PROJECT PROFILE

FAST-SETTING CEMENT FORMS THE BACKBONE OF SEA-TAC AIRPORT'S RUNWAY REPAIR PROGRAM

Project Type:
Airport

Application:
Panel replacements on runway

Location:
Seattle, WA

Project Date:
June 20-July 28, 2018

Project Owner:
Port of Seattle

Contractor:
Gary Merlino Construction Co.

Producer:
Stoneway Concrete

Product:
Rapid Set® Cement

Seattle-Tacoma (Sea-Tac) International Airport in Washington State is the fastest-growing airport in the United States, with more than 32 airlines taking off from its three runways. Between January and July 2019, more than 127,000 planes landed at the airport. That's a lot of weight moving on and off the pavement on any given day.

For the past 20-plus years, the Port of Seattle, which operates Sea-Tac, has been using Rapid Set® Cement for full-depth concrete panel replacement on the airport's runways and taxiways. The high-performance cement is the Port's material of choice because it provides high initial strengths and a faster return to service with long-term durability. Speed and durability are critical for the runway pavement repairs; much of the work is performed overnight and the repaired sections must be returned to service each morning to not disrupt operations and flight schedules.

Sea-Tac's annual pavement repair program started with replacing 18 concrete panels each year that are roughly 18x20 feet and 18 inches thick, but as airplane traffic increased, the number of panel replacements grew to 48. For 2018 repairs, the Port specified that panels must meet 550-psi flexural strength to open to traffic and reach 650 psi overall at 28 days. Project specifications also included adding lithium nitrate to the concrete mix, to mitigate alkali-silica reaction.

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Contractor Gary Merlino Construction Co. and ready-mix producer Stoneway Concrete, both of Seattle, worked together to test several concrete mix designs before a mix was approved for this project.

THE RIGHT MIX

When working with lithium-based additives, achieving an optimal concrete mix in terms of both performance and workability can be tough because lithium acts like an accelerator, causing concrete to set and dry too quickly. An opposing challenge for this project was the overnight temperatures, which fluctuated between 50 and 60 degrees Fahrenheit. Additionally, the producer's nearest batch plant was located 20 minutes away from the airport.

To counteract lithium's accelerating characteristics, Stoneway Concrete added a retarding admixture to the mix.

The Gary Merlino crew also had to construct three trial panels before the project could move forward. One was placed offsite at the producer's yard to test the mix design, one was onsite in the staging area for proof of concept and another was placed at a terminal gate area to test logistics.

Work began June 20 and was completed by July 28, with the runway opening to traffic every morning by 5 a.m. The crew finished the pavement via roller screed and used a sprinkler for water curing. Project owner Port of Seattle is happy with the results of the panel replacement program and plans to continue using Rapid Set Cement for future projects.

ABOUT CTS CEMENT

CTS Cement Manufacturing Corporation manufactures Rapid Set professional-grade cement products for concrete repairs and new construction projects. Contractors, owners, engineers and architects choose Rapid Set to eliminate problems they have with other concrete repair materials, to save time and money, when superior durability is required and results need to be aesthetically pleasing. For more information about CTS Cement and Rapid Set, please visit www.CTScement.com.