



# The Handbook

Choose wisely,  
build right, live well



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## Climate Sense

a guide to designing  
for our unique  
climate

## Energy Sense

a guide to designing  
a low energy use  
home

## Water Sense

a guide to designing  
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## Nature Sense

a guide to designing  
a nature sense  
garden



# The Handbook

Together with Ergon Energy, Stockland presents – **The Handbook**.

**The Handbook** is designed to help you make the right choices when designing your new home.

The wise choices you make today will determine how well your home copes with the Townsville climate as well as having a significant impact on the ongoing energy and water costs of your new home.

**The Handbook** provides advice on simple choices to help you make your new home the best it can be.

## North Shore – Australia's largest EnviroDevelopment

In 2012, Stockland North Shore has claimed the title of the largest EnviroDevelopment project in Australia.

Envirodevelopment is a world-leading sustainable development branding system, created by the Urban Development Institute of Australia [UDIA] that helps consumers identify truly sustainable projects. Accreditation is awarded across six key areas - ecosystems, waste, energy, materials, water and community.





# Making sense of it all


As household costs rise, the need to live more sustainably has never been greater. The good news is that there are many ways you can save on your household electricity and water bills. A very effective way to help you minimise the impact of these cost increases is to choose an energy efficient home design.

These days there are rules in place to increase home energy and water efficiency. All new homes must have a six-star rating or better. Water saving shower heads and water taps are mandatory and appliances such as air conditioners must now meet higher energy efficiency standards.

**The Handbook** informs you of a range of choices available that can increase your home's efficiency.

Some of the choices you make may cost a little extra – we ask that you weigh those decisions against savings down the track. These are one off expenses that can be implemented in the most cost effective way at the building stage to ensure you minimise your ongoing energy costs.

Buyers are becoming more aware of the long term cost of energy, so an inefficient design could affect your property's value in the future. Houses built right today are already showing up to \$10,000 in improved value for each added energy rating star. (source: TEL)



"The wise choices you make today will affect your future cost of living and home value as well as the way you use and enjoy your home. We encourage you to think about this as you plan your new home."

# Choose wisely

Stockland and Ergon Energy encourage you to Choose Wisely, Build Right and Live Well. Here are some recommendations for some simple things you can do when you decide on your new home.

## **Orient your home correctly**

Simply orientating your living areas and having cross ventilation to capture the summer breezes can reduce your reliance on air conditioning. Also, locating your main living areas on the north-eastern side of the home will minimise the impact of the hot afternoon sun.

## **Choose light colours**

These reflect the sun, while dark colours absorb its heat. Carefully place your hand on a dark coloured car in summer at midday and then do the same on a white car and you will feel the difference. The same goes for choosing the roof and wall colours of your house. You may think dark colours look better but they will cause higher temperatures inside your home.

## **Ventilate and insulate your roof**

If not properly ventilated or insulated your roof can act as one big heater, trapping the heat of the day in your house for longer. In Townsville's summer it can be like sleeping with a blanket on top of you.

## **Choose solar hot water**

Yes it costs more up front, but consider future savings – if electricity prices continue to rise, then the extra expense could be worth it? Remember, the sun's power is free.

## **Connect to the Off Peak Tariff**

Tariff 33 (off peak) costs 40% less than Tariff 11? Connect your hot water system or your solar hot water booster to Tariff 33 and don't forget to add your pool pump too.

## **Include water saving features**

Reducing outdoor water use cuts overall consumption significantly. Incorporate a grey water reuse facility in your new home, choose water wise plants for your garden, and cover your pool when it's not in use.

## **Landscape properly**

Correctly locating shade trees, constructing a garden to create a cool zone around your outdoor areas, or using landscaping to shade your western wall can have huge impacts on the liveability of your house. Planning and planting the right plants provides more than just an enhancement to the street appeal of your house; it can cool your home as well.



