Home upgrades for climate resilience

Making your home ready for extreme weather events

WORKBOOK

Created by Castlemaine Institute and for City of Port Phillip

Home upgrades for climate resilience

Making your home ready for extreme weather events

Castlemaine Institute is a research and learning hub focused on creating thriving communities, economies and landscapes.

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This is an adaptation of a workbook produced through the *Retrofitting for Resilience* project funded through ADAPT Loddon Mallee. The Castlemaine Institute and Central Victorian Greenhouse Alliance would like to extend their gratitude to the Department of Energy, Environment and Climate Action for supporting this important work.

Caveats

Buildings and works may require planning and or building approval including extensions, changes to materials, alterations, painting, tree removal and earthworks. Before mitigation measures are undertaken, it is advised to contact City of Port Phillip's planning department to understand if there are any planning approvals required prior to commencing.

Disclaimer

Although precautions have been taken to ensure the accuracy of the information, the publishers and authors cannot accept responsibility for any claim, loss, damage or liability arising out of the use of the information provided.

This information is general in nature and may not describe your property. Please consider if the information is useful and appropriate for your situation. All effort has been made to ensure this information is correct and up to date.

Wominjeka

Council respectfully acknowledges the Traditional Owners and Custodians of the Kulin Nation. We acknowledge their legacy and spiritual connection to the land and waterways across the City of Port Phillip and pay our heartfelt respect to their Elders, past, present, and emerging.

How to use this workbook

1

Investigate the flood risk to your property through obtaining professional advice, and contacting your Local Council, or Melbourne Water. Then work through this book.

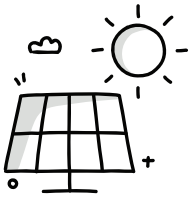
2

Read about HOUSING TYPES on pages 6-13 to learn how your house may perform in climate related events: storm, flood, poor air quality, and extreme temperatures.

3

Explore the PRIORITY UPGRADES table on page 14 to identify priority upgrades for your home that are easy and low cost.

4



Read through RECOMMENDED ACTIONS AND UPGRADES on pages 15-24 to learn more about upgrading any house for each of the climate related weather events.

5

While you are reading, use the MY HOME ACTION PLAN on page 26 to note down characteristics of your home and highlight actions to make your home more climate resilient.

Purpose & overview

Many Victorian households have been affected by climate related weather events, including extreme heat and cold snaps, storms, poor air quality, and floods. Much of the state's housing stock, particularly that built prior to 1991, has not been made to withstand the projected increase in temperatures and extreme weather events under climate change.

By improving the resilience of your home and property, you will not only reduce negative impacts of climate change on your health and wellbeing, but you can also save money through reduced future property damage costs, and reduced costs associated with heating and cooling.

This workbook will help you to assess how your house may perform in climate events and enable you to identify priority upgrades that will make your home more resilient when events do occur.

CLIMATE EVENTS

POOR AIR QUALITY

STORM

FLOOD

EXTREME TEMPERATURES

HOUSE TYPES

Describes typical examples of houses found within the City of Port Phillip:

Lightweight — Pre-World War II (1850-1945)

Heavyweight — Pre-World War II (1850-1945)

Post-World War II (1946-1990)

Contemporary (1991-present)

Consider which typology best describes your home. Note, your home may be made up of more than one type, and earlier renovations may mean some of the typical characteristics may no longer apply or be relevant. For example, a Heavyweight Pre-World War II may have a Contemporary extension to the rear.

Performance

Performance issues are identified for each house type. The visual scale is an indicative rating for a typical home: houses rated "worse" are at high risk from an event. This information is general in nature and may not describe your property. Consider which issues may apply to your property and estimate how your home may perform in each event.

PERFORMANCE SCALE

RECOMMENDED ACTIONS & UPGRADES

A scale of recommended actions you can make to homes for the identified events. The scale of minimal, medium and extensive, from no-cost preparation, through to extensive upgrades, is based on the assumed effort, skill, time and cost to undertake home upgrades.

✓ **Easy to do yourself**

Likely to require a skilled trade person

Will take time and planning

$ **Will require mid to high financial investment**

R **Actions renters can take**

Actions renters are permitted to take under the "Residential Tenancies Act 1997" and 'Residential Tenancies Amendment Regulations 2021' are noted with an '**R**'. Consider actions you could undertake to improve the performance of your home in the short, medium and long term. Some upgrades identified in this workbook can be financially supported by government rebates.

1850-1945

Lightweight – Pre-World War II

OFTEN SINGLE storey with high ceilings. Can be free-standing cottages, semi-detached, or row and terrace houses. Typically, additions of varying ages and quality have been added to incorporate modern living expectations, such as bathrooms, kitchens and additional living areas.

These homes were not designed with consideration of passive design principles. They often have poor orientation and do not effectively capture warmth from the sun, maximise daylight or breezes. Many locate verandahs on the front facade and some have hoods over windows, which provide external window shading.

Original features like chimneys, windows and exterior cladding are important to the character of these homes. Consider how these features can be maintained or subtly changed when upgrading for resilience to retain the integrity of the original house. A good place to start for all risks is to maintain, secure and improve the external envelope of your home. Before you make exterior changes to your home, check with your local council if you require planning permission.

DESCRIPTION
Usually single level pitched roof (sometimes with multiple pitches), typically weatherboard or decorative timber cladding, constructed freestanding and in rows.

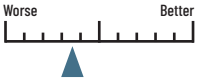
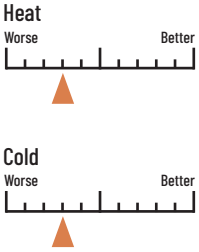
STRUCTURE
Timber wall, floor and roof framing, floor on timber stumps.

CLADDING
Walls in weatherboard or other timber cladding. Roofs are corrugated metal or slate. Some have been tiled.

WINDOWS AND DOORS
Timber doors and windows, double hung with single glazing.
These homes typically have one or occasionally two windows per room.

INSULATION
None originally. Many homes would have had ceilings insulated later.
It is less likely that walls and floors are insulated.

