastern side of Scarborough

[1] A projected sea level rise of 0.8m by 2100, with 0.3m by 2050 has been adopted, as recommended by the Queensland State Government.

Storm tide

Storm tide inundation is the temporary inundation (up to one tidal cycle) of low-lying coastal land from a locally elevated water level. Storm tide is a combination of normal tide, storm surge, and wave action. Storm surge[2] can significantly increase the water level in the Bay, pushing water onto the foreshore.

By 2050, the level of storm tide inundation is projected to increase and pose a greater risk to the community. All of Jamieson Park and Tingira Park, as well as most of the private properties on Second Avenue and Third Avenue, may be vulnerable to storm tide inundation by 2050. In addition, some of the private properties on Reef Point Esplanade and Fourth Avenue may also be exposed to storm tide inundation by 2050.

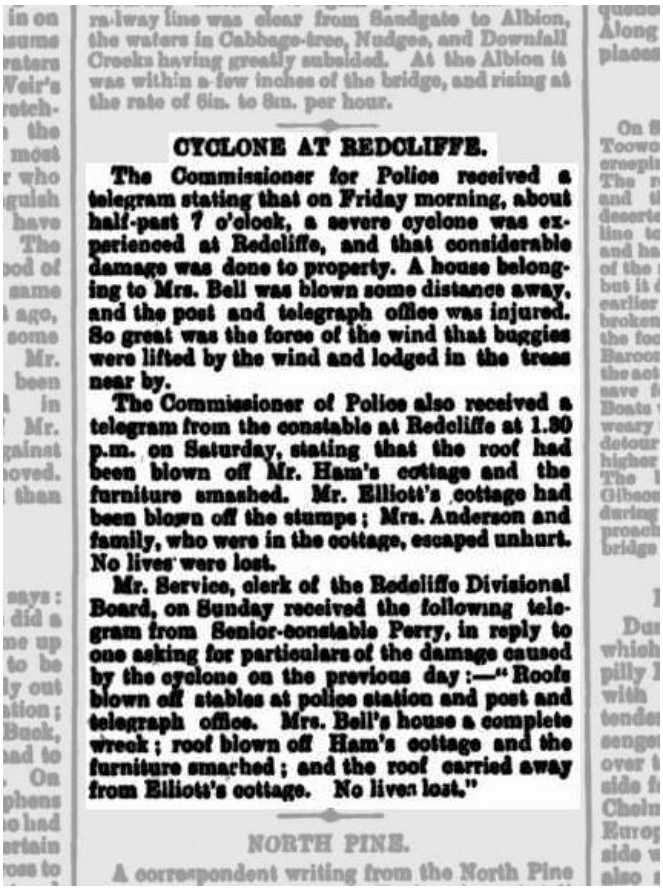
By 2100, the level of storm tide inundation at Scarborough may increase further. All private properties on Second Avenue and Third Avenue may be vulnerable to storm tide inundation by 2100. In addition, most of the private properties on Reef Point Esplanade and some of the private properties on Fourth Avenue and Fortune Steet may be exposed to storm tide inundation by 2100.

Tropical cyclones

Tropical cyclones are low pressure systems that form over warm tropical waters. While they do not frequently travel as far south as Moreton Bay before crossing the coast, the region has been impacted by multiple tropical cyclones or ex- tropical cyclones in the last 100 years.

For example, Tropical Cyclone Alfred in March 2025 impacted the City of Moreton Bay, leaving more than 62,000 properties without power.

Tropical cyclones and ex-tropical cyclones can cause significant local impacts from destructive winds, heavy rainfall leading to flooding, storm surges causing coastal inundation, and damage to infrastructure and ecosystems.



railway line was clear from Sandgate to Albion, the waters in Cabbage-tree, Nudgee, and Downfall Creeks having greatly subsided. At the Albion it was within a few inches of the bridge, and rising at the rate of 6in. to 8in. per hour.

CYCLONE AT REDCLIFFE.

The Commissioner for Police received a telegram stating that on Friday morning, about half-past 7 o'clock, a severe cyclone was experienced at Redcliffe, and that considerable damage was done to property. A house belonging to Mrs. Bell was blown some distance away, and the post and telegraph office was injured. So great was the force of the wind that buggies were lifted by the wind and lodged in the trees near by.

The Commissioner of Police also received a telegram from the constable at Redcliffe at 1.30 p.m. on Saturday, stating that the roof had been blown off Mr. Ham's cottage and the furniture smashed. Mr. Elliott's cottage had been blown off the stumps; Mrs. Anderson and family, who were in the cottage, escaped unhurt. No lives were lost.

Mr. Service, clerk of the Redcliffe Divisional Board, on Sunday received the following telegram from Senior-constable Perry, in reply to one asking for particulars of the damage caused by the cyclone on the previous day:—"Roofs blown off stables at police station and post and telegraph office. Mrs. Bell's house a complete wreck; roof blown off Ham's cottage and the furniture smashed; and the roof carried away from Elliott's cottage. No lives lost."

NORTH PINE.

A correspondent writing from the North Pine

"Cyclone at Redcliffe" from The Queenslander, 25 February 1893

Overland flooding

The Scarborough community is exposed to flooding from heavy rainfall events, where the volume of rainfall exceeds the capacity of the local drainage systems. Excess water accumulates on the surface and flows

[2] A storm surge is a rise above the normal water level along a shore resulting from strong onshore winds and / or reduced atmospheric pressure. Source: GetReadyQld.qld.gov.au

overland, pooling in low-lying areas and flooding properties, infrastructure and natural environments.

During high tide, elevated water levels in Moreton Bay limit the drainage of floodwaters from rain events. This creates a compounding effect, as floodwaters are unable to flow freely into the Bay and/or out to the ocean, leading to prolonged inundation in low-lying areas.

Urbanisation and land development increases the demand on existing stormwater infrastructure. More impervious surfaces increases runoff due as water cannot be absorbed. This makes flooding events more unpredictable and contributes to downstream flooding.

Severe storms

Severe storms can be unpredictable and occur with little warning, bringing gale force winds, heavy rainfall and flash flooding, lightning strikes and hail. They can also create storm surges, increasing the risk of storm tide inundation. Storms are more common during hot summer months when the humidity is high and temperatures are warm, creating moist air rising into the atmosphere which can develop into a severe storm. Storms can last many hours and travel long distances, with the potential to cause considerable damage to homes and vehicles, and cause loss of power, isolation and flash flooding.

Scarborough is vulnerable to the impacts of severe storms.

Bushfire

Scarborough is not situated within the bushfire-prone area. However, this does not mean that there is no bushfire risk, as the area could be subject to ember attacks.

Bushfire risks are highest during drier, hotter weather when it is easier for fires to spread quickly. As the climate becomes hotter and dry seasons become longer, the bushfire risk for Scarborough properties will increase. Those close to areas of natural bushland are at the highest risk.

Landslide

Landslides are caused by unstable ground and can be a rockfall, landslide or debris flow. While landslides aren't common, the impacts are generally very severe. Landslides can cause loss of life, property and infrastructure, and environmental damage.

At Scarborough, there are two areas of identified landslide hazard[3]. This includes the Scarborough Beach Cliffs and Thurecht Parade near Reef Point Esplanade.

