

BRICKWORKS

# Sustainable Home Guide

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Helping you achieve your  
sustainable home design goals





# Simple changes for a leading sustainable home design

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It's easy to incorporate leading sustainable design principles in the creation of your home – making it efficient, healthy and resilient. Focusing on newly recognised sustainable home standards, this guide aligns the sustainable attributes of our products and collections helping you make the right choices and achieve your sustainable home design goals.



# Design principles for a more sustainable home

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Our sustainable home guide is designed to help you achieve your sustainable home design goals. This guide is informed by leading standards such as Green Star Homes by the Green Building Council of Australia, and LEED for Homes by the U.S. Green Building Council.

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## How we can help

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Brickworks offers a range of products that help designers achieve sustainable design ratings, using tools including the National Home Energy Rating Scheme (NatHERS), Green Star Homes and LEED for Homes.

Brickworks also offers advice and training sessions to architects and designers on thermal design of housing.



# An Energy Efficient Home

## Did you know 57% of built environment emissions comes from our homes?

To reduce these emissions, leading environmental homes are designed to be energy efficient, draught-sealed, and in some cases can be designed to emit zero emissions during operation by generating and using renewable energy. Beyond a more sustainable future, this means that owners of these homes can expect lower energy bills and greater comfort all year round.

### How it works

Thermally comfortable homes are energy efficient with the appropriate combination of thermal mass and insulation reducing the heat gain and loss through the walls, lowering energy costs. Home occupants are educated on optimal home living to manage effective ventilation and shading.





## Tip #1

# Home Energy Use

Building products with thermal mass such as bricks and roof tiles can reduce heating and cooling bills by up to 40% annually when cavity brick construction is chosen over lightweight construction. This is because bricks act like a thermal battery, absorbing heat during high daytime temperatures and releasing it later to the environment when the temperature drops.



### Guiding sustainable design principles for home energy use include:

- Higher home energy efficiency ratings with Greenstar, NatHERS or LEED.
- Design to suit the local climate.
- Incorporate solar passive design principles.
- Optimise dwelling orientation.
- Include adequate ventilation and shading.

### Key points on using bricks and roof tiles for a more energy efficient design:

- Brick construction combined with solar passive design principles ensures natural thermal comfort.
- Bricks act like a thermal battery keeping your home cooler in summer and warmer in winter.
- Brick homes are more energy efficient than those constructed with lightweight materials.
- A home constructed from bricks can reduce your energy bills for heating and cooling by 40%.
- Incorporating bricks can increase your energy rating.
- Leading home builders offer home designs with high energy ratings.
- Roof tiles improve energy efficiency. Testing of similar coloured roofing products shows roof tiles transfer less heat and reduce cooling costs.

## Thermal Research: Best Building Products for Higher NatHERS Ratings

Brick veneer homes achieve higher ratings using the National House Energy Rating scheme than lightweight, increasing Green Star Home ratings.