LIGHTWEIGHT — PRE-WORLD WAR II

		PERFORMANCE	CONSIDERATIONS
POOR AIR QUALITY	 	Original doors and windows may not seal properly due to age, allowing pollen, dust and smoke to enter.	**BUILDING** Old roof sheeting was fixed with nails that can easily come loose in strong winds; a roofer can inspect your roof and fix sheets with roofing screws. Slipped or broken slate tiles may need repair/replacement. Keep gutters, roof valleys, box gutters and downpipes clear of leaves. Fit gutter and valley leaf guards. Buildings with flat roofs, box gutters or no eaves are particularly vulnerable to internal water damage if there is a blockage in the roof drainage. Working at heights should be undertaken by people with appropriate safety equipment. Maintaining good sub-floor ventilation is critical for providing airflow whilst also allowing flood waters to exit from under the building. The floor level for later rear additions can be close to ground level. Be aware of areas like this where water can enter the house. Ensure exterior drainage directs water away from such areas. Prioritise roof/ceiling insulation, then walls, then floors. If you are doing extensive renovations, take the opportunity to insulate the exterior walls and floors when external or internal cladding is removed. If roof/ceiling insulation is present, check to see it is properly installed and effective. Consider installing additional insulation over existing to increase effectiveness. Reduce draughts by sealing gaps internally and externally. Pay close attention to where walls meet floors and ceilings, around skirting boards and cornices, and around doors or windows. Seal or remove redundant internal wall vents. Install an internal chimney draught stopper, a roofer can install flashing externally. Install thermally lined curtains with pelmets or thermal blinds over windows and glass doors. Retrofitting double glazed windows and draught sealing existing windows can be carried out by experts to retain original timber frames. Fitting fly screens to windows allows for ventilation, whilst keeping insects out. Retain verandahs on northern, eastern and western sides to provide shade during summer. **GARDEN** Re-design mature gardens to be drought resistant and plant less pollen-intensive species. Deciduous trees planted on the east, west and north, shade walls in summer to reduce heat gain and allow sun to windows in winter. Manage stormwater by installing rainwater or stormwater detention tanks in locations behind or to the side of the house, under decks, or underground, where practical. Site permeability can be increased through larger garden areas and substitution of permeable paving in place of non-permeable. In flood areas, install fencing that allows flood waters to pass through or underneath.
STORM	 	If the original roof is still in place roof sheets may not be secure, or slate tiles may have slipped/dislodged or cracked. Thin window glazing is more likely to shatter. Exterior cladding may be loose.	
FLOOD	 	If below flood level, timber floor frame and stumps are vulnerable to damage. Cavities are prone to mold growth. Original materials are often hardwearing and may not need replacement.	
EXTREME TEMPERATURES	 	Have poor thermal performance. Unlikely to be fully insulated. May have no insulation. Due to the lack of thermal mass, they cool down quickly following a heat wave. In winter the lightweight cladding doesn't hold any warmth from direct sun. Can be draughty letting hot air inside in summer, and warm air to escape in winter. Smaller windows reduce heat gain but can make it harder to ventilate. Timber window frames have good thermal properties; however, the performance of the original glass is low. Sash windows can be draughty due to poor sealing between moving parts.	

1850-1945

Heavyweight – Pre-World War II

CAN BE LARGE free-standing bungalows, semi-detached, or row and terrace houses. Also flats or apartments usually 2-3 and up to 5 storeys. Typically, additions of varying ages and quality have been added to single dwellings to incorporate modern living expectations, such as bathrooms, kitchens additional living areas and bedrooms.

These homes were not designed with consideration of passive design principles. They often have poor orientation to capture warmth from the sun, maximise daylight or breezes. Many have external shading in the form of verandahs or balconies on at least one facade.

Original features like chimneys, windows and exterior materials are important to the character of these homes. Consider how these features can be maintained or subtly changed to improve resilience while retaining the integrity of the original house. A good place to start for all risks is to maintain, secure and improve the external envelope of your home. Before you make exterior changes to your home, check with your local council if you require planning permission.

DESCRIPTION
Single and multi-storey, in brick, pitched roof (sometimes with multiple pitches), some have 'flat' roofs with parapets.

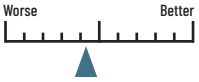
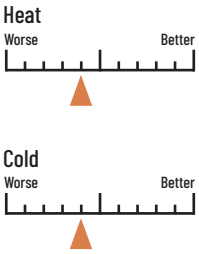
STRUCTURE
Brick walls, timber floor on timber stumps or brick piers, timber roof framing.

CLADDING
Brick walls, corrugated metal roof, or slate or terracotta tiled.

WINDOWS AND DOORS
Timber doors and double hung and casement windows with single glazing, some early apartments may have steel windows. These buildings typically have one or occasionally two windows per room.

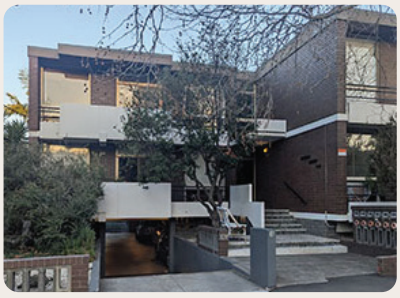
INSULATION
None originally. Many homes would have had ceilings insulated later. It is less likely that walls and floors are insulated.

HEAVYWEIGHT — PRE-WORLD WAR II

	PERFORMANCE	CONSIDERATIONS
POOR AIR QUALITY		**BUILDING** Old roof sheeting was fixed with nails that can easily come loose in strong winds; a roofer can inspect your roof and fix sheets with roofing screws. Slipped or broken slate tiles may need repair/replacement. Keep gutters, roof valleys, box gutters and downpipes clear of leaves. Fit gutter and valley leaf guards. Buildings with flat roofs, box gutters or no eaves are particularly vulnerable to internal water damage if there is a blockage in the roof drainage. Working at heights should be undertaken by people with appropriate safety equipment. Maintaining good sub-floor ventilation is critical for providing airflow whilst also allowing flood waters to exit from under the building. Be aware of areas where external ground level and inside floor levels are similar; this is where water can enter. Exterior drainage should direct water away from such areas. Prioritise roof/ceiling insulation, then floors. If roof/ceiling insulation is present, check to see it is properly installed and effective. Consider installing additional insulation over existing to increase the effectiveness. Insulation cannot be retrofitted to double brick walls. Floor to ceiling curtains or joinery on the inside of external walls can provide a thermal buffer. Reduce draughts by sealing gaps internally and externally. Pay close attention to where walls meet floors and ceilings, around skirting boards and cornices, and around doors or windows. Seal or remove redundant internal wall vents. Install an internal chimney draught stopper, a roofer can install flashing externally. Install thermally lined curtains with pelmets or thermal blinds over windows and glass doors. Retrofitting double glazed windows, secondary glazing and draught sealing existing windows can be carried out by experts to retain original timber or steel frames. Fitting fly screens to windows allows for ventilation, whilst keeping insects out. Retain or locate verandahs on northern, eastern and western sides to provide shade during summer. External works to apartments may require owners' corporation consultation. Particularly for any works upon, or abutting, common property. **GARDEN** Regularly inspect and maintain mature trees trimming branches that overhang the house or other structures. Re-design mature gardens to be drought resistant and plant less pollen-intensive species. Deciduous trees planted on the east, west and north shade walls in summer to reduce heat gain and allow sun to windows in winter. Manage stormwater by installing rainwater or stormwater detention tanks in locations behind or to the side of the house, under decks, or underground, where practical. Site permeability can be increased through larger garden areas and substitution of permeable paving in place of non-permeable. In flood areas, install fencing that allows flood waters to pass through or underneath.
 	Original doors and windows may not seal properly due to age, allowing pollen, dust and smoke to enter.	
STORM		
 	If the original roof is still in place roof sheets may not be secure, or slate tiles may have slipped/dislodged or cracked. Thin window glazing is more likely to shatter. Exterior cladding may be loose.	
FLOOD		
 	If below flood level, timber floor framing and stumps are vulnerable to damage. Cavities are prone to mold growth. Original materials are often hardwearing and will not need replacement.	
EXTREME TEMPERATURES		
 	Have poor thermal performance. Unlikely to be fully insulated, may have no insulation. Multi-unit apartment buildings with flat roofs are typically thermally poor due to restricted roof space to lay effective insulation. Walls hold heat for longer periods in summer and hold cold for longer periods in winter. Can be draughty letting outside air inside. Steel framed windows fitted to some early apartment buildings can be both draughty due to poor sealing and transmit heat and cold through the steel frames. Smaller windows reduce heat gain but can make it harder to ventilate. Timber window frames have good thermal properties; however, the performance of the original glass is low. Sash windows can be draughty due to poor sealing between moving parts. Large windows in apartment buildings provide good ventilation opportunities but can be difficult to effectively shade.	

