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Reagan Nat'l Opens Two New Security Checkpoints

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Reagan Nat'l Opens Two New Security Checkpoints

BY RONNIE WENDT



In a poignant stroke of timing, Reagan National Airport (DCA) opened two new security checkpoint buildings shortly after Americans observed the 20th anniversary of the 9/11 terrorist attacks. The \$269.8 million project was expressly designed to heighten security at the major airport just across the Potomac River from Washington, D.C., and to improve the screening experience for passengers and TSA officers.

The new checkpoints, each 50,000 square feet, expand TSA's screening operation from 20 to 23 total lanes, with the ability to expand to a total of 28 lanes. Screening operations were relocated and the new facilities engineered to create a "seamless, free-flowing environment" between Terminal B/C (Gates 10-45) and the new 14-gate concourse (Gates 46-59).

Another key objective was to help TSA officers process passengers with greater efficiency. The new screening areas are consequently deeper and more spacious than the previous checkpoints that were housed in the airport's National Hall and had remained in the same configuration since the Twin Towers fell.

"Terminal B/C opened in 1997 and was built for a different era of security lanes," explains Ryan Wolfgang, P.E., CCM,

construction project manager for the Metropolitan Washington Airports Authority (MWAA).

Wolfgang worked in tandem with MWAA colleague Jon Burgess, who served as construction manager for most of the project. Wolfgang explains that before 9/11, airport security was designed to operate in the background; it wasn't noticeable, nor did it interfere with airport operations. When the federal government created TSA after 9/11, airports had to add more security checkpoints and equipment to their existing footprints.

At DCA, that meant putting checkpoints and queuing lines in the airport's iconic National Hall, which was designed by renowned Argentine-American architect César Pelli. "This architecturally dramatic space, with views toward planes and ramp activity, was never designed for that," comments Chad Menge, AIA, NCARB, DBIA, principal architect for MWAA.

Besides distracting from the iconic Pelli architecture, using an area never meant for security slowed the screening process and



RYAN WOLFGANG

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FACTS&FIGURES

Project: New Passenger Checkpoint Facilities

Location: Reagan National Airport

Operator: Metropolitan Washington Airports Authority

Key Elements: 2 new TSA checkpoints, each 50,000 sq. ft., with combined total of 23 screening lanes with room for future expansion to 28 lanes; 15 airline check-in kiosks

Of Note: Checkpoint buildings added above arrivals roadway & partially underneath bridge where departing passengers are dropped off on ticketing level

Cost: \$269.8 million

Funding: Bonds issued against future passenger facility charges

Timeline: Construction began late 2017; activation & opening expected in Nov. 2021

Project Name: Secure National Hall

Component of: \$1 billion Project Journey capital improvement program

Design: AIR Alliance, a joint venture of AECOM & PGAL

Contractor: Turner Construction Co.

Foundation: Wagman Heavy Civil

Superstructure: Berlin Steel Construction Co.

Concrete: Corinthian Contractors Etc.

Roofing: Kalkreuth Roofing & Sheet Metal Inc.

Mechanical/Plumbing: Harris Co.

Electrical, Electronics & Security: M.C. Dean Inc.

Life Safety/Fire Protection: National Fire Protection

Plumbing, Fire Protection & Fire Alarm Engineering: Arora Engineers

Asphalt & Pavement Markings: Finley Asphalt & Sealing Inc.

Terrazzo: Boatman & Magnani Inc.

Elevators: Schindler Elevator Corp.

Baggage Handling System: Jervis B. Webb Co.

Exterior Glazing: Custom Glass Services Inc.

Dynamic Glass: SageGlass

Temporary Facilities & Maintenance of Traffic; Cast-in-Place Concrete: Christman Mid-Atlantic Constructors

Key Benefits: Increased screening capacity (from 20 to 28 lanes); purpose-built facilities with connections to National Hall & walkways from Metrorail station & parking garages; changes facilitate passenger flow between Terminal B/C (Gates 10-45) & new 14-gate concourse (Gates 46-59)



caused delays, Menge explains. The area lacked ample space for TSA equipment and officers, and there wasn't enough room for screening operations. At the back end of the checkpoint, there was no area for passengers to put their shoes back on, store their IDs and return other loose items to their carry-on bags.