# Our challenging climate

Townsville has a dry tropical climate dominated by two distinct seasons – “the wet” and “the dry”. Designing your home with the climate in mind will make it much more comfortable to live in. To help you, here's a few things you need to know:

	Wet Season	Dry Season
<b>When</b>	November to April	May to October
<b>Day time</b>	Hot, muggy	Sunny, mild to warm
<b>Day temperatures</b>	29-31 °C	25-29 °C
<b>Night time</b>	Fairly hot and muggy	Cool
<b>Night temperatures</b>	20-24 °C	13-18 °C
<b>Rainfall</b>	Average annually is 1143mm. This can occur as short heavy downpours or as weeks of constant rain	Very little or none at all
<b>Humidity</b>	Exceeds 65% - uncomfortable	Much lower - comfortable
<b>Breeze</b>	North-easterly afternoon sea breeze	Cooling south-easterlies
<b>Cyclones</b>	Occur (but not often)	Do not occur





# Climate Sense

In Townsville's hot humid climate, the priorities are to minimise solar radiation and capture air movement, with openness and shading the dominant characteristics of a well constructed building. Climate-responsive design features can be included into the design of your home to create a comfortable living environment and reduce your reliance on air conditioning.

Most of the lots at North Shore are oriented either directly north-south or east-west. It's critical to understand which way your lot runs so that you can usefully apply the information in this handbook.

There are two very important aspects of our climate that you need to consider when designing your home; the direction of cooling summer breezes and the daily path of the sun.

Regardless of the orientation you eventually choose, at the planning stage you also have the option of re-arranging the rooms in your home to maximise natural cooling.

## Cooling breezes

North Shore experiences a prevailing, north-easterly afternoon sea breeze during summer. The north-east breezes are particularly important for cooling the home during the hot and humid summer months, so it's important to make sure you get your new home's orientation right.

## Sun movement

At Townsville's latitude, the sun in mid-summer rises about 20 degrees south of east, moves almost overhead at midday and sets about 20 degrees south of west (Figure 1, left hand side). This directs the worst of the heat on the south-eastern, southern and south-western aspects of the house for several hours in mornings and afternoons.

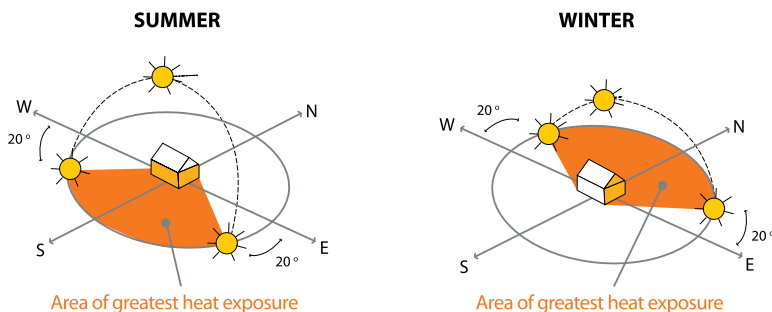


Figure 1: the picture on the left shows the daily path of the sun in the summer and the picture on the right shows its path in the winter.

By mid-winter, the sun has moved to the northern sky. It then rises about 20 degrees north of east, moves to about 50 degrees above the horizon at midday and sets about 20 degrees north of west. Winter warmth therefore falls mainly on the north-eastern, northern and north-western aspects through the day (Figure 1, right hand side).

Even if you can't re-orientate your house, you may be able to re-arrange rooms to the best energy efficient arrangement.

## Positioning your home

You can position your home to take advantage of passive cooling on all North Shore allotments regardless of their size, shape and orientation.

### TIP

Make sure you get the orientation right. Otherwise, your new home's overall efficiency will be limited, even if all other energy efficient and sustainable criteria are met.

Your home layout should consider the following:

- Position your home as close as possible to the southern and western boundaries of your block. This will leave the northern and eastern sides for gardens and outdoor living. These areas are cooler in summer.
- Place garages, laundries and bathrooms (rooms where the least amount of time is spent) on the hot southern or western side and living areas on the cooler northern or eastern side.
- Try not to locate large windows on the western side of your home, if you must, ensure they are very well shaded outside and can be sun-blocked from the inside.
- Take care not to reflect light and heat into your new home from large landscaping features or light coloured pathways next to the building.
- Position your main living areas and bedrooms to catch the cool north-east breezes in summer and design for cross ventilation – it will ensure you draw the breeze into your home.

## FACT

When sunlight passes through glass into your home it is absorbed by building materials and furnishings, which then re-radiate heat. The heat becomes 'trapped', just like in a greenhouse, resulting in higher temperatures indoors compared to outdoors.

