

Water Tower Place

Chicago, Illinois

Owner

Water Tower Place Condominium Association

Completion Date

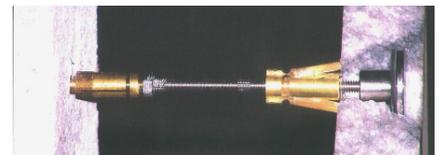
Investigation – 2006
Restoration – 2009

Construction Cost

\$1.8 million

Services Provided

Structural evaluation
Projection of strength loss per year of existing marble panels
Design of new custom façade anchoring system
Wind tunnel testing
Cost estimating
Strength testing of existing marble panels
Façade stabilization



Thornton Tomasetti was retained to develop a preservation program for the façade on the condominium portion of a 74-story, 859-foot-tall, reinforced concrete building, originally constructed in 1976. The façade is composed of Georgia Cherokee Solar Gray marble panels. A prior review of the façade by a third-party consultant concluded that the marble was losing its strength at approximately 3% per year, and it was recommended that the entire façade be immediately replaced. Thornton Tomasetti determined that the strength loss was actually closer to 1% per year, and that the façade could be preserved in-place.

When the building was constructed, marble panels on the high-rise portion of the building were anchored to the reinforced concrete structure around the panel edges only, with stainless steel pins and kerf anchors. Prior repair programs included the installation of mechanical restoration anchors in all of the spandrel panels. Thornton Tomasetti's investigations concluded that the building's exterior cladding may encounter pressures more than the original design wind load, and that several of the mechanical repair anchor heads have loosened over time.

Based on the investigation, Thornton Tomasetti determined that the distress in the existing panels is a result of in-plane and out-of-plane load-deformations. It was determined that the installation of additional repair anchors that have the capacity to resist both wind suction and wind pressure loads would provide adequate support for the marble panels, even with the projected strength loss.

Thornton Tomasetti worked with a manufacturer to design custom out-of-plane connection anchors that are able to withstand the required wind loads without failure. The implementation of the repair and maintenance program is expected to increase the durability and longevity of the façade for up to 25 years.