1946-1990

Post-World War II



CAN BE LARGE free-standing homes, semi-detached, or town houses in brick veneer and double brick. Also includes flats or apartments usually 2-4 storeys, sometimes with undercroft car parking.

These homes were not designed with consideration of passive design principles. They often have poor orientation and do not capture warmth from the sun, maximise daylight or breezes, or provide for shading. They tend to have covered entrances and balconies, but not full verandahs. External blinds are sometimes used to shade windows.

Original features like windows and exterior materials are important to the character of these homes. Consider how these features can be maintained or subtly changed to improve resilience while retaining the integrity of the original house. A good place to start for all risks is to maintain, secure and improve the external envelope of your home. Before you make exterior changes to your home, check with your local council if you require planning permission.

DESCRIPTION
Single and multi-level, some with undercroft carparking, pitched and flat roofs.

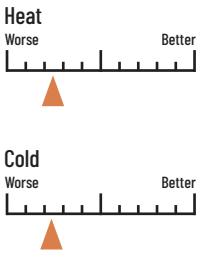
STRUCTURE
Walls in brick veneer or double brick, timber floors, with some apartments having concrete floors. Timber framed roofs with some apartments having concrete roofs.

CLADDING
Walls in brick veneer or double brick. Roofs are tiled or metal clad.
Some apartments may have accessible concrete roofs.

WINDOWS AND DOORS
Timber, steel or aluminium doors and windows, with single glazing.
These homes often have windows that are square or wider than they are high.

INSULATION
None originally. Many homes would have had ceilings insulated later. It is less likely that walls and floors are insulated. Flats with concrete floors cannot be insulated.

POST-WORLD WAR II

		PERFORMANCE	CONSIDERATIONS
POOR AIR QUALITY	 	Timber awning and aluminium framed windows along with weathered external doors may not seal properly, allowing pollen, dust and smoke to enter.	**BUILDING** Keep gutters, roof valleys, box gutters and rain heads clear of leaves. Fit gutter and valley leaf guards. Houses with flat roofs, box gutters or no eaves are particularly vulnerable to internal water damage if there is a blockage in the roof drainage. Working at heights should be undertaken by people with appropriate safety equipment. Inspect your roof and repair loose sheets, flashings and roof tiles. Be aware of areas where external ground level and inside floor levels are similar; this is where water can enter the house. Exterior drainage should direct water away from such areas. Raise items in basement above flood level. Older aluminium or steel window frames transfer heat and cold. Consider replacing windows with a sympathetic frame profile and colour. For existing windows, retrofitting double glazed units, secondary glazing, and draught sealing can be carried out by experts to retain original frames. Retain or locate verandahs on northern, eastern and western sides to provide shade during summer. Add external shading appropriate to the era of the home. Shading devices that control direct sun include verandahs, pergolas, window hoods, awning blinds, external blinds or shutters. In summer, external shading prevents sun from entering windows/glazed doors and is far more effective at managing heat gain as a result. Prioritise roof/ceiling insulation, then floors (if the house has an elevated timber floor). Insulation cannot be retrofitted into double brick walls. If roof/ceiling insulation is present, check to see it is properly installed and effective. Consider installing additional insulation over existing to increase effectiveness. Reduce draughts by sealing gaps internally and externally. Pay close attention to where walls meet floors and ceilings, around skirting boards and cornices, and around doors or windows. Seal or remove redundant internal wall vents. Install thermally lined curtains with pelmets or thermal blinds over windows and glass doors. Retrofitting double glazed units, secondary glazing and draught sealing existing windows can be carried out by experts to retain original timber or steel frames. Fitting fly screens to windows allows for ventilation, whilst keeping insects out. Replace non-water-resistant materials that are below predicted flood level. External works to apartments may require owners' corporation consultation. Particularly for any works upon, or abutting, common property. **GARDEN** Regularly inspect and maintain mature trees trimming branches that overhang the house or other structures. Re-design mature gardens to be drought resistant and plant less pollen-intensive species. Deciduous trees planted on the east, west and north shade walls in summer to reduce heat gain and allow sun to windows in winter. Manage stormwater by installing rainwater or stormwater detention tanks in locations behind or to the side of the house, under decks, or underground, where practical. Site permeability can be increased through larger garden areas and substitution of permeable paving in place of non-permeable. In flood areas, install fencing that allows flood waters to pass through or underneath.
STORM	 	Robust roof and wall materials perform well in storms. Thin glass in windows is more likely to shatter.	
FLOOD	 	If below flood level, floors are vulnerable to damage. Original materials such as bricks and timber are hardwearing and will not need replacement. Materials such as particle board, hardboard and MDF swell and deteriorate when wet. These materials were increasingly used in cabinetry, under floors and for details like skirtings and architraves.	
EXTREME TEMPERATURES	 	Have poor thermal performance. Are rarely fully insulated. Double brick walls hold heat for longer periods in summer and hold cold for longer periods in winter. Can be draughty letting outside air inside. Steel and older aluminium window frames have poor thermal performance. External works to apartments may require owners' corporation consultation. Particularly for any works upon, or abutting, common property.	

1991-present

Contemporary

Can be large free-standing homes, semi-detached or town houses. Also includes apartments, usually 2-4 storeys, sometimes with basement carparking. Low to medium height ceilings. They can have poor orientation to capture warmth from the sun, maximise daylight or breezes.