## Shading your home

Shading the building and outdoor spaces will reduce the temperature inside your home. You can use artificial shading (such as awnings and full length verandas) and natural shading (plants and shrubs strategically placed), or combine them (pergolas with vine cover or green walls).

Consider:

- Wide patios to provide shade to the internal rooms
- Shading western and southern walls
- Making sure your roof eaves are at least 600mm wide (900mm is better)
- Shrubs/greenery to provide natural shade

## Building materials and construction

It's important for you to consider the thermal property of your building materials – the extent to which they absorb and hold heat and transfer it into your home. To reduce the heat that your home absorbs, choose materials that:

- release unwanted heat quickly once the sun has gone and the temperature has begun to cool down – e.g. lightweight wall materials such as timber and fibro-cement sheeting.
- keep out the heat during the day by using appropriate insulation and light colours for roofs and external walls.

Concrete block walls exposed to the sun can hold significant heat then release it in the home during the night. However, if block walls are shaded throughout the hottest parts of the day they remain cool and can have a cooling effect.

Areas of thermal mass adjacent to the house such as driveways and nearby roads will re-radiate heat and add to the heat load on your home if not properly shaded, so consider this when you set your house.

## Your roof

Your roof is the largest surface area in the home and is exposed to the sun all day. Inevitably it will get hot.

Consider:

- Light colours (white is best) reflect heat and keep it out of your home. Dark colours absorb heat and send it into your home.

### FACT

Recent studies have shown that a light coloured roof can prevent approximately 30% less heat entering your home than a dark roof.

- Steel roof sheeting, such as corrugated iron, loses heat quickly as soon as the sun stops shining on it. Installing the right insulation under the roof sheeting helps to significantly reduce heat entering the home from the hot roof.

### FACT

Roof tiles slowly absorb heat during the day and then slowly re-radiate it into the home at night. If you choose tiles, make sure to use reflective foil under the tiles to reduce the slow release of heat into your house overnight.

## Your roof space

Poorly ventilated roof spaces will get hot and then super-heat the air in the roof space, resulting in your living space getting hot too.

Ask your builder how your roof space can be ventilated to remove or reduce heat build up. Options include eave vents, ridge vents and mechanical ventilation. These days there are locally made, low profile ventilation options available. There is an increasing number of solar powered roof vent systems available whereby a small solar panel powers a fan that sucks the hot air out of the roof space.

## FACT

Poorly ventilated roof spaces get incredibly hot and can reach up to 70°C. When the sun hits the roof it transfers heat down and super-heats the trapped air in the roof space raising the temperature in your living spaces.

## Your insulation

Insulation is one of the most important factors in helping reduce the amount of heat entering the home and also helps seal cool air in. A well designed insulation system can pay for itself in electricity savings in two to three years, and you can keep reaping the benefits for as long as you live in the home.

There are two types of insulation; reflective and bulk.

Reflective insulation is placed immediately under the roof cladding and reflects heat away preventing 95% of infrared “radiant” heat from entering the ceiling below.

Bulk insulation is installed directly on top of the ceiling and reduces the amount of heat transferred from the roof space into the home. It works by resisting the amount of heat flow between the hotter air in the roof space to cooler air inside the home.

In Townsville’s hot humid climate, bulk insulation on the ceiling sheet combined with good ventilation of the roof space is a good solution, however a better one is putting reflective insulation under the roof tiles or sheets.

## Your outdoor living

One of the great advantages of the Townsville climate is that we can spend a lot of time outdoors and most homes have an outdoor living area.

When locating your outdoor areas, consider:

- The best locations for outdoor living areas are on the north and north-east sides of the house. These areas get the prevailing breezes making them the coolest spaces in summer and are least affected by the low-angled sun in the hot afternoons.
- East and south-east locations are also good areas for outdoor living spaces as they receive direct breezes and will be fully shaded in the afternoons. It’s important to think about shading these spaces from the low, early morning sun.



## FACT

Outdoor living areas on the western side of a property will receive the worst of the afternoon sun should be avoided if possible. Wide eaves or shading on the western side of your home will reduce the amount getting into your home.