CHAD MENGE

Increasing passenger counts only compounded delays. Passenger areas originally designed to serve 15 million annual travelers had to accommodate passenger counts topping 23 million, Menge reports. "We had a need for efficient TSA checkpoint screening areas to transform and improve the passenger experience," he explains.

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Arora was proud to serve as a member of AIR Alliance's team for the Metropolitan Washington Airports Authority's Secure National Hall at Ronald Reagan International Airport!

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MWAA funded the \$269.8 million project with bonds issued against future passenger facility charges. The checkpoint improvements are a key component of Project Journey, a \$1 billion multi-year capital improvement program designed to revolutionize the passenger experience at DCA. Project Journey also included the construction of an enclosed \$391.5 million regional aircraft concourse to replace 14 outdoor gates serviced by buses from Gate 35X, plus roadway and parking improvements. The new concourse will offer passengers greater connectivity, more shopping and dining options, and a more pleasant post-security environment.

“The result is an enhanced experience not only for passengers but for TSA agents,” Menge comments. “This is a tectonic shift in the flow of passengers, and it greatly enhances what passengers can do post-security. They now have the freedom to move throughout the terminal no matter what pier or gate they use.”

The deeper and more spacious checkpoints offer ample room for TSA equipment, which includes 19 X-ray units, 12 advanced imaging technology body scanners, 12 walk-through metal detectors, four computed tomography machines for screening carry-on items, and security video cameras throughout the checkpoints. Project designers also added an area for passengers to recompose themselves after being screened.

“The new checkpoints have increased capacity, so they are more comfortable for travelers. There is plenty of light, so it's a brighter, more comfortable space,” says Lisa Farbstein, TSA spokesperson for Strategic Communications and Public Affairs. “There are more lanes, which will increase throughput. They offer a much easier, better flow for the traveler and for TSA agents. It also gives passengers more access to restaurants and shops on the secure side.”

To prepare for new TSA equipment in the future, project designers added more electrical outlets and utilities infrastructure than is currently needed. “We're always looking to the industry for state-of-the-art technology to improve our ability to detect threats,” Farbstein remarks.

Respectful Design Strategy

The new security checkpoints were added above the existing Terminal B/C arrivals roadway, which connects them directly to National Hall and walkways from the Metrorail station and parking garages.

Menge notes that all of the design decisions were informed by the iconic and beloved architecture of the existing terminal, and the rolling hills that surround the airport. As such, the form of the new checkpoint buildings echo the curving roof structure Pelli created.



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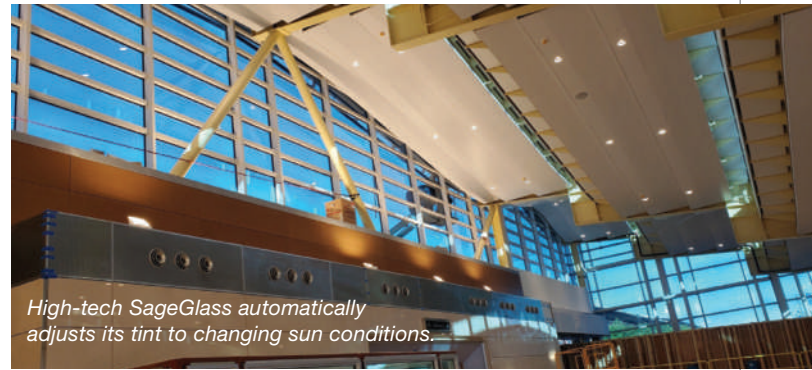
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“We didn’t want to do anything that detracted from the original architecture,” Menge emphasizes. “But at the same time, we had to address the functional requirements. We wanted a space that was worthy and fit well with the original design.”

A curvilinear roof structure and tall banks of windows met those requirements. “We didn’t want to build a very tall structure next to the existing building,” he remarks. “We also wanted a lot of light to make the space inviting for TSA screeners and passengers.”

Pelli included a north-facing glass wall in the original terminal to provide stunning views across the Potomac River to Washington, D.C. Early in the planning process, the design team decided to include a large bank of windows to visually tie the new construction to Pelli’s original design. “It’s a pretty dramatic impact on the inside when you look at the windows,” he says of the 32,860 square feet of glass.

