

LSAA-MADA Workshop

Extra Resources

Cables, fittings, shade, wind effects on shadecloth structures and other
“bits and pieces”

Structural Cable Basics

Having established the application, load requirements and desired level of corrosion protection, consideration should be given to:

1. Cable Construction.
2. Cable Termination Methods.
3. End Fitting Options.
4. Connections, Clamps, anchors and associated fittings.

1. Cable Construction - Options

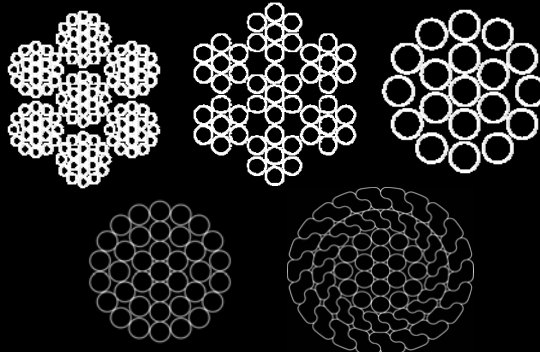
7 X 19
wire rope

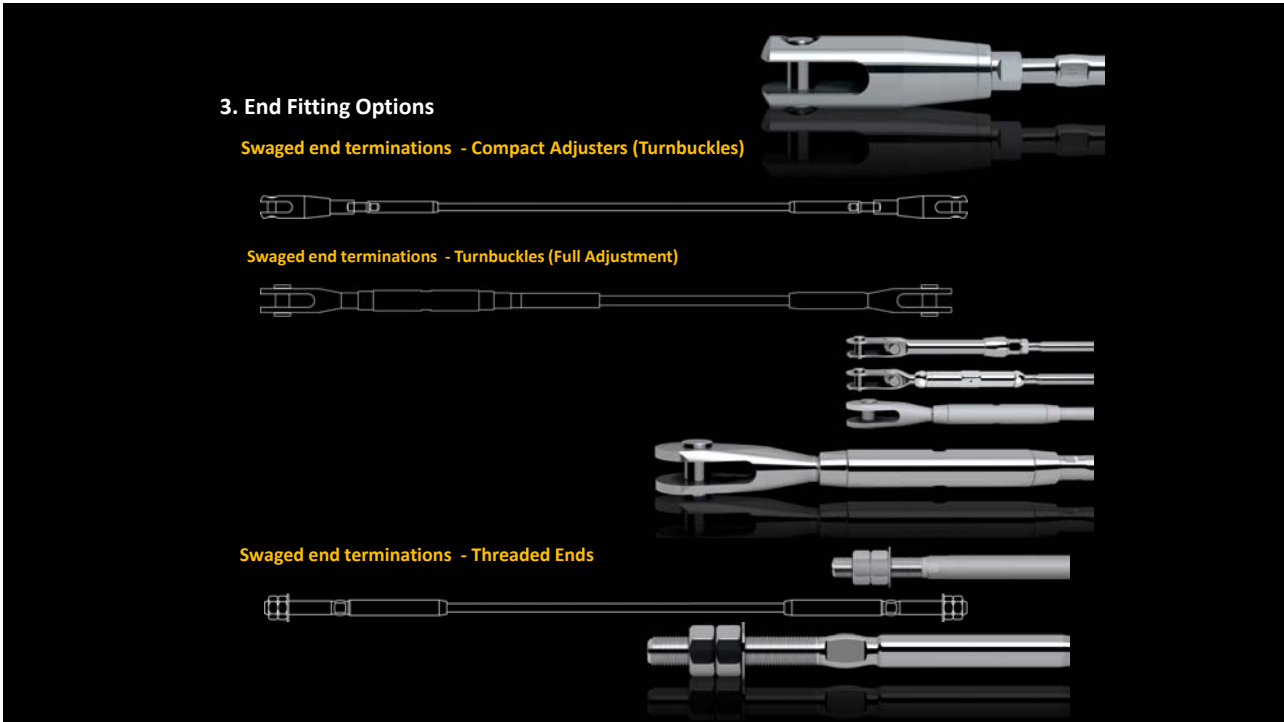
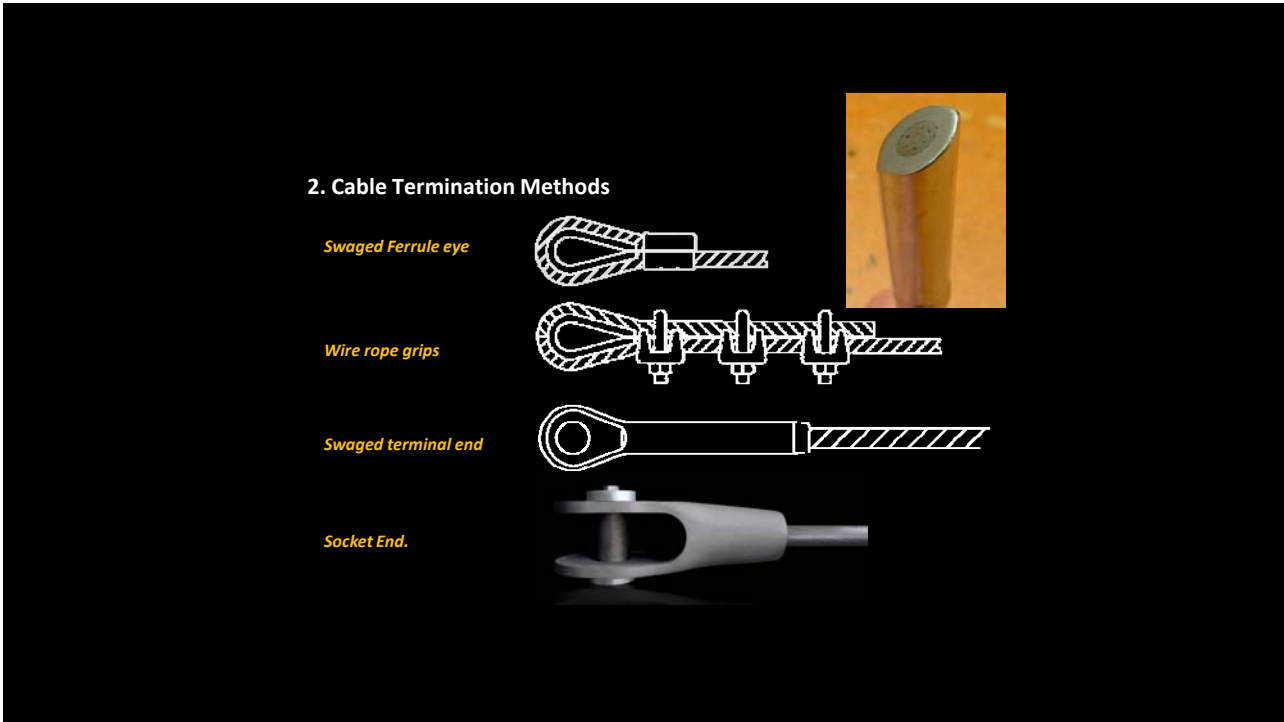
7 X 7
wire rope

