PHOTO: COURTESY OF TURNER CONSTRUCTION CO.

Soaring Innovation

Cutting-edge technologies elevate airport operations and passenger experiences

By Erica Bender

The South Terminal Complex at Orlando International Airport is billed as a critical element of the region's economic growth plan, accommodating the travel needs of up to 12 million additional annual passengers.

WHAT'S INSIDE

Landmark Airport Projects Destined to Transform the Travel Experience

Despite steep travel declines triggered by the COVID-19 pandemic, aviation infrastructure projects across the globe are moving forward to keep airline operations running smoothly and provide safe, efficient, reliable and enjoyable passenger experiences.

Orlando's New South Terminal Aims to Boost Operations

The 2.7-million-sq-ft, three-level South Terminal Complex (STC) is the cornerstone of Orlando International Airport's $4.2-billion, multiyear Capital Improvement Program. Designed to be the world's first LEED v4 airport campus, the STC project is being delivered under separate construction management-at-risk contracts held by Hensel Phelps and a joint venture of Turner Construction and Kiewit.

Crews reached a major milestone earlier this year with the installation of the terminal's first passenger boarding bridges (PBBs) at one of five multiple aircraft ramp system (MARS) airside gates that will connect travelers with their aircraft. According to PBB manufacturer JBT Aerotech, the design and control features of the new boarding bridges allow for "increased operational flexibility for changing aircraft and terminal configurations."

Construction crews are maintaining an aggressive 24/7 pace to complete the new terminal in early 2022. When operational, its 15 gates will accommodate up to 20 aircraft and support an additional capacity of 10–12 million annual passengers. The STC is also destined to become the first fully integrated, multimodal airport terminal in the U.S. for rail-air-ground transportation.

Expansion at Arizona's Phoenix Sky Harbor Terminal

Out in Arizona, crews led by McCarthy Building Companies are making progress on the Terminal 4 Eighth Concourse project at Phoenix Sky Harbor International Airport, which began construction in May 2019 and is estimated to cost $315 million.

This 275,000-sq-ft addition, designed by SmithGroup and Corgan, will be located at the southwest corner of the airport's largest terminal, which handles more than 80% of passenger traffic through its 86 gates. The project will deliver approximately 130,000 sq ft of concourse configured with apron and passenger levels, roughly 25,000 sq ft of retail and food/beverage concession space, and new transfer and connector bridges. The ambitious design also includes terminal processor improvements, expansion of the existing checkpoint D, additional ticket counters, new baggage handling systems and a new baggage claim carousel.

The project is currently on track to be completed in spring 2022 and will be pursuing LEED Silver certification. McCarthy is utilizing various innovative technologies to make design and construction more streamlined, efficient and cost-effective. The firm's proprietary mapping system, for instance, helped to identify existing underground utilities and structures during preconstruction. This approach helped the team devise solutions to minimize shutdowns or utility strikes.

A New High-Speed Baggage Handling System in Aruba

Another project intended to transform the passenger experience is in Aruba. This summer, construction crews broke ground on a $350-million modernization and expansion project at Queen Beatrix International Airport, which will increase capacity and boost sustainability of the nearly 50-year-old facility. One key project element is a $38-million, high-speed baggage transportation and sorting system designed to simplify and streamline the pre-clearance process with virtually foolproof "track and trace" technology.

An eighth concourse is being added at Phoenix Sky Harbor International Airport's Terminal 4 to support long-term airline activity. The estimated $310-million, 275,000-sq-ft project will be complete next spring.

BEUMER Group designed this innovative independent carrier system in collaboration with lead design firm Netherlands Airport Consultants and program management consultant Satterfield & Pontikes. This emerging technology will eliminate the need to reclaim checked bags prior to secondary security checks and U.S. customs inspections. It will also allow U.S.-bound flights to perform tail-to-tail transfers of checked bags at the first port of U.S. entry.

"It is also one of the first systems that shares information and images between the computer tomography X-ray system, which routinely looks for explosive devices in baggage, and U.S. Customs and Border Protection (CBP)," says S&P Aviation Project Executive Matthew Russell. He further notes that the CBP plans to use this more efficient security screening approach for all of its pre-clearance stations in the future.

"This new technology is unique in many ways, including its sustainability advantages," Russell adds. "It utilizes 60% less power compared to a conventional baggage handling system, and the security side requires 20% less manpower for operations and maintenance." The state-of-the-art baggage handling system, along with the new building housing it, are anticipated to be completed by 2024. ◆

PHOTO: COURTESY OF MCCARTHY BUILDING COMPANIES

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Unique Construction Phasing Minimizes Operational Impacts at Tucson International Airport

Major changes are on the horizon for Tucson International Airport, Arizona's second-largest airfield. An ambitious Airfield Safety Enhancement (ASE) project, overseen by the Tucson Airport Authority (TAA), is currently underway and includes construction of a new full-length parallel runway, taxiways and connector taxiways; installation of aircraft guidance systems; and modernization of the airfield's geometry.

