BUILDING PERFORMANCE

QUICK GUIDE

Resilient homes – droughts and wildfires

AUGUST 2025

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Te Kāwanatanga o Aotearoa
New Zealand Government

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Ministry of Business, Innovation and Employment (MBIE)
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MBIE develops and delivers policy, services, advice, and regulation to support economic growth and the prosperity and wellbeing of New Zealanders.

The Resilient homes – drought and wildfire quick guide is produced by the Building System Performance branch. It is intended to provide information to homeowners with practical tips to help create a drought and wildfire resilient home.

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More information

Information, examples, and answers to your questions about the topics covered here can be found on our website: www.mbie.govt.nz.

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Contents

Preparing properties to be resilient to the effects of drought and wildfires

A drought and wildfire resilient property is one that is designed, built and landscaped in a way to reduce the impacts of drought and wildfires.

Aotearoa New Zealand's climate is changing, and the effects are becoming harder to ignore. Droughts and wildfires are becoming more frequent, intense, and widespread, driven by rising temperatures, stronger wind patterns, and shifting rainfall. Warmer conditions increase evaporation and dry out vegetation, while less frequent but heavier rain leads to prolonged dry spells. These factors, combined with flammable land uses (like pine forestry) and more people living near natural areas, are creating ideal conditions for both drought and fire to spread quickly and with serious consequences.

These risks aren't limited to rural areas. Urban suburbs, coastal communities, and lifestyle blocks are increasingly exposed to water shortages, fire bans and damage from extreme weather. As previously undeveloped land is used for housing, many new builds are happening on less suitable sites such as those with clay rich soils that can shrink and crack during a drought or in areas more prone to vegetation fires.

That's why it's more important than ever to climate-proof your home. Building or renovating with drought and wildfire resilience in mind helps protect your property and family. It can also lower long-term costs, reduce insurance risks, and support more sustainable living. Steps taken during the planning stage, like using fire-resistant materials, drought-tolerant landscaping or foundations suited to expansive soils, are often more affordable and effective when included early in the process.

These recommendations align with national climate projections and guidance provided by organisations such as Earth Sciences New Zealand formerly known as National Institute of Water and Atmospheric Research (NIWA), and Fire and Emergency New Zealand (FENZ). Incorporating these considerations into your home design or renovation can help ensure your property is better prepared for future climate conditions.

The purpose of this guide

The purpose of this guide is to provide practical and affordable strategies to those planning to buy their own home or homeowners and designers planning to build or alter a house.

If you are planning on buying, building, adding to, maintaining or landscaping a property in an area that experiences droughts and/or wildfires (usually semi-rural areas), you may want to consider the advice included in this guide.

A property that is resilient to the effects of drought and/or wildfires is one that is designed, built and landscaped in a way that reduces the impact of damage to the property.

This guide focuses on the strategies related to drought and wildfires separately.

Damaging effects of drought on homes and communities

A drought is a prolonged period of abnormally low rainfall, much lower than what is typical for a region. Droughts can last for weeks or months, and due to the effects of climate change, they are becoming more frequent and severe in parts of Aotearoa New Zealand. These dry conditions place pressure on water supplies and increase the risk of wildfires, but they can also have serious effects on the structure of your home.

During a drought, the soil beneath your home can dry out and shrink, especially if it's clay rich or an expansive soil. This shrinkage can cause slab foundations to settle unevenly, leading to movement or cracking in the structure. As a result, your home may experience:

- cracked foundations or walls
- sticking doors and windows
- bowing walls
- leaks during subsequent heavy rain, as cracks allow water to seep in.

Additionally, plumbing installed beneath the slab can be damaged if the foundation shifts or cracks, resulting in costly repairs and disruptions.

Being aware of these risks and designing your home, or choosing renovation solutions, that suit your soil type and climate conditions is key to ensuring your home stays safe, stable and drought resilient.

Damaging effects of wildfires on homes and communities

A wildfire is defined as an unplanned, uncontrolled fire that spreads rapidly through vegetation such as grass, scrub, forests or gorse-covered hillsides. Wildfires can move quickly, especially in dry and windy conditions, and are becoming more common due to the changing climate.