Contemporary additions to existing historic homes are sometimes designed with consideration of passive design principles, improving sun and daylight penetration, whilst providing external window shading. They may have narrow or no eaves and tend to have covered entrances and covered patios to the rear, some have roof terraces. Windows are often unshaded but may be double glazed.

A good place to start for all risks is to maintain, secure and improve the external envelope of your home. Before you make exterior changes to your home, check with your local council if you require planning permission.

DESCRIPTION
Single and multi-level and sometimes with multiple houses on one site, with pitched, skillion or flat roof, or a combination. Some have basement carparking. Walls can be a hybrid of concrete, brick and timber framing. Ground floors of houses and townhouses are likely concrete slab, with upper floors in timber. Some houses have large areas of glazing, which if well oriented and effectively shaded, can provide winter warmth and shade protection in summer.

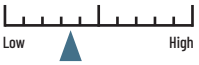
STRUCTURE
Metal, timber or concrete.

CLADDING
Fibre cement, concrete, brick and metal walls. Roofing in metal and sometimes concrete.

WINDOWS AND DOORS
Timber, aluminium and/or steel doors and windows, with single or double glazing. These homes often have windows proportioned to suit a particular room; tall narrow bedroom windows, large full height glazing for living rooms.

INSULATION
Wall, ceiling, and some houses may have floor insulation.

CONTEMPORARY

		PERFORMANCE	CONSIDERATIONS
POOR AIR QUALITY			**BUILDING** Keep gutters, roof valleys, box gutters and rain heads clear of leaves. Fit gutter and valley leaf guards. Houses with flat roofs, box gutters or no eaves are particularly vulnerable to internal water damage if there is a blockage in the roof drainage. Working at heights should be undertaken by people with appropriate safety equipment. Inspect, fill gaps and maintain cladding to ensure weather-resistance. Door thresholds can be close to ground level. Be aware of areas like this where water can enter the house; design exterior drainage to direct water away from such areas. Reduce draughts by sealing gaps internally and externally. Pay close attention to where walls meet floors and ceilings, around skirting boards and cornices, and around doors or windows. Single glazed aluminium framed windows transfer heat and cold. Consider installing curtains with a pelmet to retain heat in winter. Alternatively, install double glazed windows (with thermal-break if aluminium framed). Add external shading that can control direct sun such as verandahs, pergolas, window hoods, external blinds or shutters. External shading that prevents sun from entering windows/glazed doors is very effective at managing heat gain. Check for gaps and reinstate roof/ceiling insulation, consider installing additional insulation over existing to increase effectiveness. External works to apartments may require owners' corporation consultation. Particularly for works upon, or abutting, common property. **GARDEN** Regularly inspect and maintain mature trees trimming branches that overhang the house or other structures. Re-design mature gardens to be drought resistant and plant less pollen-intensive species. Deciduous trees planted on the east, west and north shade walls in summer to reduce heat gain and allow sun to windows in winter. Manage stormwater by installing rainwater or stormwater detention tanks in locations behind or to the side of the house, under decks, or underground, where practical. Site permeability can be increased through larger garden areas and substitution of permeable paving in place of non-permeable. In flood areas, install fencing that allows flood waters to pass through or underneath.
			New windows should seal properly preventing pollen, dust and smoke from entering.
STORM			
			Robust exterior materials perform well in storms. Constructed to more recent standards to withstand wind forces. However, flat /parapet roofs can be subject to flooding due to blocked box guttering.
FLOOD			
			Often constructed at grade with low door sills which can make them vulnerable to inundation of flood waters. Cavities are prone to mold growth. Materials can be of poor quality and may require replacement.
EXTREME TEMPERATURES			
		Heat  Cold 	Have fair thermal performance being constructed to more recent standards. Homes constructed after 1991 were required to have some insulation. Since 2004 star-ratings have been introduced and improved from 4 to 7 stars. The newer the house, the better the performance is likely to be. Window performance has improved with thermal breaks, thicker glazing, and sometimes double glazing in timber, UPVC and aluminium window frames.

PRIORITY UPGRADES

	Free and/or low cost	Air	Storm	Flood	Heat	Cold
Decks & external structures	Keep verandahs and decks dry		✓	✓		
Doors & windows	Seal draughts & gaps around windows, external doors, exhaust fans.	✓			✓	✓
	Upgrade window glazing with double or laminated glass; specify glass thickness based on hazard exposure.		✓		✓	✓
	Use door snakes (draught stoppers) for internal & external doors, along with weather seals to base of external doors and additional draught stopping to door jambs.	✓			✓	✓
	Install thermally backed curtains or blinds with pelmets; close on hot days & cold nights.				✓	✓
	Externally shade windows & doors.				✓	
Floors	If subfloor cavity is open, remove all materials and rake out leaves or debris from under house.			✓		
	Raise appliances above flood level, including washing machine & dryer, consider this for perishables, such as books and other items that may be damaged in event of inundation.			✓		
	Inspect under floor insulation, fill any gaps & replace where needed.				✓	✓
Floors/services	Raise external hot water units, airconditioners and electrical switchboards above flood level.			✓		
Garden	Remove dead vegetation, greenwaste & woodpiles.		✓	✓		
	Plant deciduous trees to provide summer shade and allow direct sunlight to windows in winter; prune branches that overhang a roof.				✓	✓
	Keep yard tidy & secure or remove loose items.		✓	✓		
	Maximise permeable surfaces in the garden to help heavy rain soak into the ground.			✓	✓	
Fencing	Inspect & repair fences.		✓	✓		
	Consider appropriate permeable fencing in a flood risk areas.		✓	✓		
Interior	Install reverse cycle airconditioning.				✓	✓
	Install ceiling fans with a winter and summer setting.				✓	✓
	Make a cool room that is zoned off & can be cooled during hottest part of day; south-facing if possible to avoid sunlight penetration. Curtains can help reduce heat load.				✓	
	Make a warm room that is zoned off & that can be heated during coldest times; north facing if possible, to receive sunlight penetration.					✓
	Keep your body warm with layering of clothes. Layering allows regulation of body temperature and reduces energy use for heating systems. Clothing can be supplemented with hot water bottles and blankets.					✓
	Use thermostat settings to regulate heater temperatures, setting to tween 18-22 degrees. Curtains can help retain heat at night.					✓
Roof	Clear gutters & roof valleys of leaves & debris.		✓			
	Clean spouting & downpipes.		✓			
	Add leaf guards to gutters & roof valleys.		✓			
	Secure any loose roof sheets, tiles & flashings.		✓			
	Inspect roof insulation and fill any gaps & replace, or top-up where needed. Laying new insulation over existing insulation increases the 'R' value, which is the measure in the conductive flow of heat.				✓	✓
	Ventilate roof cavity				✓	
Walls	Seal all gaps over 3mm.	✓	✓		✓	✓
	Seal unused chimneys.	✓			✓	✓
	Inspect wall insulation (if fitted) and fill any gaps & replace where needed.				✓	✓

