

Shade design factors to limit UVR

Every shade system should satisfy these design factors to limit Ultraviolet Radiation (UVR) at a shaded site and to maximise effectiveness.

These design principles can be used to assess existing shade or as a prompt in a new design.

General design considerations

Practicality and comfort

Design shade systems so they:

- Do not clash with the activities happening.
- Allow room to move around any furniture or equipment used in the area.
- Allow easy access for everyone who uses it (wheelchairs, prams, trolleys).
- Are comfortable for all seasons.
- Block bright sunlight and uncomfortable glare.

Flexibility

Shade systems are more successful if they are adaptable.

- Plan shaded areas that can be changed to suit different activities.

Provide clear boundaries

Shade can complement and reinforce the ordering of different areas and movement paths. You can:

- Position columns to create implied boundaries.
- Use shade to define large open areas that appear overwhelming and endless.

Variety

- Combine the effects of built and natural shade systems to create a variety of stimulating and interesting spaces.
- Take advantage of colours and textures when selecting building materials or planting to create variety and interest.
- Balance the requirement to provide good UVR protection with the need to use materials and plants that complement the setting and its surrounding neighbourhood.

Scale

- Consider how shade systems and the spaces they create will be perceived by those who will use them (important for child specific play areas).

Security

Provide a sense of security, especially in areas designed for children:

- Avoid creating dark, uninviting areas with little air circulation.
- Provide sufficient light. Integrate translucent panels or skylights into the shade canopy.

Safety

- Choose durable surfaces that can cope with continuous use. Materials should be hard-wearing, non-slip and easy to clean.
- When positioning shade, ensure supervision is not hindered by plants and structures creating hidden pockets of space.
- Avoid structures with loose elements, 'natural ladders' and entrapment or pinching hazards.
- Design portable structures that are sturdy and have reliable ground anchoring systems.
- Provide sufficient clearance zones around furniture, fixed structures, and play equipment. If required, use expert design input and ensure built shade structures are certified by a structural engineer.
- Establish a regular maintenance program to ensure shade areas provide optimum UVR protection and limit safety hazards. Some materials may deteriorate in their Ultraviolet Protection Factor (UPF) rating over time.

Indoor/outdoor transitions

- Use floor and furniture surfacing low in UVR reflectance (darker coloured, matt finishes).
- Design roof canopies to admit natural light in dark shade areas.
- Provide year round shade protection for veranda's and other areas that link indoor and outdoor spaces.
- Provide wide overhangs or adjustable awnings to block direct UVR when the sun is lower in the sky. Large canopy trees can also be effective.

Entryways:

- Choose surface materials that are non-UV reflective such as brick or concrete paving.
- Provide shaded pathways from carparks to the entry if possible or integrate existing site features (i.e. large trees) as part of a shaded entry approach.

Assessing shelter design

Large size shelters

The position of the user will be important when using a large shelter.

Design these structures so that:

- Users and equipment are situated a minimum of one metre from open edges.
- Activities take place in the central area of shade.
- Furniture is located away from open edges.
- The long side runs east to west, where possible.
- Users are positioned to face south or north, where appropriate.

Assess the actual area of canopy rather than the area bounded by the structure or structural supports.

Overhangs

Evaluate overhangs for adequate width and maximum effectiveness:

- Design features like curved edges should be avoided if possible. (or provide some compensation to increase effective area of cover.)
- High shelters should have wider overhangs.
- If there is no overhang, side shielding must be provided as a barrier to indirect and direct UVR.
- Overhangs on north and south orientations should be at least 1 metre wide.
- Overhangs on east and west orientations should be more than 1 metre wide.

Protective edges and sides

- Integrate side screening to reduce entry of UVR, especially when there are high open edges.
- Prioritise side shielding to east and west sides. The position and extent of side barriers relate directly to the need for shade at times of use.
- Limit the use of inward-curving edges.
- Extend overhangs to compensate for the effect of inward curving edges.

Continuity of cover

- Minimise or eliminate gaps when using multiple canopies by making sure they overlap.
- Combine vegetation and structures so that there are minimal gaps between the two types of shade.