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JFK Int'l Adds Boarding Bridge with Elevated Rotunda & Stacked Walkways to Accommodate A380s

BY THOMAS J. SMITH



FACTS&FIGURES

Project: Rebuild Gate to Handle Airbus 380

Location: John F. Kennedy Int'l Airport, Terminal 4

Cost: \$3.7 million

Owner: JFK International Air Terminal LLC

Designer: Aero Systems Engineering

Passenger Bridge Fabricator: JBT AeroTech

Interface Fabricator: Airport Equipment

Installation Contractor: Aero BridgeWorks

Site Work: Holt Construction

 The firm that operates Terminal 4 at John F. Kennedy International Airport (JFK) faced a unique challenge last year: It would soon have four carriers flying Airbus 380s into the terminal, and only two gates were equipped to handle the double-decker aircraft.

While the situation may sound like a “champagne problem” to some, it was a problem—a pressing problem. JFK International Air Terminal (JFKIAT), the private company that operates Terminal 4 under a lease with the Port Authority of New York and New Jersey, had just eight months to find a solution.

“As it was, we had Singapore Airlines, Emirates and Asiana Airlines; and now comes the fourth airline (Etihad) to operate an A380,” explains Edmund Quintana, a senior manager with JFKIAT. “We were not looking just for a relief gate, but a gate where we can plan A380 operations. The gate had to be built by December 2015.”

Currently, traffic into Terminal 4 is almost evenly split between domestic and international flights. The facility is Delta Air Lines’ primary terminal at JFK and also hosts over 30 foreign carriers. Since the introduction of the A380, Terminal 4 has accommodated the giant aircraft at gates A6 and A7. Now, it’s able to accommodate such traffic at Gate B29 as well.

“When Asiana, as the third A380 carrier, started flying the aircraft into JFK, we really needed a relief valve,” recalls Shawn Makinen, JFKIAT’s vice president for facility management. “It was important to have another gate with unrestricted access to the A380 upper and main deck.”

In addition, Etihad requested that its first-class customers on the upper deck access the plane from the third floor of the terminal while the rest of its passengers board from the second floor.

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The solution was a double-stacked walkway with an elevating rotunda and dual passenger boarding bridges. Since Gate B29 is not exclusively used for A380 flights, the dual-bridge unit was also designed to accommodate more common airliners such as Boeing 747s and 777s, as well as A330s and A340s from the terminal's second floor.

Experience Required

Six years of A380 flights has taught JFKIAT a lot about handling the giant aircraft. "We make sure we learn from the past," Quintana remarks, noting that each plane has a different seating configuration. When the terminal operator contracted Aero Group about designing and building a new gate to accommodate the mega-airliner, it consequently requested a number of design and structural improvements. The list of discussion topics spanned operational controls, maintenance and component materials among others.

Aero Group includes Aero Systems Engineering, the company's design firm, and Aero BridgeWorks, its construction entity. Both focus solely on fixed ground support operations and often work together, but they also handle separate projects.

JFKIAT selected Aero Group based on its past performance at Terminal 4. The firm had previously replaced three other passenger

boarding bridges via a design-build project that Quintana reports went very smoothly and seamlessly, with no impact on flight operations. "Aero Group delivered," he summarizes. "They have established confidence with us, and as a result, we continue on with them with confidence."

Beyond work at JFK, Aero Group has designed and/or provided construction services at more than 13,000 fixed ground support gates over the last 20 years, report company personnel.



ALAN BARGE

Alan Barge, president of Aero Systems Engineering, recalls the preliminary stages of the company's recent Terminal 4 project: "When we put pen to paper and collaborated with our affiliated construction arm, Aero BridgeWorks, we determined we could technically solve the problem and knew that with great effort, we could deliver the project on time. We solved the vertical transportation issue with an elevated rotunda and double-stack walkways."

Aero Group completed the \$3.7 million project on time and within budget, just eight months after their initial meeting. The new gate was commissioned on Dec. 23, 2015, and Asiana was the first carrier to use it. Although planned primarily as a relief

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AirportImprovement.com May | June 2016

gate, B29 is now used three to four times a week for A380 flights, Quintana reports.

Aero Group and JFKIAT alike credit the on-time delivery of the project to the fast approval of the plans by the port authority. Personnel from both firms note that it is not unusual for the approval process to consume a major portion of a project's timeline as drawings get revised and re-drawn multiple times to meet an airport authority's requirements. Conversely, the initial review of JFKIAT's B29 gateway project was returned with only one modification requirement, and the project was subsequently approved after only one month.

In the end, it took about two months to design, one month for approvals, two months to manufacture and one month to install.

Double-Decker Design

Mike Madlock, president of Aero BridgeWorks, describes B29 as a "unique design that has never been done before." Two 20-foot walkways stacked on top of each other extend perpendicularly from the terminal's second and third floors. An elevating rotunda allows one bridge to move between the second and third floors of the terminal and the first and second level of an aircraft.



MIKE MADLOCK

"One of the biggest challenges was the overall interface between the walkways and the bridge," Madlock notes. Ultimately, a coiling curtain proved to be the answer. The 30-foot-high, 12-foot-wide device effectively seals the unused doorway when the bridge is on the other level.

JBT AeroTech fabricated the boarding bridge as designed by Aero Systems Engineering. To save time, however, JBT purchased the coiling curtain from Airport Equipment, the firm that owns the design for the door. With the project clock ticking, the curtain was shipped from the company's facility in New Zealand to Philadelphia, and then trucked to JFK in New York, notes JBT Regional Sales Manager J. Garrett Macfarlane.

During installation, Aero BridgeWorks encountered delays when the building did not match the as-built drawings it was provided. When this occurred, crews scrambled to modify their structural plans to accommodate the existing conditions, Barge explains. Workers also saved time by re-using grade beams already in place to eliminate the time-consuming process of driving new support piles.

Although the design of the new boarding bridge is certainly innovative, Barge acknowledges that its applicability is limited. Only a handful of U.S. airports service A380s, and JFK is one of the few in the subset that need to board passengers from different levels of the terminal. "It is not a requirement at most airports, but it is



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Double-stacked walkways facilitate passenger flow to and from double-decker A380s.

a unique solution to consider, now that it has been successfully designed, built and tested at JFK," he remarks.

From JFKIAT's perspective, the new B29 gateway provides important operating efficiencies.

Based on input from JFKIAT, Aero Group designed the controls so that one operator, located in the terminal end of the bridge, can maneuver bridge placement on the second level with assistance from remote cameras. This eliminates the need for a second

operator, as had previously been the norm, Madlock notes.

He describes the remote operation as "very operator-friendly and intuitive" and notes that operators only need about 30 minutes of training.

With the B29 project behind them, Aero Group and JFKIAT are now discussing renovating other passenger boarding bridges in Terminal 4. ✈️

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AirportImprovement.com May | June 2016