Wildfires can start deliberately or accidentally, with common causes including:

- planned burn offs that get out of control
- careless disposal of cigarettes
- sparks from agricultural or industrial machinery
- bonfires and fireworks
- fires that haven't been properly extinguished
- arson.

The impacts of wildfires on homes and communities can be devastating. Fire can damage or destroy buildings, vehicles and essential infrastructure. Even without direct contact, radiant heat can cause material to ignite. Additionally, windblown embers can spark fires in homes located hundreds of metres away from the main fire front, making wildfire risk widespread and unpredictable.

Wildfires may lead to:

- loss of homes and personal belongings
- damage to power, water, and communication networks
- evacuations and road closures
- loss of life and health issues from smoke and poor air quality for both animals and humans
- economic disruption, particularly in rural and farming communities.

Homes located near bush, grasslands or the rural-urban edge are most at risk. However, with smart planning, fire resistant building materials and thoughtful landscaping, you can significantly reduce the risk to your property and protect the people who live there.

Resilience strategies

1. Collaborate – ensure the right professionals are involved early in the design stage

Homeowners are responsible for managing risks to their property, ensuring they are safe, durable and suited to local conditions. The right professionals engaged early in the design phase can help identify practical ways to reduce or minimise the impacts of droughts and/or wildfires. Architects, landscape architects, engineers and other designers should work with their local council planning and building teams. Some councils also offer eco-design advisory services, which provide free advice on sustainable and climate resilient building options.

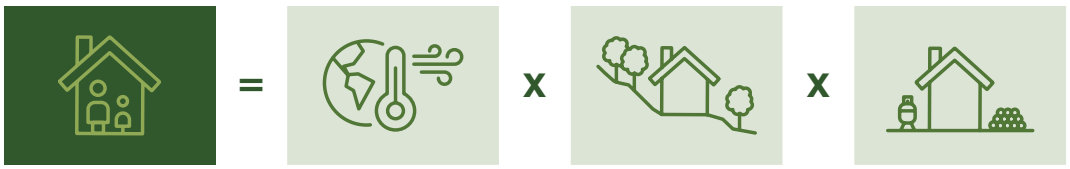
2. Understand the risk to make better informed decisions

Understanding the risk of drought and/or wildfires is an important step in planning to build or make changes to your home. The more you know about local conditions, the better prepared you will be to make informed decisions.

Start by learning about the specific risks in your area. Check local council hazard maps or talk to your council about fire and drought risk zones. Use resources available from FENZ to learn about fire danger ratings and seasonal fire bans, while for drought prone areas, look at regional climate projections from organisations such as Earth Sciences New Zealand or your regional council.

Next, assess your own property. Understand soil conditions, vegetation around your home and think about your water supply. These factors will help you understand how your home could be affected during a drought or wildfire. From there, you can take targeted actions to reduce risk and improve your home's resilience.

For example: a home is built in a drought or wildfire prone area



Climate risk

Climate hazard
Prolonged drier temperatures and strong winds

Exposure
Homes near flammable vegetation, sloped sites, rural areas, expansive soils.

Vulnerability
Lack of ember protection, combustible materials, inflexible foundations and no water storage

Information on the risk of climate hazards can be found in several places, including:

- Aotearoa New Zealand climate projections: Climate projections insights | Ministry for the Environment
- Earth Sciences New Zealand (formerly known as NIWA) climate change advice: Providing climate change advice for New Zealand | ESI
- Ministry for the Environment: Climate Change | Ministry for the Environment
- Natural Hazards Commission: Building a more resilient home | Natural Hazards Commission
- Fire & Emergency New Zealand: Wildfire resources | Fire and Emergency New Zealand

3. Understand the rules

New Zealand Building Code

All building work needs to comply with the Building Code even if a building consent is not required. This is the case for both new buildings and for some repairs and alterations to existing buildings.

Building to the minimum requirements of the Building Code may not be sufficient protection from drought and wildfires.

The Building Code sets out the minimum performance requirements of buildings so that people who use buildings are safeguarded from injury or illness. The Building Code also aims to protect other property from damage.