1 X 19
strand

1 X 31
strand

VVS-3
Full locked
cable





Stainless Cables – Swaged End Terminations



Inclined pin ended columns are more efficient and aesthetically pleasing when they "bisect" the two tensile loads.

Things that go wrong – not designed properly!

- Reaction loads grossly underestimated – probably NO engineering calcs done by contractors
- Cantilevered columns need a solid footing – not just a bag or two of concrete !!
- Shadecloth structures need prestressing. They MOVE A LOT under mild winds.
- Playground structures need CLEARANCE to fabric especially shadecloth panels







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Behaviour under moderate wind



Behaviour under moderate wind



Behaviour under moderate wind



Behaviour under moderate wind



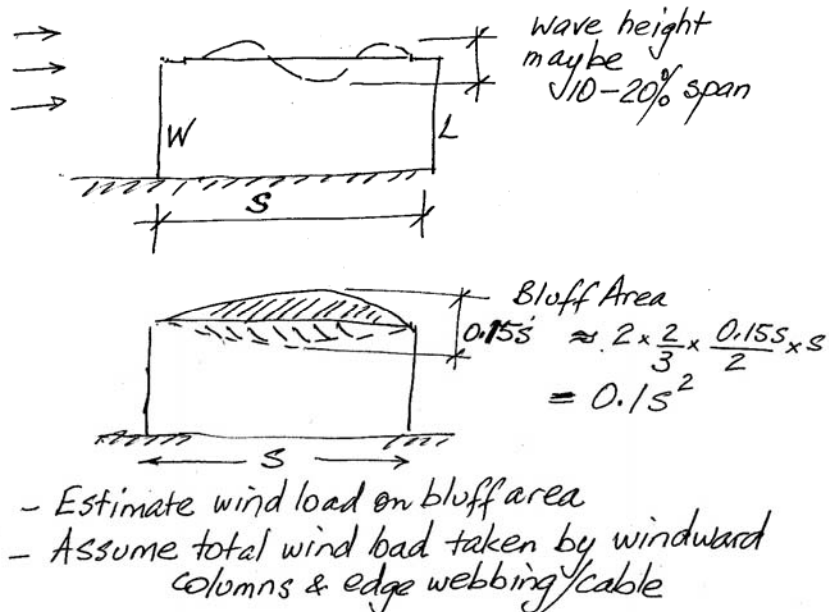
A sample playground



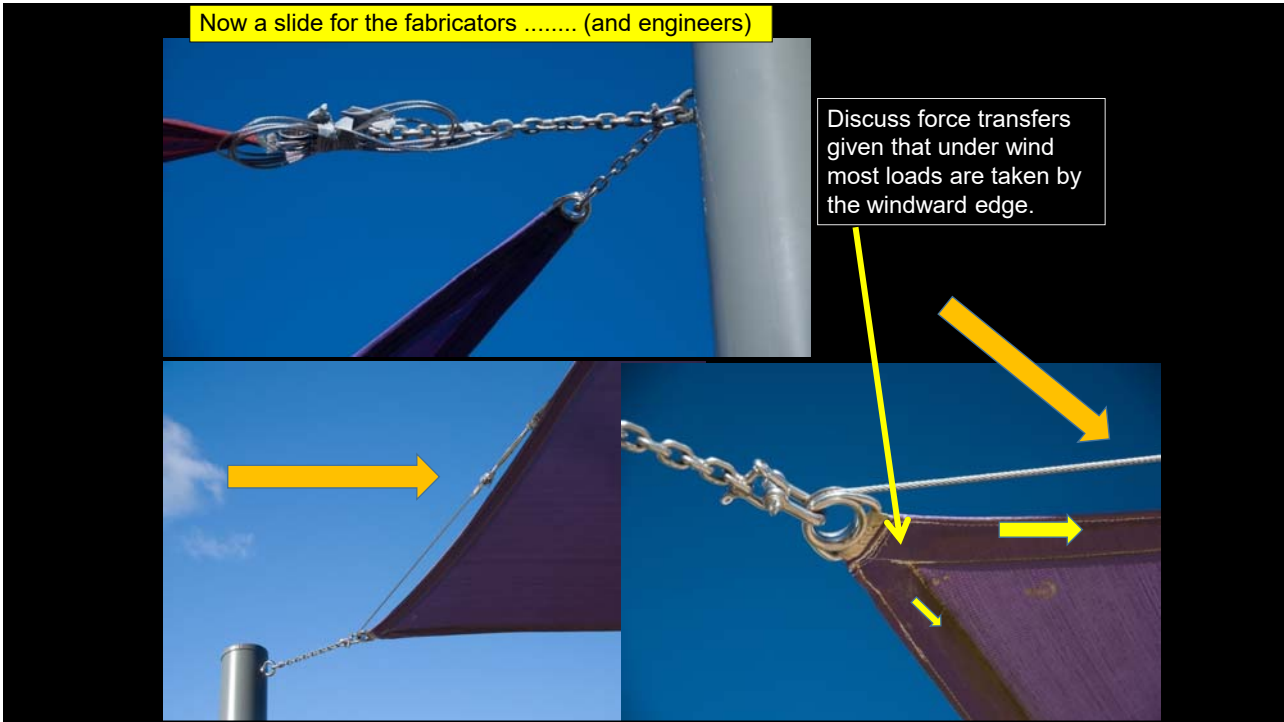
A glance at wind effects on shadecloth structures

- Often “wave-like” movements in larger “flatter” panels that are prestressed
- Very large displacements in loose panels – measured in “metres”

An approach to wind loads on shade cloth panels







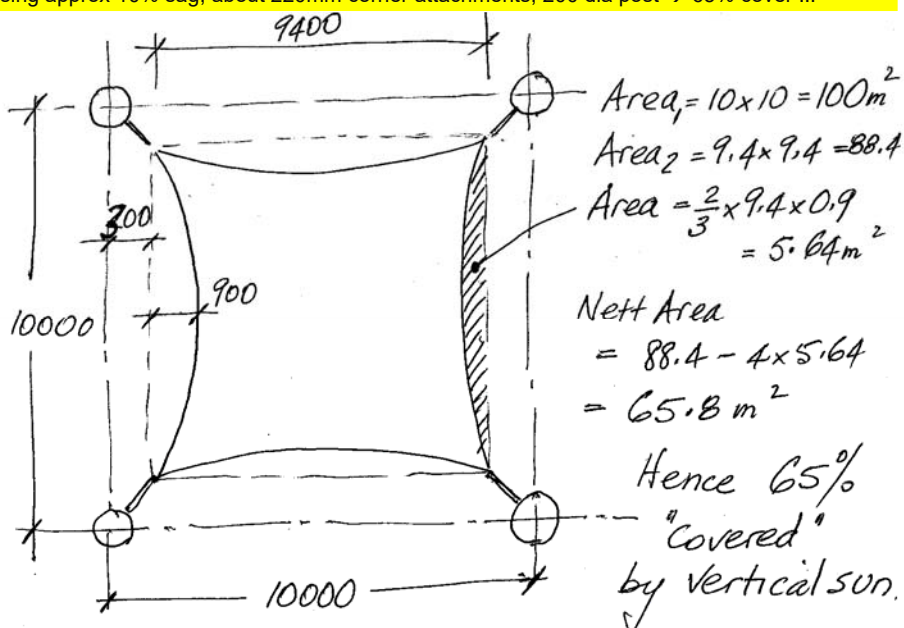


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So you are providing SHADE ??

