

Fast track for glass at ground zero

Winter Garden reopens after 9/11 damage

the glass-enclosed Winter Garden at the World Financial Center, site of the first reconstruction near ground zero in New York City, reopened just after the one-year anniversary of 9/11. Politicians and the press gave lavish praise to this sign of rebirth.

The project's glazing contractor worked on an extremely fast track to make it happen. In the short span of nine months, W&W Glass Systems, Inc., mobilized its staff and suppliers to form a team that was able to:

- Re-glaze the 35,000-square-foot skylight with 1,300 new energy-efficient low-E glass units.
- Furnish and install the Pilkington Planar

structural glass facade and roof on the east side of the Winter Garden.

- Repair or replace 10 revolving door entrances.
 - Furnish and install 8,000 square feet of custom interior glass walls.
 - Provide stainless steel railings, metal louvers, and painted aluminum panels.
 - Install over 4,200 insulating glass units in Buildings A, B, and C of the World Financial Center.
 - Provide 20,000 square feet of painted aluminum framing for the Winter Garden roof.
 - Expend over 46,000 man hours in the effort.
- One of the biggest challenges was the aggres-



Portions of the glass-enclosed Winter Garden were destroyed in the 9/11 collapse of the World Trade Center. Just a year later, the renovated structure was finished. The new focal point of the facility is a dramatic \$3.5-million glass wall.

The interior vestibule consists of two glass walls, one on each side of the entrance area to guide visitors into the atrium. Pictured is one of the 15-foot walls, this one made of approximately 5,000 square feet of Lamberts Linit U-Profile tempered channel glass from Bendheim Wall Systems, Inc.



sive schedule, explains Jerry Haber, president of the Nanuet, NY, based company—New York City's largest subcontractor of its kind, with sales exceeding \$50 million, an office staff of 40, and a field crew of over 80.

The difficult and unique working conditions also presented a challenge. The job site was going through rapid transformation 24 hours a day, around the crew as it was working. Site conditions during the recovery and clean-up phases required an enormous amount of careful coordination to maintain the highest level of safety, which was a top priority.

A Cooperative Effort

Haber was called in for a meeting on the three buildings that make up the World Financial Center three days after the terrorist attack. Turner Construction Co., the construction supervisor, was satisfied with its work on those buildings, so the companies negotiated an agreement for the work on the Winter Garden.

Architect Cesar Pelli's design concept was to put the dramatic glass wall in the front of the structure. In three or four meetings between the various parties involved, the designers and contractors were able to come up with a design that was aesthetically pleasing and could be completed in the allotted time table. "The architect wanted to make a major statement and draw attention to the Winter Garden," Haber explains. Work began on the design near the end of January, and by the end of June, installation started. It was a two-month installation process.

"There was cooperation from every trade and union," Haber points out. "Everyone went out of their way to make this a smooth job so that it could be completed on schedule."

The suppliers played a pivotal role as well. Haber explains, "Every supplier we went to, when we told them what the project was, jumped through hoops to give us material in record time. It couldn't have been done without that cooperation. The spirit and willingness of everyone to help because of the special nature of this was inspiring." And he points out that it wasn't just the U.S. manufacturers; factories in the UK and Germany displayed the same sense of camaraderie.

"It was intense. It took 60- to 70-hour weeks for months. The pressure of that date made this unique," points out Jeff Haber, vice president of W&W. "Fortunately, it was a mild winter and the weather was cooperative so that we could meet the schedule. Turner was counting on us. It was very complicated, but we had a company-wide effort. It took much of our resources, and our other customers were as patient as you could expect to get this job done by 9/11," he says, indicating appreciation for their understanding.

"It was the same with the suppliers," he continues. "They had to bump customers, and I think the whole glass industry deserves credit for helping to make this happen." (As an example he mentions that Interpane and Viracon supplied 3,000 reflective glass units for Buildings A and C in four weeks.)

And happen it did, showing just what a cooperative effort can accomplish in construction. **S**

The project

The \$50-million reconstruction of the Winter Garden, which is a 10-story atrium, was truly a sign of rebirth in lower Manhattan where the World Trade Center collapsed following the terrorist attacks of 9/11/01. New York Governor George Pataki, New York City Mayor Michael Bloomberg, and other dignitaries were on hand to mark the construction milestone on the one-year anniversary.

At the opening ceremony, Mayor Bloomberg stated, "I salute the sheer determination of the many hundreds of people who united behind this effort. The ambitious goal of restoring this glorious public space only one year after it was nearly destroyed has been realized in spectacular fashion."

The project was a big challenge for W&W Glass Systems, Inc. It participated in an accelerated design/build process with architects Cesar Pelli and Associates/Adamson Associates Architects and Turner Construction Co. to create the new Pilkington Planar structural glass curtainwall/entrance for the east-facing façade, along with similar custom interior glass walls. The 110-foot wide, 60-foot tall sheer wall of transparent glass is the focal point of the new structure.

The interior vestibule consists of two glass walls, one on each side of the entrance area to guide visitors into the atrium. Both are 15-feet high. The glass wall, supplied by Oldcastle Glass Perrysburg, is a cantilevered glass fin entrance wall. The other consists of approximately 5,000 square feet of Lamberts Linit U-Profile tempered channel glass from Bendheim Wall Systems, Inc.

The glass lites in the Pilkington Planar glass wall are 12 mm low-iron Opti-White, 16 mm airspace, over 6 mm Pilkington low-emissivity K glass.

The sloped glass roof of the entrance wall is made up of IG units with a 12 mm clear tempered glass on the outboard, a 16 mm airspace, and a laminated unit made of 6 mm tempered K glass, 2 mm liquid resin, and a 6 mm heat-strengthened clear lite. All of the glass has been 100 percent heat soaked.

Artek supplied the railings for the second floor of the entrance area.

The glass for the skylight in the Winter Garden is made of IG units supplied by Viracon. They have a 1 3/16-inch overall thickness. The outer lite is 1/4-inch tempered glass with VE1-2m coating; there is a 1/2-inch airspace; the inner lite is 7/16-inch laminated with two 3/16-inch clear heat-strengthened lites and a .060 PVB interlayer.

Winter Garden

Site: New York, New York

Facade Glass: Pilkington

Interior Glass: Oldcastle Glass Perrysburg, Bendheim (Lamberts Linit U-Profile Glass)

Skylight Glass: Viracon

IG Units for Buildings A,B, and C: Viracon and Interpane

Aluminum Framing for Skylight: Super Sky Products, Inc.

Revolving Doors: Crane Revolving Door, Dorma Group North America

Railings: Artek, W&W Glass Systems, Inc.

Louvers: Construction Specialties, Airflex Corp.

Aluminum Panels: Intra-Developmental Associates (IDA)

Ornamental Entrance Portal and Canopy: Coordinated Metals, Inc.