When incorporating the glass curtain wall, the design team knew it was necessary to balance the desire for natural light with the ability to control the glare and heat that sunlight would add inside the building. Instead of using shades and extra air-conditioning, they opted for an intelligent glass system to mitigate the problems. Specifically, the new facilities include electrochromic glass that uses a small electrical current to transform from fully transparent to as tinted as required by changing sun conditions. The product was provided by SageGlass, a Saint-Gobain company.



High-tech SageGlass automatically adjusts its tint to changing sun conditions.

“We optimize the glass for the occupants,” says Andrew Kuchel, aviation advisor for SageGlass. “We can strike the balance between energy savings, occupant comfort and camera/monitor use.”



ANDREW KUCHEL

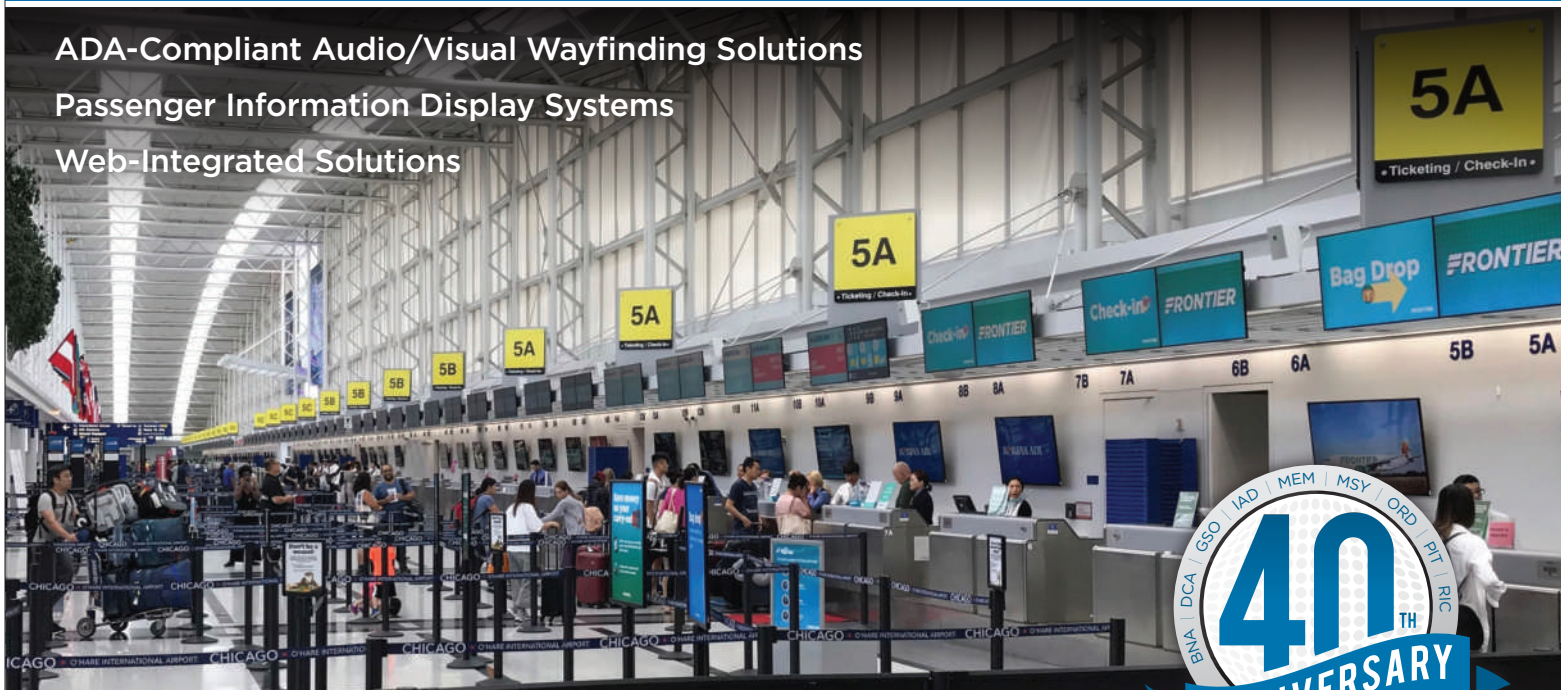
Menge notes that SageGlass met the airport’s goals for plenty of natural light in a heat-efficient, sustainable building. “Using electrochromic glass helps us minimize the heat load,” he explains. “We reduced the size of chillers and mechanical systems by using this glass in addition to reducing solar



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Construction required extra coordination because it occurred above and below active roadways.

glare. We certainly didn't want TSA screeners facing the wall of windows to suffer from glare that might impede their ability to perform their important jobs."