This correlates with independent research from the University of Newcastle



## Tip #2

# Support Home Renewable Energy

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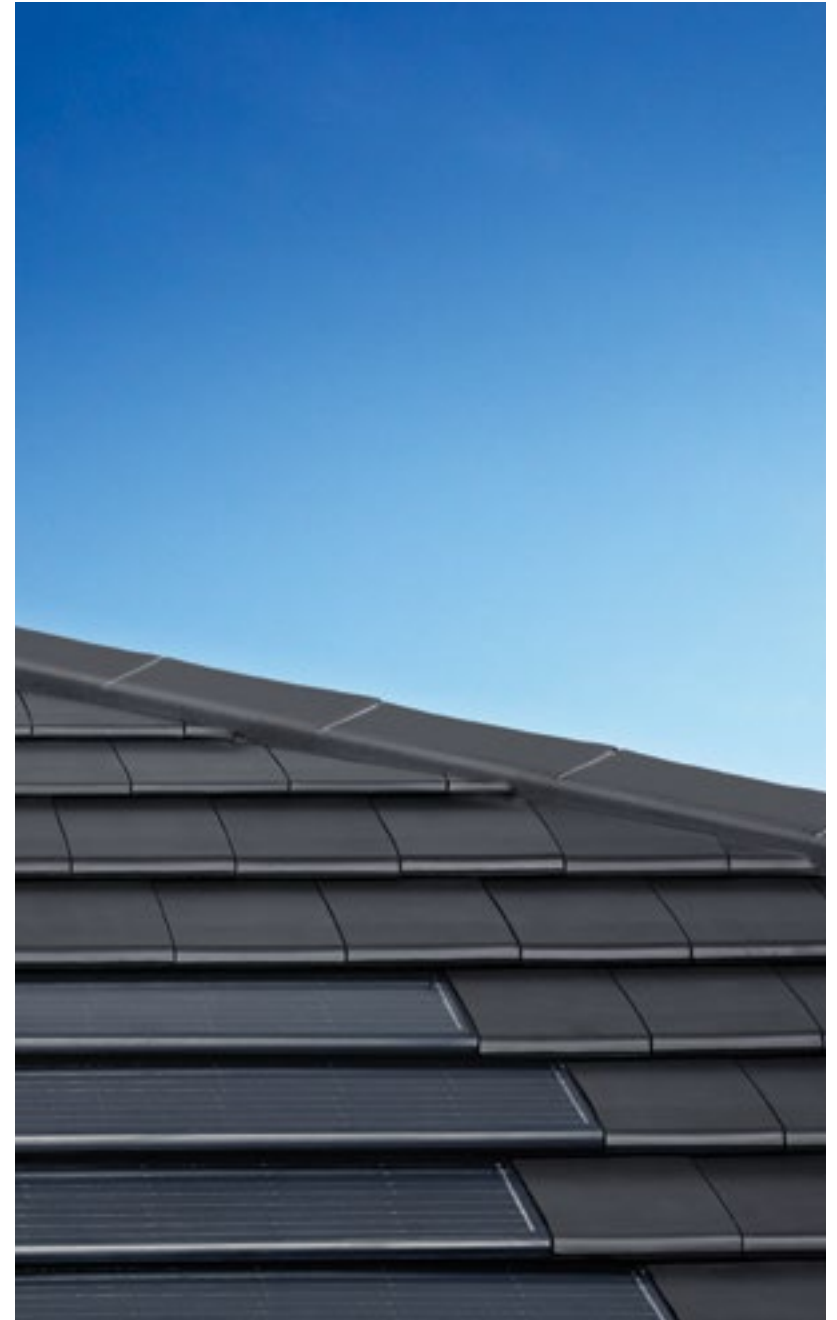
Bristle Roofing partners with specialist energy providers in the solar field to provide solutions to their customers.



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**Guiding sustainable design principles for renewable energy include:**

- Generate or use renewable energy to balance annual energy use (net zero).
- Reduce energy costs.
- Zero emissions through clean energy.



# Tip #3

## Go Carbon Neutral

Carbon neutral products offset carbon emissions from homes. Brickworks has introduced a carbon neutral range of bricks and pavers, certified under the Australian Government's Climate Active Program.



### How Brickworks products support net zero home design:

#### Carbon neutral options

- A range of more than 70 types of bricks manufactured at Brickworks Longford Plant are certified carbon neutral.
- Brickworks has introduced a new opt-in program to specify and procure any clay brick or paver made in our Australian brick plants as a carbon neutral product certified under the Climate Active Program.

### Reducing embodied carbon in our products:

- Brickworks Low Emission Technology Statement outlines our commitment to the use of state-of-the-art high efficiency brick kilns and alternative fuels to fire our bricks.
- The Sculptured Sands range is part fired with biogas reducing embodied carbon.
- All bricks and pavers manufactured at our Longford plant (TAS), including the Daniel Robertson range, are fired by biomass with the kiln's main fuel source being sawdust.
- Products from our Horsley Park Plant 21 and Plant 23 (NSW) are part fired by biogas.
- Just over 10% of raw materials used in brick manufacture are recycled and includes clay from infrastructure projects, building sites, fly ash and by-products.
- Terraçade retains its Ecospecifier Verification to qualify its leading position as a façade system that is worthy to be used in green building projects.
- Lightweight clay brick designs reduce the amount of clay used and the energy required to fire bricks.

## Make your next project carbon neutral with Brickworks

We invite you to apply for complimentary carbon offsets across our Australian-made range of clay bricks and pavers. We are looking for projects that demonstrate climate sensitive design and have minimal impact on the environment now and into the future.





