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THEATRE

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A MAGICAL OBJECT THAT HARKS BACK TO THE STRANGENESS OF THE TRAVELLING CIRCUS OR THEATRE SHOW

By Susan Dawson. Photography by Daniel Hopkinson

On a bright Sunday morning a large truck rolled into the main square of Hebden Bridge, West Yorkshire. The Horse + Bamboo Travelling Theatre had arrived to take part in the town's festival. The back doors of the truck opened and the cast pulled out some light aluminium sections. They laid them out on the ground, connected the ends together, fitted six frames on top and covered them with an outer layer of bright red fabric and an inner layer of opaque fabric. A timber floor was laid on the inside and furnished with some simple raked benches. In 90 minutes they had erected the pPOD, their new mobile theatre. And, as you can see, this is no ordinary fast-track camping tent; like the theatre company that uses and works in it, it has a dynamic, almost magical quality.

The Horse + Bamboo Theatre is a touring company that has developed a unique way of staging contemporary masked and puppet theatre. At first, the company travelled around the UK and Europe in a horse-drawn wagon – hence the name – but as success grew it found a permanent base in Lancashire. What was now needed was a mobile theatre that the company could use on tour in villages and small towns to present small shows with audiences of up to 35 people. And, as the brief explained, it should also be 'a magical space and object which linked back to the strangeness of earlier travelling circus or theatre shows'.

Based on this unusual brief, Martin Ostermann, of the Berlin practice magma architecture, working with structural engineers Florian Förster and Ian Leaper, both from the Manchester office of Buro Happold, developed a design for a

mobile structure which creates a strange and elusive appearance in scale, form and material. The geometry of the structure comprises six rectangular frames that are twisted around an imaginary axis; as a result, the side walls are distorted into doubly curved planes without the use of curved members. The twisted frames are linked by an outer layer of fabric that follows the curved hyperbolic paraboloid shapes.

This outer fabric, made of PVC-coated polyester sheeting, is a weather-resistant yet translucent skin, like a veil. It is perforated with microscopic holes that allow glimpses of the inner tubular frame and structure. Because of the size of these holes in relation to the surface tension of raindrops, water runs off the fabric without penetrating it. The fabric is stretched tight over the frames and provides lateral stability in the longitudinal direction. Wind forces are resisted by the double curvature of the wall structure.

The inner fabric forms the opaque enclosure to the auditorium and stage. It hangs from a series of curved inner frames – of aluminium tube – that also stiffens the corners of the outer frames and provides stability in the cross direction. The floor of the pPOD, 5 x 7m, is a demountable aluminium frame supporting plywood floor panels. The floor plate tapers to a ramp at the entrance to allow wheelchair access. The fabric entrance door is simply closed with strips of Velcro.

Artificial lighting is suspended between the inner and outer fabric. By day, the pPOD appears solid but when the lights are turned on it changes into a translucent glowing form.





1.



2.

1. The pPOD is ready to be unloaded from the truck

2. The floor of the pPOD, a demountable aluminium frame, is laid on the ground and fixed together

3. The main structure - six twisted rectangular frames of 40mm diameter aluminium tubes - is slotted into sleeves welded to the floor frame. The node connections are colour-coded to speed up installation



4.



5.



3.

Credits

Architect
 magma architecture, Berlin
 Martin Ostermann
 Structural engineer
 Buro Happold, Manchester
 Florian Förster, Ian Leaper
 Suppliers
Tent manufacturer Lanco, Hannover;
floor manufacturer Thein & Rios, Berlin

