Innovative Design and

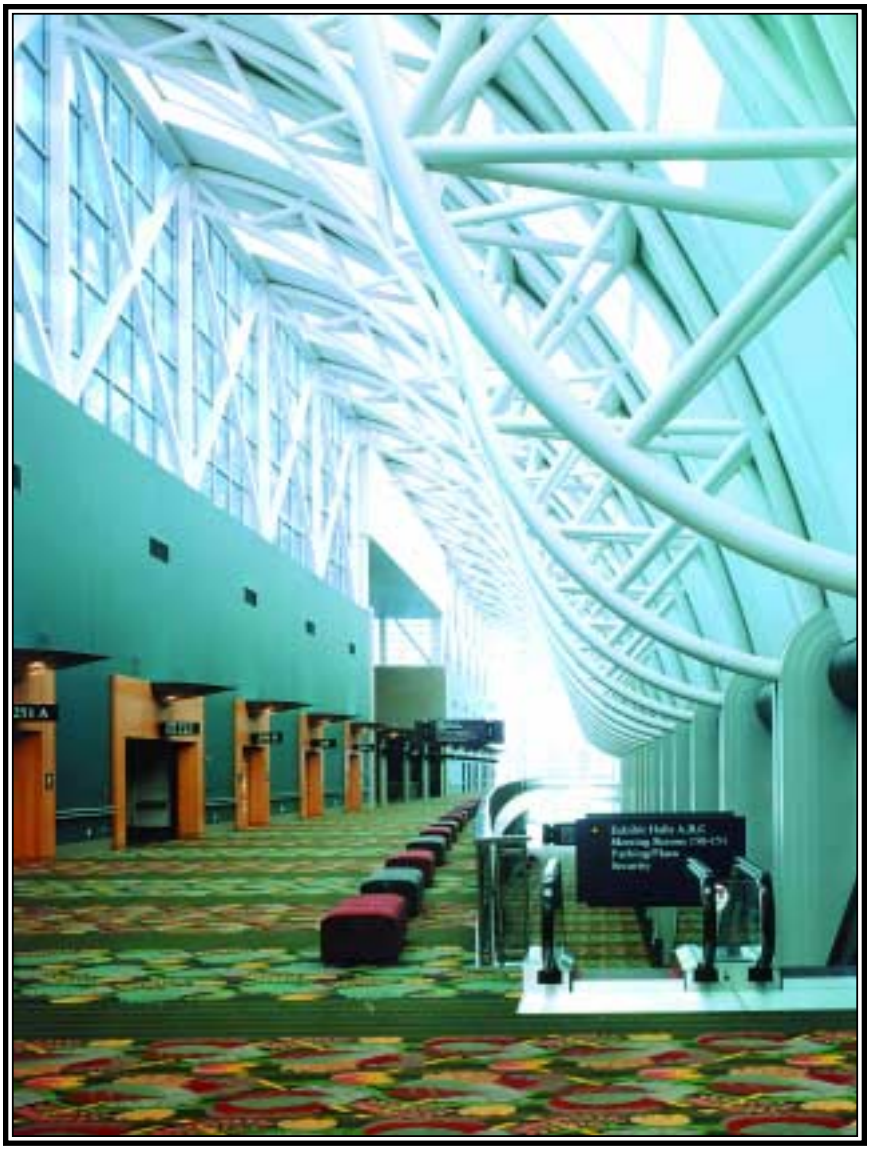
Excellence in Architecture with Steel

Regional Winner

Salt Palace Convention Center

While not previously well known as a convention center, the opening of the new Salt Palace should skyrocket the city to the forefront of many meeting planners minds. Located in a prominent downtown location across from the Mormon Temple and adjacent to the existing Arts Center, the dramatic new center features a 270'x450' exhibit hall, 36,000-sq.-ft. ballroom, and 54,000-sq.-ft. of meeting rooms.

The 110'-high entry tower clearly designates the new convention center's main entrance.



The main concourse features "banana" trusses on one side and "snowflake" X-bracing on the other.

Project Team

Project: Salt Palace Convention Center

Architect: Thompson, Ventulett, Stainback & Associates, Atlanta

Associate Architect: Gillies, Stransky, Brems, Smith Architects, Salt Lake City

Owner: Salt Lake County Commissioners Office

Structural Engineer: Reaveley Engineers & Associates, Inc., Salt Lake City

AISC Member Structural Steel Fabricator: SME Industries, Inc., Salt Lake City

General Contractor: Hughes Hunt, A Joint Venture, Phoenix

Though the functional elements of the Salt Palace are largely hidden behind windowless walls, the public areas are open and inviting-and truly visible. Indeed, the dramatic main entrance-a 110' high tower-is visible from miles around and serves as a beacon identifying the project to conventioneers in nearby hotels. "The tower is a symbol of the building," explained H. Preston Crum, AIA, senior principal with Thompson, Ventulett, Stainback & Associates, the project's Atlanta-based architects.