It is important to note that even if building work for a new home or renovation complies with the Building Code, this does not guarantee that the home won't be affected by drought and/or wildfire at some time in the future.

Building Code clauses that relate to the performance of buildings for drought:

Buildings (including the material and components that they are made from) can be affected by drought, which can impact the performance of the building related to structure and weathertightness. This is set out in the following Building Code clauses:

- **Structure and stability (B1):** Building materials and components may be vulnerable to shifting due to expanding and contracting, as a result of both the drought and any subsequent rainfall.
- **Durability (B2):** Concrete slabs constructed on expansive soil may be damaged if the supporting ground shrinks and swells, resulting from drought and subsequent rainfall.
- **Protection from Fire (C1-6):** Where a building has a sprinkler system installed, the water supply could be compromised by drought.
- **Access and accessibility (D1):** Windows and doors may not open and close properly if the structure of the house moves.
- **Surface Water (E1):** Intense rainfall after a drought can lead to erosion and runoff if water is not properly managed. Drainage systems need to prevent the accumulation of surface water that could impact the ground condition for a building's foundation (for example clay soils that can shrink and expand depending on the water content).
- **External moisture (E2):** Cracked foundations may allow moisture into a concrete slab, which may, over time, allow the reinforcing steel to rust. The moisture may also get into the house and cause mould to grow. Cracked foundations can also cause plumbing leaks, exacerbating moisture issues.
- **Water Supplies (G12):** Droughts can cause pressure on water supply systems. It's important that the systems support efficient use and allow for alternative sources like rainwater in times of scarcity.
- **Foul Water (G13):** A limited water supply during a drought can impact wastewater systems and any system should be able to remain functional under reduced water flow conditions.

Building Code clauses that relate to the performance of buildings for wildfires:

The performance of a building can be affected by wildfires, particularly in relation to their durability. This is set out in the following Building Code clauses:

- **Durability (B2):** Using fire resistant external cladding materials will improve a house's ability to withstand a nearby wildfire.
- **Protection from Fire (C1 to C6):** Provides fire safety objectives which include: limiting fire spread to other buildings and enabling safe evacuation and firefighting operations. The key is choosing fire-resistant materials and designing safe building layouts. Specific code clauses include:
  - **Fire affecting areas beyond the source (C3):** Buildings must be able to limit the spread of fire to other buildings which can be achieved using fire-resistant walls and claddings.
  - **Movement to a place of safety (C4):** Buildings must be provided with means of escape to ensure occupants can move to a place of safety without being injured.
  - **Access and safety for firefighting operations (C5):** Buildings must provide safe and practical access for firefighting crews and vehicles to support effective wildfire response and control.
- **Structural stability (C6):** Buildings must remain structurally stable during and after exposure to fire, to prevent collapse and reduce the spread of wildfire hazards.
- **Water Supplies (G12):** Ensures there is a reliable water system to assist with firefighting during a wildfire event.

Other resources:

Wildfire Safer Housing Guide – Homeowner's Guide to Wildfire Protection

Landscaping for wildfire safety

Get fire safe at the interface

Homes, buildings and places | Ministry for the Environment

Homeowners: Natural Hazards Commission Toka Tū Ake

Drought

4. Invest in good design

Droughts are becoming more frequent and severe in many parts of Aotearoa New Zealand due to our changing climate. Whether you're planning a new build or renovating an existing home, there are practical steps you can take to reduce water use, protect against climate-related damage, and keep your home comfortable during extended dry periods.

If building on clay rich (expansive) soils, like those common in parts of Auckland, it's important to understand how these soils behave during drought. They shrink when dry and swell when wet which can lead to cracking and movement in concrete slab foundations, especially shallow designs like stiffened raft or waffle slabs. Talk to your designer or engineer early in the process about the best foundation type for your site. A well-designed foundation can prevent costly repairs and ensure your home performs well as climate conditions continue to change.

Good design can reduce the need for water hungry cooling systems. Features like shade, natural ventilation, and quality insulation help keep your home cooler in summer and more energy-efficient all year round. By thinking ahead during the planning stage, you can create a home that is both climate-resilient and cost-effective.