Heatwave

Heatwaves are defined as three days or more of unusually high maximum and minimum temperatures, particularly during summer months. In heatwaves, hot nights make it harder to recover from the heat of the day and this puts more stress on the body.

Heatwaves can be deadly and can lead to health issues like heat stress and heat stroke among vulnerable individuals. During

[3] City of Moreton Bay Landslide Hazard Overlay: https://datahub.moretonbay.qld.gov.au/datasets/mbrc-planning-scheme-landslide-hazard-overlay

extreme heatwaves, everyone must take steps to keep cool. In the future, City of Moreton Bay is expected to face an additional 33 heatwave days per year.

Drought

Drought is an extended period of unusually dry conditions where water availability falls below normal requirements. Short-term impacts include crop and livestock losses, water restrictions, heightened fire risk and environmental degradation. Over the long term, drought can lead to economic and social challenges, changes in groundwater systems, ecosystem disruption and damage to infrastructure.

Seqwater's Water Security Program 2023[4] sets out a 30-year plan to ensure high levels of water security are maintained for South East Queensland. This includes working with Unitywater to refine water demand forecasts to inform ongoing planning for water infrastructure.

Climate change is expected to increase the frequency and duration of droughts, requiring both governments and residents of our drought-prone state to reduce water consumption.

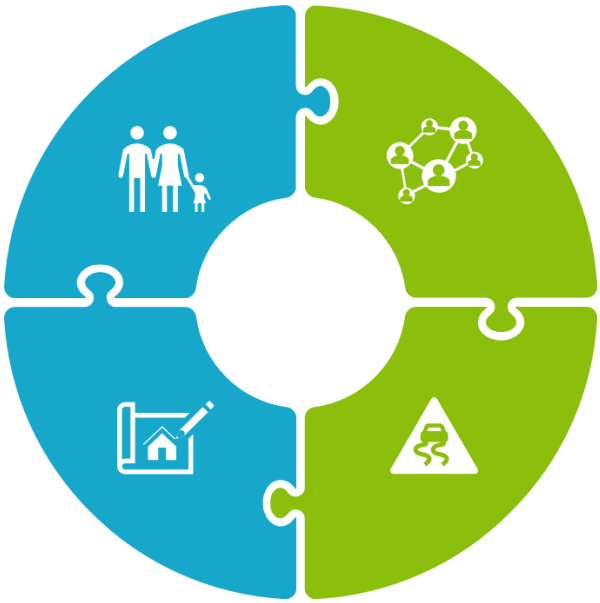


Construction of North Pine Dam, the primary drinking water supply for the area, in 1971. From the Moreton Bay Libraries Collection

[4] South East Queensland Water Security Program 2023 https://www.seqwater.com.au/sites/default/files/2023-10/J018969%20Seqwater%20Water%20Security%20Program%20FINAL%201-3_0.pdf

A resilient community

Resilient people
Aware of hazards, ready to respond, and able to recover quickly.



Social networks
Networks that come together to support each other.

Resilient buildings
Built to withstand temporary impacts from hazards.

Infrastructure
Can withstand hazard impacts and reduce hazard impacts to the community.

While it is impossible to completely remove the risk posed by natural hazards, a resilient community has the ability to withstand, adapt to, and recover from natural hazard impacts over long periods of time.

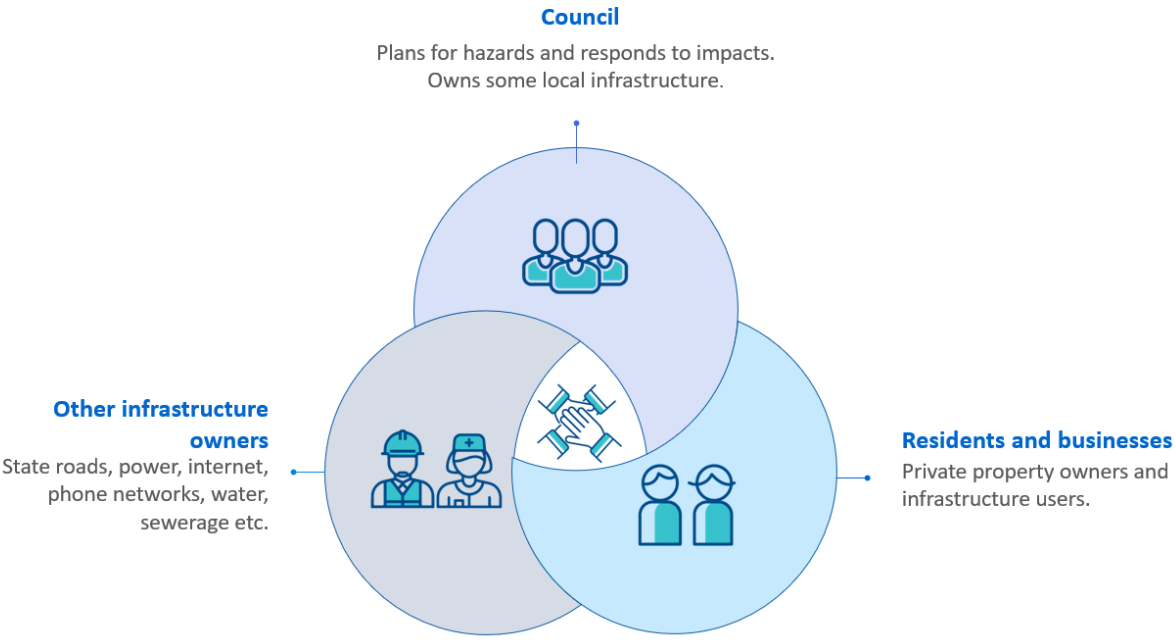
A resilient community is socially connected and has infrastructure that can withstand disasters and foster community recovery. They understand, prepare and manage possible impacts from natural hazards to properties and homes.

New or improved infrastructure can help reduce the impacts. Council is investigating future infrastructure requirements as part of future planning.

A resilient community cannot be created by any level of government working alone, nor by community members alone. It requires an ongoing collaboration between all stakeholders to achieve the four elements of a resilient community: resilient people, social networks, buildings and infrastructure.

Working together for a resilient Scarborough

Council plays a key role in identifying climate risks and planning for natural hazards such as flooding, cyclones, erosion, storm tides and sea level rise. However, managing these risks is a shared responsibility between the Council and other asset owners, such as Unitywater, Energex, Telstra, Optus, NBN and the community, including private property owners.



As climate change brings more frequent and intense extreme weather events, it will be increasingly important for Council and residents to work together. Council will continue to invest in infrastructure and regional planning, and there will be times when property owners need to take action to reduce their risk and build resilience.

By staying informed, understanding the potential impacts on your property, and getting involved in planning and recovery efforts, you can help make your whole community more resilient and strengthen our collective response.

Together, we can protect our coastline, support a thriving community and ensure that Scarborough is well prepared for the future.

Identified local infrastructure resilience needs

As part of the development of this Local Resilience Plan, consultations revealed the following concerns raised by residents of Scarborough:

- Worsening impacts of localised flooding, exacerbated by ongoing developments that increase runoff.
- Rising costs of insurance, and in the future, the ability to even obtain insurance.
- Lack of suitable drainage (additional pits/stormwater drains required).
- Vehicles driving through flood water causing damage to private properties.
- Effectiveness of coastal drainage infrastructure (e.g. duckbill outlets).
- Difficulties faced by property owners navigating complicated processes relating to grant funding and property resilience actions.

