

## Case Study



Photography by Guillermo Campuzano Martinez

## PROJECT CREDITS

**Owner**

Terra Group; Miami

**Architect/Designers**

Bjarke Ingels Group (BIG); New York

**Vitre Glass Products**

Solarban® 72 Starphire® Glass  
on Starphire Glass

**Glass Fabricator**

Tecnoglass; Miami

**Glazing Contractor**

Giovanni Monti & Partners  
(GMP); Miami

Custom-designed floor-to-ceiling windows made with Solarban® 72 glass and balcony railings laminated with Starphire® glass not only give Grove at Grand Bay “curve” appeal but also help protect against hurricane damage.

## Grove at Grand Bay

COCONUT GROVE, FLORIDA

### PROJECT BACKGROUND

The combination of luxury and creativity can produce visually stunning results. Nowhere is that more evident than with the award-winning Grove at Grand Bay condominium towers in Coconut Grove, Florida.

As the oldest continuously inhabited neighborhood in Miami, flush with 1980s-era office buildings and static high-rises, Coconut Grove needed a catalyst. The building’s designer lit the spark.

Leveraging what he called the area’s “well-defined soul,” globally renowned architect Bjarke Ingels and BIG, his equally celebrated firm, created a truly distinctive structure that takes full advantage of the region’s pristine beauty, while equipping it to stand tall against the occasionally ferocious weather. “We wanted to ‘re-grove the Grove,’” Ingels declared.

#### *Leaving Nothing to Chance*

With the Atlantic Ocean, picturesque Biscayne Bay and abundant natural foliage as the backdrop, BIG sought to maximize views for every resident in the complex. At the same time, because of its location in a hurricane zone, every aspect of Grove at Grand Bay—from its infrastructure to its abundant glass doors and aspect—required reinforcement and protection.

## Grove at Grand Bay

Two Vitro Glass products, *Solarban® 72* and *Starphire Ultra-Clear®* glass, helped to achieve the desired clarity and transparency, while the customized assembly ensured the openings' ability to withstand hurricane-force winds.

Carlos Amin, vice president of sales for glass fabricator Tecnoglass, said nothing was left to chance. "Our engineers designed the floor-to-ceiling windows with three pieces of ¼-inch *Solarban® 72* glass, and the balcony railings are laminated with two lites of *Starphire®* glass. We also hermetically sealed the doors and installed custom-made rollers to ensure they operated properly," he explained. "Everything is hurricane-resistant and insulated."

As for the building itself, BIG's first challenge was to address the space limitations and terrain of the construction site—a three-acre lot with a sloping grade—that was formerly occupied by the iconic Grand Bay Hotel.

Local zoning regulations that restrict high-rises to 20 stories required the firm to design two towers to accommodate the planned 98 units, which range in size from 1,300 square-feet to a 10,000-square-foot penthouse. The ground floor needed to be 13 feet above grade to comply with FEMA flood regulations.

The short end of the property faces the Atlantic Ocean, which also complicated matters because it gave only residents of the south tower unobstructed views of the water. In addition, site constraints dictated a square footprint for the base of the south tower, while the footprint of the north tower required it to retain a rectangular shape throughout its height.

The desire to maximize views from both towers despite these restrictions demanded creativity. BIG, known for its startling, large-scale gestures, made dozens of 3-D prototypes, carved from different materials and resembling everything from drifting icebergs and terraced hillsides to stacked biscuits. The firm ultimately determined that two twisting, identical tornado-like forms would achieve the optimal orientation.

### ***Withstanding and Protecting Nature***

Although the condominiums would be outfitted with hurricane-resistant glass, additional safeguards against natural disasters were necessary. Reinforced concrete fortified the towers' infrastructure, while a composite core of concrete and steel internal plates for their shear walls helped to mitigate torsional forces. Additional stability was provided through the installation of cambered (arched) floor plates and pressure-injected auger-cast piles averaging 80 feet in depth.

To learn more about *Solarban® 72* glass or *Starphire®* glass by Vitro Architectural Glass, visit [www.vitroglazings.com](http://www.vitroglazings.com).



The excellent clarity and transparency of *Solarban® 72/Starphire Ultra-Clear®* glass help give residents of Grove at Grand Bay breathtaking views from every vantage point.

When Hurricane Irma and its 100-mile-per-hour winds hit in September 2017, the two towers "did extremely well—including the hurricane-impact glass," said Jason Gilg, senior development manager of Terra Group, the building's owner.

Several sustainable measures, including innovative landscaping and irrigation systems that reduced potable water consumption by 80 percent and the installation of high-efficiency chillers and variable-speed exhaust in the heating and cooling systems, helped the luxury condominium complex become the first LEED® (Leadership in Energy and Environmental Design) Gold Certified residential building in Miami-Dade County.

Completed in 2016, Grove at Grand Bay is the tallest twisting structure in the Western Hemisphere and the first of its kind in the United States. It has earned numerous industry awards for its innovation, construction quality and design, including being named the 2017 Building of the Year, U.S. Southeast Region, by *The Architect's Newspaper*.

More importantly, it has revitalized the storied neighborhood with an influx of several new retailers and restaurants. Delivering optimized views, abundant outdoor spaces and flexible floor plans, the two twisting towers "interact with one another," said Ingels. "They become equally privileged."

Formulated with an advanced triple-silver coating engineered for use on *Starphire Ultra-Clear®* glass, *Solarban® 72* glass has visible light transmittance (VLT) of 71 percent with a solar heat gain coefficient (SHGC) of 0.30 and a light-to-solar gain (LSG) ratio of 2.37.