RECOMMENDED ACTIONS AND UPGRADES

- ✓ Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Poor air quality

		PREPARATION ✓		MINIMAL ✓ $
GARDEN 	☐ R	Understand the flowering cycle of plants in the garden to determine when pollen levels will be at their highest. Check air quality forecasts (smoke and pollen levels) as some days of the year will carry more pollen than others.	☐ R	Where practical, consider watering/wetting-down gardens on days of poor air quality to reduce extent of airborne particulates. Avoid working outdoors on high pollen-count days, or when air is smoky due to bushfire.
FLOORS 	☐ R	Damp-mopping floors removes dust/pollen. On warm days, when using a ceiling fan, or other type of fan, use a low speed to reduce the extent of air being moved around which may contain dust or pollen particles.	☐ R	Use of a vacuum with HEPA (high-efficiency particulate air) filter will remove particulates that have settled on floors.
ROOF 			☐ R	Temporarily cover exhaust fan openings in the ceiling will reduce the extent of particulates blowing in from the roof space on windy, high pollen days.
DOORS & WINDOWS 	☐ R	Keep doors and windows closed on days of forecast poor air quality. Locate 'door snakes' at base of external doors to reduce entry of particulates.	☐ R	Use an air purifier to improve indoor air, in tandem with keeping doors and windows closed.

- ✓ Easy to do yourself
- 💬 Likely to require a skilled trade person
- 🕒 Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Poor air quality

		MEDIUM 💬 🕒 $		EXTENSIVE 💬 🕒 🕒 $ $
GARDEN 		Replace pollen-rich plants with species less pollen intense, or that flower at different times of the year. This will help reduce airborne pollen.		
FLOORS 				Replace existing carpets with low-allergy carpets.
ROOF 		Where practical, seal roof gaps to reduce particulate entry. Install draught stoppers to exhaust fans and chimneys.		Install sarking (a pliable membrane) under tiled or metal roofs to keep out pollen and dust.
DOORS & WINDOWS 		Seal gaps around external doors frames using adhesive foam or similar strips to reduce/prevent particles from entering. Replace standard flyscreens with those that can filter out fine dust and pollen particles.		Replace or modify external doors to provide a seal around door jambs. Install draught sealing strips to all windows and doors. Installation of a reverse cycle air conditioner with air purification feature will assist in removing particulates from the air.

RECOMMENDED ACTIONS AND UPGRADES

- ✓ Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Storm

		PREPARATION ✓		MINIMAL ✓ $
GARDEN 	☐ R	Keep your yard and verandahs free of clutter. Safely secure loose items such as outdoor furniture, umbrellas, trampolines and anything that could be uplifted or affected by strong wind.		Trim or remove trees or branches overhanging your home, or powerlines on your property. Make sure to prioritise your safety and practice caution on ladders and with old and weak gutters. Never work near powerlines. Engage a professional service if concerned.
FLOORS 				
WALLS 	☐ R	Regularly check wall cladding for loose boards or panels.		Check fuses and upgrade to RCD switches to protect from lightning strike.
ROOF 		Regularly check your roof area for loose tiles or metal sheets (this can be done visually from the ground in some cases).		Replace roofing nails with screws. Keep the roof in good repair. Fix or replace loose tiles. Ensure roof sheets and ridge capping is secure. Working on roofs can be dangerous and should be done by a suitably skilled tradesperson.
EAVES & DOWNPIPES 	☐ R	Clean gutters, spouting and downpipes regularly; make sure to prioritise your safety and practice caution on ladders and with old and weak gutters. Consider a professional service if concerned. Warning: cleaning roofs and gutters should be undertaken by people with appropriate safety equipment.		Ensure below-ground drainage is clear of blockages which could otherwise affect the performance of roof drainage. Ensure all downpipes are in good condition and free of holes with no broken/damaged joints. Ensure the underside of eaves are in good condition and eave linings are secure.
DOORS & WINDOWS 		Damage and injury during a storm is often the result of materials that have flown off buildings or out of yards.		Ensure doors and windows are operational and in good condition. Latches, locks and hinges on external doors and windows should be functional or be replaced so they can be secured in strong winds or rain.
DECKS & EXTERNAL STRUCTURES 				Inspect and repair loose palings on fences. Inspect and repair decks/pergolas/verandahs and other similar external structures.

- ✓ Easy to do yourself
- 💬 Likely to require a skilled trade person
- 🕒 Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Storm

		MEDIUM 💬 🕒 $		EXTENSIVE 💬 🕒 🕒 $ $
GARDEN 		Increase permeable surfaces like soft landscaping, gravel and stone to allow rain to infiltrate groundwater. Make fences permeable to allow wind to pass through. Grade slope away from the house to direct water away from the house.		Install a cavity drainage solution beneath the floor to remove floodwaters. This requires a sump and pump system. Large trees can be assessed by an arborist and who can prune limbs away from houses and check the general health and structure of trees that may be prone to dropping limbs in high winds.
FLOORS 				Construct floors from water resistant material (concrete, durable floorboards, clay tiles, rather than MDF, plywood or ceramic tile).
WALLS 		Replace rotten timber weatherboards and deteriorated exterior panelling to ensure weather tight.		Have a builder check the structural integrity of your house and make recommendations for tie-downs or fasteners to resist uplifting forces (wind). Replace your roof cladding with hail resistant roofing materials.
ROOF 		Ensure all roof fasteners are in good condition and free of rust. Replace roofing nails with screws.		Upgrade gutters and spouting to move water away from the building faster. Additional spouting may be required to areas of roof that carry more storm water than areas that carry less. Install sarking (a pliable membrane) under tiled or metal roofs to keep out rain. Install an engineered storm water retention and detention system to control the flow of water off your property.
EAVES & DOWNPIPES 				Upgrade or replace rusted or un-serviceable gutters and spouting, along with replacement of damaged or loose eave linings.
DOORS & WINDOWS 		Install debris screens or shutters on windows, or anti-shatter film to windows and glazed doors.		Doors should have additional support such as barrel bolts or dead locks and sturdy plates in the door jamb.
DECKS & EXTERNAL STRUCTURES 		Ensure garage doors lock correctly and can withstand wind speed, particularly hinged doors. New doors may have wind locks or other braces to resist wind loads. These loads transfer additional stress to ends of roller doors, where older walls may require strengthening. Replace nails/screws to decking boards and other fixtures.		Build structures that are attached to the house, such as carports and verandahs, to the same standards as the main building and ensure able to withstand wind loading of a higher magnitude storm. Install a solar system and battery for energy storage. Install a suppression or surge protection system for your entire house.