In response, Council is working on several investigations at Scarborough. These investigations, along with ongoing infrastructure upgrades, will help us identify, plan, design and deliver long-term infrastructure responses to natural hazard risks:

- Scarborough Flooding Mitigation Options Assessment (completed in 2025)
- Bushfire Hazard Identification and Response Project (expected completion end of 2025)
- Landslide Hazard Identification and Response Project (expected completion end of 2025)
- Flood Risk Assessment Study and Strategic Flood Risk Management Plan (expected completion 2026)

Council is currently pursuing grant funding for drainage improvements in Scarborough. We will also liaise with other infrastructure owners, including State Government departments, to deliver improvements in their assets.

Delivering complex infrastructure projects takes time. We will continue to keep the community informed of progress on all investigations, advocacy efforts and projects by regularly updating this plan. Where appropriate, Council will consult the community on identified infrastructure options and other resilience activities.

My risks

Living Coast Plan

The Living Coast Plan[5] identified that Scarborough will be increasingly prone to coastal hazard risks in the future. The following adaptation pathway is currently recommended for Scarborough:



Monitor (look and learn)
At localities where the coastal hazard risk profile is low, the adaptation response is to monitor the risks by observing changes and regularly reviewing whether these changes represent an increasing risk approaching a local limit, known as look and learn. The best practice is to undertake maintenance/asset management activities and continue active stewardship of the coastal zone. Where these observations suggest an increased risk (as indicated by local trigger levels), then the adaptation response may shift to active management.

Continuing to collect and record data on culturally significant sites and places, and places of high environmental and social value will help to grow knowledge and inform future decisions.

Actively manage
At localities where coastal hazard risks have been identified, the adaptation response is to proactively manage the risk through implementing a range of adaptation options. Adaptation options will be tailored to each locality, incorporating site-specific processes, community input, and statutory planning considerations. If, over time, the risk profile is observed to increase (as indicated by local trigger levels), and active management becomes unfeasible (due to economic or other factors), then the adaptation response may shift to transition, requiring a change in land use or relocation of assets.

Transition and change
For specific assets that experience intolerable risk, where the coastal hazard risk profile is very high, and active management becomes unfeasible (due to economic or other factors), a change in the location of the asset may be required. Transition is likely to be a gradual process over time, where mitigating hazards for a period is part of the transition process. A range of adaptation options will be part of the transition process.

The present day adaptation response for Scarborough is to continue to actively monitor coastal hazard risks. At the same time, we will begin preparations for future hazard mitigation and land use transition for very high (intolerable[6]) risk areas. If a resilient built form cannot be achieved by 2050, planning would need to commence for potential transition for very high-risk areas of Scarborough.

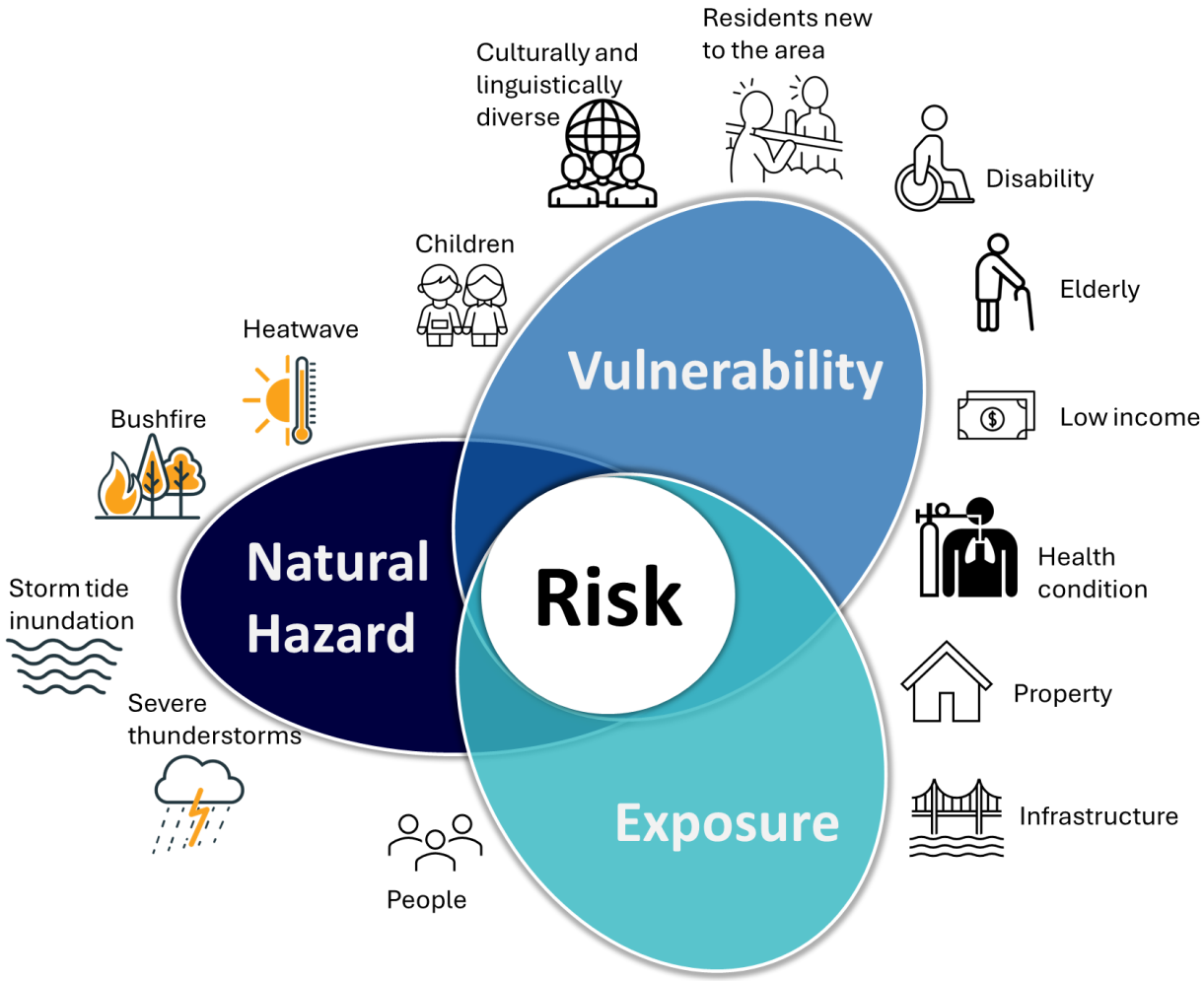
[5] yoursay.moretonbay.qld.gov.au/coastal-hazard-adaptation-strategy

[6] "Intolerable risk" refers to an assessment under the Planning Act 2016 (Queensland) that the level of threat to life or property from natural hazards is unacceptable.

Personal circumstances

Everyone's situation is different, and personal circumstances can significantly increase vulnerability during a hazard event (some of these are highlighted below). It is important to note Council's assessment of risk levels has not factored in your personal circumstances. Your personal circumstances may increase your risk level. Consider your personal circumstances and factor them into your household emergency plan. It is essential to note that individuals may face personal circumstances beyond those outlined below that could increase their risk level, and these should also be taken into account.