Water is a limited and valuable resource. With over 60% of New Zealand homes on water meters, saving water also helps lower household bills. A drought-resilient home should include water-efficient fittings, drought-tolerant landscaping, and systems that make the most of every drop.

Rainwater tanks are a great way to collect and store water from your roof for use in the garden or even inside the home. Most tanks don't require building consent and can be fitted with a pump if needed. Learn more here: Collecting and using rainwater | Building Performance

Greywater systems let you reuse water from your bath, shower, or laundry to help keep your garden healthy during dry periods. A basic system that uses the water straight away and doesn't require plumbing changes shouldn't require a building consent. When planned and installed correctly, greywater systems can be a smart, long-term solution for homes in drought-prone areas.
More info here: Reusing greywater | Building Performance

A well landscaped garden can save water and cope better during dry weather. Choose plants that need little water and plant them in autumn or spring so they can settle in before summer. Add compost or mulch to help the soil hold moisture, but in fire-prone areas, use pebbles instead of bark or wood chips.

Wildfires

5. Invest in good design

Wildfires are becoming more common in parts of Aotearoa New Zealand. By making smart choices when building a new home or renovating, you can reduce the risk of fire damage and help protect your home, family, and property. A key focus should be on reducing the risk of ignition, especially from windblown embers, radiant heat and direct flame contact.

A building that performs well will have the following features:

a simple roof design	non-combustible roofing and exterior cladding	enclosed eaves, sealed gaps and protected vents	fire resistant doors and windows	defensible landscaping and clear space around the building

Focus on the parts of your home that are most at risk during a wildfire, especially the roofline, windows, doors, decks and surrounding vegetation. Use non-combustible materials like steel or tiles for your roof, and fibre cement, brick, or stucco for your walls instead of timber. Seal all gaps, vents, and joints to stop embers from getting inside. Choosing a simple roof design can also help, as it reduces the number of places where leaves, twigs and embers can collect.

Good landscaping can also make a big difference. Keep a clear space around your home by removing flammable plants, mulch and firewood, and consider using stone, gravel, or low-flammability plants near the house. It's also a good idea to install an external water source to help if a fire comes close. If your property is close to your neighbour's (within about 30 metres), it's worth having a friendly conversation with them about any potential fire risks on their land as well.

When choosing a builder or designer, make sure they understand wildfire resilience and have experience using the right materials and meeting building standards. Even if you're renovating rather than building new, taking these steps can make a big difference in protecting your home and your family from embers, radiant heat and fire spread. Where you place a building is important too, fire moves faster uphill, so think carefully about your building site if you're on a slope.