When designing outdoor living areas, consider:

- two outdoor living areas – one to use in summer and one for winter.
- a high ceiling will create a cooler environment for you and your family by promoting a feeling of airiness, allowing the hot air to rise and cool air to circulate. For this to occur, the ceilings (or underside of roofs) of outdoor living areas should be at least 2.7 metres high.
- stacking slider doors which retract onto each other (leaving as much of the wall space open as possible) are a good solution for indoor living areas adjoining outdoor spaces. These days, you can still get insect screens to use with bi-fold or stacked doors.
- use ceiling fans in your patio area to circulate air on still days.
- natural shade is important to reduce heat radiating into your home. Why not plant a shade tree or garden close by – the air under shady trees and shrubs is cooler!

## FACT

Water features and swimming pools located in the path of prevailing, north-east breezes can help cool your home. As air moves over a body of water this increases the rate of evaporation and results in a cooler air temperature.





# Energy Sense

According to a recent survey of North Queensland households, air conditioners, refrigerators and hot water heaters are the three biggest users of electricity in the average home.

There are a number of ways you can reduce your electricity bills. Here's some ideas:

## Hot water

Traditional electric hot water systems use a lot of energy and therefore are a big contributor to your ongoing electricity bills. More efficient models are available today including solar hot water system, a heat pump or a gas system.

To choose the system that is best for you, first estimate your hot water needs. This is usually based on the number of people that will live in your house. You can also estimate this based on the number of bedrooms you are building using Ergon Energy's HWS guide reference. Visit our website and search using HWS Size guide.

- **Solar hot water** – Solar hot water systems cost virtually nothing to run. Occasionally, after a series of rainy or overcast days, you may need to use the booster function on your system. Make sure you install a one shot relay and connect the booster to Tariff 33. That way, when you do run your booster you will save 40% for every kilowatt of electricity that you use.
- **Heat pumps** – Heat pumps are a low cost way of generating hot water, using about one third of the energy of a standard electric hot water system. Make sure you connect your system to Tariff 33 to save that 40%.
- **Instantaneous gas hot water** – Heat the water as you need it and do not store water to keep it hot. If you are looking at also getting gas cooking it makes it an even better choice

## Air conditioning

Air conditioning is expensive and has a large carbon footprint. If you design your home to incorporate the suggestions in the "Climate Sense" section of this handbook, cooling your house in summer will be more manageable.

It is a good idea to design your home so the use fans and open windows can cool it down naturally wherever possible. This will also go a long way to reducing your reliance on air conditioning.

When you are using air conditioning, having the fans on low will move the cool air and you will notice a greater sense of comfort.

Fans should be positioned to take advantage of ventilation from the prevailing breezes. Ideally, fans are located in parts of the room for the most benefit where the main activities go on, for example, where people sit to watch TV or listen to music.

Higher ceilings and the right choice of windows (casement windows and louvres are best) will also help keep your house cool. As air heats, it rises, so if casement windows or louvres are open and located close to the ceiling, this will assist hot air to escape from the house on summer days.

Another way to help keep your new home cool is to include a breezeway in its design. A breezeway is an architectural feature similar to a corridor that allows the passage of a cooling breeze. It could be as simple as a roof connecting two structures (such as the main house and a detached garage, shed or parent's retreat) or it could be closed in with lattice work on either side.

**FACT**

Air conditioners use much more energy than fans. A ceiling fan is one of the lowest energy consuming devices in your home, with some using as little as 80 watts of energy.





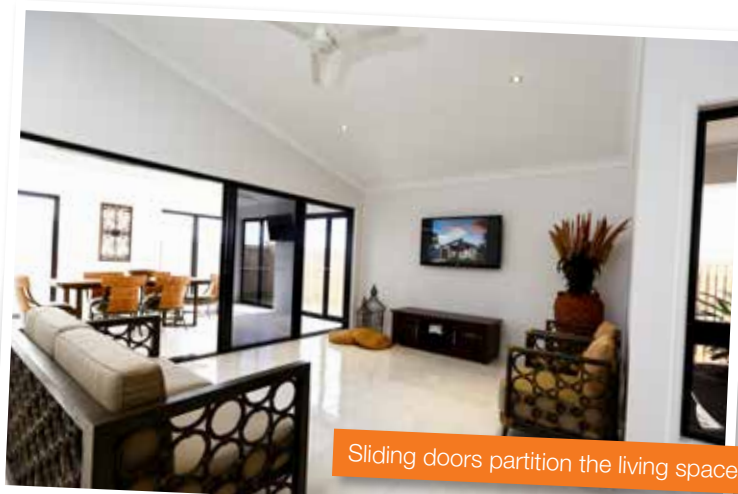


Note the position of the fan and use of louvres in the room above.

