

Developing quality shade in schools



This information complements the Department of Education and Early Childhood Development's (DEECD) *Building Quality Standards Handbook*, which sets the minimum quality criteria for all DEECD projects, including new construction and refurbishment. Section 7.5.5 provides information about shade areas.

PDF copies are available from eduweb.vic.gov.au/edulibrary/public/propman/facility/BuildingQualityStandardsHandbook.pdf

Why is shade important?

Overexposure to ultraviolet (UV) radiation during childhood and adolescence is known to be a major cause of skin cancer.¹ Two in three Australians will develop some form of skin cancer before the age of 70.²

Cancer Council Victoria recommends the use of shade as one of the five sun protection measures to minimise UV radiation exposure. Shade alone can reduce overall exposure to UV radiation by about 75%.³ Building shade is an effective practical option for protecting students and staff against UV radiation.

Research in 2008 showed that students will use shade if schools make it available. The findings give schools a strong incentive to build shade as part of their sun protection policies to help reduce students' risk of skin cancer.⁴

Planning effective shade

Good planning ensures effective shade. Whatever the scale of the project, planning should include:

- identifying where and when shade is needed
- understanding shade options
- considering built shade and natural shade

Shade areas must provide protection in summer while maintaining a cool temperature. It should allow adequate light and ventilation. If the structure is permanent, the shaded area also needs to be warm and allow some UV exposure for vitamin D in winter.

Shade audits

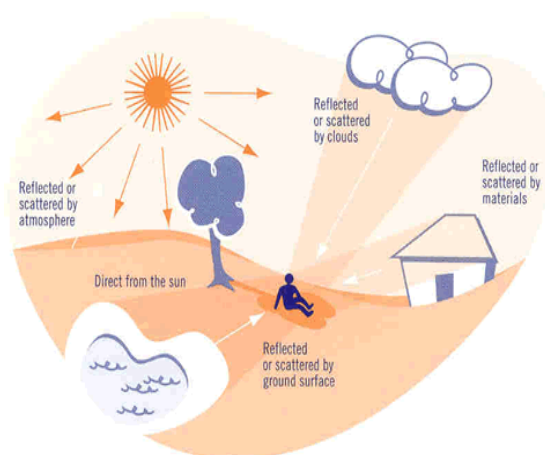
A shade audit is recommended to help review and plan for effective built and natural shade. It will help determine:

- what shade is currently available
- if it provides effective sun protection
- if better use can be made of existing shade
- if additional shade is required
- where shade should be located
- how it can best be created.

Before building new shade, important things to consider include:

- ☐ make existing shaded areas more attractive?
- ☐ make existing shaded areas accessible?
- ☐ relocate some activities into existing shade?
- ☐ reschedule activities to make the most of existing shade?
- ☐ reschedule activities outside of peak UV times?

Direct and indirect sources of UV radiation



Shade options

Shade options include the use of built structures (permanent or temporary) natural shade or a combination of both.

Built shade

Built shade structures include:

- Permanent structures: these should be able to withstand harsh weather conditions and high winds. Regular maintenance is essential to ensure their long lifespan.
- Temporary structures: easy to set up and take down, these include large tents and marquees. These are good for a space that only needs shade occasionally or when temporary shade is needed.
- Adjustable systems: these are often very flexible, allowing for changes in shade as the sun moves during the day and at different times of the year.
- Shade sails: these usually require minimal support structures due to the combined effect of tension and the curved fabric used in the design. The curve of the fabric affects where the

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shade will fall. The design and construction of these structures is a specialised field; you will need to engage professionals to design and build this type of shade.

- Pre-made structures: these are ready for installation on any site. They can offer a cost-effective, readily available shade solution. You will still need to ensure that it is safe and provides adequate shade in the right area at the right time.
- Portable shade: such as beach shelters. These are ideal for places where other shade is not available. They often provide a quick and cheap solution to shade problems but may not be effective in protecting people from indirect UV radiation.

Textile and shade cloth covered structures

The quality of the covering material will largely determine the effectiveness of the UV radiation protection.

Textile or coated fabric (canvas, etc.) can provide up to 99% UV radiation protection. Features can include tight weave; coating to resist mildew, rot and light exposure; and water resistance. It often has a shorter lifespan than shade cloth.

Shade cloth may be either woven or knitted. It allows some light, air and water through and usually has a lifespan of up to 15 years but only offers limited protection against UV radiation. Most shade cloth offers less than 94% UV radiation protection.

Natural shade

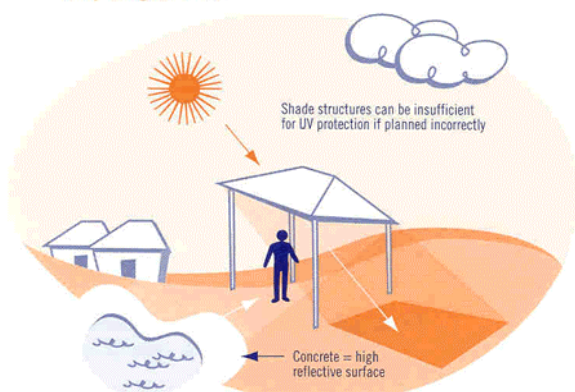
The most suitable trees for natural shade have broad canopies, dense foliage and sufficient clearance beneath the canopy to allow access. A higher canopy usually provides less overall shade. Natural shade is particularly well suited to large recreational areas such as surrounding school ovals. Trees must be carefully selected to ensure they are appropriate for the soil type and climate in your area including:

- foliage only when needed (e.g. a deciduous tree drops its leaves in winter, allowing sunlight for warmth and light)
- broad, low and dense canopies (i.e. any visible open sky indicates UV radiation can penetrate the shade cover)
- no spiky branches, fruit or seed pods that could drop or attract bees
- ensure your shade tree will cast shade where you need it.