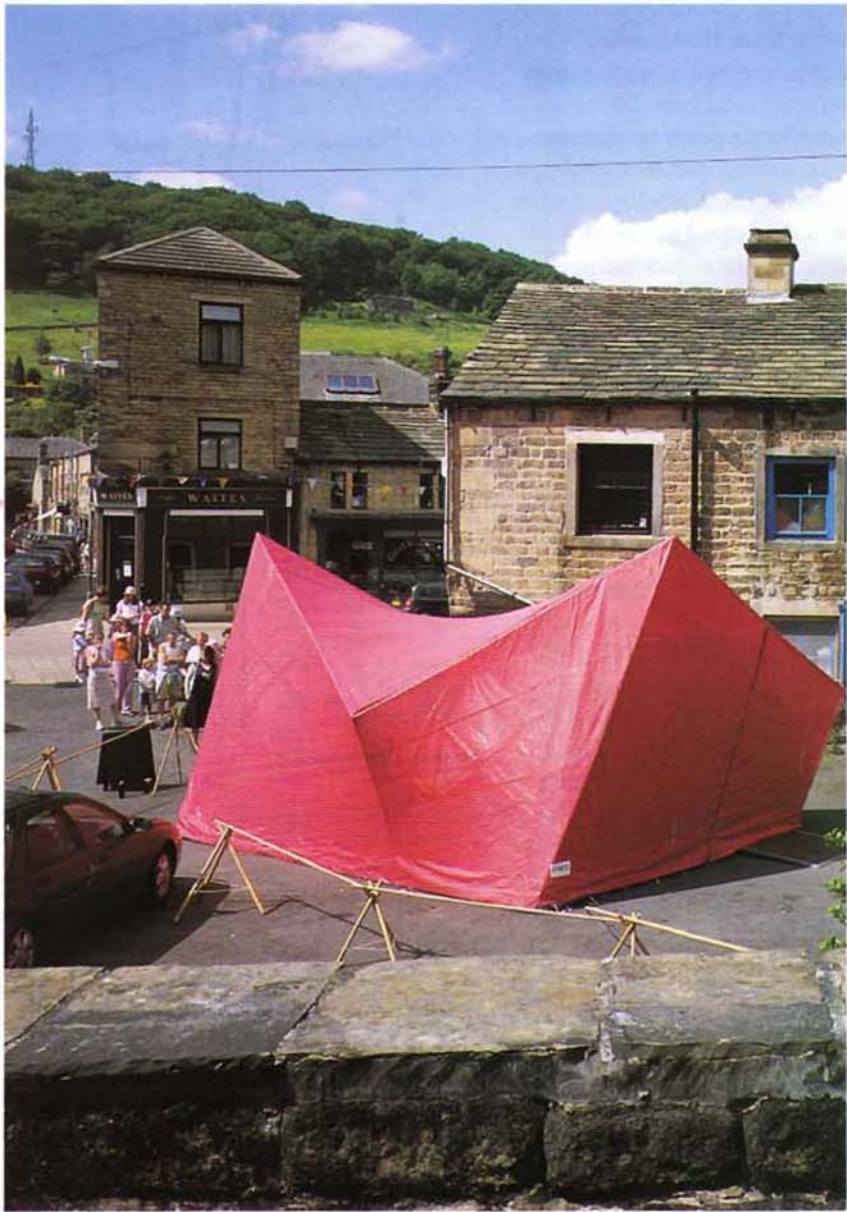
4 & 5. The outer layer of fabric, red PVC-coated polyester sheet, is pulled over the rectangular frames. The frames are then raised to their final position and the fabric is secured at the base. The ply floor panels can now be installed

6. The inner layer of fabric is fixed to a secondary, inner framework of curved aluminium tubes

7. In 90 minutes the pPOD is installed and ready for customers



6.



7.

