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FILE NOTE

Design of Temporary Structures

Alert SC/12/001 issued on 11th January 2012 by the Standing Committee on Structural Safety (SCOSS) provides advice for Local Authorities. The alert advises Authorities to ensure that their Safety Advisory Groups consider the structural safety of temporary structures and consider that, prior to build, the designer of the structure provide design documentation, evidence of the competence of the designer and evidence of an independent design check.

This file note is intended to provide evidence as to the competence of Prior Associates as designers and gives examples of our work in this field, details of our design and independent checking procedure and evidence of the public liability and professional indemnity insurance that we carry.

We recommend that you retain a copy of this file note to show your compliance with the SCOSS alert.

Evidence of Competence

Prior Associates have designed and inspected temporary structures at stadia and sports grounds for over ten years. We currently provide inspection and certification of such venues in accordance with the Guide to Safety at Sports Grounds. We have significant experience with temporary structures, particularly those constructed from lightweight aluminium lattice trusses and extruded aluminium sections. Design of temporary structures forms a significant part of our current practice.

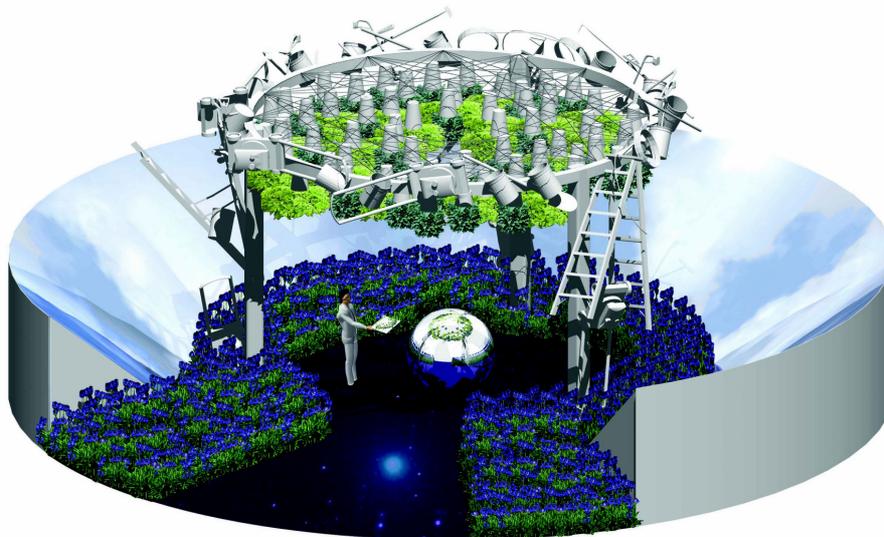
The practice has Chartered Mechanical, Civil and Structural Engineers on its staff. This enables a true multi-disciplinary approach to design, including both static and dynamic analysis of lightweight structures, design in all common structural materials and the design of adjustment and installation mechanisms.

Some examples of recent work are given overleaf:

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Our Standard Conditions of Appointment apply, copies of which may be obtained from our Soham offices

No document produced by this Practice may be published in any form including uploading to any website without our written permission.