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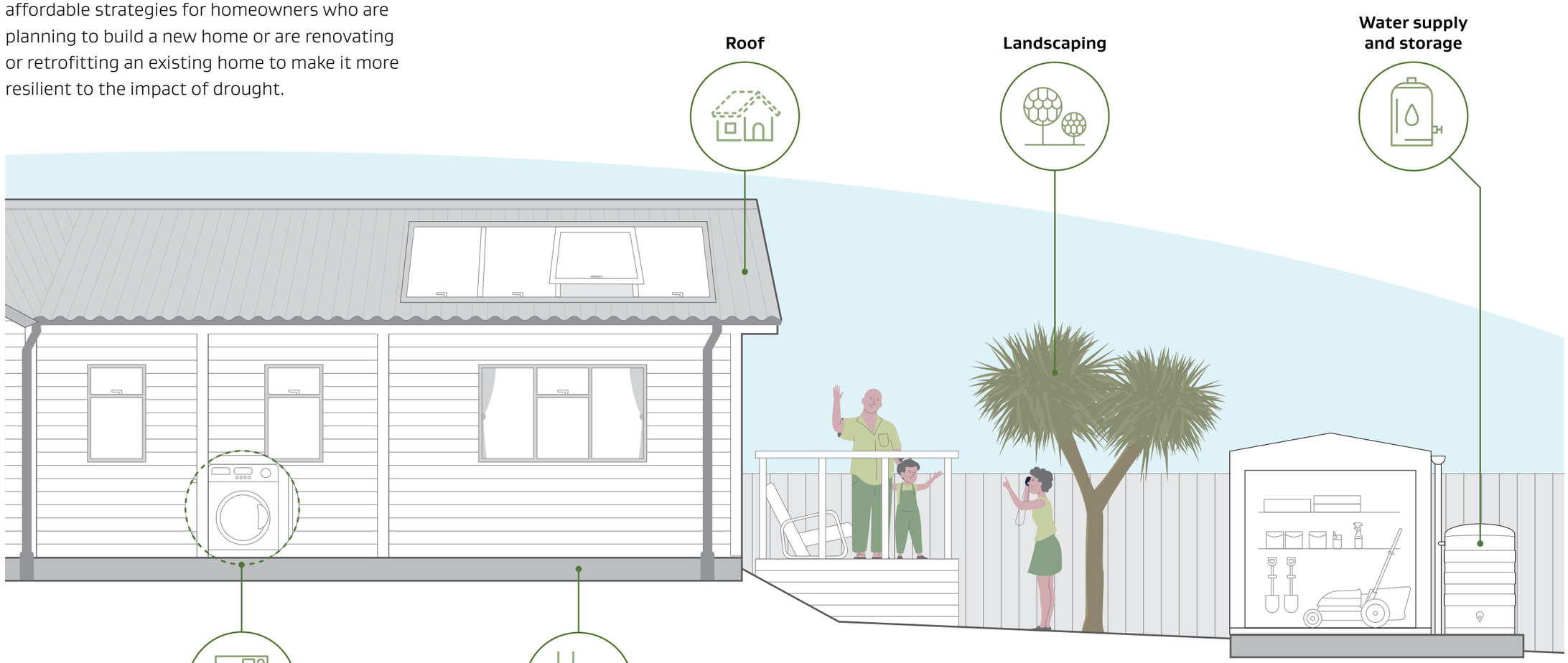
Drought resilient home

This illustration presents some practical and affordable strategies for homeowners who are planning to build a new home or are renovating or retrofitting an existing home to make it more resilient to the impact of drought.



Contact the local council and your insurance company

It is important to speak with the local council and your insurance company as early as possible in the design stage.

Seek independent professional advice

Before applying any of these strategies shown you should seek independent professional advice.

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Drought resilient home

An existing home

When altering or repairing an existing home, consider including drought resilient design features. Homes are altered for a number of reasons; it may be to add an extension, alter the internal layout, or to increase the performance of the house by adding insulation or upgrading windows. Making repairs after a drought can be expensive, but by making smart decisions with water usage, and choosing materials and systems that suit dry conditions, any damage caused can be mitigated. A drought-resilient home helps reduce reliance on mains water, lowers costs and is better prepared for Aotearoa New Zealand's changing climate.

A new home

New homes need to comply with the Building Code. The Building Code sets the minimum performance requirements for buildings. Building better than the minimum that is required by the Building Code will result in a more drought resilient home.

Applies to new homes only
All other strategies apply to both new and existing homes

Roof design

- Simple roof shapes like gable or mono-pitch are best for capturing rainwater as they direct water to fewer collection points, making it easier to install gutters and connect downpipes.
- Use long-run metal roofing as its durable, low maintenance and ideal for collecting clean water.

Foundations

- Always get a soil test to identify if you're building on expansive or reactive soils which can shrink during drought and swell with rainfall.
- For clay rich soils you may need a more robust foundation system to minimise the impact of any future soil movement.
- Structural and/or geotechnical engineers can provide advice to ensure drought and climate change risks are addressed in foundation design.
- When renovating or extending your home, consider how the proposed work will interact with existing foundations and whether any drought related movement or cracking has already occurred.

Water efficient fixtures and appliances

- Use water efficient appliances and fittings like low flow taps, dual flush toilets and water efficient washing machines (check their WELS ratings – Water Efficiency Labelling Scheme).
- Group wet areas (kitchen, laundry and bathroom) in the floorplan to reduce plumbing needs and potential water loss.

Water supply and storage

- Installing a rainwater tank is one of the most effective ways to prepare for drought conditions.
- Most rainwater tanks don't require building consent, but plumbing connections to internal fixtures do. A pump may be required if water needs to be delivered uphill (eg raised garden beds).
- Tank placement should allow for easy access and have good connection to downpipes.
- Greywater systems are another useful way to irrigate gardens, although you may need a building consent if they are storing water for a period of time or require plumbing alterations.