WORKING DETAILS / HORSE + BAMBOO THEATRE

A TENT STRUCTURE FOR A MOBILE THEATRE

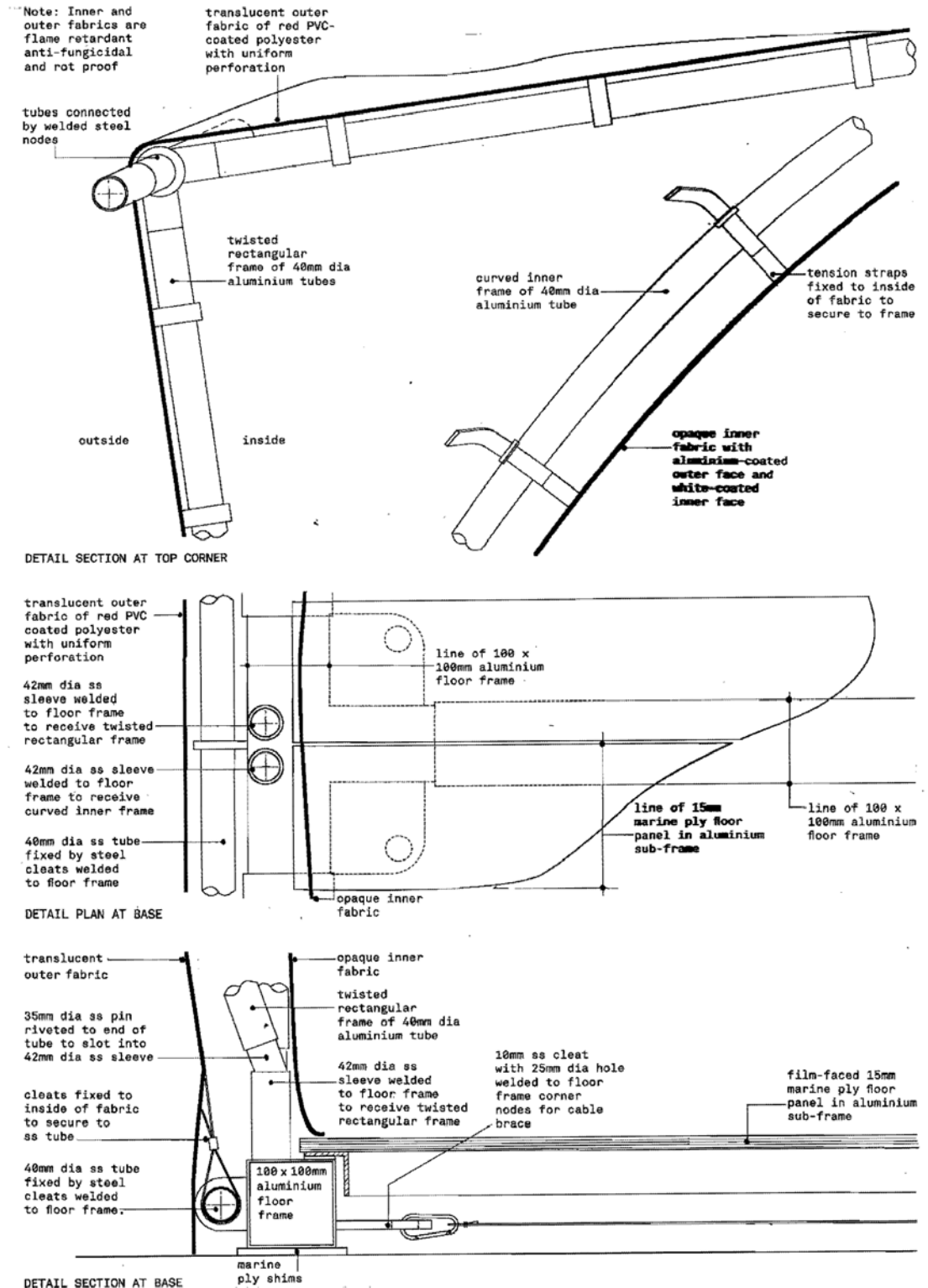
The pPOD mobile theatre has a floor frame of 100 x 100mm rectangular hollow aluminium sections fitted together and set to correct positions with bracing cables. Plywood floor panels fit onto the frame. Six twisted rectangular frames of 40mm-diameter aluminium tubes form the structure. They are connected at node points by solid steel bars. Because each node point connection is at several different angles, a colour-coded labelling system was developed to ensure fast erection. To reduce complexity in welding and cutting, a solid steel ball was used at the centre of each node and tubes were simply cut at right angles.

