

HSS: DESIGNS FOR THE 21st CENTURY



Los Angeles Convention Center Addition, Los Angeles, California

THE GREAT SPACE ADVENTURE



LOTS OF UNOBSTRUCTED SPACE A 'MUST' IN DESIGN OF EXPANSION

When you set out to make one of the country's largest exhibit centers even larger, you have one prime consideration: space...lots of open, high-ceiling, unobstructed space.

That was the challenge faced by Gruen Associates/Pei Cobb Freed & Partners in designing a 325,000-square-foot addition to the Los Angeles Convention Center, which makes it the largest such facility on the west coast.

The expanded center serves as a striking visual

entry to Los Angeles' downtown. The city's skyscrapers, palms, freeways and mountains serve as pieces of urban art as convention visitors view them through the center's glass walls.

Strength of HSS Supports Hall's High, Vaulted Ceiling

According to Elliot Barker, one of the project's architects, "We needed a huge space because, let's face it, some of the things people bring to exhibits are huge themselves. To create this kind of column-free space," he adds, "you need a great, vaulting ceiling. And the best way to span the large distances beneath that ceiling is by building it of trusses made of steel Hollow Structural Sections (HSS). HSS is incredibly strong, it's lightweight and it gives you tremendous design flexibility."

The result is truly huge! The center's new South Exhibit Hall



covers nearly 221,000 square feet and features a 960'-long by 230'-wide by 40'-high column-free expanse. It was a complex engineering assignment--and made more so by the need to build everything to Seismic Zone IV requirements.

HSS: 'You Can Pretty Much Do What You Like!'

According to James Freed, Design Architect, the use of steel HSS gave the builders great flexibility. "With HSS, you can fabricate all kinds of complex structures and



shapes easily. It lets you create odd angles and continuous connections that you just can't make with other kinds of structurals. All you need are some bolts, some gussets and a welding machine, and you can do pretty much anything you like!"



The design shows Freed is true to that vision, because the uninterrupted open space is created by the use of "star" columns placed on 240' centers. The columns consist of four 14"-wide flange sections, welded together around a central 16"-square HSS section. Each star column supports a pair of

20'-deep trusses and a second pair of 20'-deep secondary trusses.

3-D Space Frames Brace Entry Pavilions

Elsewhere in the addition, the entry pavilions feature an exposed-HSS grid supporting huge expanses of glass. The pavilion structures were built of welded sections of HSS that form a three-dimensional space frame designed to withstand the lateral forces caused by wind and seismic activity. The entry pavilions are 160' high, as high as a ten-story building.

The space frame sections consist of 12"-diameter sections of round HSS--with wall thickness varying from 7/8" to 3"--that create a completely unique design. In some instances, as many as 14 sections emanate from a single node, and in several locations where long spans were required, double



sections are connected with perpendicular tubular spacers; these structures act like trusses.

Taken as a whole, the Los Angeles Convention Center addition is a striking amalgam, born of glass, steel and other materials, as well as innovative design and the use of leading-edge computer technology.

It's an appropriate symbol for a new age, yet its very existence is made possible by the strength and versatility of one of the most ancient building shapes: the column. And in this application, that shape has found a 21st Century expression in the form of steel HSS.

Principal participants in the convention center project, in addition to

the architect, included John A. Martin & Associates, Inc., Structural Engineer; The Tanzmann Associates, Edward C. Barker Associates, Escudero, Fribourg Associates and Stuart Ahn & Associates, Associated Architects; and George Hyman Construction Co./M.A. Mortinson Co., General Contractor