The effect of using fans on low with air conditioning means you can save money by raising the thermostat a few degrees higher with the same cooling effect.

Even with ceiling fans and natural ventilation, high temperatures combined with high humidity can make the Townsville summer very uncomfortable. This is when you will be reaching for the air conditioner controller. You can ensure you get the best effect from your air conditioner by designing your interior areas to allow them to be partitioned off. This will contain the cool air for longer.

All new air conditioners must meet a minimum tested average Energy Efficiency Ratio (EER). For best long-term results, choose a unit with the highest efficiency.



Sliding doors partition the living space.

## Lighting

New houses, townhouses and units must have:

### either

energy efficient globes installed to a minimum of 80% of the total fixed light fittings, including attached garages, balconies and decks

### or

lights which do not exceed the following maximums:

- 5 Watts per square metre for fixed lights inside the house
- 4 Watts per square metre for outside living verandas and decks
- 3 Watts per square metre for garages

### Energy efficient lights include:

#### Compact fluorescent tubes

(CFLs), which use about one quarter of the energy that incandescent lights use.



**LED lights**, which use about half the energy of CFLs.



### Other lighting types include:

**Incandescent bulbs**, which are the old-style lights that are being phased out. They are the cheapest to buy, but the most expensive to run.



**Halogen lights**, which are popular but consume a lot of energy. Consider using infrared coated (IRC) halogens instead.



Light type	Energy sense	Consider these factors
<b>Incandescent</b>	Being phased out	
<b>CFL</b>	Good choice	Limited options for dimming
<b>LED</b>	Even better choice	Best option where halogens are generally used should last 10 plus years and they don't heat up
<b>Halogens</b>	Expensive to run	The transformer uses a lot of energy and they get hot
<b>IRC Halogens</b>	Better than normal halogens	Infrared coating (IRC) means they use almost half the energy of traditional halogens

## Making sense of energy star ratings

When buying new appliances for your home, it makes sense to check the star ratings. Generally the higher the number of stars on an appliance the more efficient (less energy) it needs to function at normal performance. The kilowatt-hours used by the appliance will also be on the label. By comparing this measure between appliances, you can assess which will use the lowest amount of energy.

### Fridges

The refrigerator is a large power consumer in some households. Refrigerators and freezers typically make up over 20% of total residential electricity consumption.

There is a big difference in energy consumption between the best and worst models for many types of refrigerators. In some cases, the best models use only half the energy of a similar, less efficient model.

Decide on the size, type and features you want; don't buy something that's too big for your needs. If you're not keeping a fridge at least two thirds full or a freezer at least three quarters full, it's probably too big and wasting energy.

### Washing machines

The standard energy labelling test for clothes washers specifies a warm wash so the majority of the energy shown on the label is for heating the water. Choose a model that has low water consumption and choose the cold wash option when possible – this saves both energy and water!

## Televisions

Televisions can also be big users of electricity in some households. In the extreme, a large plasma TV can use more energy over the course of a year than a family-sized fridge, or more than your dishwasher, clothes washer and dryer combined!

The most energy efficient televisions are LEDs, as on average they cost 20% less to run than LCDs. The worst performers are older plasma televisions, with some using more than twice the energy of LEDs.



### FACT

If you choose the highest star ratings for all your new appliances you could save, on average, over \$350 per year.<sup>1</sup>

1. Based on 2013 Tariff 11 electricity prices and an average household appliance package including dryer, washing machine, combined fridge freezer, dishwasher and 42" television. For more information go to <http://www.energyrating.gov.au>



## FACT

The energy that your PV panels produce is sent back to the electricity grid. At the end of each quarter, your electricity bill will show how much energy your panels have generated and then subtract what you have used. If you have used less than you generated you will be paid for the excess power you have supplied.

