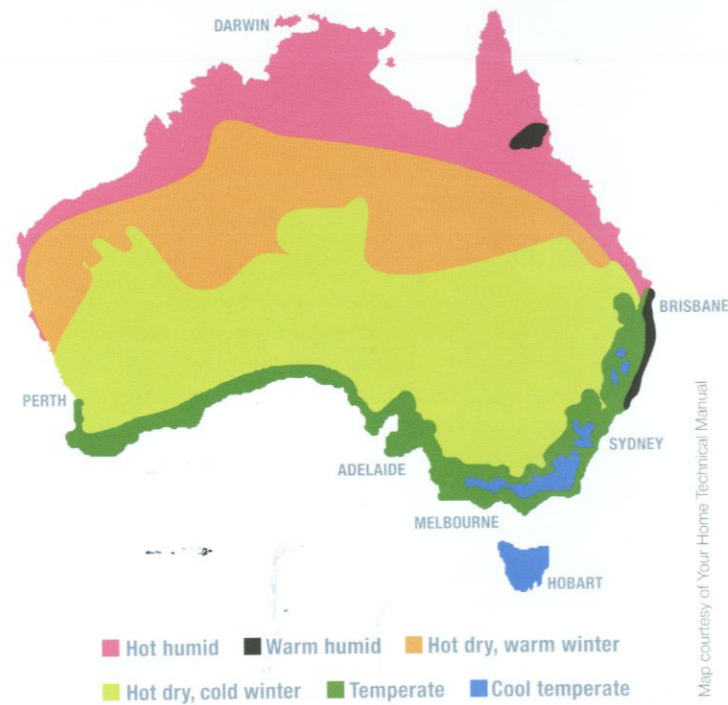




Putting it all together

You've got passive and active, sun and shade, insulation and mass – just how do you mix these ingredients to design the most comfortable home for the climate? And how do you do it with James Hardie products?

Whilst there are a number of different climate zones in Australia – the Building Code of Australia lists eight and *Your Home Technical Manual* lists six – there are five main ones that cover Australia's capital cities and some important regional areas: temperate, covering Sydney, Perth, Melbourne and Adelaide; cool temperate, covering Hobart and Canberra; warm humid, covering Brisbane and much of the NSW North Coast; hot humid, covering Darwin, Cairns and Townsville; and finally hot dry, cold winter, covering Alice Springs.

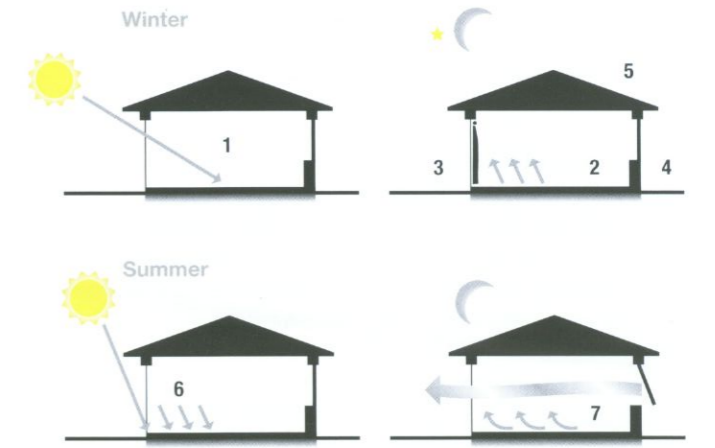


In each of these climates, there are essential design elements to consider, as well as other design options for best practice outcomes. These tips are outlined in the following tables. Remember, though, that transitions between climate zones are gradual. Every site will have specific microclimatic variations and these should have a significant impact on any design.⁵⁰

Temperate climates: Sydney, Melbourne, Adelaide and Perth

These climates require a balanced approach to solar design and ventilation. However, the right balance of passive design for solar heating in winter, combined with good design for passive cooling in summer, can almost eliminate artificial heating and cooling.

A sensible approach to thermal mass, mainly in floors, can be combined with insulated walls and roofs to minimise energy use when it is required. Take special care to choose appropriate glazing and protect from summer overheating.



- 1 Eaves are designed to admit winter sun. Heat is stored in the thermal mass in the floor.
- 2 Heat is released at night.
- 3 Heavy drapes or other window insulation to minimise heat loss at night.
- 4 Reverse mass construction and double glazing should be used in cooler regions.
- 5 Well insulated ceilings and roofs are required in all regions.
- 6 Heat is absorbed during summer day to keep interior cooler.
- 7 Night-time flushing removes stored heat.

Design elements	Design essentials	Best practice design options	Recommended James Hardie materials
Siting	Encourage good orientation to north while reducing wall and glazing areas to east and west. Layout of dwelling should make optimum use of favourable orientations.	Site new homes for solar access, exposure to cooling breezes and protection from cold winds.	
Sub-floor and floor	Use slab on ground where possible to incorporate high thermal mass, in association with passive solar design.	If building on sloping sites using bearer and joist construction in steel or timber, insulate the sub-floor and reduce sub-floor ventilation to the minimum. Consider minimising ventilation cavities through walls from the sub floor to the roof to prevent heat leakage.	
Roof	Bulk insulate ceilings.	Use reflective sarking under tile roofs. Light coloured metal deck roofs should be fixed over an insulation blanket/foil laminate suitable for condensation control.	
Walls	Use reflective insulation to keep out heat in summer and bulk insulation to keep heat in during winter.	Use reverse mass construction and passive solar principles where possible.	Any James Hardie cladding material in combination with bulk insulation and reflective foil.
Openings	Carefully balance orientation of glazing to provide optimum north facing passive solar access for living areas. Minimise east, west and south facing glazing. Use cross ventilation and passive cooling in summer.	Use heavy drapes with sealed pelmets, or close fitting blinds to insulate windows for winter nights. Draught seal thoroughly and use entry airlocks.	
Clip-ons	Design eaves and other sun shades of correct proportions for summer shade to both walls and glazing, and use adjustable shading to windows.	Use extended pergolas for outdoor living. Provide shade in summer and sun in winter.	For pergolas and adjustable window shading systems, use HardiPanel® compressed sheets or Scyon™ Trim battens with appropriate design and detailing. See examples in <i>The Smarter Design Book</i> at http://jameshardie.com.au/smarterdesign James Hardie eave lining materials like Versilux® lining and HardiGroove® lining for soffits.
Landscape elements	Consider some deciduous planting for summer shade and winter sun.		