

Hurricane-proof

Material longevity and its inherent impact on long-term project sustainability are changing the way buildings are designed. Memorials like the new Four Freedoms Park in New York have to last for hundreds of years. Corrosion resistant 2205 duplex stainless steel was necessary so that the sculptural handrails were as durable as the massive blocks of granite in this highly-acclaimed new monument.

On January 6, 1941 President Franklin D. Roosevelt delivered a speech establishing the ideological basis for America's involvement in WWII. He looked forward to a world with freedom of speech and expression, freedom of worship, freedom from want, and freedom from fear. Roosevelt's famous Four Freedoms speech later became the basis for the United Nations Declaration of Human Rights.

The plan

A plan for developing the Franklin D. Roosevelt Four Freedoms Park on

the southern end of Welfare Island (subsequently renamed Roosevelt Island) in New York City's East River was announced in 1973. The New York Times said, "It would face the sea he loved, the Atlantic he bridged, the Europe he helped to save, the United Nations he inspired..." A master of 20th century architecture, Louis I. Kahn designed the memorial park, but New York City's subsequent bankruptcy put the project on hold.

Finally, in 2010, the city gave the go ahead for the realization of Kahn's vision.

The park consists of a tree-lined garden that narrows to an open-air plaza with the four freedoms inscribed in its walls. The plaza provides stunning views of the city and the United Nations Building. Despite the proximity of crowded Manhattan and Long Island, the park offers great tranquility and is described as a spiritual oasis.

The park is designed to be an enduring tribute to Roosevelt, with massive blocks of North Carolina granite forming its walls and walkways. Kahn designed elegantly minimal, sculptural, dull gray ➤



The Four Freedoms Park memorial has great views of the New York skyline.
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stainless steel handrails for the project. (Pipe railings were also added to meet modern safety concerns.) The railings were to visually blend with the granite, which has a gray-white background flecked with medium to dark gray spots.

Implementation of the plan

The project team retained an architectural metals consultant to help identify a finish that would achieve Kahn's aesthetic goals and an appropriate stainless steel for essentially maintenance-free service.

A customized dull, relatively rough, abrasive-blasted finish was needed to aesthetically blend the stainless steel and stone. Both this rough surface finish and the unique curving design, creating sheltered areas, meant that the railings would accumulate higher levels of corrosive salt. In addition to adjoining brackish water, the project had to withstand 100-year storm surge events, which could submerge the railings in salt water for days.

Type 316 stainless steel (with 2% Mo) is often used in coastal areas due to its good corrosion resistance, but it would not have met these stringent requirements. Instead, the more corrosion-resistant duplex stainless steel 2205 with 3% Mo was selected.

The traditional architectural fabricators contacted did not have duplex stainless steel experience and were unwilling to make this complex shape. The logical solution was to turn to an industry which uses duplex stainless steels regularly and has demanding surface finish requirements. The pharmaceutical industry is such an industry. A U.S. pharmaceutical industry and architectural fabricator, CMPI, ultimately won the project. In October 2012, the park was finally completed with its unusual handrails.

2205 passed the first test

Just days after the park opened to the public, Hurricane Sandy submerged the railings. They were undamaged and



The custom made duplex handrails blend in with the granite. © Diane Bondareff

remained corrosion free, confirming that 2205 was an appropriate choice. New York City is home to the world's largest concentration of architects and the performance of these highly visible railings has not gone unnoticed – another testament to the role of Mo in building a sustainable future. (Catherine Houska)