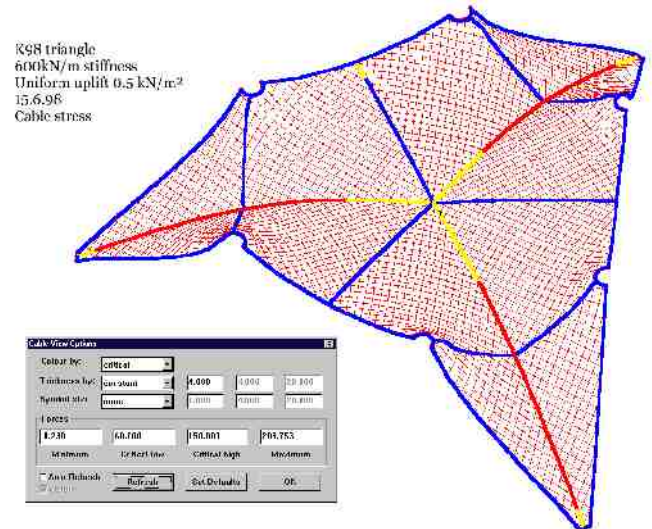


Services

Special Structures Lab provide services to architects, engineers and manufacturers of special structures of all kinds, in particular membrane structures.

The experience of designing and engineering the worlds largest portable venue (Guinness book of records) and many other portable structures such as seating grandstands, demountable trailer units and stages of all kinds, gives SSL a unique perspective when approaching new projects. The lessons learned in the fields of architecture and construction can be combined with those of the event industry to provide a technology lead design methodology.



SSL's engineering capabilities include the design, analysis and certification of structures, both traditional and fabric supported, with specialist knowledge of mobile or temporary installations, specialist services to manufacturers for the production of 3 dimensional membranes, with regard to surface or form generation, finite element analysis using the 'force density' method, manufacturing information such as edge and pressure point detailing, and cutting patterns generation.

SSL are pleased to work direct with clients or as specialist consultants to other engineers and architects. An in-house design team utilises state of the art equipment to provide the following services:

Fabric structure design, Air structures, Cable Net structures

Finite element analysis of fabric membranes, to calculate wind and snow loading.

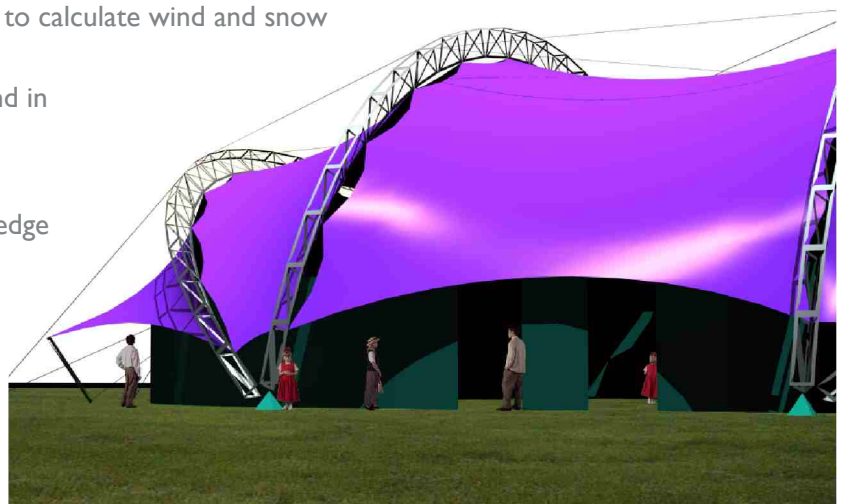
Structural analysis on all forms of unusual and in particular, mobile constructions.

3 Dimensional computer aided design.

Presentation quality graphics for that extra edge in obtaining work.

Conceptual Modelling of projects of all kinds including rendered visuals, 2D + 3D CAD drawings and animated fly-through's on CD or Travan© tape.

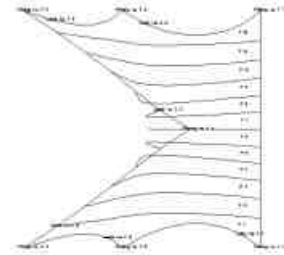
Cost analysis and manufacturing information.



Software used for the design, analysis and manufacture of pre-tensioned fabric structures.

Patterner for Windows (r) - Bruno Postle

Patterner is one of the few software packages in the world to provide the tools to create membrane structures. Developed in house at Rudi Enos Design by Bruno Postle, it is considered to be 'state of the art' for visualisation and patterning. All the production patterns for many different projects have been created with 'Patterner'.



Tech-net 'EASY' membrane force and cable analysis software.

EASY analysis tools provide the most effective method of assessing the forces in the structures membrane, it's cables and the reaction loads on the supporting steelwork. With the ability to define and model precisely the ultimate tensile strength and stiffness of the membrane and reinforcement materials, and then to determine maximum loads, deflections and reaction loads from the dynamic membrane, every condition can be simulated and shown.

Fabric structures possess significant structural and architectural advantages over conventional structures. However, fabric structures also present a unique set of design challenges. The shapes of membrane structures cannot be chosen at random. The absence of bending resistance's requires designers to work within the constraints of feasible membrane equilibrium shapes. These shapes are usually complex, doubly curved surfaces which must be pretensioned in such a way to resist applied loading such as wind and snow. A tensile membrane structure is prestressed and stabilised by the counteracting tensions of opposing curvatures of an anticlastic surface (two-directional curvature of opposite sign, as a saddle surface). Where flat profile sheet design is envisaged, the initial prestress is significantly higher due to the need to prevent movement. Special non-linear techniques are necessary for the structural analysis of tension structures, since membranes undergo shape changes under varying load conditions and fabric materials exhibit complex stress-strain response. Computer-based finite element techniques such as EASY are used to solve these non-linear problems.