The initial design of the convention center did not feature the tower and instead had a horizontal entry largely integrated into the design of the neighboring Arts Center. "The client felt it wasn't dramatic enough, though," Crum said. The 48'-diameter tower features a series of exposed arching steel members that set the tone for the highly visible steelwork on the inside of the center. "We call it the 'gull' tower because the steel members are reminiscent of seagulls in flight," Crum explained. Seagulls are an important image for Salt Lake City and its large Mormon population. In addition, the top and bottom of the tower are designed in a stylized "beehive" motif to reflect Utah's state nickname.

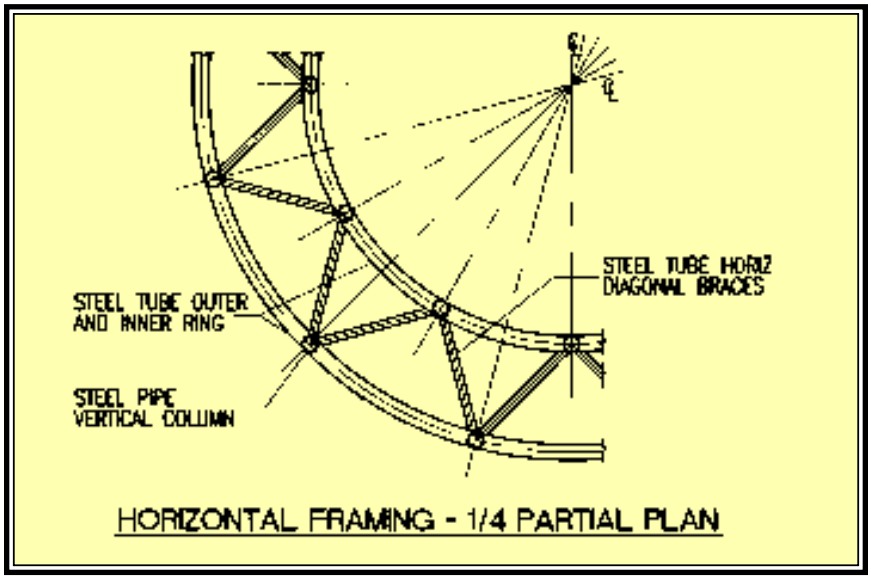
The use of exposed steel continues throughout the public circulation areas. Most dramatic is the use of "banana" trusses in the grand concourse to create an exciting and unfor-

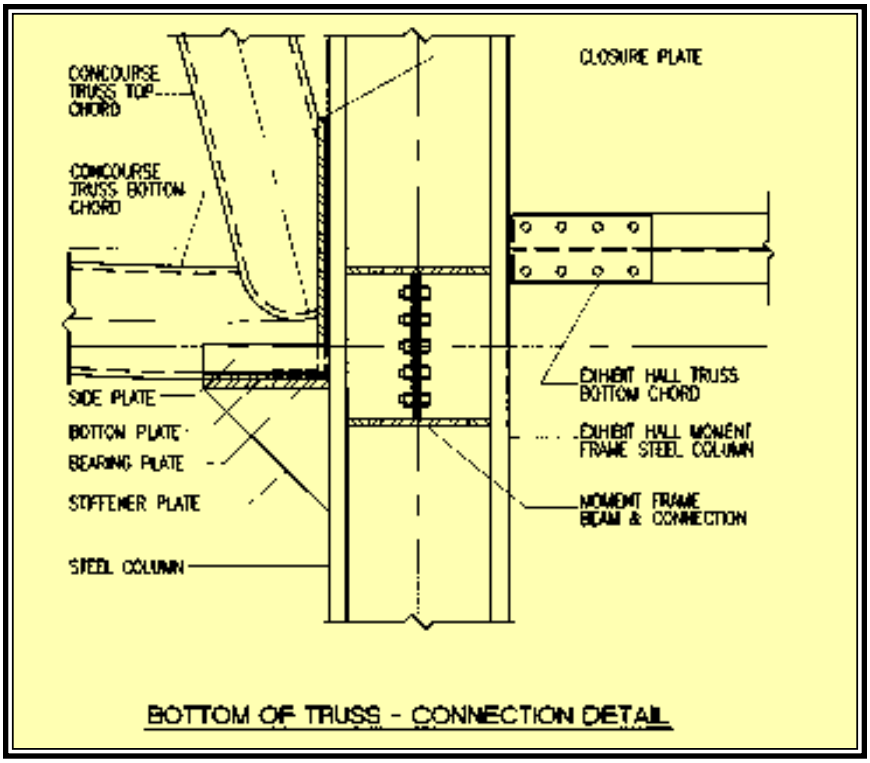
gettable 600'-long ceiling. "The nature of buildings such as this is that there is not a lot of windows in the functional areas," Crum said. "We wanted to flood the circulation areas with natural light and we wanted to take advantage of the light on the exposed structural members." The 70'-long, 13-ton steel pipe trusses have an S-shaped bottom chord that narrows as it rises, explained Ronald J. Reaveley, P.E., president of Reaveley Engineers & Associates, Inc. While not the most efficient structural shape, its design instead reflects its architectural purpose. "Architecture is about the play of light on form, so we wanted to provide some interesting form," Crum stated.