If you believe you are vulnerable, consider creating a Person-Centred Emergency Preparedness Plan.



Council's assessment of key risks to your property

This pilot has a focus on coastal hazards and bushfire hazard, but other natural hazards impact Scarborough.

The following outlines Council's assessment of key risks to your property from coastal hazards and bushfire hazard. This risk rating has been developed using a property database informed by the risk assessment from the Living Coast Plan, along with some additional assumptions detailed in this section. Please note, the risk level defined here is based on objective data and may differ from individual perceptions of risk. For more information on risk levels, please refer to the tailored risk tolerance categories in the Living Coast Plan[7] (page 21).

Understanding the hazard impacts to your property

The diagram below illustrates the various events that can impact your property due to coastal hazards.

- **Any flooding above your habitable floor level for a 1% AEP event or more likely events** - A 1% Annual Exceedance Probability (AEP) event means there is a 1% chance of this size flood or storm happening in any year. This is the same as saying there is a one in one hundred chance each year. It does not mean the event will only happen once every one hundred years. It could happen more than once in a lifetime, or even more than once in the same year.
- **Any flooding above your habitable floor level during HAT +0.8m (sea level rise by 2100) -** This is the level of predicted impact by 2100 from a Highest Astronomical Tide, with a 0.8m sea level rise.

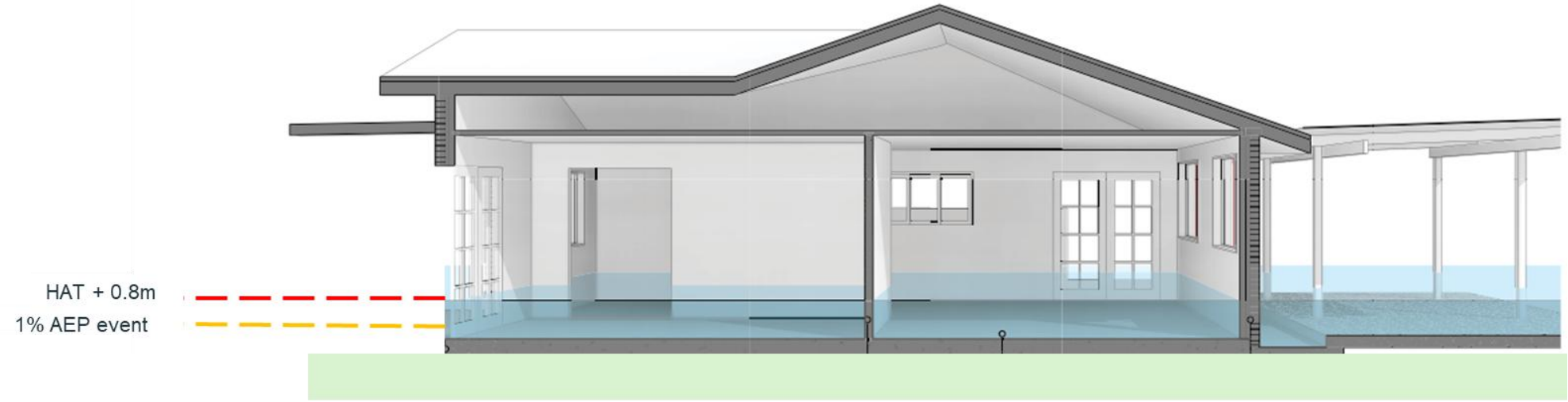
The different hazard events are colour coded based on the type of resilience action recommended these include:

- **Orange dashed line:** refers to the retrofit actions
- **Red dashed line:** refers to the rebuild/elevation actions

Please refer to the resilience actions section for more information.

Note: This section of the Local Resilience Plan will be tailored to your individual property, using information Council already has about your land and buildings.

[7] yoursay.moretonbay.qld.gov.au/coastal-hazard-adaptation-strategy



(Slab on ground property with the different hazard events impacting your property adapted from: Flood Resilient Building Guidance for Queensland Homes)

Note: This section of the Local Resilience Plan will be tailored to your individual property, using information Council already has about your land and buildings.

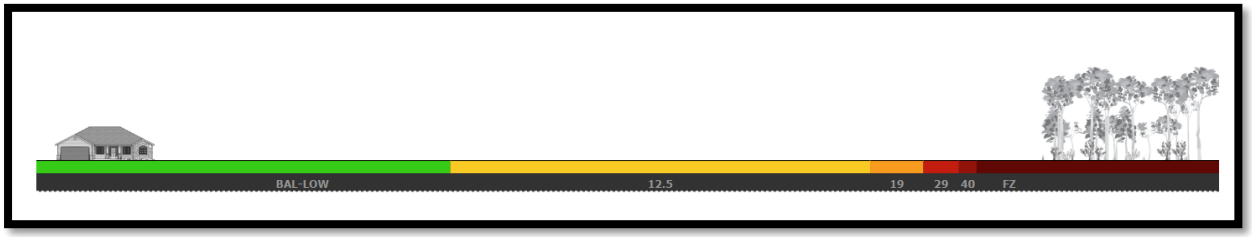
Bushfire Risk

The Bushfire Attack Level or BAL[8] is a method for categorising local bushfire intensity the house may experience. BAL provides a local estimate of the potential radiant heat and flame exposure (from bushfire flame fronts travelling through unmanaged vegetation only) at the house location.

Bushfire Attack Level details for your property:

Bushfire Risk Attack Level	Distance of Bushfire Attack Level
Low	More than 100m

Based on the BAL for your property, no property retrofit or rebuild actions are recommended.



Calculate the Bushfire Attack Level (BAL) for your property: https://best-practices-assessment-tool.herokuapp.com/calculator?slope=0&vegslope=0&FFDI=80&vegtype=Scrub

Note: This section of the Local Resilience Plan will be tailored to your individual property, using information Council already has about your land and buildings.

Understanding your other natural hazard risks

For all other hazards please refer to the City of Moreton Bay Disaster Dashboard for regularly updated hazard information and mapping which can be used to assess your own risk:
https://disaster.moretonbay.qld.gov.au/risks

A shared journey to resilience

Our goal is clear: a resilient community by 2050. Achieving this is not about one single action, it's about many different efforts working together, like pieces of a puzzle.

When homeowners retrofit, rebuild, or elevate their homes, they are making important investments in resilience. These actions reduce risks from hazards and protect families, but they are also part of a larger effort.

[8] research.csiro.au/bushfire/assessing-bushfire-hazards/bal-assessment/

Property owners are not alone on this journey. Council and other asset owners are investing in infrastructure that supports communities, such as roads and stormwater management systems. At the same time, ongoing disaster preparedness ensures we are ready to respond when hazards occur.