# A Healthy Home

**Leading environmental home designs are well ventilated, naturally comfortable and built with products that are better for you.** The impact our homes have on us physically is significant. We spend 90% of our time indoors with two-thirds of this time at home.\*

## How it works

A healthy home is designed to minimise condensation and be well ventilated to prevent the growth of mould. It is designed to minimise the entry of pollutants, such as smoke. It is thermally comfortable and uses materials that are low or non-toxic. It also includes high quality lighting.



## Tip #1

# Reduce Material Toxicity

Brickworks products are the natural healthy choice as they emit no toxic Volatile Organic Compounds.



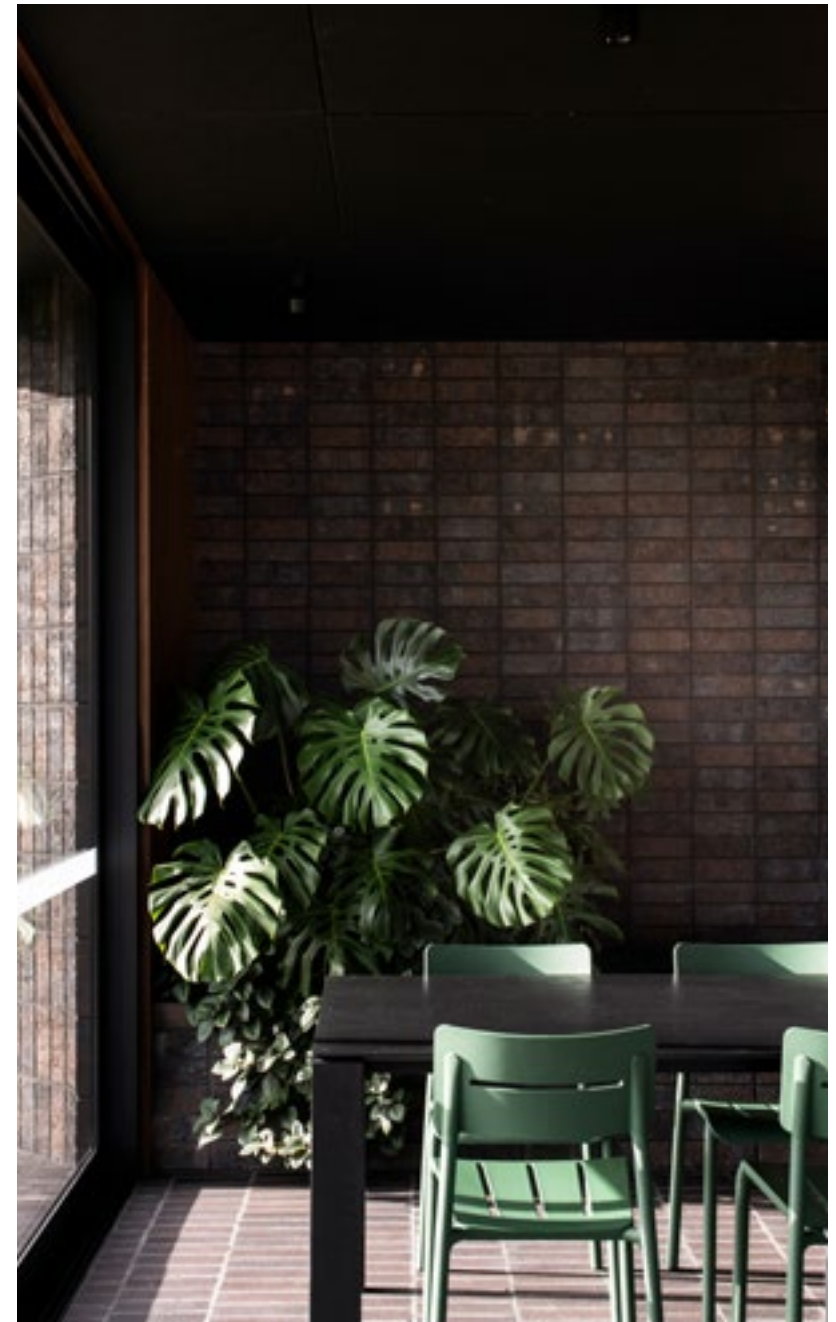
### Guiding sustainable design principles for reducing material toxicity:

- Paints, sealants and adhesives used in constructing homes have emissions associated with them which continue after they have been installed. These Volatile Organic Compounds (VOC's) have negative human health impacts including headaches, lethargy and respiratory problems like asthma. To reduce these health impacts, materials with high VOC's must be avoided.