Similarly, the main lobby features large tree columns, also made up of round hollow structural sections, that emphasizes the height and drama of the space. "The lobby is flooded with natural light to emphasize the soaring quality of the space," Crum explained.

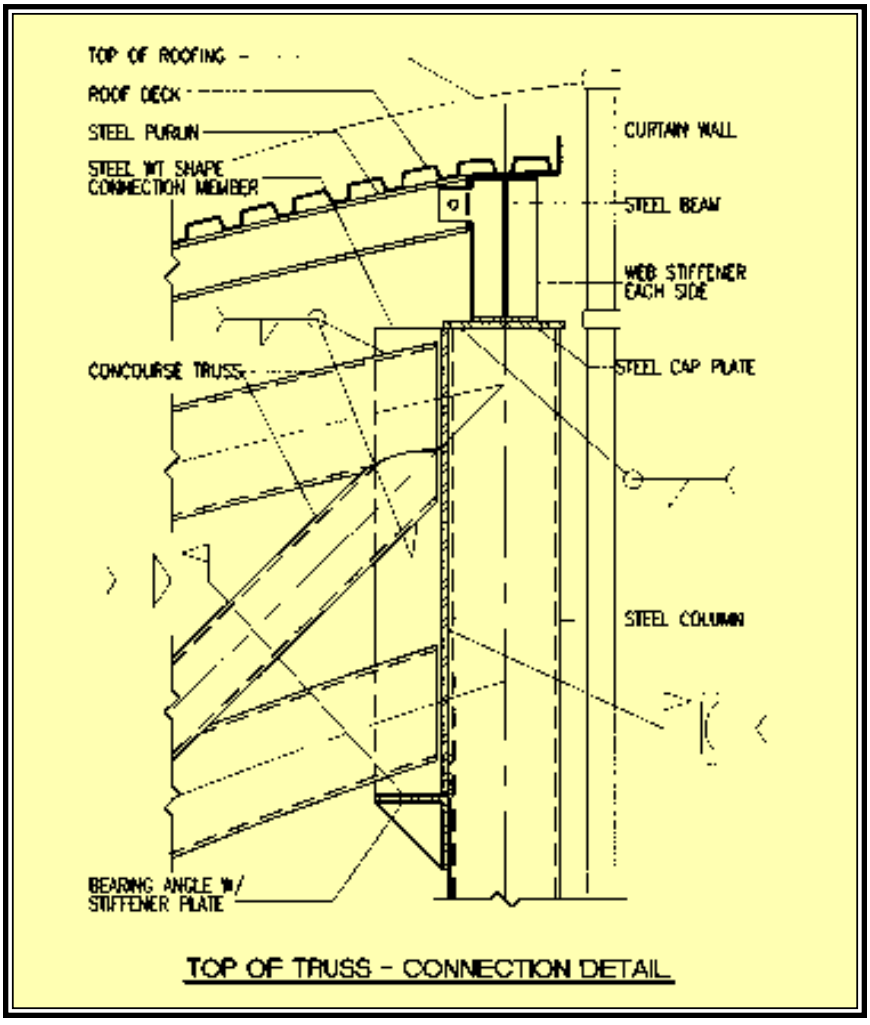
While the dramatic steel members make the space memorable, it also made the engineering more difficult. Complex 3D structural computer analysis was required to model and design the curving steel pipe frames and trusses, Reaveley explained. These steel frames and trusses must support snow and wind loads required for the Salt Lake Valley as well as UBC Seismic Zone 3 lateral loads.

The tree columns create an interesting interplay between light and form. Also, note the "snowfllake" design on the doors, which is similar to the design created by the bracing on the window walls.