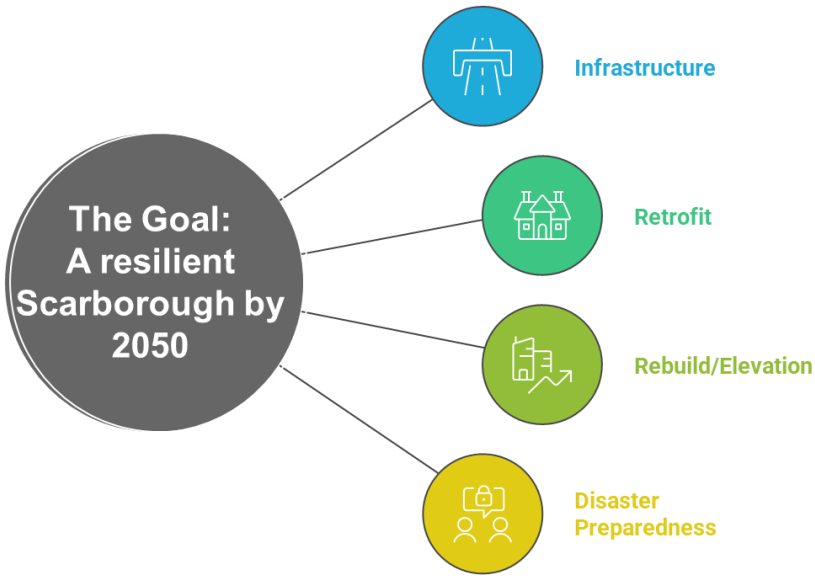
Resilience comes from linking all these actions together:

- **Infrastructure** improvements led by councils and other asset owners.
- **Retrofits and rebuilds** by property owners.
- **Disaster preparedness** through planning and readiness.

Together, each of these actions helps achieve the overall goal of a resilient Scarborough by 2050.

Resilience actions

Using the information from the above risk assessment of your property, a number of resilience actions have been identified that could increase the resilience of your property by 2050. These actions consider the current status of your property and the potential impacts of coastal hazards and bushfire hazard, both now and in the future. Below are the resilience actions identified for your property. The resilience actions are broken down into:



- Resilient people and social networks actions
- Resilient buildings actions
    - Retrofit resilience actions
    - Rebuild/elevation resilience actions

The actions you undertake for your property and circumstances are up to you. This information is provided as guidance to help you make informed decisions for the future of your property at Scarborough.

For information about the resilient actions, visit the Scarborough LRP website.

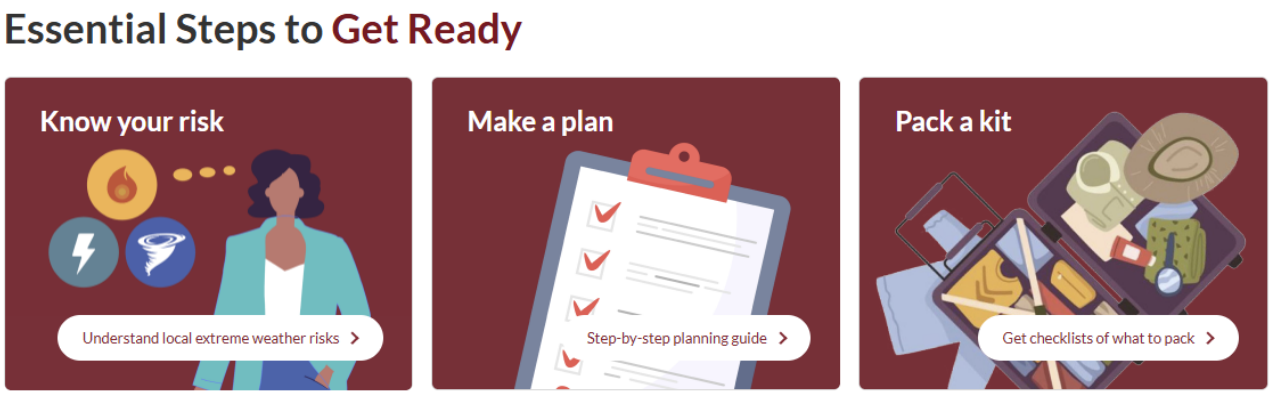
Resilient people and social networks – Disaster Preparedness

Your first step to being prepared is to find out:

- what, when and where a disaster might happen,
- how severe it could potentially be,
- and if you would be affected.

By making a plan now, you can help keep your home, loved ones and community safer.

Natural hazards and extreme weather can cause your home to lose power, phone and internet access. You also may not be able to leave your community or get to a supermarket or pharmacy for supplies. Prepare an emergency kit and store it somewhere safe so you have the things you need when you need them.



☐ Check Council's Disaster Dashboard: Understand Your Risks story maps to understand your risk of impacts and isolation in a disaster event	Include: ☐ Meeting Points ☐ Emergency Contacts ☐ Evacuation Routes for different hazards ☐ Share with all household members ☐ Remember to include your pets ☐ If vulnerable, consider creating a Person-Centred Emergency Preparedness Plan	Include: ☐ Water (3 days supply) ☐ Non-perishable food ☐ Torch ☐ Batteries ☐ First Aid Kit ☐ Important Documents

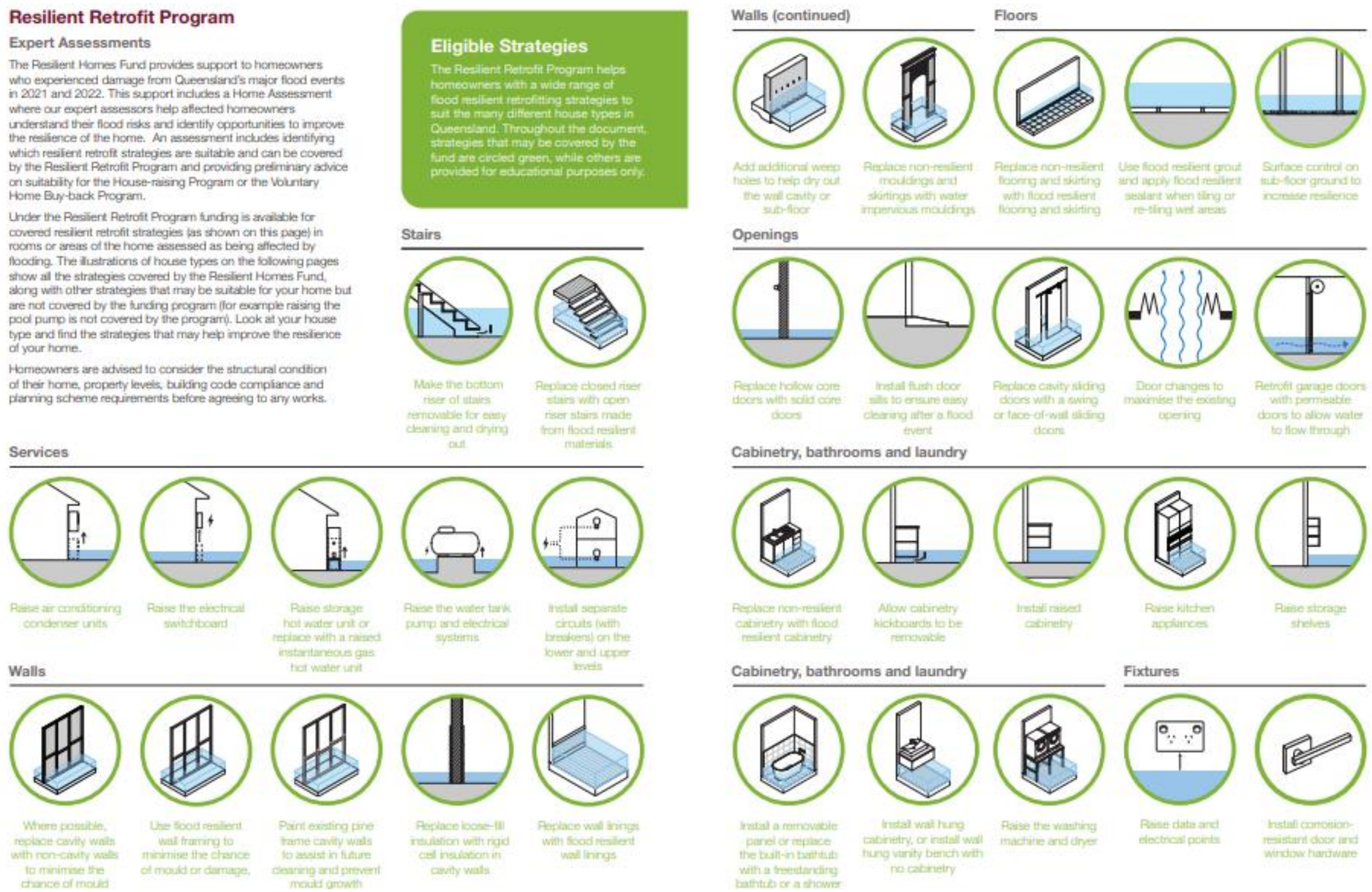
Source: https://www.getready.qld.gov.au/