Permeable surfaces allow water to penetrate to the natural ground below. They include materials such as soil, lawn, stone or wood mulch, gravel, specialist paving products.

RECOMMENDED ACTIONS AND UPGRADES

Flood

Melbourne Water's *Flood Resilient Guide to Retrofitting Your Home* provides practical advice to help homeowners reduce the impacts of flooding. It outlines three key strategies for improving resilience: floor raising or elevation, wet-proofing, and dry-proofing. The guide also offers tips on selecting suitable materials and minimising repair costs and disruption after a flood event. You can find the guide via this link: flood-resilient-guide_retrofitting-home.pdf

- ✓ Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

		PREPARATION ✓		MINIMAL ✓ $
GARDEN 		Avoid removal of vegetation that holds soil layers together and earthworks that cut into unstable soils. Keep your yard and verandahs free of clutter. Safely store outdoor furniture, umbrellas, gardening equipment and toys. Items that cannot be safely stored should be secured in place.		Install a dry well (hole filled with gravel or stones) to reduce flow of water to the house and collect and retain stormwater, before it filters into the soil.
FLOORS 	☐ R	Raise valuables, furniture, books, poisons, oils and chemicals above flood level, onto benches or tables or move them off-site. Tie down objects likely to float and cause damage. Rugs laid over existing hardwood timber or concrete floors (instead of carpet) can be rolled up and removed in advance of potential flooding. Rugs can be easily removed and dried if they do become wet. Obtain a suitable width broom and squeegee expressly for the use of pushing water outside after a flooding event.		Seal existing tiled areas to minimise the chance of mold. Where practical, raise power point & appliance heights above flood level, including washing machine & dryer.
WALLS 		Discuss proposed works with your neighbours to encourage a collective approach to managing stormwater. Consider the wider neighbourhood, and how impervious surfaces, such as footpaths, roads and car parks contribute to flooding. Consider where pervious surfaces are located, such as parks, grassed and soft landscaped areas, as these mitigate flooding. This approach may assist in guiding works across the minimal, medium and extensive categories.		Select hardwood furniture and cabinetry that can better withstand water damage. Flash flooding occurs within six hours of heavy rain. Flash floods can occur in urban areas if drainage systems can't cope, and additional flooding is caused by local waterways If you're new to the area ask a neighbour if the area has experienced flash flooding before.
ROOF 	☐ R			
EAVES & DOWNPIPES 		Clean gutters, spouting and downpipes regularly; make sure to prioritise your safety and practice caution on ladders and with old and weak gutters. Consider a professional service if concerned. Warning: cleaning roofs and gutters should be undertaken by people with appropriate safety equipment.		Add leaf guards to gutters and valleys.
DOORS & WINDOWS 	☐ R	Obtain and store sandbags in advance of a predicted flood event to reduce the amount of water that could enter through external doors.		Install waterproof seals on doors and windows. Seal gaps in frames with water resistant products such as silicone. Add barrel bolts or dead locks to doors.
DECKS & EXTERNAL STRUCTURES 		In Victoria, for most types of development,the 1% AEP flood level is used to define a flood zone. An 1% AEP flood is a large flood having a 1% chance of occurring in any given year. Flood level information can be obtained from council.		Leave gaps in walls below decks and the sides of carports to allow flood waters to pass through and drain away. Provide shelves to outbuildings and keep floor areas clear. This allows water to escape and reduces chance of damage to stored items.

- Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Flood

		MEDIUM		EXTENSIVE
GARDEN 		Provide adequate drainage, soil cover and vegetation near potentially unstable land. Increase permeable surfaces like soft landscaping, with deep friable soils, gravel and stone to allow rain to slow surface flow and for better ground infiltration. Make fences permeable where possible. This can be achieved by selectively removing non-structural elements (such as individual timber palings), and/or removing plinth boards from the bottom of fences.		Create a rain garden with plants that cope with water inundation, to help slow, filter and collect flood water. Add solid walls or raise ground level above known historic flood levels to manage water flow. Consider the impact this may have on neighbours. Grade slope away from the house for drainage. Increase site permeability by removing or reducing extent of hard paved surfaces. Relocate rainwater tanks below ground to remove these obstructions from the flow path.
FLOORS 		Install flood resilient flooring such as hardwood, vinyl or tiles over a flood resilient substrate to minimise damage. Use water resistant insulation material below the predicted flood level. Ensure insulation can be dried out after a flood event through adequate ventilation. Install perimeter drainage to prevent dampness in basements and cellars. Install flood resilient cabinetry, and stainless steel framed benches.		Raise the house above the historic flood level, noting footings, posts and bearers, slabs and other under-floor structures and services must be resistant to overland flow and inundation. (Applicable to timber-floored, framed and clad houses). Construct floors from water resistant material (concrete, durable floorboards, clay tiles, rather than MDF, plywood or ceramic tile). Install a cavity drainage solution beneath the floor to remove flood waters. Requires a sump and pump system. Ensure backup power is available in case of power failure. Remove carpet and underlay entirely and substitute with removable rugs and mats.
WALLS 		Seal external walls under existing cladding to minimise the chance of water entry.		Eliminate wall cavities by replacing loose-fill insulation with rigid insulation. Ensure insulation can be dried out after a flood event through adequate ventilation.
ROOF 		Provide access to roofs for maintenance and inspection. Use water resistance insulation material below the predicted flood level. Ensure insulation can be dried out after a flood event through adequate ventilation.		Dry-proofing applies to the sealing of exterior walls (and doors), preventing water entry. Wetproofing is a response to 'allowing' flood water to enter. Construction and materials used in wetproofing are highly water-resistant and more resilient to inundation than typical MDF sub-floors and plasterboard walls.
EAVES & DOWNPIPES 		Water-resistant insulation includes: rigid insulation, closed-cell foam, fibreglass, mineral wool or wool.		Upgrade gutters and spouting to move water away from the building faster. Install an engineered stormwater retention and detention system to control the flow of water off your property.
DOORS & WINDOWS 		Replace external doors with flood doors to minimise the chance of water entry. Install strengthened glass and frames to withstand water pressure/ entry and collision from floating debris. Add sturdy plates in the door jamb to provide structural strength against water pressure		Raise window and door sills to above flood level to minimise the chance of water entry if possible. Prevent basements flooding by providing flood barriers to an appropriate height above flood level.
DECKS & EXTERNAL STRUCTURES 		Raise hot water units, air conditioning condensers and electrical switchboards above flood level. Make outbuildings permeable to allow water to flow through them.		Structures that are attached to the house, such as carports and verandahs, are to be built to the same standards as the main building. Install solar system and battery for energy storage, with the battery located above maximum predicted flood level. Install a surge protection system for your entire house.

