Building a sustainable home

Checklist

switch your thinking

Using good design principles can save energy, water and money, while creating a more enjoyable and comfortable home.

These practical checklists can help you design a more sustainable home for Perth's climate, with lower running costs and improved environmental performance.

Building a Home - The 3 most important decisions

1. **Location, Location, Location**
   A home that is close to everything you need will save on transport and fuel costs. Consider the walking and cycling distance to public transport, shops, parks and schools.
2. **Size**
   Bigger isn't always better. If you really want a sustainable home, choose a smaller size. Larger homes require more heating, air conditioning and lighting and also take up valuable garden space.
3. **Orientation**
   Look for a block with good orientation that allows for the placement of living and entertaining areas in the north and minimal windows on east and west.

Why build a sustainable home?

- ✓ Save energy and water
- ✓ Low running costs
- ✓ More comfortable
- ✓ Higher resale value

Buying off the plan?

A few simple changes to your chosen design could improve the performance of your home and reduce your energy and water bills.

For example, you might ask your builder to rotate or flip the house plan to improve its orientation or move doors and windows to achieve a more superior passive design.

This document was originally produced and published by the City of Cockburn.

City of Cockburn

Little or no extra cost

These principles can be applied to most homes to improve thermal comfort and reduce heating and cooling expenses. Many builders will make these changes at little or no extra cost.

Design Basics

❒ **Living areas and windows in the North.**
Provides natural lighting all year round. Allows winter sunlight to enter the home during the colder months. Easy to shade from the harsh summer sun with eaves.

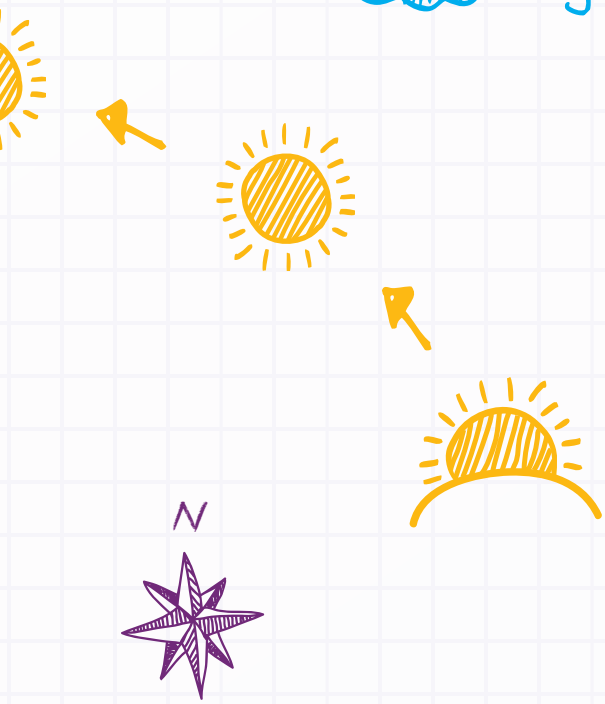
❒ **Light coloured roof**
Reflects solar radiation and keeps the interior cooler during summer.

❒ **Natural ventilation**
Make the most of the cooling south west breeze. Allow for cross ventilation by aligning windows and doors opposite each other to enable natural air flow.

❒ **Universally accessible home**
Plan ahead by creating a liveable home that is easy to move around in. Check your design has wide doors (minimum 820mm), hallways (minimum 1000m), flush entry doors, hobless showers and an easy access toilet with strong walls. For a full checklist visit www.liveablehomes.net.au

❒ **Minimise windows in the East and West elevations**
Avoid exposure to the morning and afternoon sun by moving, deleting or reducing the size of windows on the east and west.

❒ **Thermal mass**
Use of materials with high thermal mass can make your home more comfortable in summer and winter. For example dark tiles or exposed concrete in north facing rooms (that are exposed to winter sun) helps to stabilise internal temperatures both during the day and at night.



Additional Considerations

❒ **Solar hot water**
Solar hot water or heat pump systems are cheaper to run and use less energy. By locating your hot water system near the bathrooms, laundry and kitchen you can reduce the amount of cold water that needs to be run while waiting for hot water to arrive at taps and shower heads.