Please refer to Appendix A for a list of disaster preparedness actions.

Resilient buildings - Retrofit resilience actions

Coastal hazards and flooding

Retrofit involves using flood resilient materials and construction techniques to allow flood waters to enter the house while minimising the chance of damage and moisture problems afterwards. By accepting a level of risk through wet proofing, and creating space for water to flow, you can be better prepared for the next time a flood happens. This means working with water rather than against it.



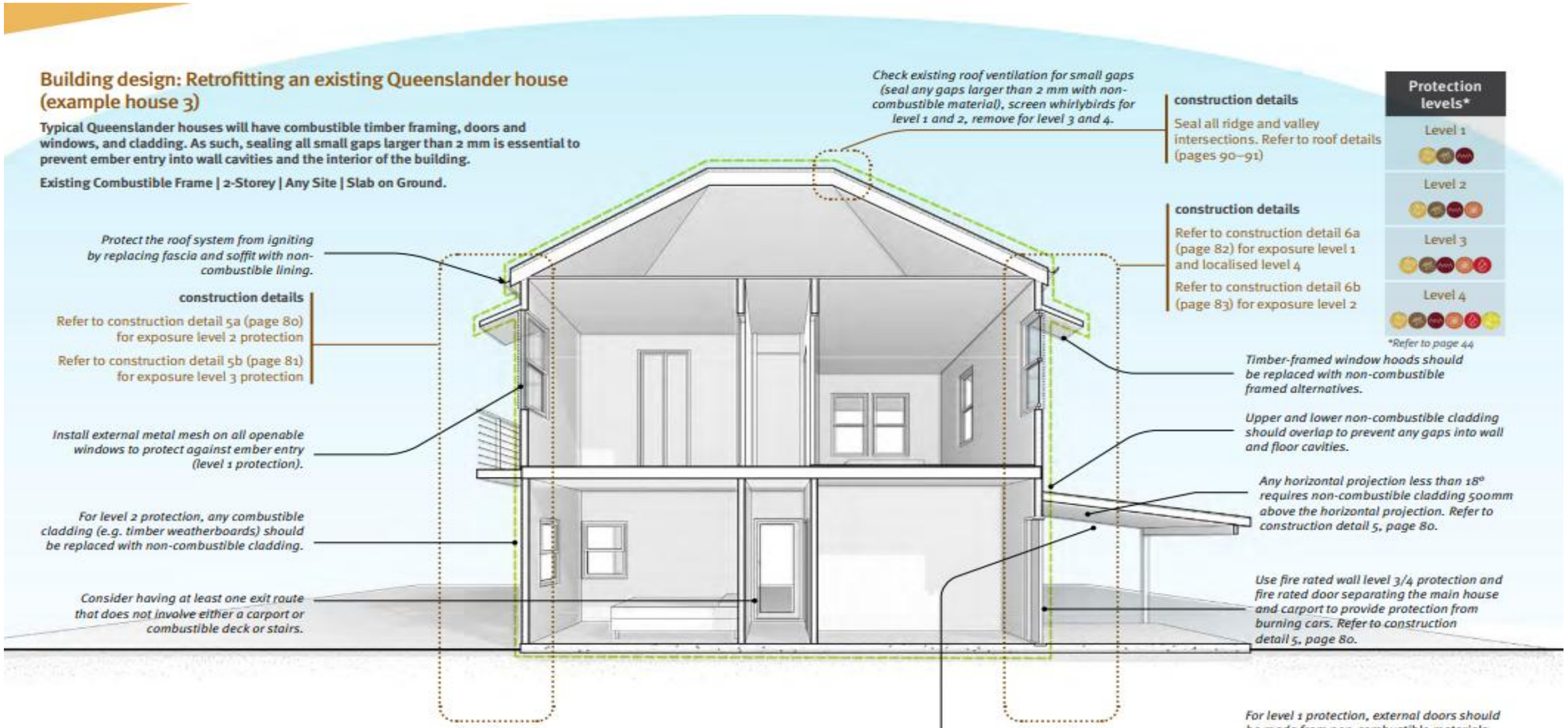
Bushfire

The bushfire resilience of a building is only as good as its weakest element. Therefore, when considering the benefits of retrofitting for bushfire resilience, especially when working with a limited budget, it is important to first address the weakest or most vulnerable aspects of the house and its surroundings.

Building design: Retrofitting an existing Queenslander house (example house 3)

Typical Queenslander houses will have combustible timber framing, doors and windows, and cladding. As such, sealing all small gaps larger than 2 mm is essential to prevent ember entry into wall cavities and the interior of the building.

Existing Combustible Frame | 2-Storey | Any Site | Slab on Ground.



To prevent ember entry:
- seal any gaps larger than 2 mm
- protect vents and weepholes using metal mesh (less than 2 mm).
If possible, add flame resistant sarking to resist ember and flame penetration.

A combustible frame is not recommended, but is often unavoidable when retrofitting an existing Queenslander house due to the construction costs of replacing wall framing.

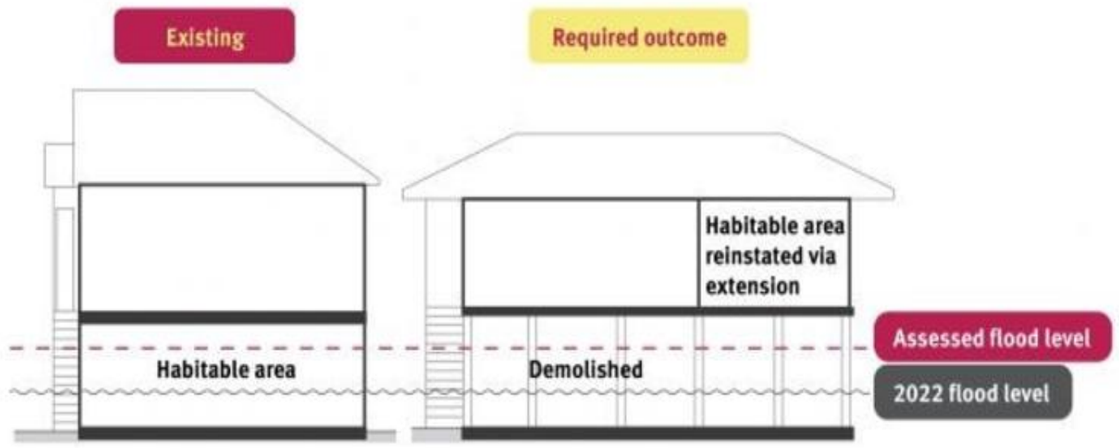
Resilient buildings - Rebuild/elevation resilience actions

Coastal hazards and flooding

Raising the level of the house and its services is effective at mitigating flood damage to your home.