Excuse me whilst I kiss the Sky

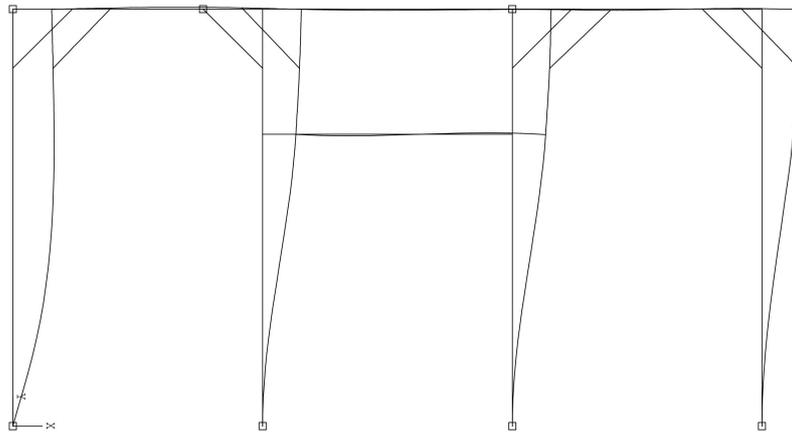
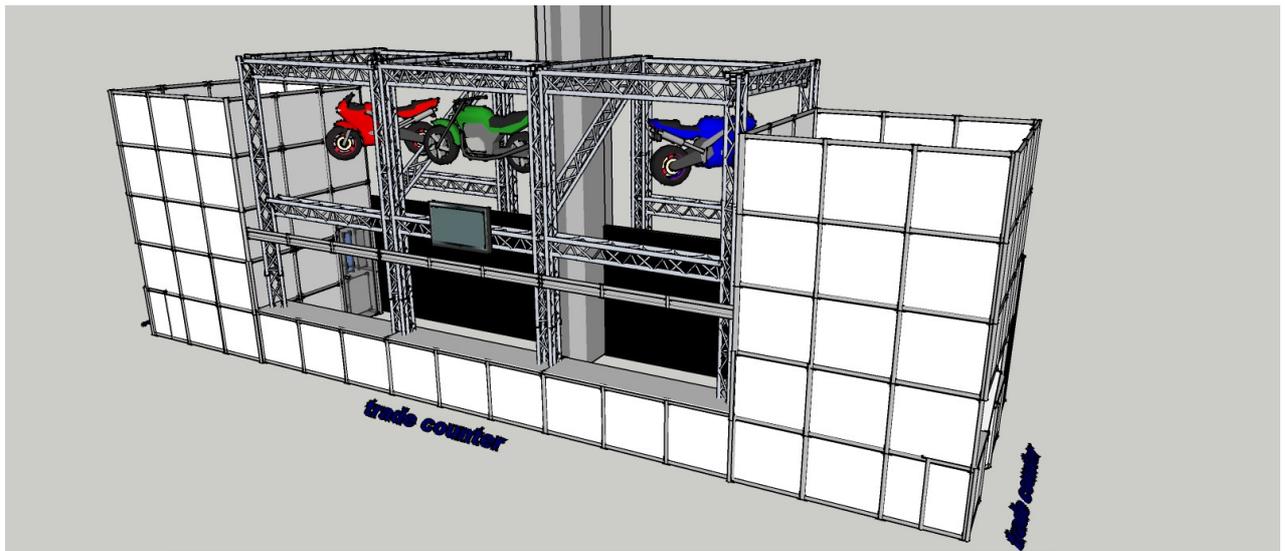
A contemporary garden designed for the RHS Hampton Court Flower Show with plants suspended from stainless steel catenary wires running between a circle of aluminium lattice struss supported on further legs of truss.