❒ **Extra insulation**
A well-insulated home will provide year-round comfort reducing the need for artificial heating and cooling. Consider increasing the insulation levels in walls, ceiling and lining the roof to keep the heat out in summer and retain warmth in winter.

❒ **Shading**
Use verandas, eaves, trees and shrubs to shade walls and windows on the east and west. A pergola with tilted slats, removable sail shades or deciduous vines on the north side will allow winter sun in, while shading the harsh summer sun. Window treatments, such as well fitted curtains and pelmets will further reduce unwanted heat gain.

❒ **Health and wellbeing**
Avoid toxic carpets, flooring and paints which can release chemical emissions into your home for years. Choose zero or low Volatile Organic Compound (VOC) paints and materials.

❒ **Energy and water wise appliances**
Choose appliances and fittings with the highest energy efficiency star rating and Water Efficiency Labelling (WELS) to reduce your bills and improve the environmental performance of your home.

❒ **Energy efficient and natural lighting**
Energy efficient lights (e.g. LED) and the use of natural lighting with skylights and north facing windows can significantly reduce your electricity bills.

❒ **Heating and Cooling**
A well designed home minimises the requirement for artificial heating and cooling. Ceiling fans are a good alternative to air conditioners as they use less energy.

❒ **Solar Photovoltaic Panels**
Onsite renewable energy generation (ideally on your north facing roof) will help to reduce your carbon emissions and can lower your bills.

Passive Design

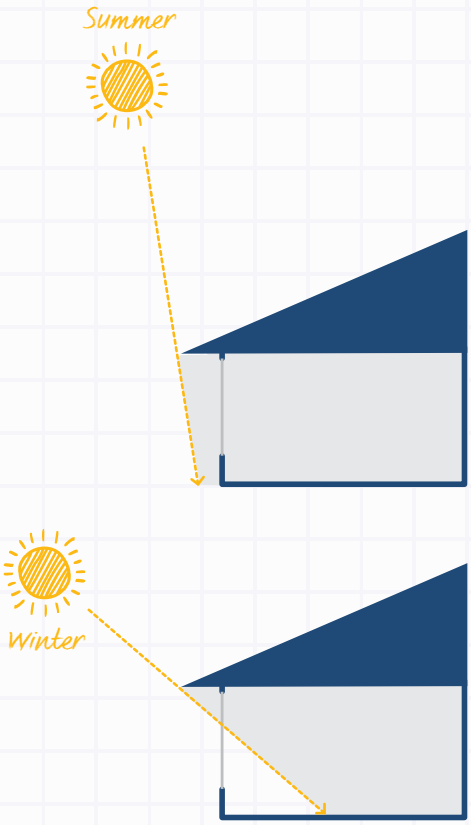
The importance of passive design cannot be overstated.

Passive design principles make use of the local climate including the sun's energy and local breezes to make a building warm in winter and cool in summer. Good passive design is achieved by appropriately orientating your building.

In Perth, the summer sun travels high across the sky on an approximate angle of 82° at noon. In winter its path is lower in the sky on an approximate angle of 34° at noon.

Ideally a passive designed house in Perth would have larger (but appropriately shaded) windows on the northern side of the building to allow access of the low winter sun, with minimal windows on the east and west to restrict heat gain from the rising and setting sun in summer. Windows, doors and hallways would be aligned to capture the cooling sea breeze from the south west.

Shading, thermal mass, insulation and skylights also make a contribution to energy efficiency and comfort.



Landscaping tips

Trees and gardens can add value to property, offer privacy, provide shading and reduce the amount of heat reflected into a building. Trees also filter air pollution, reduce traffic noise, and create habitat for wildlife.

- North side— plant trees that lose their leaves in winter, to allow the sun into your garden and house, whilst providing shade in summer.
- East and west Side— plant water wise shrubs, vines and trees to shade the walls and windows of your house from the morning and afternoon summer sun.
- Set aside a sunny area for your washing line to reduce the need to use a dryer. Use a waterwise irrigation system and mulch your gardens to save on water bills
- You may be eligible for local council incentives including native plant subsidy schemes, street trees, free garden workshops and more.