



## Development Review and Coordination

### LANDSCAPE ADVISORY NOTE

LAN 02

### Shade sails & shade provision

#### **Background:**

The community expectation is that playgrounds and other high use open space areas are adequately protected from the sun radiation and heat during summer months. It is also a one of the objectives of the ACT Climate Adaptation Strategy.

Territory supports use of shade sails however due to high maintenance, repair and replacement cost, the final product has to be of a high quality to enable its longevity.

This advisory note which has been prepared by Development Review and Coordination [DRC] in cooperation with the asset owners and Capital Works areas of TCCS provides advice on the acceptable use, quality of product and the installation method that enables the desired outcome.

#### **Advice:**

##### **Location**

Shade sails will only be permitted in areas where there is insufficient shade provided by existing structures or trees. Shade sails will be permitted where a higher level of quality, advanced specifications and general requirements can be demonstrated and are strictly adhered to and achieved.

New trees should be strategically located around the area where necessary, to provide additional shade options in the future. Deciduous trees are desirable to allow some winter sun.

##### **Specifications**

The following specification should be complied with as minimum requirements:

#### **a) Product**

- i) Product quality assurance ISO9001;
- ii) Product to have minimum 10 years warranty on sails, structure or poles. Steel coating should be either two Pac paint or hot dip galvanised after fabrication. Coating thickness for HDG to be minimum 500g/m<sup>2</sup> to 600g/m<sup>2</sup> as per AS/NZS 4680. Paint to have a 5 year warranty for peeling;
- iii) UV protection; minimum UVR of 80%, desirable 90%;

- iv) Material stitching to be of high quality – UV stabilised ~PTFE stitching (minimum 15yrs UV Warranty) required;
- v) Cloth to be fire retardant to AS1530.2 (with a spread factor of 0 and a heat factor of 1 or less) and Flammability index to be less than 5 in Bushfire Zone);
- vi) Post diameter to be over 160mm and as determined by anti climbing factors contained in Requirements for Design Review below;
- vii) Tamper proof fixings to be used. (e.g. No tap on caps, eyebolts, or wire slings to be used), and
- viii) Stress points on Sails to be reinforced by double layer of mesh or webbing (e.g. corners, catenary curves, seams).

**b) Installation**

To prevent sagging:

- i) Sails to have 0.150kN/m pre-stress in every direction (Catenary Curve sag 7%), and
- ii) Rectangular, square or polygonal sails to demonstrate three-dimensional shape. At minimum have a height difference of longest diagonal divided by seven to achieve a hyperbolic parabola.

**Requirements for Design Review**

- 1) Structural certification for the design of the sail structure from the suitably qualified professional with minimum 5 years experience with shade/tensile membrane structures;
- 2) Justification – as part of design report, the applicant to provide justification of the areas requiring shade. Selection for areas of shade must consider play items that are dark, metal or come into contact with skin.
- 3) Risk assessment to show safety and maintenance issues with special consideration of steps taken to prevent ability to climb. The location should be minimum 1.5m away from walls, fences, tables, seat backs, barbecues, bins, bike racks, bubblers and other elements that could be used to climb the posts.; Posts should demonstrate prevention of access to sail through anti-climbing devices (e.g. Fins, Collars, or Spikes without sharp edges)
- 4) Shade sails to be engineered and installed to be permanent structures able to withstand extreme winds. Design life of 50 years, ARI500, and Importance level 2 as per AS 1170.
- 5) Shadow mapping- demonstrating how the shading covers playground including carers seating during summer and allows some sunlight during winter; summer shade (between months of September and March) to be provided at a minimum between hours of 11am and 3pm when UV is high (Cancer Council ACT).
- 6) Poles are to be located outside the fall zones of any play equipment as per AS 4685, and AS 4486. , and must consider circulation patterns and mowing clearance requirements;
- 7) Design drawings to clearly specify height of lowest point of sail to top of any equipment via elevation view. This should be a minimum of 3.0m over any accessible surface or 1.5m over inaccessible parts of play equipment or site furniture;

- 8) Design drawings must clearly show details of safe backup to both sail attachment points. Fixing points of sail to demonstrate suitable reinforcement;
- 9) Sail attachments to be load-rated galvanised chain to be sufficient to withstand worst load case on shade sail as per AS 1170. At minimum Working Load Limit (WLL) of fittings to be 1.4t (13.9kN). This is to change the risk profile from the sail attachment to the sail itself in view of reducing the residual risk for park patrons.

### **Requirements for Operational Acceptance submission**

- 1) Installers must have a licence to build covering commercial structural shade sails of any size in the ACT as per the Construction Occupations (Licensing) Act 2004. Minimum Class B Licence is required for commercial structural work. Appropriate Building Certifier endorsement is to be supplied with Operational Acceptance submission.
- 2) Certification of Installation as per Structural design by Rigger or other suitably qualified professional.
- 3) Certification from the civil engineer, structural engineer or other suitably qualified professional with minimum 5 years experience confirming compliance with relevant standards, including: AS4174:1994 Synthetic Shade Cloth including Amendment 1:1996 The Supply of ~ including Cover Factor Ranges ...; and AS2741:2002 – Requirements for Forged Shackles.

### **Definitions**

#### **For the purpose of this document:**

Play spaces: open space which includes assets for play that is associated with, or is nearby a playground but may include other elements such as trike circuits, ball-courts, cricket nets, kick-against walls, kick-about ovals, or adventure play areas.

Playground: an area of equipment or structures which are specifically intended for play.

Shade Structure: a built shelter that provides shade.

Shade Sail: a specific shade structure generally comprising posts supporting shade cloth stitched to a wire rope hem.

#### **Notes:**

The factors that determine sizing include Design Life, Average Recurrence Interval (ARI), and Importance Level:

- Design life is the period of time during which the assets is expected by its designers to work within its specified parameters; A 50 year design life is to reduce whole of life costs for shades.
- ARI refers to the average time for an extreme wind event. The 500 means on average it appears every 500 years. By reducing the ARI to 100 or less it is to say that the shade structure is a temporary structure, i.e. blow away. With an ARI 500 it is to show that it is seen as a permanent asset.
- Importance level the level of consequences in the event of a building failure. The higher the level, the greater consequences there could be to person or public. There

are five levels of importance, considered by the importance of the building to society: level of 2 means that upon failure there could be loss of life and level 3 refers to structures that may contain crowd (as defined in AS 1170)

### **Administrative Arrangement**

This LAN is to be used as advice pending update of TCCS standards. It is to add to, and is not to override, any applicable Australian Standard. It takes effect from date of endorsement by the Senior Manager.

### **Amendment history**

<b>Version</b>	<b>Issue date</b>	<b>Amendment details</b>	<b>Author</b>
1.1	31.05.2017	Initial release	Grant Thomas
1.2	11.10.2017	Page 2, point 6 - change AS4485 to AS4685	Grant Thomas

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