Alpro Soya Breakfast

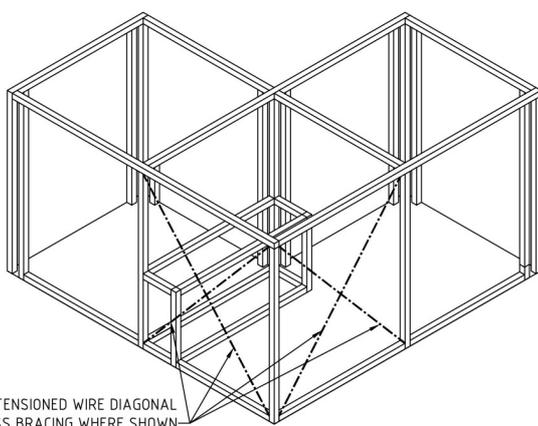
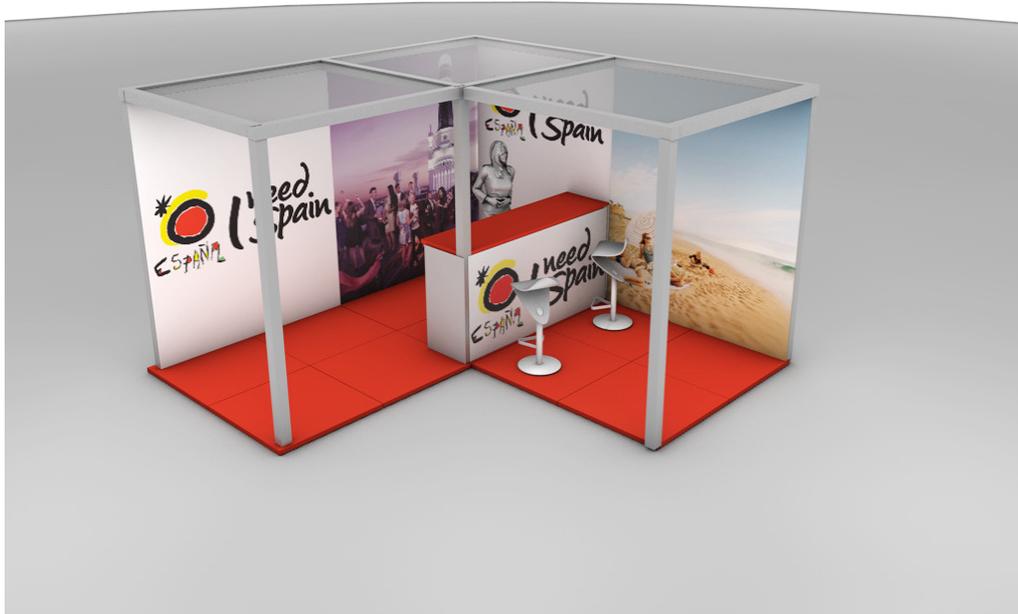
A 10m x 8m x 4m portal frame 'table' for promotional uses at a range of UK music festivals. Spaced legs of aluminium lattice truss provide frame rigidity under wind loading. The structure has since been modified to allow for increased loading from rigid carton, pot and bowl devices and an increase of 50% in the depth of the 'tablecloth' banner.

Larnaca City Airport

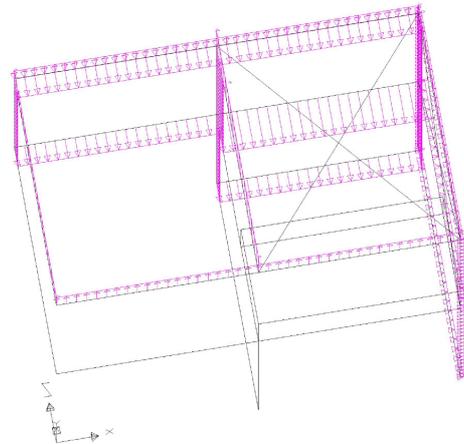
An oval structure permanently sited indoors, created in two independent sections either side of an “earthquake-proof” movement joint. A grid of aluminium truss tubes carrying internally lit fabric, LCD projectors and services, cantilevers over the edge of two semi-elliptical rings of lattice truss supported off a combination of hollow section aluminium tubes and truss legs. Fabric covered lamps hang beneath the semi-elliptical rings.