## Generate your own power

Installing solar power generation in your new home makes energy sense. You minimise future energy costs and you may be able to earn money from the extra electricity you put back into the grid.

You will need to check with your installer on the latest rebates for solar photovoltaic panels.

If you choose solar power, it's wise to ensure the house and roof is constructed to maximise the amount of sun that reaches the solar photovoltaic (PV) panels.

PV panels capture the sun's energy as direct current (DC). This is then converted to AC power by an inverter. It is critical your installer contacts Ergon Energy to get the necessary approvals prior to installing your system.



Photovoltaic panels





# Water Sense

There are strong connections between water and electricity:

- Most of Townsville's electricity comes from coal-fired power stations which use an enormous amount of water to generate electricity.
- Water is pumped to your new home using electricity.
- Making clean drinking water is energy intensive.

You can reduce your water consumption by installing a water tank for rainwater, or a grey water system, or both. The water you get from either of these systems can be used to water your garden in the dry season.

You can also reduce your water consumption (and save on your energy bills at the same time!) by installing water efficient washing machines and dishwashers.

## Reusing grey water

Wastewater from baths, showers, basins, laundries and kitchens is called grey water.

Reusing grey water on the garden can significantly reduce water demand for an average home. As well as reducing pressure on drinking water supplies, using grey water has other benefits:

- Lower fertiliser use
- Improved groundwater maintenance
- Reclamation of nutrients
- Reduced demand on electricity used to supply drinking water

A typical Australian house generates an average of 100 litres per person per day of grey water that is suitable for watering gardens. At this rate, over a week a four-person household will generate enough grey water to irrigate 100m<sup>2</sup> of garden.

To reuse grey water, you will need to install a grey water diversion device and subsurface irrigation. You may also need to install surge tanks and/or pressure pumps if there is insufficient elevation. The diversion device consists of a manual switch and coarse filter which a licensed plumber connects to the waste plumbing of the laundry basin, bath etc. The facility must be installed externally to allow easy access for maintenance.

Council approval is required to install a grey water reuse facility in a new home. Also, it must be installed by a licensed plumber. There are a range of suitable grey water systems on the Queensland Government's approved list. For information about how to get approval, visit the Townsville City Council website.

## TIPS

- Choose garden-friendly cleaning products. This will keep your garden green and healthy.
- Maintain your grey water reuse facilities. This can be as simple as changing or cleaning a filter in the diverter device or pump.
- Ensure the grey water application area is undisturbed and preserved in its approved form.

## Pools

If you are putting in a pool you will be able to take advantage of the cooling effect of air passing over the water, so locate your outdoor living next to the pool.

Pool pumps consume a lot of energy. Make sure you talk to your pool installer about putting your pool pump on Tariff 33. This way, the electricity you use will cost about 40% less. There are also eco-efficient pool pumps on the market now that can further reduce your electricity use.

Try to keep the water level of your pool halfway up the skimmer opening. Overfilling the pool stops the skimmer working efficiently and wastes water. You should also make sure you install the correct size pool pump. Check with a pool equipment supplier to ensure the pump is the correct size for your pool.

A pool cover is a clever way to reduce evaporation and the need to regularly top up your pool's water level. Without a cover, most of the water in your pool can evaporate over a year.

## Water wise gardens

There are several ways in which you can reduce the amount of water that your garden needs:

- Use grey water.
- Choose water wise plants – many native plants and introduced plants cope well with minimal watering during the dry winter months.
- Apply deep mulch to your garden – this improves the soil and reduces water loss through evaporation.
- Improve the quality of the soil – choose a suitable soil improver that makes the soil retain moisture better.



- Consider a drip irrigation system. It will cut wastage by making sure the water goes only where you need it.
- When deciding on a lawn type, go for a slow growing, water saving variety. They have deep roots for drought tolerance and they don't need mowing as much as other varieties.

For more tips about landscaping to conserve water, check out the next section of The Handbook – Nature sense.

### TIPS

Save water, save money. If you are a dedicated water saver, you may be able to save money on your water bills. Townsville City Council offers a Water Watchers option for residential water charges. This suits homes that consume less than 300 kilolitres of drinking water a year.