Key questions to ask when developing shade

- ☐ Does the shade designer/developer have a good understanding of *what the shaded area will be used for*? Will this area mainly be used for passive activities, active play, sports, spectators or all of these? Knowing this will help determine the best type of shade structure to use.
- ☐ What will be the most suitable *form of shade* (permanent, temporary, adjustable, portable or natural) for our needs?
- ☐ What is the *UV protection rating (UPF) of materials*? To provide adequate sun protection, materials must have a minimum 94% UV block. However, even if the material has a high UPF, this does not necessarily mean the entire shade structure has the same rating. The sun protection properties of an entire shade structure depend on the overall design.
- ☐ Will the shade *protect from both direct and indirect UV*? About 60% of the day's UV reaches us during the middle of the day when the sun is directly overhead. UV can also be reflected off different surfaces. For example, lawn grass can reflect between 2 – 5% of UV and sand can reflect between 15 – 18% of UV (Table 1).⁵
- ☐ Will the plans include a *shadow projection plan* (showing the shade cast at different times of the day and different times of the year)?

Poorly designed shade



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Table 1: Levels of reflected UV radiation.⁵

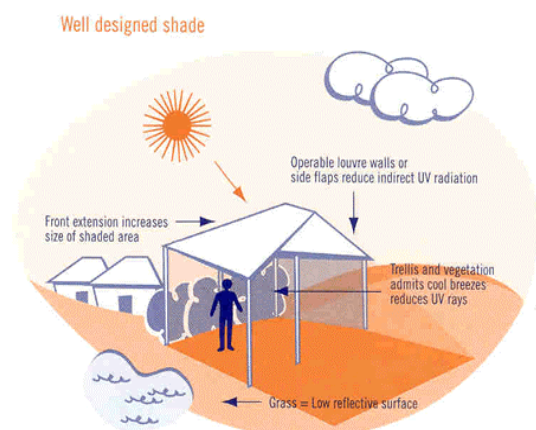
Some ground and building surfaces reflect solar UVR.

Material	Level of reflected UV radiation
Lawn grass, summer/winter	2.0% – 5.0%
Grasslands	0.8% – 1.6%
Soil, clay/humus	4.0% – 6.0%
Asphalt roadway, new (black), old (grey)	4.1% – 8.9%
House paint, white	22.0%
Boat deck, wood/fibreglass	6.6% – 9.1%
Open water	3.3%
Open ocean	8.0%
Sea surf, white foam	25.0% – 30.0%
Beach sand, wet	7.1%
Beach sand, dry, light	15.0% – 18.0%
Snow, old/new	50.0% – 88.0%
Concrete footpath	8.2% – 12.0%

- ☐ Will the construction comply with *safety guidelines* for playground/outdoor play areas? The shade should not only be sun safe but play safe as well!
- ☐ Does the quote include *ongoing maintenance* plans to ensure continued shade effectiveness including safety checks, maintenance and cleaning?

Further considerations include:

- Warranty
- Insurance
- Liability
- Permits



For further information regarding Shade Audits contact:

1. Archicentre (a division of the Royal Australian Institute of Architects), 1300 13 4 513, archicentre.com.au
2. WebShade Pty Ltd, (02) 9818 2177, webshade.com.au
3. SunSmart will be developing a shade audit tool in coming months to help services plan for effective natural and built shade.

For further information on shade please refer to the *Shade for Everyone: A Practical Guide for Shade Development* booklet.

PDF copies are available from sunsmart.com.au/sun_protection/seek/

References

- ¹ Armstrong BK. How sun exposure causes skin cancer: an epidemiological perspective. In: Hill D, Elwood JM, English DR, eds. *Prevention of Skin Cancer*. Dordrecht, the Netherlands: Kluwer Academic Publishers, 2004, pp. 89-116.
- ² Staples M, Elwood M, Burton R, Williams J, Marks R, Giles G. Non-melanoma skin cancer in Australia: the 2002 national survey and trends since 1985. *Medical Journal of Australia* 2006; 184 (1): 6-10.
- ³ Parsons PG, Neale R, Wolski P, Green A. The shady side of solar protection. *Medical Journal of Australia* 1998; 168 (7): 327-330.
- ⁴ Dobbins SJ, White V, Wakefield MA et al, Adolescents' use of purpose built shade in secondary schools: cluster randomized controlled trial, *British Medical Journal* 2009; 338:b95.
- ⁵ Sliney DH. Physical factors in cataractogenesis: ambient ultraviolet radiation and temperature. *Investigative Ophthalmology & Visual Science* 1986; 27 (5): 781-790.

This information is based on current available evidence at the time of review. It can be photocopied for distribution.

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