- Skin cancer now taken very seriously
- Schools, playgrounds need EFFECTIVE SHADE between 10am – 2pm at least
- Separate “panels” have very large gaps between
- Overlapping panels, or panels joined together at mid-sides may help.
- It is not the area directly under a membrane that is shaded – sometimes NONE of the area under is shaded.
- Playground, open car parks are examples where there is inadequate shading – not good for a designer’s reputation, or the industry!!

Using approx 10% sag, about 220mm corner attachments, 200 dia post → 65% cover !!!



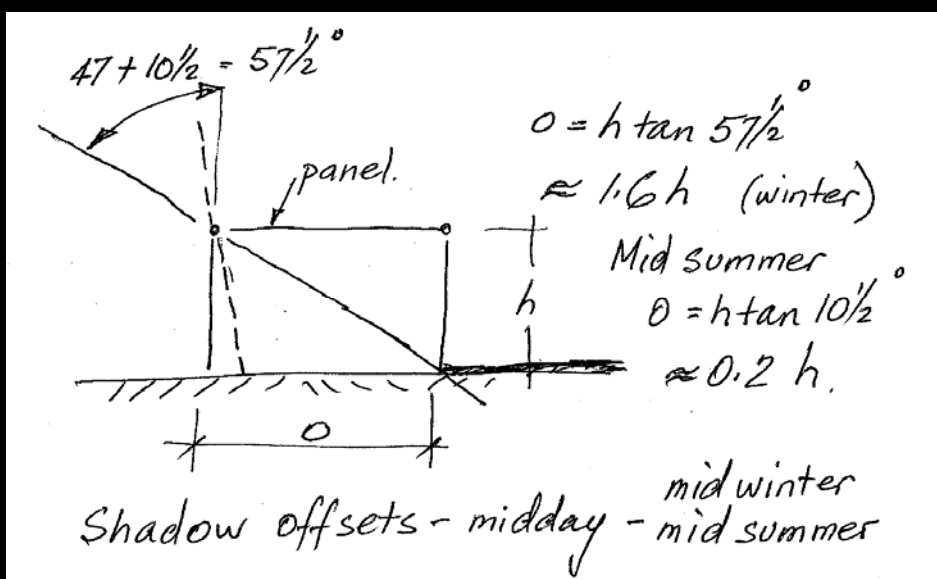
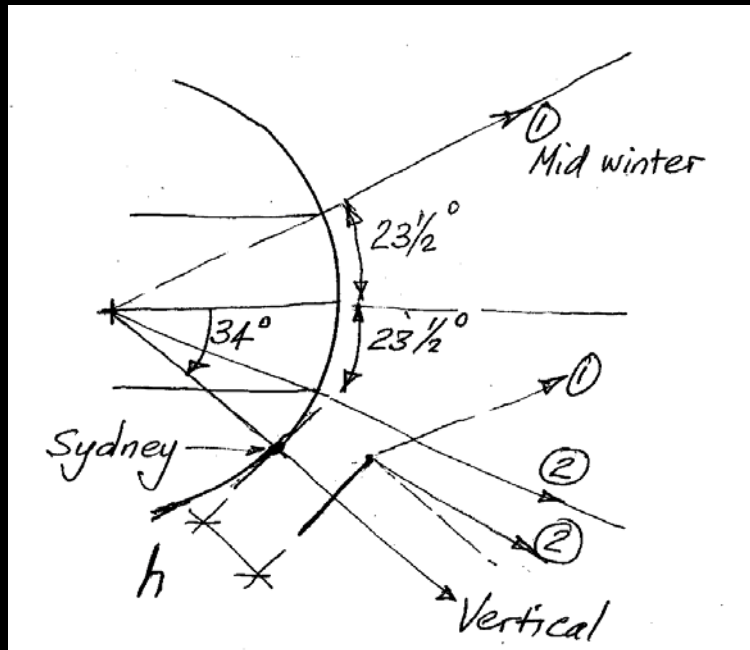
Earth shown with sun angles at extreme seasons.

A shade panel at height "h" above ground at Sydney (lat 34 deg South) with extreme sun angles as 1, 2

Does not show effects of sun angles early morning or late afternoon.

Software may simulate shade. USE A TORCH ON A PHYSICAL MODEL

Suppliers of shade structures should supply "Shade Diagrams" to clients





Cables, Forces, Stuff that goes wrong, Shade and Shadecloth Issues