

Case Study:

## Clear views of Manhattan from new Rockefeller Center viewing platform

Seventy stories above Manhattan, an observation deck at the Rockefeller Center offers a thrilling and panoramic view of New York City.

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*To meet wind loads and weathering requirements, the glass construction consists of two layers of 15 mm (19/32 in.) low-iron laminated tempered glass with a 2.28 mm (90 mil) SentryGlas® interlayer.*

Large, freestanding balustrades of laminated glass containing SentryGlas® ionoplast interlayer key to the success of the newly-reopened "Top of the Rock" viewing platform at the Rockefeller Center in New York City. As one visitor said: "You feel absolutely safe, yet on a clear day you can see forever!"

On 1st November 2005, the renovated and much-anticipated 'Top of the Rock' observation deck at the top of New York City's famous Rockefeller Center re-opened to the public. The centerpiece of the project lies with the reopening of an extraordinary city observatory, some 260 m (853 ft) above the sidewalk of 30, Rockefeller Plaza, on the 67th-70th floors of the building. The observation deck was first opened in 1933 but had been closed to the public since the 1980s. It has now been fully revitalized using 465 m<sup>2</sup> (5,000 ft<sup>2</sup>) of large, freestanding panels or balustrades of laminated glass containing SentryGlas® ionoplast interlayer that specialists say are at least 20 percent thinner than any other glass construction tested. Thomas Furman, project manager with SLCE Architects of New York City said: "The objective in using these unique and very large laminated glass balustrades was to provide a safe and secure viewing

experience for all visitors to the observation deck and the Rockefeller Center, while maintaining the thrilling experience and expansive, 360-degree views afforded from this unique and historic viewing platform, located 70 stories above Manhattan.

"The laminated glass installation consists of freestanding panels, cantilevered vertically up to three meters (10 feet) tall, with all supports and connections hidden below the walking surface of the roof. There are no clips or connections between the panels except at the corners. This allows the laminated safety glass assembly to be a perfect backdrop or frame for the views, as opposed to an obstacle.

"The decision to use laminated glass with SentryGlas® came out of discussions with glazing contractor W&W Glass, LLC of Nanuet (NY), and exterior wall consultant Israel Berger & Associates of New York. They advised us that the use of SentryGlas® would solve many important challenges regarding the structural complexity of the laminated glass panels, our desire for absolute clarity of vision and the need for minimal reflectivity.

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### Lighter façade panels enable more subtle supporting structures

For decades, interlayers made of polyvinyl butyral (PVB) have been the industry standard when producing laminated safety glass. Architects are well aware of the possibilities and limitations of such glass when used extensively in façade engineering, for roofing and window panels. In contrast, SentryGlas® enables an entirely new approach because the interlayer is over 100 times stiffer and five times stronger than PVB. As a consequence, there is an

almost perfect transmission of load between two laminated sheets of glass, even at high temperatures, leading to the excellent flexural behavior of the glass when under load - also under direct sunlight in high summer. Accordingly, laminates with SentryGlas® show less than half the rate of deflection when compared to laminates with PVB, when under the same load, and thus almost the same behavior as monolithic glass of the same thickness.

Also, as the exposed, polished glass edges would be visible, the ability to maintain a clean and weatherproof edge to the glass was very important." The Dlubak Corporation of Blairsville (PA) did all the specialty glass fabrication and lamination for this project.

Scott Haber, managing partner in W&W Glass told Laminated Glass News: "As well as viewing clarity and visitor safety we had to satisfy the city building codes that require the glass construction to be able to withstand substantial wind load requirements of 45 psf or 140 mph at the corners, at the 70th floor of a building in downtown Manhattan. In addition, the glass construction, consisting of two layers of 15 mm (<sup>19</sup>/<sub>32</sub> in.) low-iron laminated tempered glass, with a 2.28 mm (90 mil) layer of SentryGlas® interlayer has to contend with a

wide range of inclement weather conditions such as snow-storms and ice in the winter and high temperatures in the summer. We had originally considered using a 4-ply, low-iron, anti-reflective glass construction for this demanding application - but this proved to be a more expensive and heavier glass type to use. Laminated glass with SentryGlas® - which is 20 percent thinner than any other glass solution we tested - satisfied all the city's stringent wind load and environmental tests with ease."

A visitor to the viewing platform told Laminated Glass News: "It's amazing, really impressive! You're standing there, looking out with all of Manhattan beneath you, and it's like there's nothing between you and what's below, no barrier at all. You feel absolutely safe, yet on a clear day you can see forever!!"



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As well as improved strength and stiffness, other benefits of SentryGlas® include:

- **Safety:** In the event of breakage, glass fragments remain firmly bonded to the interlayer, reducing the chance for injury
- **Security:** SentryGlas® can be used in glazing that withstands bullets, hurricane-force winds and even bomb blasts
- **Durability:** SentryGlas® is extremely durable and resistant to clouding, even after years of exposure
- **Design Versatility:** SentryGlas® can be used in glass manufactured flat or curved, including annealed, toughened, heat-strengthened, spandrel, wired, patterned and color tinted glass
- **UV control:** SentryGlas® is available with or without UV transmittance

**Architekt:** SLCE Architects  
**Consultant:** Israel Berger & Associates  
**Glazing contractor:** W&W Glass, LLC  
**Laminator:** Dlubak Coproation

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