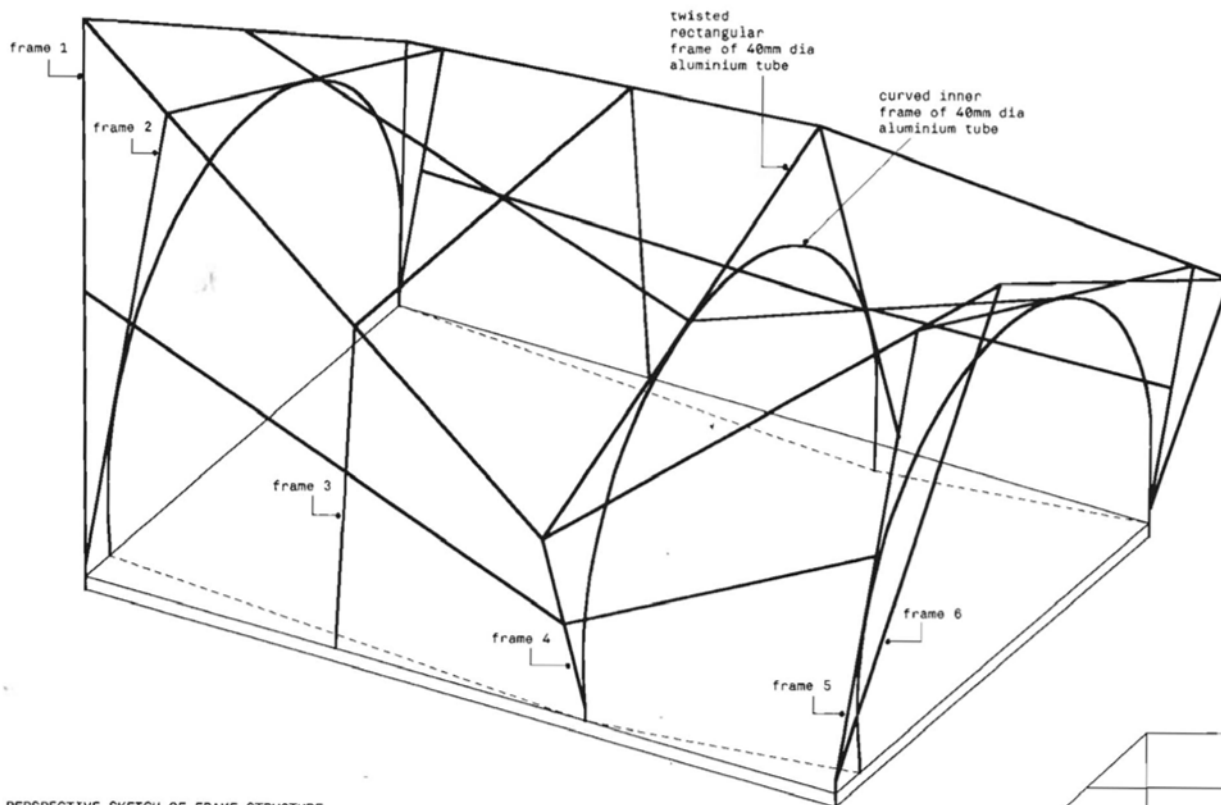
At its base each tube has a 35mm-diameter stainless steel pin riveted to it which slots into a 42mm-diameter steel sleeve welded to the top lip of the aluminium floor frame. The inner frames of 40mm-diameter curved aluminium tubes are fixed in a similar manner.