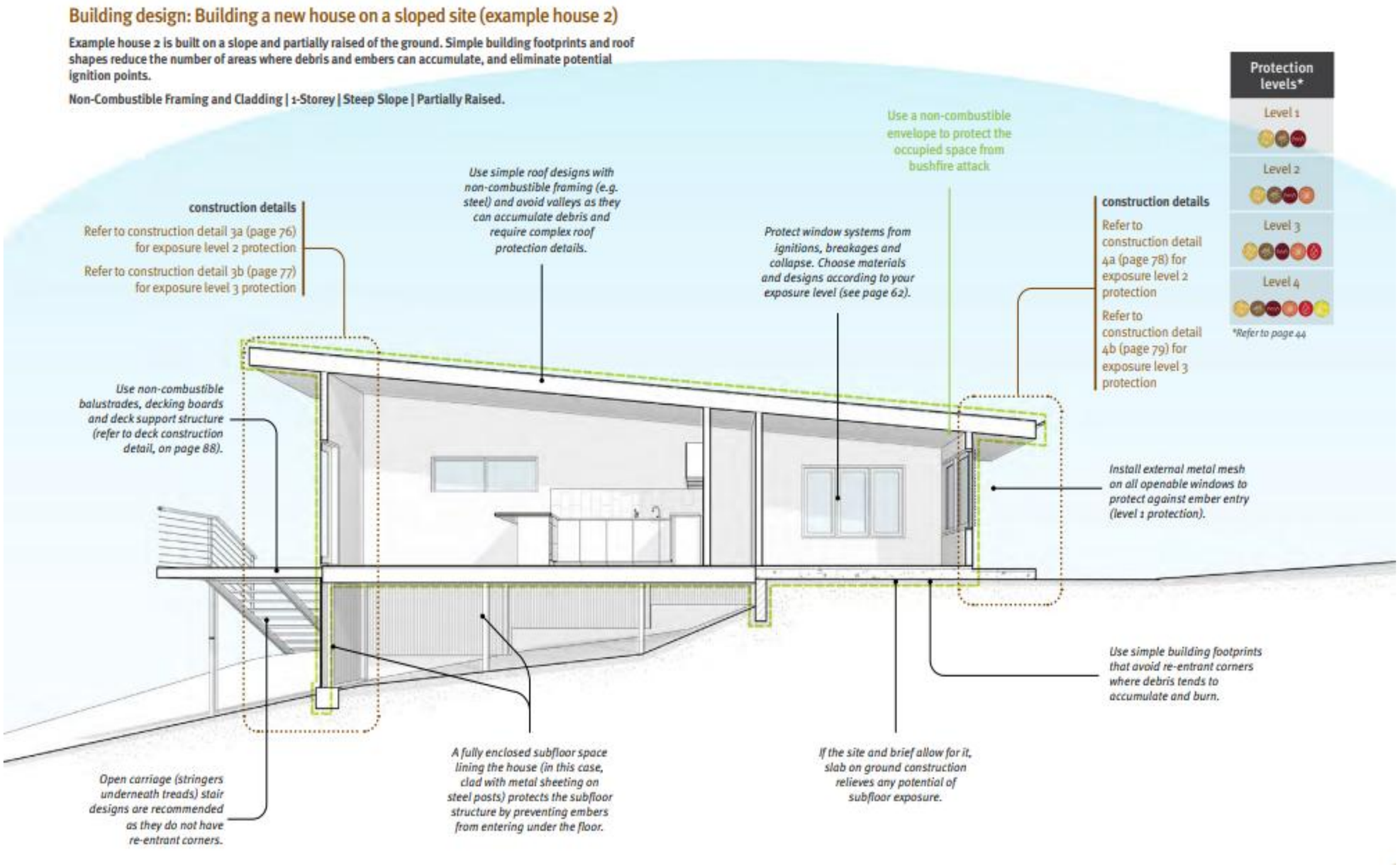
Two-storey demolition and rebuild as extension

The existing habitable floor below the assessed flood level is demolished and rebuilt (above the assessed flood level) as an extension to the existing home. The lower level is not enclosed or converted into a new habitable area.



Bushfire

If you are building a new house in a bushfire prone area, ensure it is designed and constructed with bushfire protection in mind.



Glossary of terms

Hazards, risks and vulnerabilities

Natural hazard - A hazard is something that has the potential to cause harm. Natural hazard refers to the potential for natural processes to cause harm, such as fires, floods, and severe storms.

Riverine flooding vs Overland flow - Both of these natural processes can cause flood impacts. Riverine flooding refers to the water level in a river or creek rising and "breaking the banks" so that water flows onto the floodplain. Overland flow is caused by rainwater draining from higher land to lower areas. The more saturated the soil is, the more water will flow over it rather than soaking in.

Exposure - Exposure describes who and what is at-risk in an event. For example: residents and businesses in the area expected to be affected by flooding.

Vulnerability - An assessment of characteristics of a person, home, business or other asset that can change their level of risk, either by making them more/less likely to be impacted or by making them more/less severely impacted. For example: a person with respiratory health issues is more vulnerable to bushfire smoke impacts, and a building made of bricks and concrete is less vulnerable to fire.

Impacts (direct and indirect) - Direct impacts occur when the event directly impacts a person, home, business, or other asset. For example, a bushfire burns a home, or a flood inundates a shop. Indirect impacts are those that affect people, homes, businesses and assets away from the actual event. For example, smoke from a bushfire causes health issues, or a flooded road prevents people from going to work.

Risk - Risk is the likelihood that a particular hazard event may happen and the consequences if it does. Risk assessments use a matrix of likelihood and consequences to determine a risk rating.

Likelihood \ Impact	Negligible	Minor	Moderate	Significant	Severe
Very Likely	Low Med	Medium	Med Hi	High	High
Likely	Low	Low Med	Medium	Med Hi	High
Possible	Low	Low Med	Medium	Med Hi	Med Hi
Unlikely	Low	Low Med	Low Med	Medium	Med Hi
Very Unlikely	Low	Low	Low Med	Medium	Medium

Tolerable risk - A level of risk to properties and infrastructure that is within acceptable limits to both residents and Council. It considers the forecast frequency and severity of hazard events as well as any measures in place to mitigate or adapt to those risks. The level of risk may be considered intolerable because of either the frequency or level of impact associated with hazards.

AEP or Annual Exceedance Probability - Used in relation to flood hazards, it means the probability that a flood of a particular size will happen in any given year. A 1% AEP means there is a 1 in 100 probability that a flood of the level modelled will happen this year. This is sometimes referred to as a "one in a hundred year" event, however the same probability applies every year regardless of when the last event was. Council also models floods events at higher and lower AEPs. A 0.1% AEP flood event has a 1 in 1,000 probability of happening this year, while a 5% AEP flood event has a 1 in 20 probability of happening this year.

