

# DISNEY ICE

## THE WARMTH OF WOOD HEATS UP AN ANAHEIM ICE RINK

### Project Summary

#### PROJECT

Disney ICE

#### LOCATION

Anaheim, California

#### OWNER

Disney Development Company of  
Burbank, California

#### DESIGN ARCHITECT

Frank O. Gehry & Associates

#### EXECUTIVE ARCHITECT

Langdon Wilson Associates

#### CONTRACTOR

Matt Construction Corporation

#### STRUCTURAL ENGINEER

John A. Martin & Associates

#### ELECTRICAL ENGINEER

Kocher & Schirra

#### ROOF INSTALLATION

Western Wood Structures, Inc.

#### ROOF SIZE

88,000 square feet total;  
57,000 square feet of timber

#### COMPLETED

Fall, 1995

When Disney Development Company wanted to build an ice rink facility with a focus on aesthetics and a desire to maintain a budget, they built with engineered wood products. The result is a “visually exciting centerpoint to the downtown area” of Anaheim, California, according to Disney ICE’s design architect.

Disney ICE is a dual rink facility which supports neighborhood activities and skating, including the Disney GOALS youth hockey program. It is also the permanent practice and training facility for the Anaheim Mighty Ducks NHL hockey team. The center also hosts community and hockey events in a large plaza at the arena’s front entrance.

The ice center’s saddle-shaped, double-curved design was chosen to create a strong sculptural statement, said Tomaso Bradshaw, Project Architect for Disney ICE at Frank O. Gehry & Associates. From the exterior, the building exudes a cool mood.

The front plaza is asphalt painted with yellow, purple, and aqua stripes. The stripes lead to the entrance of the light grey, acid-washed aluminum building. But on the inside, the cool tones are replaced with the warmth of wood.

“The interior space is vaulted over each rink, defined by a series of massive glued-laminated timber beams, which follow the curving exterior profile,” said Bradshaw. “The sculptural quality of the interior and exterior forms create graceful shapes and lines similar to the movements of the skaters.

Bradshaw notes that “An exposed plywood ceiling contributes to the warm environment, recalling traditional wooden rinks.” The beams to which he refers are custom glulams, manufactured and trademarked under the provisions of Engineered Wood Systems, a related corporation of APA – *The Engineered Wood Association*. The APA-EWS trademark is

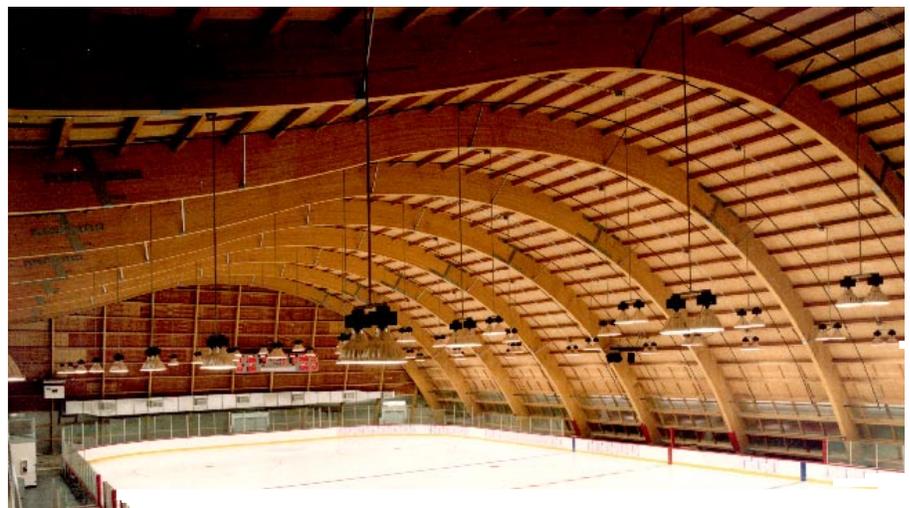


PHOTO COURTESY OF FRED STOCKER

*Glulam and plywood create a modern sculptural quality and recall traditional wooden ice rinks.*

