

Projects and installations



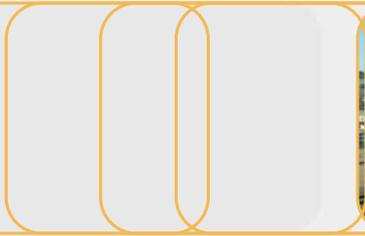
Introduction

Over the course of many years, Total Structures has been at the forefront of many cutting edge projects and installations. From the technically challenging to those whose sheer scale has been impressive and of course those projects that seem to have it all: The Nike pavilion at the Atlanta Olympics with its 15000 sq./ft cantilever built atop a parking garage. The beautiful star array at a desert casino, the custom stage roofs, or the 8000 sq./ft temporary restaurant assembled each year to house Vanity Fairs Oscar party. There have been Superbowls, Rock and Roll Shows, Theatre Houses, TV Shows, Bungie Jumps, Underwater Rigging, Triple decked exhibit booths. There have been Projects for Ford, GM, Nike, Disney, Fox, Universal, BBC, Budweiser, Anheuser Busch, Stanford

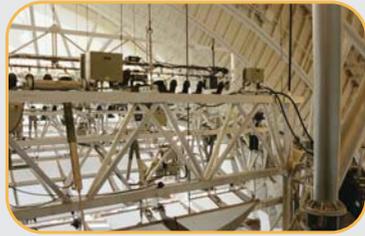
University, Texas State Fair, Madonna to name but a few. The following pages seek to give you a flavor of some of the more recent projects we have undertaken.

These projects have involved Total Structures from concept through design, engineering, manufacture to installation, but of course the most important project is the next one we do for you....

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Hollywood Bowl

The new acoustic canopy measures some 78 feet by 68 feet and is supported at a 10 degree angle below the main roof structure by inclined tubular steel struts. The principal components of the canopy are an elliptical perimeter ladder truss with integral catwalk, 4 cross stage triangular trusses which support 28 acoustic panels and 3 lighting battens.

The perimeter truss has curved 6" square aluminum chords with 3" diagonals and 6" x 3" vertical members onto which ribbed plates are bolted to form the supports for a continuous open grid aluminum catwalk. These ribs are formed from aluminum plate that were water jet cut to the correct profile to provide support for the curved fiber glass panels which cover the underside of the ellipse.

The side sections of the perimeter truss can be lowered to stage level to allow conventional lighting grids to be rigged from the points provided on the steel arch trusses of the main roof structure. In contrast, the front and rear sections are permanently fixed to the main roof structure with large tubular steel struts.

Four large triangular trusses span between elements of the perimeter truss and carry the main hinged acoustic panels. These panels are fabricated with aluminum ribs which support matte Makrolon panels on one side and can be deployed at various angles using remote controlled linear actuators. The trusses comprise 4" square aluminum chords with 2" square secondary members and the end sections are designed to hinge down, so that the truss better fits the profile of

the domed main roof structure when it is raised into its storage position.

Three ladder truss lighting battens span between sections of the perimeter truss. Again, the chords are 4" square aluminum with 2" diagonals with galvanized steel lighting bars supported from the bottom chord. The battens can also be raised above the perimeter ring truss and stored high into the main roof structure.

The interaction of the main roof structure and the acoustic canopy presented a number of interesting structural engineering problems particularly when seismic and wind forces were considered.



Ford Motor Company NAIAS 2006

The brief for the project was to create a "Corporate Box" that would house all the Ford brands (Ford, Lincoln, Mercury, Mazda, Volvo, Jaguar, Land Rover, Aston Martin) in an enclosed space. The "Box" description is literal as what was required was a ceiling and walls on three sides containing a space 460ft x 240ft (over 110,000 square ft) x 28ft high. The entire structure was then to be clad in fabric leaving only exposed lighting troughs that were required to be large enough to house all the fixtures and provide room for focusing. It was crucial to the design that no part of any lighting fixture was hanging below the ceiling surface.

The truss was designed large enough so that it could house 4 individual adjustable light bars to allow any fixture (including automated fixtures) to be mounted in its optimal position in the truss, and also to be pre-rigged. A further consideration was that the bottom face of the truss was to be free of members so that they did not interfere with focusing and positioning of

the lamps, and also so that there was no visible structure from the ground. The careful location of internal bracing allowed this to happen.

The grid was then made up from 24 rows x 240ft long cross stage trusses on 20ft centers with a perimeter truss and additional spreader trusses at the ¼ span points. Many of the building columns and the support structure for the city's people mover train had to be incorporated into the space, and where these interfered with the grid, custom truss elements had to be made to accommodate them and provide a structure that the ceiling fabric could be attached to.

In addition, a 40ft diameter circle (known as the "Ford Halo") was also included as part of the structure over the Ford brand area and a 6ft pelmet was required to finish the ceiling at the open front entrance of the exhibit.

In addition to the ceiling grid, a structural wall system was developed to construct the 460ft walls required along each side. This had to carry its own self weight, the tension of the fabrics attached to it, a plywood skin on each side behind the fabric (to stop anyone falling through the wall) and also to carry wooden dowel panels around the access openings which were part of the finished dressing. Total Structures developed a new system of horizontal and vertical ladders on approx 10ft centers that formed the thickness of the wall, and into which could be accommodated the 4 traffic and exit points along each side.

It is believed that the entire rig is probably the largest "Temporary Lighting Grid" ever assembled as a single structure and required 216 motor points to lift it.

Some stats....

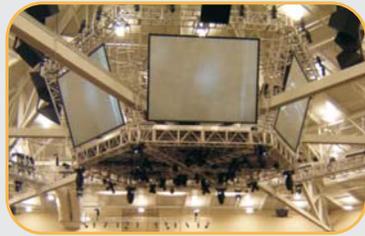
Approx 2.5KM of truss was used

Around 5 million individual weld points

Approx 55 tons of Aluminum

50000sq ft of painted area (Truss and wall metalwork only)

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New Life Church

To provide "the ultimate solution for lighting, sound and video" for their church in Colorado Springs, New Life Church commissioned Barbizon.

For the structure that would compliment this "Church in the round", Barbizon turned to Total Structures with whom they had a long standing relationship, cemented since commissioning their award-winning LDI booth in 2000.

The solution was a 120' span hexagonal catwalk connected to a central cluster of 6 x 14' by 10 1/2' rear projection screens that housed the rear projectors and provided the mainstage lighting position, suspended 25 feet in the air. The hexagonal catwalk, 50 feet on each side, provided additional lighting positions with 4 x 2" integral lampbars providing hanging points for lighting and other equipment, non-slip steel decking for high resistance to wear and integral kick rails.