The ASE program's GMP1 phase consists of building a new 1,200-sq-ft airfield lighting vault, replacing 8,000 ft of existing duct bank with 32,000 linear ft of new conductor, installing a 450kW generator and relocating five existing circuits to the new vault.

PHOTO: COURTESY OF GRANITE CONSTRUCTION

This month, crews led by Granite Construction will complete the first phase (GMP1) of a $130-million construction management-at-risk (CMAR) contract, one of four construction packages comprising the estimated $320-million ASE program. "This is Granite's third CMAR contract for TAA in the past decade," says Granite Area Manager Anthony Alfonso. "We are honored to continue the long-standing partnership we have cultivated and participate in such a monumental project."

Working in an active airfield presents significant logistical and safety challenges. The phased construction approach has been essential to minimizing impacts to air service operations and improving jobsite safety. "For GMP1, our phasing strategy allowed for flexibility in maximizing construction efficiencies," Alfonso explains. "This permitted us to nimbly shift our attention to other project areas as needed in order to accommodate changing airport operations."

Decommissioning of the existing general aviation runway—a major project component—is currently scheduled for 2023. Approximately 45,000 ft of temporary fencing will be installed to allow for the bulk of construction to take place landside in an effort to avoid intermittent impacts to airport operations in the secured area. The entire ASE program is anticipated to be completed in 2027. ◆

Deep Foundation At New Salt Lake City Airport to Last 100 Years

The needs of Salt Lake City International Airport (SLC) are much different today than when it was constructed more than 60 years ago.

The project team working to replace the aging SLC facilities subcontracted Ralph L. Wadsworth Construction Co. (RLW) to drive the steel piles used for the foundation of the new earthquake-resistant buildings. RLW worked with Nucor Skyline to procure the steel products needed for the job.

For this multiphased project, Nucor Skyline initially delivered products in 2016 and 2018, including 2,000 tons of HP 14 x 102 piles and 13,000 tons of 16-in. x .500-in. spiralweld pipe piles.

South Terminal Phase 2 is currently underway. Nucor Skyline is providing 10,400 tons of HP 14 x 117 piles, 1,650 tons of NZ 19 sheet piles and 3,500 tons of 16-in. x .500-in. electric resistance welding (ERW) pipe piles. ERW permanently bonds the pipes together by heating them with an electric current, melting the metal at the joint. In general, resistance welding is efficient and causes less pollution than other pipe manufacturing methods.

For additional information about Nucor Skyline products, please visit www.nucorskyline.com. ◆

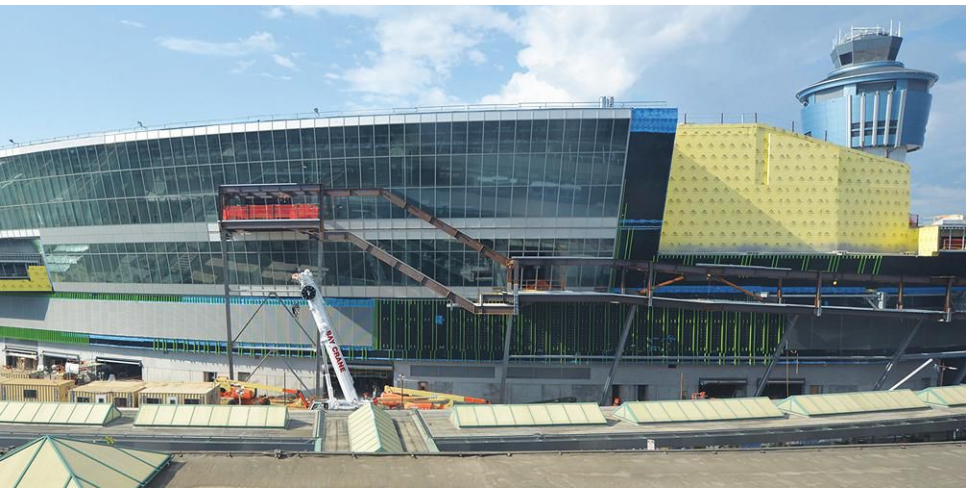
Nucor Skyline NZ 19 sheet piling will support deep foundations at the new Salt Lake City International Airport.

PHOTO: COURTESY OF NUCOR-YAMATO STEEL

Documenting the Nation's Largest Public-Private Aviation Project at LaGuardia Airport

Complex projects that heavily impact their surrounding communities require effective ways to keep the public informed about construction progress.

One such example is LaGuardia Airport's $8-billion reconstruction program, which is taking advantage of EarthCam's jobsite cameras.



LaGuardia Airport's new Terminal B was captured by EarthCam.

