

## ■ Design features for natural shade

Natural shade is generally created using trees.

- Trees can provide protective shade, however their effectiveness depends on the density of the canopy foliage.
- Although the intensity of the sun's rays will be lower in winter, the relative proportion of the UVR in tree shade compared to the UVR from full sun will be marginally higher compared to summer.
- Try to locate seats, tables, BBQs or play equipment under existing tree canopies.



When planting trees for shade try to:

- Select the most appropriate shade trees for your geographical region. Your local Council may be able to provide advice
- Choose trees that do not drop branches or lose leaves in winter
- Choose trees that have wide spreading, dense leaf canopies
- Plant trees in clusters to provide the most effective shade cover.

## ■ Maximising sun protection

Remember shade only reduces the level of direct exposure to UVR and does not offer 100% protection.

To maximise protection against the sun:

- Minimise time in the sun between 10am and 3pm
- Wear clothing that provides good sun protection
- Wear a hat with a broad brim or a legionnaire style hat (not a peak cap)
- Wear wrap-around sunglasses or those with lateral shields complying with the recommended UVR protection, and
- Apply SPF 30+ broad spectrum sunscreen 20 minutes before you go out in the sun. Reapply every 2 hours after that.

## ■ Other reference material

- Planning for Sun-Safe Outdoor Environments in Queensland – Shade for Swimming Pools Published by Queensland Health (available through the Queensland Cancer Fund on 13 11 20)
- Planning for Sun-Safe Outdoor Environments in Queensland – Shade for Sports Fields Published by Queensland Health (available through the Queensland Cancer Fund on 13 11 20)
- Planning for Sun-Safe Outdoor Environments in Queensland – Shade for Young Children Published by Queensland Health (available for loan only through the Queensland Cancer Fund on 13 11 20)
- Creating Shade at Public facilities – Policy and Guidelines for Local Government Available on the Queensland health Healthy Living Website at [www.health.qld.gov.au/phs/Documents/shpu/20267dmp.html](http://www.health.qld.gov.au/phs/Documents/shpu/20267dmp.html)

### Acknowledgments:

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# Creating Better Shade



## ■ Creating effective shade

This information will help increase the effectiveness of shade, both artificial and natural.

While shade does not provide 100% protection from the sun, it does reduce direct sun exposure and is important in preventing skin cancer.

## ■ Solar Ultraviolet Radiation (UVR)

Exposure to the sun's ultraviolet radiation (UVR) can cause skin cancer and sunburn.

UVR can be both direct and diffuse.

Diffuse UVR is due to scattering by the atmosphere and clouds, and reflection and scattering caused by nearby surfaces. It may be as high as one half of the total UVR and comes from all directions.

The proportion or percentage of diffuse UVR is usually higher in the morning and afternoon and is higher in winter than summer. This is due to the longer path of radiation through the atmosphere.

Of the three types of UVR, ultraviolet B scatters the most and also generally causes the most skin damage.

Reflection from surfaces also contributes to UVR exposure. Design and building materials can reduce the impact of reflected UVR. Light coloured surfaces such as concrete and white house paint are particularly reflective. Examples of surface and UVR reflection include:

Materials	% of UVR reflection
Grasslands	0.8-2%
Lawn grass	2-5%
Soil-Clay/Humus	4-6%
Open water	3-8%
Bitumen road	4-9%
White sand (wet)	7%
Light coloured concrete	8-12%
White sand (dry)	15-18%
White house paint	22%

## ■ Recommended materials for shade

There is a huge choice of manufactured shade materials and each provides different UVR protection.

### ■ Awnings and outdoor roofing materials

These are durable, require minimal maintenance and provide all weather protection. Where possible, high use areas such as verandahs and picnic tables should have a solid roof to maximise UVR protection.

### ■ Aluminium and tin

These materials are also durable, require minimal maintenance and usually provide maximum protection from UVR.

### ■ Polycarbonate and fibreglass

Whilst these sheetings are solid, they allow in infra red (heat) rays and visible light. They are useful for locations where winter heating is desirable. Before using these products, contact the manufacturer about UVR transmittance. Try to use products that offer maximum UVR protection.