Coastal Hazards

Coastal hazards - Natural coastal processes can create hazards for coastal areas, including tidal inundation, erosion and accretion, and changing sea levels. Coastal hazards events can be sudden or very slow.

Erosion vs Accretion - These are both natural coastal processes that can occur over long periods or quickly as a result of storms or other events. Wind, waves and coastal currents shift sand and sediments either away from the shore (erosion) or onto the shore (accretion). Coastlines are in a constant state of change through these processes.

Sea level change - Sea levels are constantly changing with tides and other processes, but "sea level change" generally refers to long-term changes in average sea levels. Sea levels have changed many times throughout history and are currently rising.

Storm tide - The total elevated sea height at the coast combining storm surge and the predicted tide height.

Storm tide inundation - When ocean water levels and waves are high enough to cause localised flooding of normally dry land.

Overtopping - When water flows over the top of structures designed to hold it back, like seawalls. Overtopping can cause damage behind the structure, weakening it and making it less effective.

Living Coast Plan (or Coastal Hazard Adaptation Strategy, CHAS) - City of Moreton Bay's Living Coast Plan was a risk assessment to adapt and respond to coastal hazards forecast up to 2100. The plan was endorsed by Council in May 2023 and can be viewed at yoursay.moretonbay.qld.gov.au/coastal-hazard-adaptation-strategy. The Living Coast Plan identified at-risk communities that are now part of the Local Resilience Plans pilot project.

Resilience and adaptation

Adaptation - Adjusting buildings, infrastructure and lifestyles to live safely with natural hazards. For example, raising a house on stumps to allow water to flow under it without causing harm.

Mitigation - Actions to reduce or eliminate natural hazards impacts or associated risks. For example, removing trees around a house to reduce bushfire hazard.

Resilience - The ability to cope with and quickly recover from hazard events. A resilient community is prepared for natural hazard events and takes steps to reduce or avoid some impacts. It has plans in place to manage any impacts and quickly "bounce back" after the event.

Short, Medium and Long-term actions - To achieve long-term resilience both Council and residents will need to take actions.

- **Short- term actions** are things that can be done in a weekend at a low cost. Examples include making a Household Emergency Plan or starting to stock an Emergency Kit.
- **Medium-term actions** require some planning and a moderate cost to implement. Examples include replacing carpet with tiles or Council improving drainage in your street.
- **Long-term actions** need more thought and may come at a higher cost. Examples include raising your house or Council constructing a new seawall.

Infrastructure solutions - Improvements to community assets that can help to mitigate or adapt to natural hazards. For example: seawalls that reduce the likelihood of tidal inundation (mitigation), or relocating a water pump station to higher ground (adaptation). Some infrastructure is owned by Council. Some is owned by the State Government. Infrastructure for utilities like water supply, electricity, phone and internet services is usually owned by companies.

Local Resilience Plan - A Local Resilience Plan is an area-specific plan to improve community resilience to natural hazards such as flooding and sea level rises.

Transition and change - For specific assets that experience intolerable risk, where the coastal hazard risk profile is very high, and active management becomes unfeasible (due to economic or other factors), a change in the location of the asset may be required. Transition is likely to be a gradual process over time, where mitigating hazards for a period is part of the transition process. A range of adaptation options will be part of the transition process.

Common abbreviations and acronyms

Government organisations

BoM - Bureau of Meteorology

DTMR - Department of Transport and Main Roads

DESI - Department of Environment, Science and Innovation

QPWS - Queensland Parks and Wildlife Service

Emergency services and responses

QAS - Queensland Ambulance Service

QFD - Queensland Fire Department

QPS - Queensland Police Service

RFS - Rural Fire Service

SES - State Emergency Service

Environmental terms

HAT - Highest Astronomical Tide (predicted highest possible astronomical tide)

LAT - Lowest Astronomical Tide (predicted lowest possible astronomical tide)

AHD - Australian Height Datum (baseline for measuring elevation, based on average sea level)

Appendix A - Disaster preparedness actions

	Category	Action	Details
1	**Understand Your Risk**	Identify your household risk to hazards	☐ Check Council's Disaster Dashboard: Understand Your Risks story maps to understand your risk of impacts and isolation in a disaster event ☐ Download Flood check property report for detailed property flooding conditions ☐ Look up Flood Viewer to understand the possible extent of a range of flood scenarios in your local area ☐ Check Queensland Fire Department's Postcode Checker to see the bushfire potential in your neighbourhood
		Understand your bushfire risk	☐ Look around your property and neighbouring land, and note any potential fire hazards (dry grass, dead leaves, overhanging branches, trees/shrubs).
			☐ Use tools to identify potential bushfire hazards on your property and at the local landscape scale. This includes the CSIRO Hazard Identification Tutorial.
			☐ Develop a map of your property highlighting important bushfire-related features
		Determine your Bushfire Attack Level (BAL)	The BAL is a measure of your property's risk of bushfire exposure. Calculate using either: ☐ Online calculator (Dash) ☐ Consulting a professional
2	**Emergency Plan**	Create or update your household emergency plan As you are in an isolated area, consider a bushfire survival plan which considers leaving early before a bushfire threatens and travelling by road becomes hazardous	Include: ☐ Meeting Points ☐ Emergency Contacts ☐ Evacuation Routes for different hazards ☐ Share with all household members ☐ Remember to include your pets ☐ If vulnerable, consider creating a Person-Centred Emergency Preparedness Plan

3	**Emergency/ Evacuation Kit**	Pack an emergency kit	Include: ☐ Water (3 days supply) ☐ Non-perishable food ☐ Torch ☐ Batteries ☐ First Aid Kit ☐ Important Documents
		To be prepared for if you need to leave your home, pack an evacuation kit	Include: ☐ Mobile phone & charger ☐ Medications & scripts ☐ Battery-operated radio ☐ Blankets (natural fibres) ☐ Family photos, valuables & documents
4	**Home Preparation**	Secure outdoor items	☐ Store loose items (garden furniture, tools) to prevent them from becoming projectiles in high winds
		Check roof, gutters and drains	☐ Ensure gutters are clear of debris ☐ Secure roof tiles to reduce risk during storms
		Create defendable spaces around your home	☐ Keep grass short ☐ Remove dead plants ☐ Trim trees and shrubs ☐ Ensure flammable items are stored in appropriate spaces
5	**Communication**	Charge devices and backup power sources	☐ Fully charge phones, power banks, and portable radios
		Download or have access to emergency information	☐ Install apps like “BOM Weather” ☐ Sign up to MoretonAlert ☐ Stay informed by listening to ABC, 101.5Fm or 99.7FM radio stations ☐ It is your responsibility to monitor Fire Danger Ratings and stay alert to Bushfire Warnings
6	**Community**	Connect with neighbours	☐ Share plans and support vulnerable individuals in your community
7	**Insurance**	Review insurance coverage	☐ Ensure policies cover natural disasters common in the City of Moreton Bay

Appendix B- Flood Check Property Report

Note: This section of the Local Resilience Plan will be tailored to your individual property, using information Council already has about your land and buildings.