# Nature Sense

## Landscaping

Landscaping should form an integral part of a sustainable home. It can help shade your home from the heat and promote cooling breezes as well as making outdoor living areas more attractive.

The overall landscaping theme for public areas in North Shore aims to recreate and reinforce the character of the natural vegetation of the region. Generally, species native to the local area are being planted.

In your private garden, native species are more likely to grow faster, look healthier, require less maintenance, and more importantly provide for native wildlife.

The Sales Office will have more information for you on specific plant varieties that are suitable for this area.

## Landscaping for shade

### Facing north:

- On the north-facing side of the house, trees with a high horizontal canopy and exposed trunk teamed with low shrubs and groundcovers are most effective in providing shade and allowing the prevailing north-easterly breezes to cool your house.
- Pergolas are also an effective landscaping device to use on north-facing areas.

### Facing east and west:

- On the west and east-facing side of the home, the sun will be low in the sky, penetrating deep into the garden and onto the unprotected walls and windows of the house.
- Landscaping that will offer the best protection will be vertical and dense in form and shape.
- Mixed-height planting composed of tall-growing shrubs together with trees or multi-stemmed palms are also useful for shading west and east-facing areas.
- If space is limited, vertical structures, such as trellises or screens covered with climbers can be just as effective.
- Shade large paved areas such as driveways and parking areas with shade sails, pergolas or shade trees to reduce radiating heat and glare.
- A tree can take up to five years to reach the height needed to provide the required shade. Consider installing a sail or similar structure to provide instant shade while the landscaping becomes established.

## Landscaping for breezes

- Plant sparsely, or select species that allow breezes to filter through on the property's north-east areas, where prevailing breezes come from.
- Position swimming pools and water features to the north or northeast (upwind) of your home and shade where possible. Breezes will increase the rate of evaporation over a body of water, resulting in cooler air passing through the garden and house.
- Locate driveways and uncovered car parks (which can get hot) away from the path of the prevailing breeze.
- Locate structures, such as garages, carports, sheds and greenhouses away from the path of prevailing breezes.

### TIPS

Landscaping correctly can create a cool micro-climate close to the home. This is because plants affect the air temperature and moisture content (humidity) as well as provide shade.

### TIPS

Plants give cooler shade than artificial shade structures. This is because of the transpiration and evaporation of water from the plant's leaves. The shade associated with transpiration created by vegetation can lower the temperature by an estimated 3-5°C.



# For more information

## Climate sense

For more information about climate smart design in Townsville, visit [www.townsville.qld.gov.au](http://www.townsville.qld.gov.au). Use the “Search” function and type in “sustainable housing information kit”. This online resource includes detailed guides on climate-responsive design.

Information on how to design a sustainable home is also available at [www.yourhome.gov.au](http://www.yourhome.gov.au) and [www.sustainable-homes.org.au](http://www.sustainable-homes.org.au).

## Energy sense

Go to [www.ergon.com.au](http://www.ergon.com.au). Select the “Your home” tab and then click on “Save on your bill”. Check out the “Energy sense” hints and use the energy calculators to work out how much each appliance costs to run.

The energy efficiency of a wide range of household appliances such as air conditioners, washing machines, refrigerators and TVs is rated at [www.energyrating.gov.au](http://www.energyrating.gov.au). This site also lists minimum energy performance standards for products such as hot water heaters and light bulbs.

The national ENERGY STAR program promotes the use of energy efficient electronic equipment at home and in business. For more information, go to [www.energystar.gov.au](http://www.energystar.gov.au).

## Water sense

Visit the council website at [www.townsville.qld.gov.au](http://www.townsville.qld.gov.au) and use the “Search” function. For more information about how you can use grey water in your garden, type in “grey water reuse in Townsville”. For more tips on how to reduce household water consumption, type in “how to save water”.

## Nature sense

Visit [www.dews.qld.gov.au/waterwise](http://www.dews.qld.gov.au/waterwise) for more information about how to incorporate water saving principles into your gardening. Use the online plant selector to find water efficient plants suited to your location and climate conditions.

## Matthew Bolten and Natalie Coombes

Set on a 416m<sup>2</sup> Block that is 32m x 13m wide, it was important for North Shore residents Matthew Bolten and his partner Natalie Coombes to take advantage of breezes and views and orientate their house correctly.

