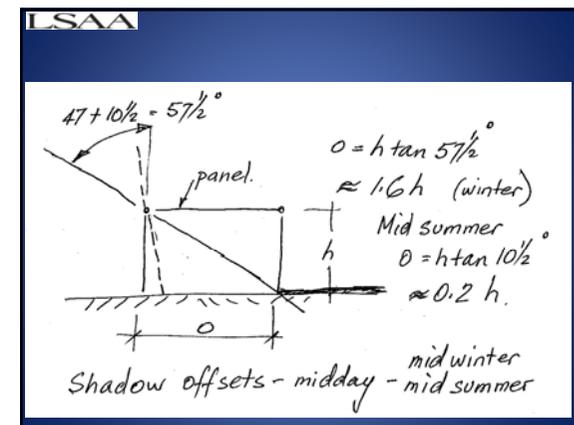
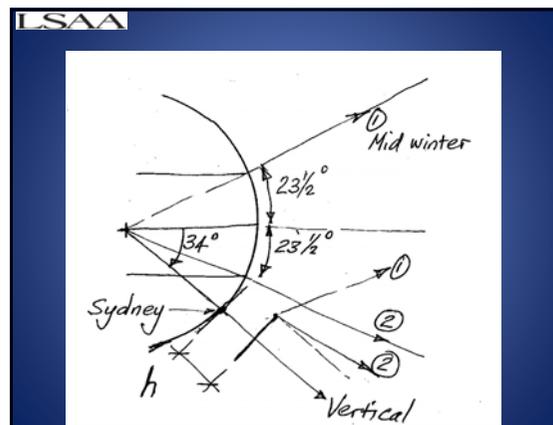
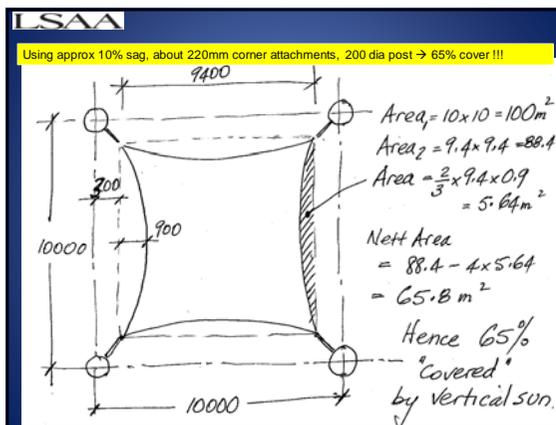


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## Case Study Simple Hypar Shade Panel



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- ### Some Basic Guidelines
- To be done by competent persons
  - Struct. Eng, Fabricator, Installer
  - Performance based – fit for purpose; assist the client
  - Shade or waterproof role
  - How much shade does a flat hypar provide
  - Angles to the sun and “offsets” to shade
  - Wind effects on flat, horizontal panels



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An approach to wind loads on shade cloth panels

Wave height maybe 10-20% span

Bluff Area  $0.15S \approx 2 \times \frac{2}{3} \times \frac{0.15S \times S}{2} = 0.15^2 S^2$

- Estimate wind load on bluff area
- Assume total wind load taken by windward columns & edge webbing/cable

Example structure where edge cables not adjusted correctly - mild wind. Note position of shade on ground (mid afternoon, winter)

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Avoid extremely pointy corners, and triangles and keep ratios of panel side lengths within 25% if possible for 4-sided panels. Note sagging of cloth and large areas of wrinkles as well as the position of the shade on the ground.

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Shade panel removed during winter? Attachment cleat had only one small hole?

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Now a slide for the fabricators ..... (and engineers)

Discuss force transfers given that under wind most loads are taken by the windward edge.

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Different "Hypars" or saddle shapes placed within a cube.

L,L,L,H    L,H,L,H    L,H,L,H    L,H,H,H



- Discussion of LSAA Technical Sub-committee's work on two documents:
  - Design Guidelines for Tension Fabric Structures
  - Design Handbook for Tension Fabric Structures
- Both to be released in Draft form for Comment
  - Refer to separate PDF files.