PHOTO: COURTESY OF EARTHCAM

"The Port Authority relies on EarthCam to monitor progress of its historic redevelopment of LaGuardia Airport—the largest public-private partnership aviation project in U.S. history," notes Pasquale DiFulco with the Port Authority of New York and New Jersey. EarthCam delivers the highest-resolution camera technology to capture the full transformation of this major transportation hub.

EarthCam's industry-leading camera solutions are ideal for projects of any size. With a 24/7 livestream, users can get real-time updates from anywhere, making it easy to share status updates with key stakeholders or the public.

To learn more about EarthCam's decades of expertise in helping clients document, monitor and promote their projects, please visit www.earthcam.net. ◆

Boosting Safety at Runways and Taxiways With Innovative Barricade Solutions

Airport construction and maintenance activities can be complex and even dangerous, particularly in areas near active taxiways. Trinity Highway Rentals offers a broad range of innovative products to reduce potential safety risks and keep projects moving toward completion. The company provides solutions for construction sites, traffic control, pedestrian/vehicular delineation and perimeter security.

Durable and versatile, Yodock 2001MB Barricades can be accessorized for longitudinal barrier, perimeter fencing, road closure and temporary sign support applications.

PHOTOS: COURTESY OF TRINITY HIGHWAY RENTALS

One example is the low-profile Aerocade Airport Barricade, which is a water-filled, collapsible channelization system that is used to delineate construction zones on airport runways and taxiways. Lightweight enough to be installed and removed by hand, it comes with reflective sheeting that works in tandem with accessory options such as warning lights and flags to help boost visibility, and it is stackable for efficient transportation and storage. The Aerocade can also be interconnected end-to-end for use as a demarcation device, and it meets FAA Advisory Circular 150/5370-2G requirements for operational safety during construction.

Other popular offerings available for purchase or rent include Yodock water-filled barricades, runway and taxi-closure marker signs, and runway-closure marker trailers. To learn more about Trinity Highway Rentals' full line of airport solutions, please visit www.trinityhighwayrentals.com. ◆

Aerocade Airport Barricades are FOD free and, when ballasted with water, can withstand blasts from jet engines, propellers and extreme weather.

Gliding Ahead With Brilliant Daylighting Systems

From the curb up to the sky, Kalwall and its strategic partner Structures Unlimited offer single-source solutions for daylighting structures that are used in airports, parking decks and other applications nationwide.

Kalwall's translucent sandwich panels paired with Structures Unlimited's pre-engineered box-beam system provide a total building system that can span areas in excess of 100 ft. The design features a clean appearance and is virtually maintenance free, energy efficient and highly corrosion resistant. Structures Unlimited also offers total project responsibility—from drafting and daylight modeling to fabrication and installation.

PHOTO: COURTESY OF KALWALL

Structures Unlimited and Kalwall partnered to deliver a multipurpose daylighting system at Gerald R. Ford International Airport.

At Gerald R. Ford International Airport in Grand Rapids, Mich., Kalwall and Structures Unlimited worked together on a delegated design incorporating aluminum box-beam rafters. The end result is a rugged panel system that serves as a canopy to protect pedestrians on the parking deck as well as a skylight over the parking garage helix. The helix shape consists of a straight-rafter circular skylight with an integral gutter system that transitions into a radial shed.

Learn more at www.kalwall.com and www.structuresunlimitedinc.com. ◆

A Streamlined Approach to Baggage Handling

Last month, construction commenced on Gateway 2030, a major modernization and expansion program at Aruba's Queen Beatrix International Airport, which is owned and operated by Aruba Airport Authority. The estimated $350-million project, which is designed to achieve LEED Gold certification, aims to sustain future growth by addressing capacity constraints, enhancing customer experiences and improving sustainability at the nearly 50-year-old facility.

A state-of-the-art, high-speed baggage handling system (BHS) is the centerpiece of this multiphased project, which was delayed approximately 18 months due to the pandemic. The BHS will consolidate the U.S. customs preclearance process by enhancing and streamlining identity verification and luggage inspection measures.

Program management consultant Satterfield & Pontikes (S&P) was chosen to oversee the design and integration of this emerging technology, which features the world's first tote-based independent carrier system (ICS) certified by the Transportation Security Administration. "Approximately 5% of bags get lost in transit with traditional baggage handling systems and have to be reacquired manually," says Matthew Russell, vice president of S&P's Aviation Center of Excellence. "An ICS delivers 100% tracking accuracy."

The new BHS is scheduled to turn fully operational in 2024. ◆

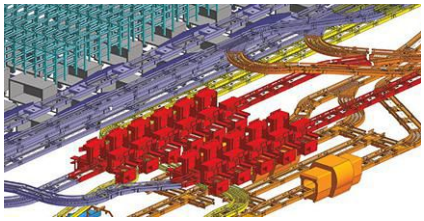


IMAGE: COURTESY OF SATTERFIELD & PONTIKES

At Aruba's Queen Beatrix International Airport, a new tote-based independent carrier system was created to prevent travelers' bags from being lost in transit.