RECOMMENDED ACTIONS AND UPGRADES

- ✓ Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Extreme heat

		PREPARATION ✓		MINIMAL ✓ $
GARDEN 	☐ R	Keep garden lush, particularly in areas close to the house.		Plant drought tolerant species that are placed with consideration given to mature height and spread, particularly for providing shade to exposed north, east and west facing windows and walls.
FLOORS 				Inspect your insulation and fill any gaps.
WALLS 				Inspect your insulation and fill any gaps.
ROOF 				Inspect your insulation and fill any gaps. Draught stoppers can be installed to seal ceiling exhaust fan openings, to prevent heat from the roof space entering inside.
DOORS & WINDOWS 	☐ R	Close and seal off external doors with door snakes. Open doors and windows at night to let in cooling breezes. Draw external blinds early in the morning before the sun hits the windows and close any open doors and windows before external temperatures exceed the internal temperature. Install non-permanent window film for insulation.		Install draught seals on external doors and windows.
INTERIOR 	☐ R	Use ceiling and pedestal fans when you are in a room. Use air conditioners in zones you are using to keep cool, with an appropriately set thermostat. Avoid running the oven and other appliances that produce heat. South facing rooms and downstairs areas tend to be the coolest rooms in a house.		Install thermally backed curtains/ blinds or honeycomb blinds; use pelmets and seal curtains/blinds down to the floor or to window sill to prevent convection currents of air. Seal all gaps with suitable draught proofing products.

The R-Value indicates how well an insulation product resists heat flow. The higher the R value, the higher the level of insulation. The appropriate degree of insulation depends on your climate, building construction type, and whether internal heating and/or cooling is used.

- Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Extreme heat

		MEDIUM		EXTENSIVE
GARDEN 		Install a timed irrigation system, operated at night to reduce evaporation, for efficient water use. Landscape gardens with species providing high shade cover, to the garden and house, particularly north and west facing windows.		Reduce the extent of impervious surfaces such as concrete, brick and pavers. These surfaces prevent soil water absorption and retain heat during the day and releasing at night. Use permeable surfaces or lighter coloured or reflective paving to reduce heat absorption.
FLOORS 		Install under floor insulation under raised timber floors. Select insulation with a high R-value. Enclose subfloor cavity, retaining some open areas for cross-flow ventilation. This provides access for cool night air and ensures moisture cannot accumulate and cause mold.		Strengthen foundations to avoid movement caused by changes in soil moisture due to heat/dry.
WALLS 		Seal external surfaces with weather protecting sealants and paints to protect against thermal movement as the temperature fluctuates.		Install wall insulation to all external walls, or add further insulation to existing. Select insulation with a high R-value. Install sislation to external walls.
ROOF 		Add additional insulation in the ceiling where required. Select insulation with a high R-value. Passively ventilate the roof cavity through vents installed in the underside of eaves, and/or at roof gable ends. Install a wind-powered 'whirly bird' or solar powered roof space heat extractor that can be decommissioned over winter.		Install insulation throughout the ceiling. Select insulation with a high R-value. Install a mechanical ventilation heat recovery system in the ceiling space. Ensure high-level flows of cooler air in summer and a complete seal in winter. Install sislation to underside of roof. Sislation is a reflective insulative membrane used under roofs and within walls with insulative properties. Replace dark roof colours with reflective or light-coloured roof cladding to reduce heat load to the roof space.
DOORS & WINDOWS 		Add external shade to north facing glass with eaves, verandahs and awnings. The width of the projection relates to the height of the glass, and must be calculated before construction. Externally shade all east and west glass in summer with adjustable blinds, screens or planting (depending on bushfire risk).		Install timber, UPVC or thermally improved window and door frames in a light colour that does not absorb excessive heat Replace window glazing with low U-value double glazing. Different glazing may be selected for each façade. Seek advice for your situation.
INTERIOR 				Make the home air-tight using a heat exchange ventilation system. Add shaded internal thermal mass to help regulate internal temperature.

Thermal mass is the ability of a material to absorb, store and release heat. Thermal lag is the rate at which a material releases stored heat. For most common building materials, the higher the thermal mass, the longer the thermal lag. Materials with a high thermal mass include stone, concrete, brick.

RECOMMENDED ACTIONS AND UPGRADES

- ✓ Easy to do yourself
- Likely to require a skilled trade person
- Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Cold

		PREPARATION ✓		MINIMAL ✓ $
GARDEN 	☐ R	Prune shrubs to allow sunlight to windows in winter.		Prune trees to allow direct light to windows in winter, particularly north-facing windows. Make sure to prioritise your safety and practice caution on ladders. Consider a professional service if concerned.
FLOORS 		The R-Value indicates how well an insulation product resists heat flow. The higher the R value, the higher the level of insulation. The appropriate degree of insulation depends on your climate, building construction type, and whether internal heating and/or cooling is used.		Inspect your insulation and fill any gaps. Lay rugs over floorboards and tiled areas to retain heat.
WALLS 			☐ R	Seal unused chimneys where possible.
ROOF 				Inspect your insulation and fill any gaps. Install a draught stopper to seal ceiling exhaust fans.
DOORS & WINDOWS 	☐ R	Close and seal off external doors with door snakes. Close curtains and blinds once night falls to retain internal heat.		Install draught seals on external doors and windows.
INTERIOR 	☐ R	Use heaters or reverse cycle air conditioners to keep warm. Turn ceiling fans to winter setting, which draws warm air down from the ceiling. Zone off a space that can be heated and that you can spend time during the coldest times. Rooms that capture direct sunlight for the longest periods of the day, like north facing rooms and upstairs areas tend to be the warmest rooms in a house. Ensure blinds and curtains are fully open to encourage as much sunlight into a room as possible for passive heating.	☐ R	Keep doors to non-habitable rooms such as bathrooms, laundries and halls closed so as not to lose heat from living areas. Locate rugs and similar floor coverings in sunny spots to absorb solar energy. Seal all gaps with suitable draught proofing products (note renters cannot do sealing).