Landscaping

- Choose plants that cope well with dry conditions (such as native plants) and group those with similar watering needs together to make watering more efficient.
- Use mulch or compost to keep moisture in the soil and reduce evaporation.
- Add organic matter like compost or manure to your soil to improve its water retention.
- Use non-combustible ground covers such as gravel or pavers close to the house to reduce water demand and fire risk.

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Wildfire resilient home

A wildfire resilient home is one that is built or renovated to reduce the risk of ignition, damage or destruction during a wildfire. It incorporates fire resistant materials, design prevention measures and landscape management to protect against flames, heat and embers.

This illustration presents some practical and affordable strategies for homeowners who are planning to build a new home or are renovating or retrofitting an existing one to make it more resilient to the impact of wildfires.

Chimneys
Seal chimney-to-roof junctions thoroughly and fit chimneys with spark arrestors.

Roof
Choose a simple roof shape to reduce places where embers and debris may accumulate and use fire-resistant roofing materials such as metal or concrete tiles.

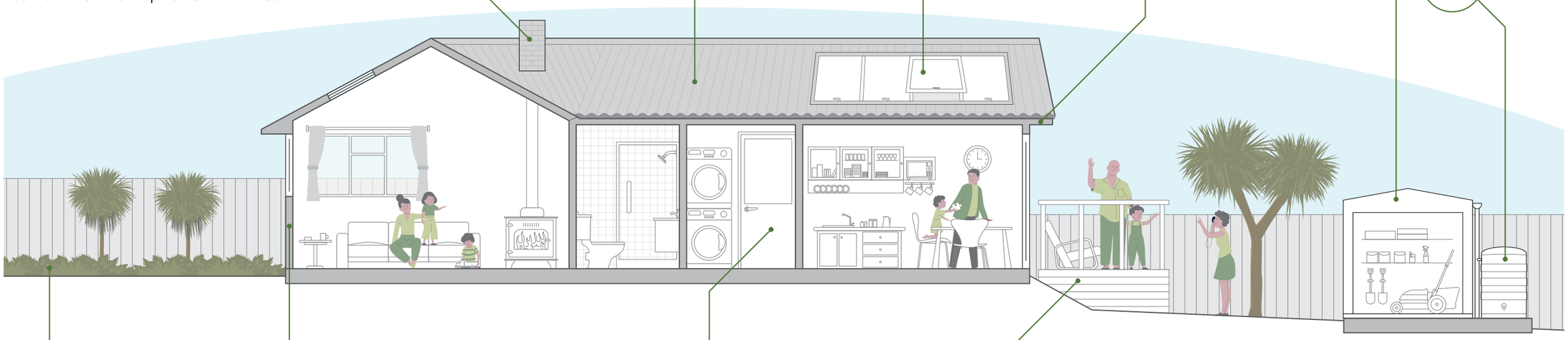
Skylights
Install skylights made from fire-resistant tempered (toughened) glass and ensure they are properly sealed.

Eaves and gutters
Seal and enclose eaves to prevent embers from entering and igniting internal roof structures or insulation.

Regularly clean gutters and fit them with metal mesh guards to prevent debris build-up.

External storage
Keep firewood, gas bottles and other combustible items stored safely away from the house.

Water storage



Landscaping
Remove or limit flammable vegetation and materials such as bark mulch close to your home to reduce fire risk.

Exterior walls
Avoid flammable materials such as untreated timber weatherboards; instead choose fire-resistant cladding like fibre cement, brick or metal.

Doors and windows
Use fire-resistant frames (such as aluminium or treated timber) and double-glazed or tempered glass to prevent breakage from radiant heat.

Decks and balconies
Construct decks from fire-resistant materials or treat timber appropriately and enclose areas underneath to stop embers from accumulating.

Contact the local council and your insurance company
It is important to speak with the local council and your insurance company as early as possible in the design stage.

Seek independent professional advice
Before applying any of these strategies shown you should seek independent professional advice.