BOTTOM OF TRUSS - CONNECTION DETAIL



TOP OF TRUSS - CONNECTION DETAIL

Visual imagery abounds. For example, X-bracing carefully detailed into a "snowflake" design interrupts the large expanses of glass. That same image is picked up throughout the center in such areas as doors, ballroom walls and air conditioning vents.

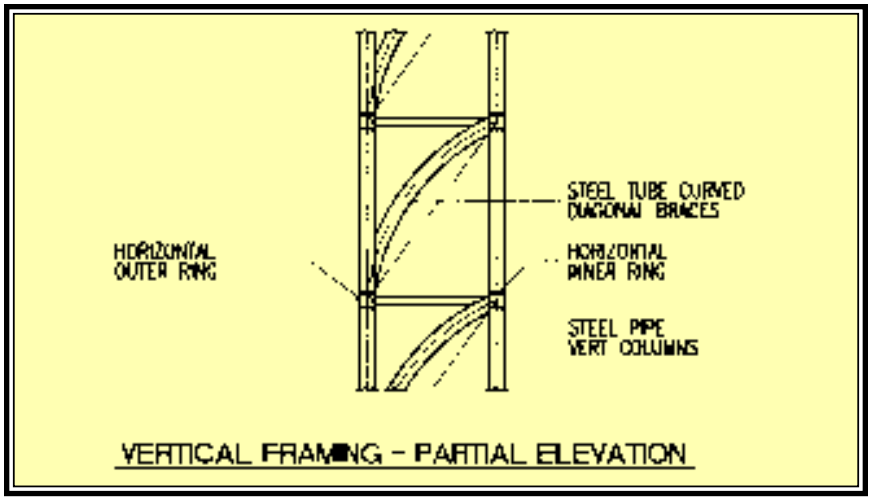
Juror's Comments:

A celebration of steel to create both form and space. Highly imaginative use of structural steel as both functional support as well as intricate decoration. It's exciting and graceful with many ideas to hold your attention.

The Exhibit Hall presented its own set of unique challenges. Provisions for future expansion of the 120,000-sq.-ft. space to the south and west required that no restricting lateral force resisting elements such as shear walls or braced frames be located along these walls. Moment resisting steel frames utilizing jumbo-sized steel wide flange columns and long-span steel roof trusses were designed to meet these needs. The roof framing system utilized 270'-long continuous two-span steel trusses. Innovative design of the two-span continuous steel roof

trusses resulted in significantly shallower trusses and lighter weight truss members than would have been required with a traditional single span design. This design also incorporated extremely stringent deflection requirements to accommodate the operable partitioning wall system below. Significant reduction in structural steel weight and cost of the structural roof framing system was a direct benefit of this design approach.

The 36,000-sq.-ft. Grand Ballroom also was designed with a provision to expand to the south. The lateral force resisting structural system for this area is composed of both structural steel vertical cross bracing and concrete/masonry shear walls. The temporary south shear wall consists of reinforced masonry spanning horizontally between columns to resist the lateral wind and seismic loads applied to this 50'-high wall. When the future ballroom expansion occurs, this masonry shear wall will be totally removed and the lateral capacity of this element will be moved to the new south wall location. The Grand Ballroom has movable partitions that allow for multiple smaller groups to utilize the subdivided space simultaneously. The 186'-long steel trusses were designed to deflect less than 4" (L/744) due to full roof snow loading so that the movable partition walls will operate properly.



The transition connecting the new Salt Palace facility with the architecturally significant Abravanel (Symphony) Hall/Arts Center along the front façade presented many complex conditions. A new large masonry colonnade now straddles the main entrance of the existing Arts Center, providing a sympathetic tie between the existing and new facilities. This connecting element gives the appearance of a masonry structure but is in fact a steel truss/column frame wrapped with masonry veneer.

The meeting room floors offer 54,000-sq.-ft. of space, which can be divided into as many as 53 areas for groups ranging up to 1,800 persons. Proprietary structural floor vibration analysis techniques developed by Reaveley Engineers and Associates on earlier scientific research laboratory projects

The steel members in the entry tower are designed to give the impression of sea gulls in fllight.

were used to design the suspended meeting room floors. Vibration performance criteria was discussed with the owner and other design team members and then used to size the meeting room floor framing members to provide the desired vibration performance properties. No human perception of floor vibration has been reported to date, which is unusual in long-span suspended convention center meeting rooms.

After opening in February 1996, the Salt Palace Convention Center booked more than $104 million of convention business in 1996 alone. The tourism income generated by the influx of additional tourist guests is a major economic benefit for the Salt Lake Valley and the State of Utah.