With parkland planned for across the street, the house orientation faces west which allows for great views of the parkland with a large covered porch providing great shading. Built to the boundary on the Southern side, the home is in two sections creating a service corridor for air-conditioning units, the hot water system and the clothesline.

Not a typical house, there is no front door. This provides increased living space at the front with bi-folds opening to create a larger area.

The front fence allows for 95% of the available space to be used – typically on smaller lots where there is no front fence, up to 20m<sup>2</sup> can be lost meaning there is less roof for kids and dogs to enjoy the whole yard.

Very importantly, the shortest side of the house is facing west reducing heat gain. The pool in the rear of the yard amplifies cooling North Easterly breezes and a central hallway connects all ends of the house and is uninterrupted creating excellent cross ventilation of North Easterly breezes.

The pool filter, air-conditioners, washing machine and dryer are all connected to Tariff 33 for cheaper kw/hour energy usage.





## Brooke and Joel Johnston

Perched on a 690m<sup>2</sup> lot at North Shore, owners Brooke and Joel Johnston have placed a major focus on keeping heat out of their house through their clever design. The couple have incorporated light colours on their roof, external walls and even on their internal tiles.

Grey glass helps keep out the heat and ceiling fans feature throughout the house, extending into the covered patio area. These energy efficient features, along with the R3.5 insulation used in the ceilings, all work together to keep the house cool.

Power points in Brooke and Joel's house have been cleverly wired to a switch at the entrance of the house that can be turned off at night, or when the couple leave the house, and this means non-essential electronics like televisions and microwaves can be set to standby.

High star rated inverter air conditioners are connected to Tariff 33, and together with the gas cooking and heating appliances and a 1.5kW solar system on the roof mean Brooke and Joel have the ability to live a comfortable life in their new home while minimising their ongoing bills.







# What questions should you ask your builder?

## How to plan for an effective home

During your planning, what should you ask your builder to help make your home more energy efficient?

1. How is my home orientated?
2. What is the best orientation for my home design on my block?
3. What is the best orientation for rooms in my design on my block?
4. Will/can you re-arrange them to suit?
5. Will there be a cost to change my plan to suit the best possible orientation?
6. What level of insulation is included in my home design? Does it cover the patio and garage areas?
7. What will it cost me to upgrade my insulation type for house and patio to R3.5?
8. What would it cost to upgrade the air-conditioning included in my home design to a four or five star inverter model?
9. How much will it cost me to upgrade to low-e or mid-tint glass so I can keep my house cooler in summer?
10. If I want a white roof so my house is cooler in summer, is there an additional cost for a different trim if I choose it?



Tear here and  
take with you to  
your builder!



# Star rating system

## Reference guide

To get to a highly rated, energy efficient home that improves its ability to keep out heat and contribute to lower ongoing power costs, you will need to incorporate:

Sustainable features	6 star	7 star	8 star	9 star	10 star
R2.1 insulation (on the entire ceiling)	✓				
Roof sarking	✓	✓	✓	✓	✓
Tinted windows	✓	✓	✓	✓	✓
Roof space ventilation	✓	✓	✓	✓	✓
Light coloured roof	✓	✓	✓	✓	✓
R3.5 insulation (on the entire ceiling)		✓	✓	✓	✓
Light/white roof and external walls			✓	✓	✓
Light/white walls and vents			✓	✓	✓
Shading to the western walls			✓	✓	✓
Correct orientation			✓	✓	✓
Breezeway designed for maximum exposure to prevailing breezes				✓	✓
Tinted windows				✓	✓
Fixed building shading				✓	✓
Blocked off western wall				✓	✓
Correct room orientations				✓	✓
Air-flow maximisation					✓

For more information on greenstar visit [www.gbca.org.au/green-star](http://www.gbca.org.au/green-star)



## The Handbook

Choose wisely,  
build right, live well

More and more Townsville residents are embracing sustainability into their lifestyles. Never before has it been more important to think about ways to reduce your on-going household costs and future proof the biggest investment you will ever make. That's why we have designed The Handbook – it's a guide to help you make sense of sustainability, from the time you make your land purchase until you turn the lights on in your new home. The Handbook is full of information and tips to make your new home make sense in every way possible.

