BURNS McDONNELL

CASE STUDY / **AIR TRAFFIC CONTROL TOWER DESIGN**

TAKING AIR TRAFFIC CONTROL TO NEW HEIGHTS

At McConnell Air Force Base, the aging air traffic control tower was in need of updates to successfully support upcoming and ongoing missions. Building a new facility would require a modern approach to tower design and construction.

BRINGING HIGH-PERFORMANCE DESIGN TO SUPPORT AN UPDATED MISSION

Replacing a century-old air traffic control tower with a fully updated facility required phased delivery to avoid operational interruptions.

PROJECT STATS

CLIENT
U.S. Air Force,
USACE Kansas City District

LOCATION
McConnell Air Force Base, Kansas

COMPLETION DATE
2019

LEED SILVER CERTIFICATION

30%
REDUCTION IN WATER USAGE

CHALLENGE

McConnell Air Force Base recently added the new KC-46A aerial refueling and strategic military transport aircraft to its fleet, requiring new and updated facilities across the base. One existing facility in particular — the air traffic control tower (ATCT) — was in major need of an upgrade.

To accommodate the new aircraft, McConnell needed a new ATCT. Siting of the new tower presented challenges that our design team resolved with a problem-solving approach. To avoid costly utility relocations, the new ATCT had to be sited to avoid a communications line that runs through the location. The new ATCT also had to be positioned to avoid interference with the existing tower's visibility during construction, while still meeting function and sustainability needs as well as U.S. Air Force Standards.

Maintaining the daily operations of the base was paramount to project success. Delivery of the new tower and demolition of the old, therefore, would need to be accomplished without interference to base operations.

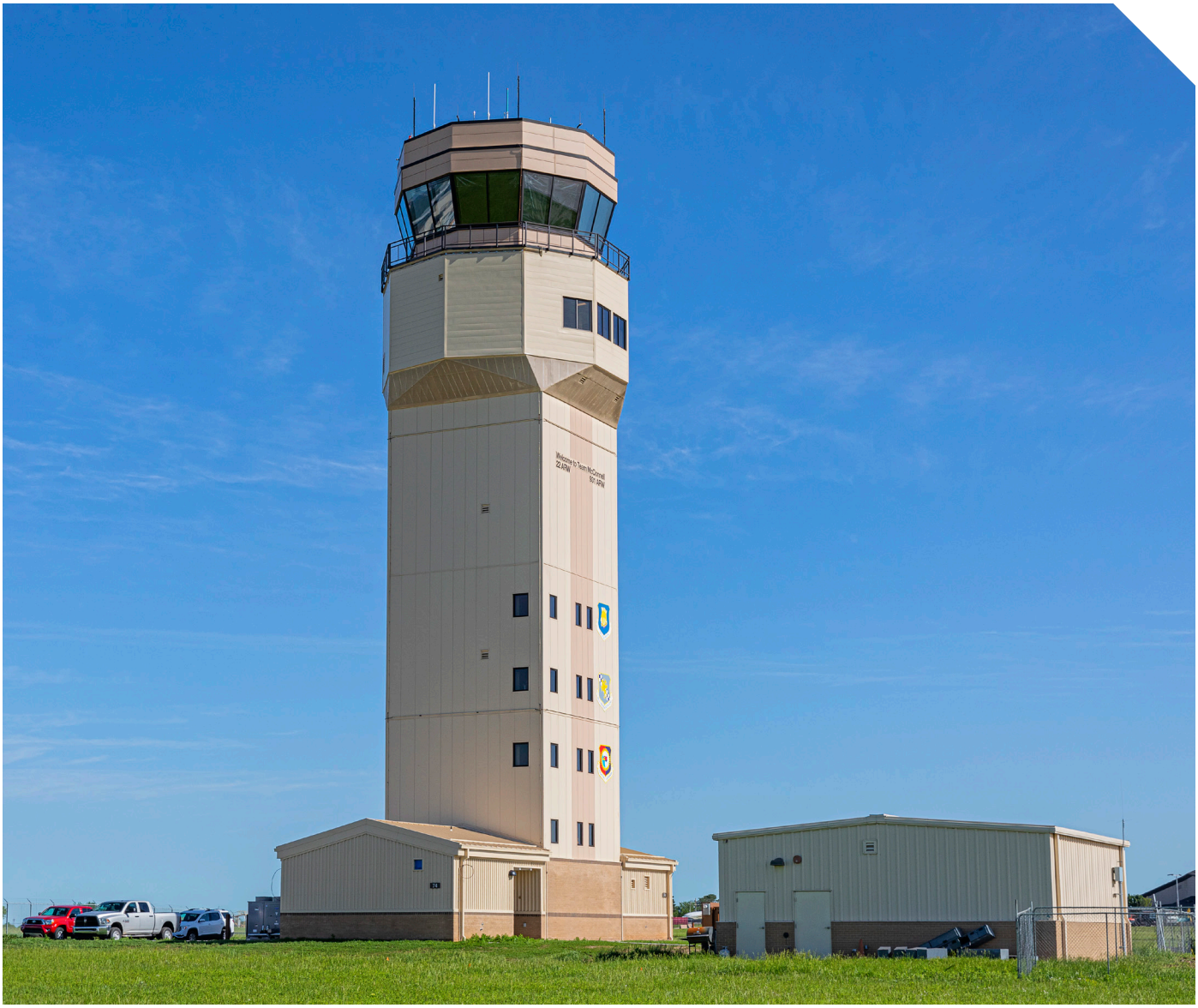
SOLUTION

We provided full design services for architecture and engineering disciplines as well as construction phase services.

Having authored the latest U.S. Air Force Standards for ATCT design, we understood the complex requirements for siting, adjacencies and cab design. To begin, a new siting study was performed to find the most effective height and location for the new ATCT, avoiding the existing communications and utility lines while utilizing building information models as a quality control tool for the coordination of various structures. The design phase also included a line-of-site analysis as well as other complex phasing plans to keep the new tower from impeding visibility to the airfield from the existing tower during construction.

In order to properly fit the required functions into the tall and narrow ATCT, our design team developed blocking diagrams, allowing for spaces to be stacked within the ATCT. This design element not only improved functionality of the facility but also made it easier for the construction process to adhere to the phasing method.

To meet the resource conservation goals set up during the initial design charrette, an improved thermal envelope was integrated with high-efficiency HVAC and lighting systems to provide optimum energy performance while a



robust commissioning program extends equipment life and reduces ongoing maintenance.

RESULTS

Proactive planning was a key factor in project success. To solve logistical constraints for contractors accessing the secure airfield, we worked with the tower operators, security and base civil engineer during design to provide a flexible and economic solution for site access and project phasing. We developed a construction phasing plan that limited the crossover from existing to new ATCT to seven total days with only four days of downtime.

The new ATCT is nine floors, with the cab located on the 10th. Spaces include a storm shelter, conference room, chief and assistant chief controller offices, administration offices, computer training rooms, restrooms with showers, control tower equipment room, and break room. Also included is an elevator and emergency generator.

The Air Force Sustainability Requirements Scoresheet was used to track facility performance, with LEED used for third-party certification. Based on 34 awarded design points — plus 21 projected construction points — LEED Silver certification was achieved with 55 total points.

Due to the high-performance design solutions offered throughout the design and the phased construction delivery, Burns & McDonnell received Very Good Contractor Performance Assessment Reporting ratings from USACE on the project for quality, schedule and cost control with an Exceptional rating for management.

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