The outer fabric is pulled over the rectangular frames; cleats, running on the inside of the fabric at the base, are secured to an 40mm-diameter stainless steel tube fixed by steel cleats welded to the floor frame. The inner fabric is clipped with cleats to the curved inner frame.

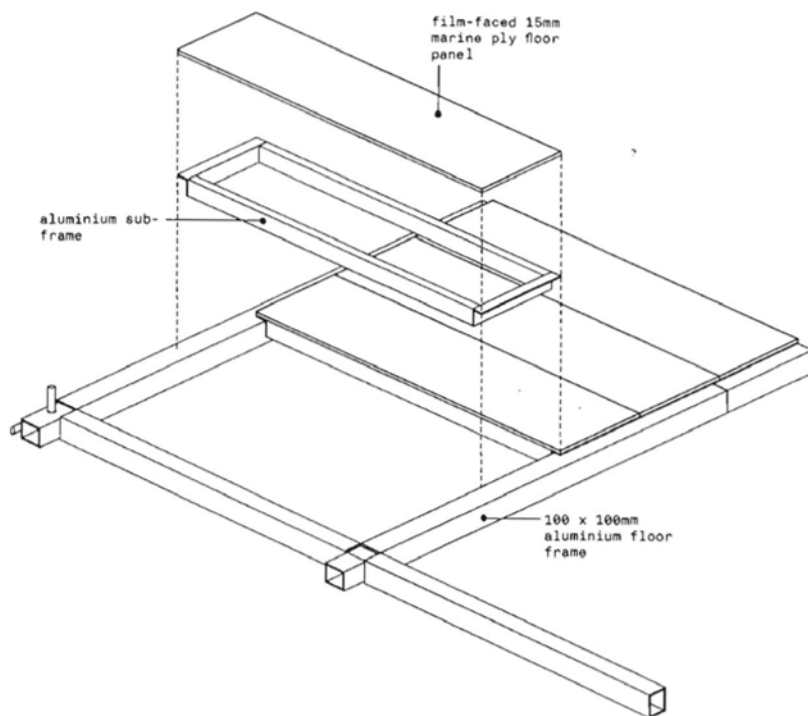
The pPOD is a light structure. When used outdoors it has to be anchored to the ground by ground anchors or counterweights connected to the perimeter of the aluminium floor frames.

Susan Dawson

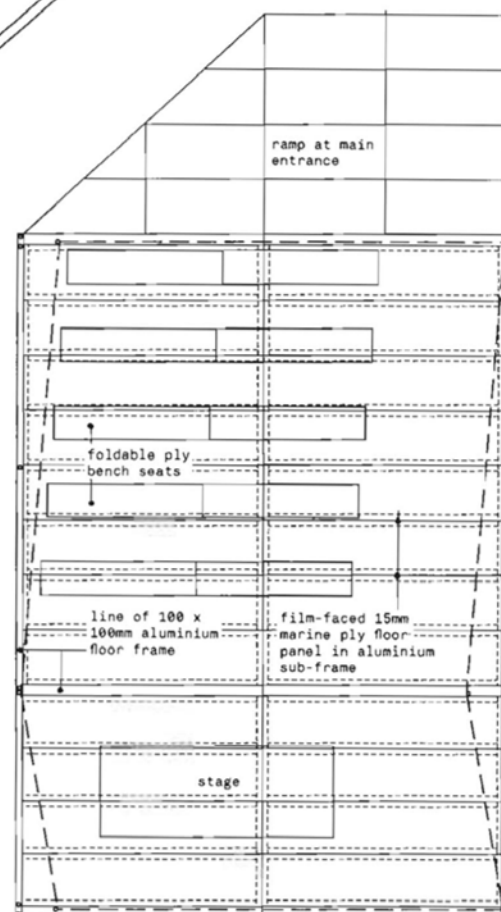




PERSPECTIVE SKETCH OF FRAME STRUCTURE



DETAIL OF FLOOR CONSTRUCTION



FLOOR PLAN