### How Brickworks products reduce material toxicity for your home:

- Brickworks products emit no VOC's.
- Bricks are the natural healthy choice as they breathe and allow moisture to escape.
- Some Austral products even hold additional labels certifying the absence of toxic materials. Nubrik Traditional and Artisan Ranges hold the 'Declare' label. This label means the bricks have been "declared" by the Living Building Challenge as Red List free.



## Tip #2

# Moisture Management

Brickworks products are the naturally healthy choice as they breathe and allow moisture to escape. Bricks and roof tiles are also maintenance free, and do not rot or rust.



### Guiding sustainable design principles for the management of moisture include:

- Prevent moisture, condensation and mould.
- Install weather protection barriers between windows and walls.
- Ensure there are no gaps in the insulation.
- Avoid thermal bridging by eliminating paths of heat flow through the building envelope.
- Ensure adequate roof drainage.
- Allow internal moisture to escape by venting bathrooms and kitchen exhaust to the exterior.



### How Brickworks products assist in moisture management for your home:

- Allow moisture to escape.
- Are breathable.
- Bricks are not damaged by moisture, they don't fade, rot or rust.





## Tip #3

# Air Quality

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Brickworks products are breathable, natural and healthy.



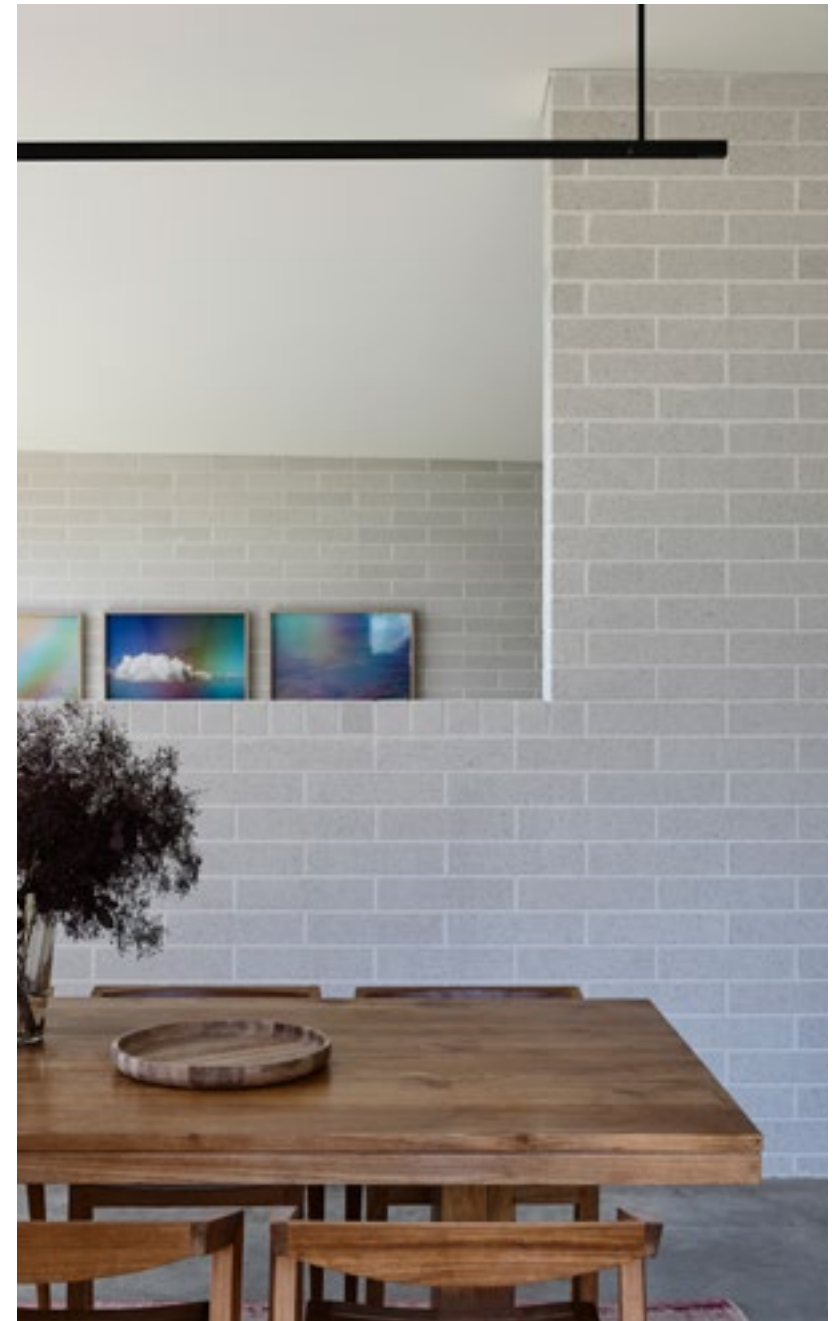
### Guiding sustainable design principles for improved air quality include:

- Minimise pollutants and provide fresh air.
- Circulation of fresh air.
- Locate windows and doors to optimise air flow.
- Limit air pollutants from kitchens, bathrooms, laundry and garage.



### How Brickworks products support air quality for your home:

- Bricks are breathable.
- Bricks are natural and healthy.
- Bricks are maintenance free, they don't rely on paints, sealers or coatings for performance.
- Bricks don't release toxins.



# A Resilient Home

A resilient home is one that has been built to withstand even the harshest conditions and environmental changes, such as bushfires, flooding and heat stress. A resilient home is better for you and the environment, providing safety and security whilst reducing energy and water use.



# Tip #1

## Resilience

Make your home design durable for the long term. Only Austral Bricks and Bristile Roofing\* products are **guaranteed for 100 years**.



### Guiding sustainable design principles on how to create a resilient home:

- Use long-lasting, enduring and durable products to build your home.
- Avoid building materials that can be damaged or destroyed by bushfires, floods and hail.
- Implement measures to withstand extreme weather events and natural disasters.

### About Brickworks:

The Brickworks Bushfire Relief Initiative helped victims of the 2019 fires rebuild their homes, lending a hand to those who need it most.

### How Brickworks provides weather resilient products for your home:

#### Austral Bricks

- Are fireproof, unlike glass and fibre cement that shatter and fail.
- Are durable and colourfast for life.
- Are maintenance free, don't fade, rot or rust.
- Only Austral Bricks are guaranteed for 100 years.
- Following a flood, internal brick walls can be washed down and will maintain their structural capacity.

#### Bristile Roofing tiles

- Are non-combustible, ideal for bushfire prone areas.
- Are durable and limit hail damage.
- The weight of concrete and terracotta roof tiles offers more resistance to high winds than lighter weight materials such as metal sheeting.
- If damage is sustained during a hailstorm, you only need to replace the individual damaged tiles rather than entire sheets, as in the case of metal roofing.

#### Austral Precast Double Wall

- Is fire resistant and non-combustible.
- Improves installation safety, time and costs.



\*Limited range



## Tip #2

# Heat Resilience

**Light coloured roof tiles will reflect heat away from the home and will reduce heat flow through the roof.**

Roof tiles are available in more colour and profile combinations than any other commonly used roofing product in Australia.



### Guiding sustainable design principles to keep your home cooler:

- Minimise hard surface areas that absorb, store and radiate heat.
- Increase tree planting and native landscaping.
- Reduce heat radiation through shade structures.



### How Brickworks products help keep your home cool:

#### Bricks

- Provide human thermal comfort.
- Made of high density materials that have the ability to effectively absorb and store heat energy, keeping your home cooler in summer and warmer in winter.
- Reduce overreliance on artificial heating and cooling.

#### Roof Tiles

- Reflect heat away from the home.
- Offer many colour and profile combinations.
- Bristle Roofing Light Collection offers an elegant light range with natural tones.



## Tip #3

# Water Resilience

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### Water run-off from terracotta and concrete tiled roofs is safe to use.

Incorporating permeable pavements can contribute to water sensitive urban design by reducing impervious areas which can lead to poor stormwater quality and flow.



#### Guiding sustainable design principles for reduced water use include:

- Install water efficient fixtures and appliances.
- Reduce water use and water bills.
- Use alternative water sources for irrigation.
- Install a rainwater tank.
- Use collected rainwater for laundry and toilet.