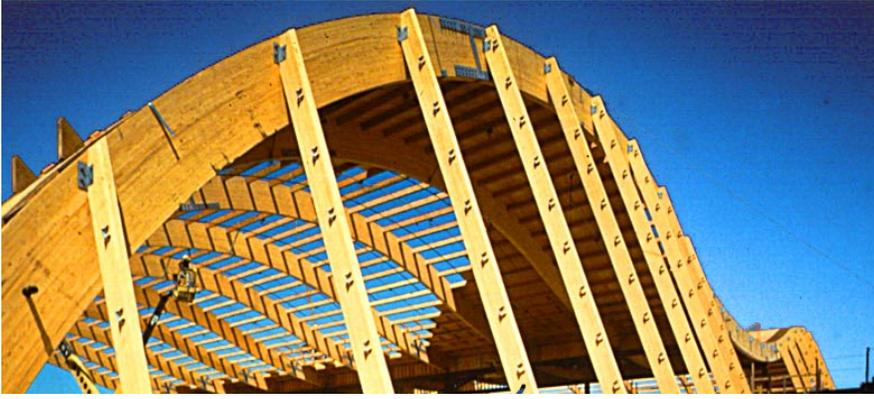


PHOTO COURTESY OF LORI J.P. STOCKER

Glulam arches were curved to a 75-foot radius to form the ice center's roof system.

used on approximately 70 percent of the glulam produced in North America.

Bradshaw describes that from the entry, a curving, skylit lobby leads to the NHL and Olympic-sized ice rinks. The lobby is the center of activity and contains a snack bar, ice skate rental counter, and a large equipment shop. On the second floor, a restaurant looks out over both rinks, providing a warm area to view skating. Bleachers provide event seating for approximately 800 spectators in the NHL rink and 200 in the Olympic rink. The second story is as transparent as possible to allow the two rink spaces to flow together.

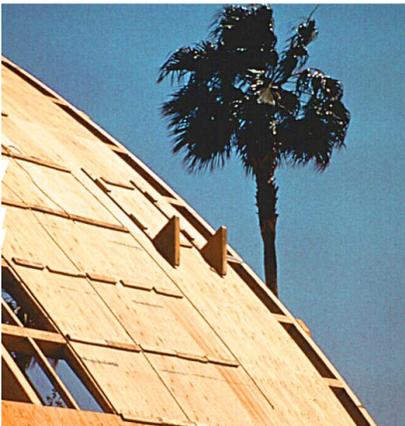


PHOTO COURTESY OF LORI J.P. STOCKER

Bending the plywood by hand over the curved glulam presented a challenge.

The project presented both architectural and construction challenges: How could the design and structural requirements be integrated and met within the budget? Initially, steel was chosen for the roof system. But the project team found it impossible to stay within the budget using steel, said Paul Matt, owner of the project's general contractor, Matt Construction Corporation.

The executive architect, Langdon Wilson Associates, considered replacing steel with wood. The team contacted Western Wood Structures, Inc. of Tualatin, Oregon, a member of the EWS Quality Plus Roof Erector program. Western Wood Structures recommended using glulams for the project, said President Steve Turner. The team learned they could maintain their budget and still meet city building codes by using glulams. So, Frank O. Gehry and Associates modified the drawings accordingly and contracted Western Wood Structures to erect the roof.

The roof system is a combination of southern yellow pine glulam girders and solid sawn Douglas-fir purlins spaced at 48" on center. Curved supporting columns are steel encased in concrete. The arched glulam girders are 8-3/4" x 50-7/8" in section, manufactured in accordance with EWS layout combination 24F-V5. The curved girders are spaced at 22 feet on center and span 116 feet. Moment splices were used to permit easy transportation from the manufacturer, EWS member Alamco Wood Products, at Albert Lea, Minn., to the jobsite. The entire ice center measures 197 feet x 288 feet and is about 88,000 square feet.

Matt Construction had worked with glulams before, but this was their first project using curved glulams. Matt said the glulams went together more quickly than expected. The builders from Western Wood Structures had worked with curved glulams before, and they finished erecting the roof within a day or two of their estimated completion date. In its entirety, the ice facility was constructed in ten months.

The roof sheathing is 1-1/8" tongue-and-groove APA trademarked plywood. Terry McKee, Vice-President of Field Services at Western Wood Structures, said that bending the thick 1-1/8" plywood over the glulam beams by hand was very challenging because the arches were curved to a 75-foot radius. Mendenhall said 1-1/8" plywood was used to satisfy Type III 1-hour construction requirements for this structure (which means the wood roof system meets the city code's fire rating) and to span 48 inches between purlins.

The finish roofing and exterior walls are clear anodized acid-washed aluminum panels, which help to create a strong sculptural form. The standing seam cladding reinforces the "curvilinear" shape of the rink shell.

The arena has generated national interest among architects and builders. Its modern, clean design is certain to remain a vibrant part of downtown Anaheim.

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