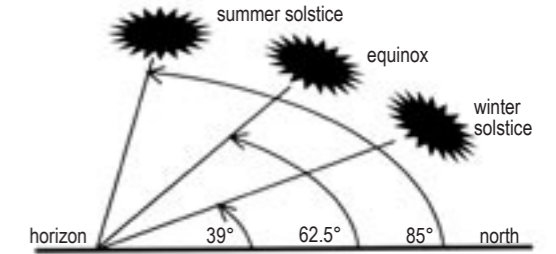
### ■ Umbrellas, canopies and canvas

These provide different levels of UVR protection. Like clothing, the density of the material weave is critical; the denser the weave, the higher the sun protection factor. When new, canvas umbrellas usually offer high UVR protection. However, prolonged exposure to weather can deteriorate this protection and make it less effective. If material used is plastic coated, it may provide more protection as plastics generally absorb UVR well.

### ■ Shadecloth

This is the least effective roofing material for UVR protection as it allows a large amount of UVR to pass through. Generally, if you hold the cloth up to the light, the more you can see through it, the less UVR protection it provides. Tightly woven shadecloth can absorb up to 90% of UVR. Remember colour, washing and the level of tensioning of the cloth can alter its UVR absorption properties. Contact the manufacturer to find out the sun protection ability of their shadecloth. Recommend only shadecloth with

maximum UVR protection. If shadecloth is used, it is very important that people still wear sun protective clothing and sunscreen.

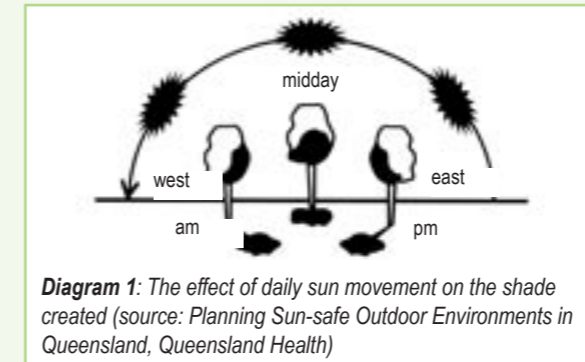


**Diagram 2:** Sun altitude levels for Brisbane at noon throughout the year (source: Planning Sun-safe Outdoor Environments in Queensland, Queensland Health)

## ■ Design features for built shade structures

To maximise sun protection for new or upgraded shade structures consider:

- The movement of the sun during the day particularly between the high-risk times of 10am and 3pm. This will impact on the size and shape of the shade structure (refer Diagram 1). Generally the east and west sides require wider overhangs to improve shade protection.



**Diagram 1:** The effect of daily sun movement on the shade created (source: Planning Sun-safe Outdoor Environments in Queensland, Queensland Health)

- The seasonal variation in the shade. The sun's path changes throughout the year and varies in different latitudes, but it always follows the same yearly sequence (refer to Diagram 2). Try to ensure items under the shade structure remain shaded even in winter when the sun is low in the sky. Even in winter, the UVR in full sun can be more than enough to cause skin damage.

- The effect of diffuse UVR scattered from the atmosphere and clouds. Remember shade only reduces the level of direct UVR. In shade, the amount of diffuse UVR is proportional to the amount of visible open sky from the shade. Try to minimise the amount of open sky visible from the structure to keep the level of diffuse UVR low.
- Vertical sides. They help to reduce UVR and should be considered for shade structures wherever possible.
- Combining natural (for example trees) and built shade as it produces the most effective and sustainable sun protection. It minimises the effects of both the sun's movement and of reflective surfaces.
- Where the shade from the structure falls. Shade will be at a maximum in the middle of where the shade falls, and when the sun is low in the sky, this may not be in the centre of the structure.
- Avoiding shade structures with concave and scalloped edges. These reduce sun protection effectiveness. Aim for at least one metre of overhang past the equipment you are aiming to cover (eg outdoor setting or play equipment). If you need more than one shade structure try to avoid gaps that will allow UVR to penetrate.