SageGlass has installed its dynamic glass in numerous airports throughout the world. Using the technology reduces HVAC load and thus energy costs, says Carl Newhouse, a regional sales director for the company.

"On average, the savings at peak load time will be around 8 to 10 percent," he specifies.

The high-tech glass also met DCA's construction requirements for vibration. "This is double-laminated glass to prevent it from shattering if something runs into it," Newhouse adds. "There is a roadway very close to the glass. We wouldn't want any projectiles or anything to go into the building; so they needed very strong, safe glass."

SageGlass manufactured insulating glass units in a variety of shapes and sizes, some as small as 12 inches, to fit with the building's curvilinear roofline. "This was complex," Kuchel acknowledges. "They wanted us to maintain the same design and effect as the original terminal. It involved a large number of different shapes."

Because a low-voltage cabling system operates the SageGlass, engineers had to plan locations for the controls upfront. "This process went smoothly because we planned so carefully during the design phase," says Newhouse. "We knew where the controls would be in advance, and everything worked well because of that."

Every glass wall needs structural support; and for that, the airport again stayed true to Pelli's design. Crews painted the steel support beams the same shade of yellow used in the original terminal.

Coordinating Construction

Priyam Shah, P.E., construction project manager for MWAA, considers the security checkpoint project the most challenging of his 18-year career. "It required a lot of



CARL NEWHOUSE



PRIYAM SHAH

coordination just to get the building 'out of the ground' because we sandwiched it between two roadways," Shah reflects.

"It's not only above the roadway designated for arrivals on the baggage level, but also partially built underneath the bridge where passengers are dropped off on the ticketing level of Terminal B/C," Menge explains.

Because the buildings are located underneath an active roadway, they required an independent structural system that absorbs vibrations from the roadway. The design consequently included deep foundations and low headroom foundations that were drilled and augered in place beneath the departures roadway. This required 2,700 tons (4,200 pieces) of steel beams, 247 support piles and 5,500 cubic yards of concrete. Engineers mitigated vibration by supporting all utilities, lighting, etc. with spring isolators in the high-ceilinged, tiered rooms that house checkpoint queues.

"We had to put everything on suspension to absorb vibration because the roof is a roadway," Shah explains. "We had to mitigate the vibrations coming from the roadway into the building."

Because the building extends over all inner and outer traffic lanes—eight in total—the project team had to coordinate construction carefully to keep traffic flowing. "Everyone at the airport who contributes to running it had a part to play," says Shah.

The airport also re-evaluated flow for personal vehicles, shuttle buses and vehicles associated with transportation network companies (TNC) such as taxis, Uber and Lyft during construction phases. By inviting TNCs and shuttle bus companies into the design phase, the project team came up with what Menge describes as a simple but creative solution. "We diverted traffic between the two lanes and outer lanes on the arrivals level, and moved certain pickups and drop-offs from upstairs to downstairs and vice versa," he explains. "The concepts developed during the design phase were the framework for operations throughout construction."

Finally, the airport needed to tie the new construction into the existing B/C terminal, which also added an element of coordination. Stakeholders met regularly to study upcoming work and determine how best to execute it without affecting airport operations. Much of the construction activity occurred after hours, and all of it had to be coordinated in advance, Shah specifies.

"We had to keep the flow of passengers going and keep everyone safe, while maintaining the heating and cooling systems in an active terminal," he recalls. "It required a lot of collaboration and coordination."

Though 9/11 occurred two decades ago, the need for high security at the airport nestled in the U.S. capital remains. These days, DCA's new checkpoints are located in a space as iconic as the original building, but filled with modern security technology and the ingredients for a more pleasant passenger experience. ✈️