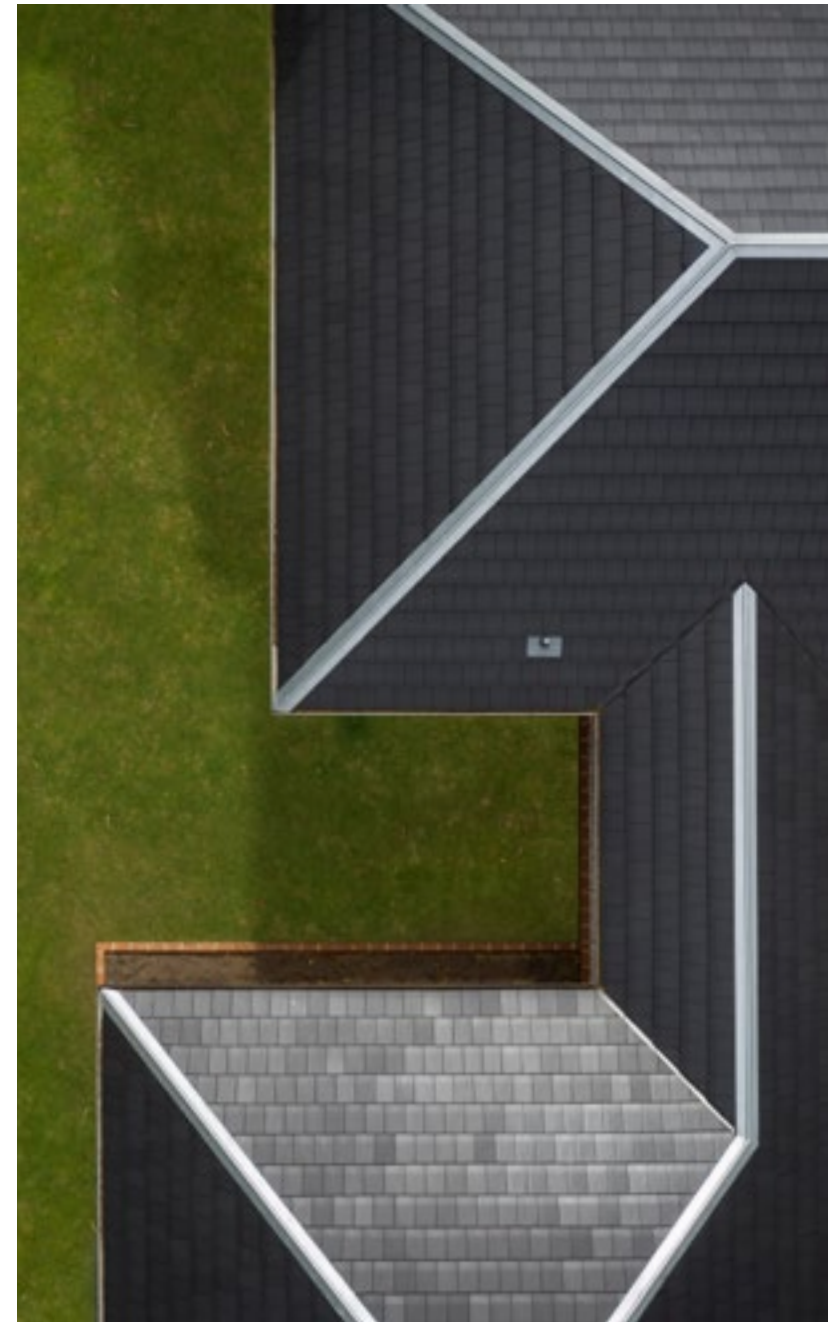
#### How Brickworks products support water management:

##### Bristle Roof Tiles

- Allow safe to use water to run off for collection.

##### Austral Masonry Permeable Pavers

- Are porous, allowing water to drain away.
- Contribute to 'water sensitive urban design'.
- Improve drainage and flow of stormwater.
- May contribute to reducing localised flooding.



Brickworks' genuine building products create the most beautiful and sustainable environments and places in Australia

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# Further Reading

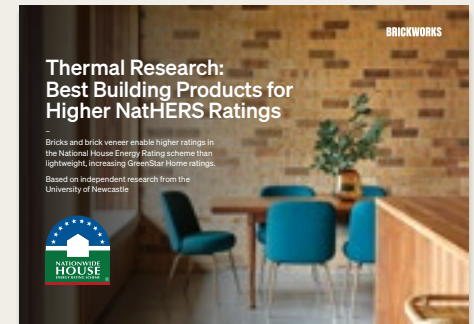
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## Online resources

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## Additional resources from Brickworks

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Thermal Research