



# Up and Away

By Beth S. Pollak



© Paul Warchol

This private club for jet owners in Scottsdale, AZ features 200'-long plate girders, 80' steel cantilevers, and a 120' steel-framed paper airplane.

**T**he Airmore Hangar One project in Scottsdale, AZ is a custom, private club for jet owners. Two 30,000 sq.-ft hangars accommodate up to 15 personal and corporate aircraft. A fully integrated 68,500 sq.-ft multi-purpose space includes below-grade parking, pilot and staff offices, aircraft maintenance facilities, a gallery, a garage for the display of vintage cars, and space for everything from small parties to large gatherings. A signature feature of the building is a steel-framed, aluminum-clad, 120'-long "paper airplane" on the roof of the structure.

Steel was chosen for its long-span capabilities and its light weight compared to concrete. The project was managed through a "design-assist" process, with the fabricator providing important input to the designers through all phases of the project.

"This was a unique and challenging structure. The constructability was reviewed with a fine-tooth comb," said Joe Uribe, project manager for AISC-member fabricator Schuff Steel Company. "When awarded a project, we always review the details and offer suggestions that could save the owner money."

Schuff works with Paul Koehler Engineers on many projects, which has opened the lines of communications between the two companies. "We both are open to sitting down together to discuss any detail that might be in question," he said. "We talk about it and figure out the most user-friendly details and connections, with the owner's pocket book as the main focus."

The construction process was tricky, since the hangars were built on a tight 5-acre site. "There were existing hangars on either side of the project, an active run-



© Werner Sagarra

way on the third side, and a roadway on the fourth side," said Jeff Esgar, project superintendent for Sunt Construction. "So there were space constraints on material delivery. We tried to schedule delivery so that once materials arrived, they were put in place right away."

One hangar is smaller than the other, with W40×372 columns and 160' plate girders. The larger hangar consists of W40×372s with 200' plate girders. The hangar roof spans feature 4'-deep plate girders spaced at 20' o.c. and supporting steel joists and metal deck. All of the long-span plate girders were fabricated in two halves and field-spliced prior to erection.

The lateral-force-resisting system consists of a combination of braced frames, moment frames, and concrete shear walls. The braced frames consist of W40×372

columns and W24×55 beams. Diagonal braces are HSS 10×10×<sup>3</sup>/<sub>8</sub>. Office floors and mechanical mezzanines are framed with composite beams and metal deck.

On the exterior, curved, steel canopies feature 80' tapered cantilevers. The cantilevers, framed with exposed HSS, are anchored back into the main roof plate girders for stiffness. The canopies were fabricated from 16×12×<sup>1</sup>/<sub>2</sub> HSS rolled the hard way, and columns and braces fabricated from HSS 20×20×<sup>1</sup>/<sub>2</sub>. The canopies are draped in a fabric material to create shade. The uplift forces on the cantilevers are significant, requiring oversized footings to counteract the forces.

The project was a national award winner in the \$10 million or greater but less than \$25 million category of the 2004 IDEAS awards. ★

### **Owner/Developer**

Bennett Dorrance, Scottsdale, AZ

### **Architect**

Vernon D. Swaback, FAIA, Swaback Partners, Scottsdale, AZ

### **Structural Engineer**

Paul Koehler Engineers, Scottsdale, AZ

### **Steel Fabricator/Erector**

Schuff Steel, Phoenix (AISC member)

### **Steel Detailer**

RMM Global, Akron, OH (AISC member)

### **General Contractor**

Sundt Construction, Inc., Tempe, AZ

### **Structural Engineering Software**

RISA-3D, RAM Structural System

### **Detailing Software**

SDS/2