R&G Racing Stand

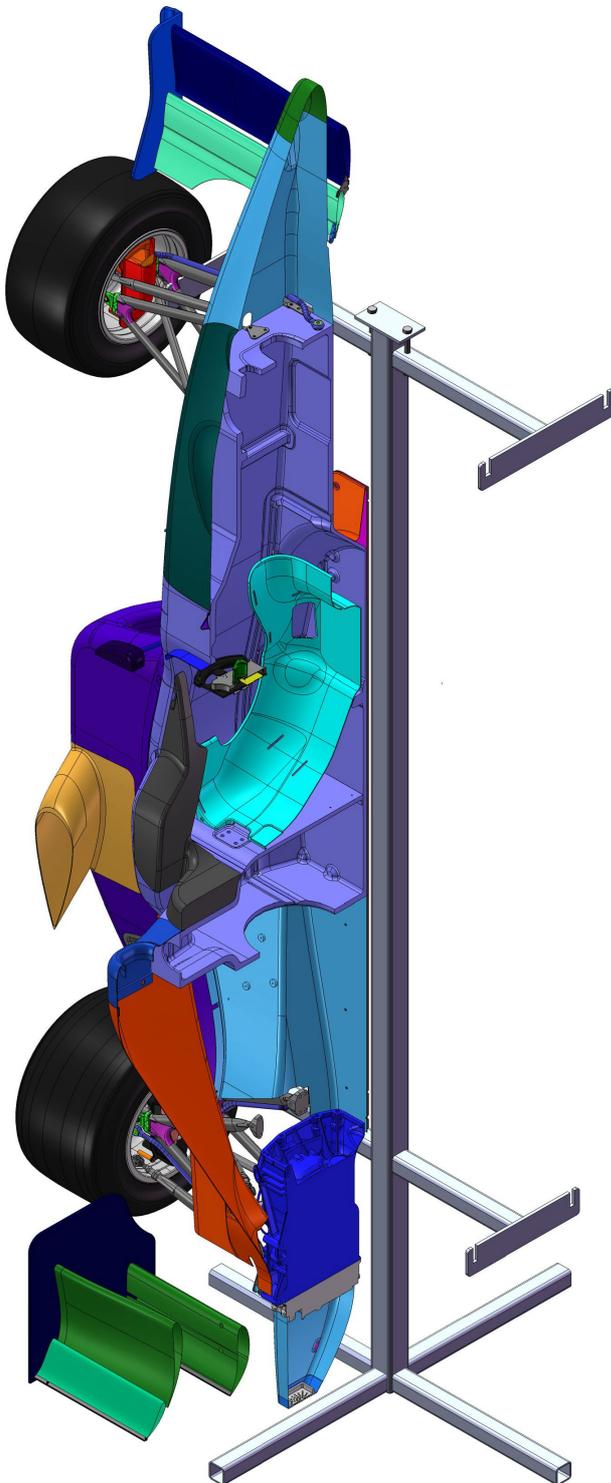
A temporary, internal stand for the Motorcycle Live show at NEC where motorcycles were suspended from a braced frame of lattice trusses at height above show staff.

A Taste of Spain

PROVIDE TENSIONED WIRE DIAGONAL
CROSS BRACING WHERE SHOWN



A portal space frame with Perspex glazed roof for a 1-day trade show outdoors in Regent Street, London. A spaceframe formed from aluminium extrusion sections. To provide sufficient stiffness, spaced columns formed of three extruded legs with standard connector pieces were used to resist wind and crowd loading.

Autosport International

A steel column support for two Formula Two racing cars suspended vertically, via precision laser cut plates designed to support the suspension wishbones. The support was designed for both crowd loading during the show and installation loads when the structure would be eccentrically loaded by only having a single car suspended from the support.

Outline Design Method

Unless otherwise directed, all calculations are prepared in accordance with loading codes contained within BS 6399 rather than Eurocode 1. Where a structure is going to be in place for less than 28 consecutive days, a design wind speed recommended by the 3rd edition of “Temporary demountable structures, Guidance on procurement, design and use” is used. For longer durations, a site-specific wind load is determined from the British Standard and BREVe software.

Snow loading is applied to a structure if there is a risk of such loading occurring, e.g. a bandstand structure installed outdoors during winter months. Accidental crowd loads and installation loads are also considered to give the worst case loading conditions for the frame during all phases of its use.

Frames are modelled using the skeletal finite element analysis package NL-STRESS. This represents the elements of the frame as individual beams with appropriate connections at joints. A sway analysis method is employed to ensure that all loads on the frame, including those generated by its motion are captured.

The frame is analysed to determine the lateral deflection at the tops of support columns and vertical deflection of all elements. The maximum permissible deflections are selected from either the design specification or the appropriate standards for the materials used.

Once the frame has been proven to meet deflection criteria, the capacity of individual frame members to take the loads is confirmed using either BS 5950 for steel components and BS 8118 for aluminium components. Where requested, Eurocodes 3 & 9 are used for component checks.

Holding Down methods are specified to allow for both overturning and lateral sliding of the structure. Typically, this is either static ballast, with an appropriate factor of safety, or marquee pins driven into the ground. Where marquee pins are used, their capacity is determined using methods specified in research literature.

Once calculations are complete, a full summary sheet is provided which details the loadings applied to the frames, any necessary ballast and stiffening components required and any limitations as to use, e.g. a prohibition against resting ladders against the frame during construction.

All design calculations are prepared by a Chartered Engineer with previous experience in temporary demountable structure design. The completed package is then subjected to a further independent design check by another Chartered Engineer at the practice prior to issue.

Insurance

Prior Associates carries full professional indemnity and public liability insurance for our design work. A copy of our insurance certificate is available on request.