

Merit Award—Under \$15M

MUSEUM OF FLIGHT, T. EVANS WYCKOFF MEMORIAL BRIDGE—SEATTLE



photos by Lara Swimmer Photography



“A progressive, **innovative** connector to the local heritage.”  
—Mike Moravek

The Museum of Flight in Seattle is one of the largest air and space museums in the world, attracting nearly 500,000 visitors each year. A recent addition to the museum—a symbolic 340-ft pedestrian bridge—helps to better circulate these visitors and also provides an eye-catching icon to the industrial area where the museum is located.

A conventional, utilitarian public works bridge would have been possible but inadequate to convey the spirit of the museum and the area’s aviation history. Instead, the design of the bridge is inspired from the metaphor of the contrail, a stream of crystallized vapor created in a plane’s wake. The metaphor is carried out in the bridge’s unusual tube truss design, made of crossing circular steel pipe sections surrounding an inner glass enclosure and culminating in what juror Mike Moravek deemed “a progressive, innovative connector to the local heritage.”

The unique structure of the bridge evolved from the design collaboration between SRG Partnership (architect), MKA (structural engineer), and Jesse Engineering (steel fabricator). The design team conceived a structural design that did not rely on conventional truss webs, but instead distributed

the vertical shear in the bridge structure through a matrix of curving steel pipes. This exciting and dynamic form had the potential to be overly complex and unachievable within the project budget. However, using standard steel member sizes, constant radius pipe bends, and predetermined “fish-mouth” end cuts, the complex design was fabricated economically.

The main truss, 200 ft long, is made of a series of crossing 5-in.-diameter pipe hoops tilted at 45°. The elliptical cross section swells slightly in the center, narrowing at its ends to heighten the sense of movement. Lightweight materials and a composition of transparent, translucent, and metallic surfaces soften the reflected light, at times appearing to dissolve against the sky.

Using a steel truss allowed the structural depth to surround the partially enclosed interior space and more successfully reference the language of the existing museum architecture. The bridge uses approximately 10,000 linear ft of steel pipe at a total steel weight of 190 tons. The contrail configuration used approximately 151 pieces of tube rolled to different radii, as the bridge was wider at the middle

than the ends (all the pipes were rolled at a constant radius but as the width changes, so does the radius.). Shorter pieces needed to be cut to fit between the full hoops to make the truss that surrounded the main chords, which were made of 10-in.-diameter pipe; the pipes for the chords were purchased in 60-ft lengths, then spliced together.

For more on this project, see “Taking Flight” in the December 2008 issue of MSC, available in the Archives section at [www.modernsteel.com](http://www.modernsteel.com).

**Owner**

Museum of Flight, Seattle

**Architect**

SRG Partnership Inc., Seattle

**Structural Engineer**

Magnusson Klemencic Associates, Seattle

**Steel Fabricator**

Jesse Engineering Co., Tacoma, Wash. (AISC/NSBA Member)

**Steel Detailer**

MKE Detailing, Inc., Seattle (AISC/NISD Member)

**General Contractor**

Sellen Construction Co., Seattle