Keeping the Olympics on Schedule

By Brian Whelan

In anticipation of the 2002 Winter Games February 8 through 24, Salt Lake City, Utah erected buildings to host the various events. On every building, of course, is a roof—and that's how one roofing systems manufacturer became involved with the Olympics.

For the speed skating events, the city proposed to construct an Olympic Ice Oval, also known as Oquirrh (pronounced "okerr") Park, with a base of concrete that expands and contracts with perfect uniformity. To create the perfect base for the Olympic speed skaters, it was imperative that the concrete remain dry—which is why the roof of the Olympic Oval played an important role in the construction of the building.

Because the roof, which is constructed like a suspension bridge, can deflect up to 18 inches when the wind blows or when it's covered with snow, metal and built-up roofing systems were out of the question. Instead, a high-quality, single-ply roofing system would be needed.

The solution was to go with a mechanically-attached, polyester-reinforced thermoplastic membrane over two layers of isocyanurate insulation totaling three inches. Sarnafil S327 with Sarnatherm insulation was chosen. Sarnafil roofs had been performing successfully for years on many Utah buildings, including the Delta Center, Temple Square, Bountiful Regional Center, and Weber State University.

The deciding factor was the logos. Custom colors were required to create the Salt Lake City and Olympic logos on the Ice Oval roof. But the color of the roof was more than an aesthetic choice. For the Olympic Speed Skating Oval to be designated as a LEED-rated building by the U.S. Green Building Council, the roof would need to remain cool in hot weather. The LEED ("Leadership in Energy and Environmental Design") rating system evaluates environmental performance from a whole building perspective over a building's life cycle, providing a definitive standard for what constitutes a "green building."

In addition, the color of the roof had to be conducive to logos. For these reasons, the architect chose Sarnafil's EnergySmart® white roofing membrane. This roof meets the Environmental Protection Agency's ENERGY STAR® standard for roofing products and helped the Utah Olympic Oval become one of only 19 buildings worldwide with a LEED certification.

Layton Construction, Sandy, UT, the general contractor on the building project, brought in Clark's Quality Roofing, Salt Lake City, UT, to install the roofing system. The actual roofing began on April 1, 2000. The rush was on, as "They needed to have the building operational by a certain date in order to have test events," explained project manager Kevin Miller of the architectural firm Gillies Stransky Brems Smith. "An Olympic venue is required to have had a number of championship-level events in it prior to the Olympics to make sure the venue will function properly." This was another reason that a single-ply

system was chosen. "It's much faster to get on," says Miller. "A traditional built-up roof takes a long time to mop into place."

This was no typical roofing project for Clark's Quality Roofing. First of all, there was the issue of cables. The roof employs a suspension-bridge system that eliminates the need for pillars that might block spectators' views of the action. To get a watertight seal around a moving cable was going to be very difficult.

To overcome this obstacle, Sarnafil technical field representative Dave Conder, Mountain Region sales representative Darrin Curtis, and Gillies Stransky Brems Smith designed a steel plate that attached to the I-beam on which the metal deck was placed and that had attachments for the cables above the roof. A metal hood was then welded onto the plate about 18 inches above the roof deck, and the contractor installed a wood curb around the metal plate below the hood. The roofers were then able to wrap the membrane around the curb in a watertight fashion.

After fastening the two layers of insulation to the steel deck, the workers started laying out the roofing membrane. Because the project was fast-track construction, the roofing contractor started laying the roofing after only half of the deck was installed. "We started right behind the steel erectors and proceeded from the north to the south," recalls Carl Clark, owner of Clark's Quality Roofing.

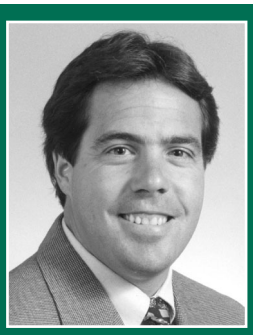
Then catastrophe struck. In late April of 2000, the final towers on the south end of the building collapsed due to faulty anchor bolts. The entire building was evacuated. The accident led to a four-month delay in the roofing project as workers reconstructed and reinforced the collapsed towers and replaced all the anchor bolts in the building.

The deadline for the entire project was now tighter than ever. Workers were ready to pour the concrete in one large sweep to result in one of the smoothest pieces of pavement in the world, suitable for world-class ice skating competition. They needed a roof without delay so that there would be no chance of moisture hitting the concrete. So triple crews of Clark's workers—up to 20 men at a time—put their noses to the grindstone 12 hours per day and got the second half of the roof done in half the time it took them to do the first part.

The end of the project brought additional challenges. Usually, membrane terminations are anchored to plywood or masonry. But in the Olympic Oval project, the towers were made of plate steel, with no way to attach the terminations. The roofing contractor had to come up with a plan that wouldn't void the 15-year warranty. The contractor ended up using a membrane-clad sheet metal, Sarnaclad, to form the flashings. "It's an integral part of the roofing," says Clark. "Years from now, you won't have a delamination problem." Because this solution makes the flashings an integral part of the roof, they are also covered by Sarnafil's warranty.

Clark's Quality Roofing put in more than 5,300 man-hours on the 205,000-square-foot project, including installation of the logos on the roof. The Salt Lake Organizing Committee and the membrane manufacturer worked together to match the membrane to colors of Salt Lake City and Olympic logos. In fact, Sarnafil's logo also appears on the roof. The graphics help further distinguish what will be a landmark building of the 2002 Winter Olympic Games. ■

About the Author



Brian Whelan

Brian Whelan has been employed by Sarnafil, Inc. for 20 years and is currently the Vice President of Sales and Marketing. He first spent six years as the technical director of Sarnafil, Inc., and five as General Manager of Sarnafil Services, the construction management division of Sarnafil, Inc. He has two patents pending on hot air welding of thermoplastic membranes and profiles. Prior to joining Sarnafil, Inc., Brian was a Project Manager for the consulting/engineering company of Simpson, Gumpertz & Heger. Whelan has a degree in Architectural Technology. He was one of the original members of SPRI (Single Ply Roofing Institute), and later became a member of the Board of Directors and chairman of the thermoplastic subcommittee. He is also a member of the RICOWI Board of Directors (Roofing Industry Committee on Wind Issues) and a member of both RCI and CSI. He has participated in many ASTM Committees on Roofing and Waterproofing. Whelan has written many published articles and technical pieces on roofing and waterproofing. Brian lives in Canton, Massachusetts with his wife Mary Kay and two daughters, Brianna (11 years old) and Michelle (9 years old). Brian enjoys sports of all kinds, especially skiing, golf, and baseball.