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Wildfire resilient home

An existing home

When altering or repairing an existing home, consider including wildfire resilient design features. Homes are altered for a number of reasons which could be to add an extension, alter the internal layout, or to increase the performance of the house by adding insulation or upgrading windows. Repairing after a fire can be expensive, therefore, building in fire smart features now may save money later. By including resilient design features, some of these costs may be reduced.

A new home

New homes need to comply with the Building Code. The Building Code sets the minimum performance requirements for buildings. Building better than the minimum that is required by the Building Code will result in a more wildfire resilient home.

Applies to new homes only
All other strategies apply to both new and existing homes

Skylights and chimneys

- Install skylights made of toughened glass or other non-combustible materials and ensure they are tightly fitted to the roof.
- Install a spark arrestor over the top of the chimney to stop embers from escaping or entering.
- Seal the chimney-to-roof junction properly to prevent ember entry around flashing and base connections.

Roof

- Use simple roof shapes (eg gable or hip) to avoid complex valleys where embers can settle.
- Install fire resistant materials such as long run metal sheeting, concrete or clay tiles.
- Maintain a clear perimeter from overhanging trees and vegetation.

Eaves and gutters

- Use metal gutters and downpipes (eg aluminium, colourteel or copper) and fit metal guards to prevent debris build up.
- Use of fire-retardant plastics can reduce the risk of fire spread, but these may melt if temperatures get too hot.
- Construct eaves with non-combustible linings (eg fibre cement) and enclose them to prevent ember entry.
- Cover vents with fine metal mesh to let air in but keep embers out.
- Regularly clear gutters, especially during the fire season, to prevent ignition from embers.

External features

- Store firewood or other combustible items (eg LPG bottles) away from the house and ideally in a closed shed.
- Secure or relocate items that can catch embers such as outdoor furniture, mats and covers.
- If there is a nearby wildfire, inspect your property for any combustible materials and relocate them.

Landscaping

- Clear flammable materials like bark mulch, shrubs, wooden furniture, and firewood from within 2 metres of the home and deck.
- Use non-combustible ground covers (eg concrete paths, gravel, pavers) close to the house.
- Choose low-flammability, drought-tolerant plants, space them well apart and prune lower branches of trees and shrubs.
- Maintain a 10 metre defensible space with fire safe landscaping and regular upkeep (eg trimming grass and removing dead leaves).
- Ensure access for emergency services (4m wide by 4m high clearance) and keep your RAPID number (rural properties) clearly visible.
- Use irrigation where practical to keep gardens hydrated during dry periods to prevent direct flame spread.

Exterior walls and cladding

- Use non-combustible materials or fire-resistant cladding such as fibre cement, brick, concrete, stucco, metal or rendered masonry.
- Seal up any gaps, vents or cracks where embers could get in with fire resistant sealants.
- Keep building design simple, flat and continuous wall surface reduces the risk of ignition.
- If you have a suspended timber floor, consider enclosing with masonry, steel cladding or fine steel mesh.

Decks and balconies

- If decks are timber, treat them with fire retardant products or include a non-combustible buffer (eg concrete strip) between the deck and house.
- Enclose the underside of decks to prevent ember accumulation.
- Minimise gaps between deck boards to reduce ember lodging and ignition risk.

Doors and windows

- Fire resistant glazing such as toughened (tempered) safety glass or double glazing will reduce the risk of glass breaking under intense radiant heat.
- Aluminium or powder coated steel frames are more resilient than untreated timber. If timber is to be used, it should be treated or fire rated, particularly in exposed areas.
- Using fine metal mesh screens will prevent ember entry.
- External doors should ideally be made from solid timber, steel or composite doors.
- Make sure garage and side doors are sealed and made from fire-resistant materials.

Water storage

- Install water tanks for dampening down the property when conditions are very dry or there is a nearby wildfire. A pump may be needed to ensure there is enough water pressure.
- Ensure emergency services can access stored water.
- If your site has a natural water reservoir such as a stream or a well, this could become your emergency supply in case of fire.
- Plan how to handle an emergency, including being able to easily connect a hose to the emergency water supply.
- Keep this in mind when choosing a site and positioning your buildings. Selecting a rural site | Building Performance.

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