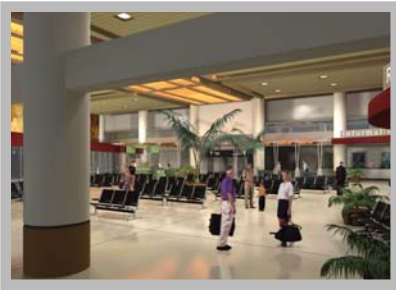


CaseStudy

Exceeding Customer Expectations and Project Goals



Phoenix Sky Harbor International Airport Terminal 2 Facility Upgrades Phoenix, Arizona

The renovation and upgrade at Sky Harbor's oldest terminal included complete electrical systems replacement, mechanical systems upgrades, upgraded/replacement boilers and chillers, concrete apron replacement, new inbound baggage handling and conveyors, and new and expanded security checkpoints.

CHALLENGES AND SOLUTIONS

Challenge: Terminal 2 was to be replaced at a future date by a new one, yet many of its systems needed to be replaced or upgraded because of the length of time needed to build the new one. The owner wanted to have the project done quickly and as inexpensively as possible.

Solution: Mortenson and the architect proposed a design-build method which would allow them to help the owner prioritize their many needs before the start of design.

Challenge: To accommodate steadily increasing passenger loads, the terminal needed to remain operational 24/7 with construction being done with minimal to no disruption to airport activities.

Solution: Mortenson and the architect worked together to be virtually "invisible". With 100,000 passengers using the airport every day and a short window (2-3 hours at night) open to do the major electrical and mechanical shutdowns or transitions, communication and planning were critical. On a daily basis, more than 10 stakeholders were notified of and communicated with regarding the various activities

Challenge: The owner placed an enormous amount of importance on safety – a task made difficult because of the 24/7 nature of the construction and the large area of space being worked on simultaneously.

Solution: The team made it a goal to have a zero injury project. A site-specific safety and health policy manual was developed; a complete safety training program (including .OSHA 30-Hour, Disruption Avoidance, Fork Lift Operation and User Scaffold elements) was instituted, as were weekly "all-hands" safety meetings. Lastly, the foremen developed daily (in the morning) pre-task planning reviews.

Project Type:

Aviation

Delivery Method:

Design-Build

Key Participants:**General Contractor:**

Mortenson Construction

Architect:

DWL Architects

Engineer:

LSW Engineers

Electrical Engineer:

Cannon & Wendt

Challenge: The electrical system replacement was a significant undertaking with substantial financial risk to the design-build team, especially given that the critical elements needed to be done in short 2-3 hour bursts of time while the terminal remained open.

Solution: The design-build format allowed the team to revise the design and create new electrical rooms in a low profile, previously-unused underground space (freeing up premium terminal space). Improvements also included new cooling towers and controls (with a more compact footprint) which added extra cooling capacity and provided space for future growth, and equipment was replaced with new higher density equipment which optimized energy efficiency.

Challenge: Terminal 2's existing security checkpoints included only four usable checkpoint lanes, often causing overflow into the lobby/waiting and baggage claim areas due to the high volume of travelers. This created the potential for security issues and reflected badly on the airport's image.

Solution: Again using design-build's inherent flexibility and collaborative environment, two floors totaling 20,000-sq-ft were converted into a new six lane checkpoint area. The former checkpoint area was transformed into a lobby for those meeting deplaning passengers, and newly freed-up space was created for potential revenue-generating businesses by incorporating retail and dining establishments.

Challenge: The owner also placed extreme importance on ensuring that the team provided a quality project, despite its fast-track nature.

Solution: Mortenson implemented its formalized Quality Assurance/Quality Control Management Program, which had two goals: provide a quality product that all project partners could be proud of; and be proactive in solving the inevitable issues. The program included: the involvement of all craft and trades people in the quality process; a review of all submittals for accuracy prior to submitting them; integration of quality with safety by creating project-specific safety Work Plans and Pre-Task Planning Cards; and the monitoring of all non-conformance work performed by sub-contractors through non-conformance notices.

Results:

- The team returned \$1 million in contingency to the owner following the original contract (GMPs I - III), which allowed for improvements to all lighting throughout the terminal, replacement of ceiling tiles, as well as the refurbishment of all bathrooms.

- The project team's success in prioritizing work, coupled with effective cost control, helped the owner to award an additional \$10 million worth of work (GMPs IV - VII) to the design-build team.
- The project was completed (with a total of 78,000 man hours) with zero OSHA recordable accidents, zero OSHA restricted day cases, and zero OSHA lost-time accidents.
- Both projects were completed on time and on budget – with very few (yet always planned) disruptions.