- ✓ Easy to do yourself
- 💬 Likely to require a skilled trade person
- 🕒 Will take time and planning
- $ Will require mid to high financial investment
- R Actions renters can take

Cold

		MEDIUM 💬 🕒 $		EXTENSIVE 💬 🕒 🕒 $ $
GARDEN 		Plant deciduous species on north side of house to allow winter sun to windows.		Consider removing evergreen trees that block winter sun from entering particularly north facing windows, and replant deciduous species instead. Consider the impacts to summer shading prior to removal.
FLOORS 		Install under floor insulation under raised timber floors. Select insulation with a high R-value. Enclose subfloor cavity.		Carpet (including underlay) bedrooms and living areas to help retain warmth and reduce heat loss through floors.
WALLS 		Seal external surfaces with weather protecting sealants and paints to protect against thermal movement as the temperature fluctuates.		Install wall insulation. Select insulation with a high R-value. Install sislation to external walls. Sislation is a reflective insulative membrane used under roofs and within walls with insulative properties.
ROOF 		Add additional insulation in the ceiling where required. Select insulation with a high R-value.		Add insulation throughout the ceiling. Select insulation with a high R-value. Install sislation to underside of roof.
DOORS & WINDOWS 		Control direct sunlight to northerly glass with eaves, verandahs and awnings calculated to let in winter sun. The width of the projection relates to the height of the glass and must be calculated before construction. Install adjustable blinds, screens or deciduous planting in front of east and west facing glass to let in winter sun.		Install timber, UPVC or thermally broken aluminum window and door frames. Replace window glazing with low U-value double glazing. Different glazing may be selected for each façade. Seek advice for your situation.
INTERIOR 		Install thermally backed curtains/ blinds or honeycomb blinds; use pelmets and seal curtains/blinds down to the floor or to window sill to prevent convection currents of air.		Make the home air-tight using a heat exchange ventilation system. Add internal thermal mass that is heated by winter sun to help regulate interior temperature.

This information is general in nature and may not describe your property, please consider if the information is useful and appropriate for your situation.
All efforts have been made to ensure this information is correct and up to date.

My home assessment

Address

Which extreme events may impact your home

☐ AIR QUALITY

☐ STORM

☐ FLOOD

☐ EXTREME TEMPERATURES

When was your house built?

What is it built with?

Walls		Roof	
☐ Lightweight	☐ Heavyweight	☐ Metal	☐ Tiles

House type/s

Is your subfloor cavity open or enclosed?

☐ Open ☐ Enclosed

Is your house insulated?

☐ Roof ☐ Ceiling ☐ Walls ☐ Floors

What type of windows do you have?

☐ Timber ☐ Steel ☐ Aluminium ☐ Other

Are your doors & windows draught sealed?

☐ Yes ☐ No

Are your windows double glazed?

☐ Yes ☐ No

Do you have window coverings?

☐ Blinds ☐ Thermal blinds ☐ Curtains ☐ Curtains with pelmets

Are your windows shaded in summer?

☐ Yes ☐ Mostly ☐ Some ☐ No

Does your garden drain well after rain?

☐ Yes ☐ No

Do you have any of the following?

☐ Rainwater Tank ☐ Pump

My home action plan

Performance issues identified at your house

Actions and upgrades you can take on within 12 months

Actions and upgrades you can take on within 10 years

Actions and upgrades you can take on after 10 years

Notes

Glossary

AEP flood	Annual Exceedance Probability. A term describing how likely a flood is to occur in a given year; 1% AEP flood is a flood with a one in a hundred chance of being exceeded in any year.
Brick piers	Vertical structures built to support floor structures or walls.
Brick veneer	A single layer of brick built on a timber-framed house.
Building envelope	All the building components that separate the indoors from the outdoors.
Cavities	Empty spaces under the house or within the walls.
Cladding	Covering of boards, tiles, tin or other material fixed to the outside of a building.
Door snakes	A long strip placed along the bottom of a door or window to exclude draughts.
Draughts	An unwelcome current of air coming into a room.
Dry proofing	Protection from flooding by making a building impermeable to floodwaters.
Eaves	The part of a roof that meets or overhangs the walls of a building.
Flashings	Thin material used for waterproofing.
Glazing	Part of a window or wall, made of glass.
Heat recovery system	A ventilation system that recovers and reuses heat from exhaust air to preheat incoming fresh air improving energy efficiency and indoor air quality.
HEPA	High Efficiency Particulate Air.
Hollow core doors	A door made of fibreboard or laminated wood with honeycomb cardboard interior.
Joinery	The wooden components of a building, such as doors and window frames.
Kick plates	A metal plate at the base of a door or panel to protect it from damage or wear.
MDF	Medium-density fiberboard; an engineered wood product
Orientation	The position a house faces, particularly in relation to where the sun moves.
Passive design	House design that considers orientation to sun and breezes to maintain a comfortable temperature, with minimal heating & cooling.
Pelmets	A narrow piece of wood or fabric placed above a window, to hide the curtain rail & reduce heat loss.
Permeable	Allowing water to pass through.
Permeable fencing	A fence that by design or modification, allows flood water to pass through or under.
Pitch	The steepness of a roof.
Pitched roof	A two-sided roof that slopes downwards, at an angle from a central ridge.

RCD	Residual Current Device; commonly known as an electrical 'safety switch'.
Ridge capping	Roofing material used to cover the ridges of a pitched roof, where two roof sides meet.
Roof fasteners	Any type of screw, rivet or device used to secure roofing materials.
Roof valleys	The channel created where two roof planes meet.
R-value	The measure of an insulation batt's resistance to heat flow.
Sarking	A pliable membrane which is installed under tiled or metal roofs for insulation and protection from weather.
Sash windows	Windows that slide up and down, also referred to as 'double hung'.
Services	Electrical, plumbing and mechanical systems such as air conditioners, hot water units and electrical meter boards.
Sisalation	A type of sarking in the form of reflective foil insulation used in building construction, particularly under roofs for radiant heat reflection.
Skillion roof	A roof with a single sloping plane.
Slab	A flat horizontal surface, such as a floor, made of concrete.
Star rating system	Energy efficiency standards for houses.
Stumps	Foundations of a home that elevate the building above the ground.
Subfloor cavity	The area under the house between the floor structure and the ground.
Sump and pump	A device that moves water from your basement to the outside of your home.
Surge protection system	An electrical device used to protect equipment against power surges.
Thermal breaks	An insulating material or barrier used to prevent heat transfer.
Thermal mass	The ability of material to absorb, store and release heat.
Thermal performance	The amount of heating or cooling required to make a home a 'comfortable' space.
UPVC	Unplasticized Polyvinyl Chloride.
U-value	A building component or material's resistance to heat transfer.
Ventilation	The provision of fresh air to a room.
Wet proofing	Measures applied to prevent or resist damage from flooding, whilst permitting flood waters to enter a building.

Resources

Climate Change in Australia
CSIRO

Cooling your Home: Home retrofits, appliances and adaptions for a hotter future
Beyond Zero Emissions

Flood Resilient Guide to Retrofitting your Home
Melbourne Water
flood-resilient-guide_retrofitting-home.pdf

Preparing for Emergencies
Australian Red Cross

Renew magazine

State of the Climate
CSIRO

Your Home Adapting to Climate Change
ACT Government

Sustainable Design Factsheets for Buildings
Sustainable Design Fact Sheets

Porous Paving Guidance
Melbourne Water

Draught Proofing a Home
Sustainability Victoria

Climate Council

Green Building Council of Australia

Sustainability Victoria

Melbourne Water

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Home upgrades for climate resilience

Making your home ready for extreme weather events