

SECUR System Case Study

North Slope Alaska Runway Stabilization



Project Background

A large oil producer located in the North Slope of Alaska, was seeking a solution to stabilize their gravel runway infrastructure to facilitate year-round safe operations of Dash Q400, 107 Hercs, C-130, and DC6 aircrafts. In addition to a stabilized runway surface course, the Q400 operators required that the treated gravel surface be exposed during the winter months instead of using a snow packed surface.

The major issues with the existing runway were major loss of surface fines and poor operating conditions/strength during thawing and periods of heavy rainfall. Due the remoteness of this facility, there are no permanent roads connecting to other North Slope Infrastructure, so a reliable runway is of critical importance to their operations.

Challenges

The following challenges were encountered when designing the solution:

- **Time Constraints** – The entire installation had to be completed within a weekend to accommodate scheduled incoming flights. To ensure the deadline was met, two crews worked 24 hours a day to complete the installation.
- **Weather**– Due to the geographical location and climate, there was a short window in which the ground is thawed and it is warm enough to allow for construction and proper installation of the SECUR System.
- **Poor Existing Surface Course Aggregate** – The existing surface course aggregate was installed 7 years prior and became completely void of fines over the years. A new 4" aggregate surface course was installed prior to installing the SECUR System.
- **Year-Round Stabilized Surface** – The surface must remain exposed and in optimum condition year-round to protect the aircrafts and ensure safe operating conditions.

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Design

The customer and Midwest worked together during the testing and design stage in which extensive laboratory testing was performed on the site-specific material including Particle Size Distribution, Proctor and CBR testing. Testing was performed to determine the optimum mix design required to produce the best performing runway and meet all CBR requirements for each aircraft.

The design chosen was the SECUR System which included the blended installation of EK35 into the newly installed 4" surface course. The customer's Aviation Group and Environmental Team reviewed and approved the design.

Installation

The airport's construction and maintenance crew performed the SECUR System installation with the assistance of Midwest's onsite technical team. To expedite the installation, a CAT RM300 reclaimer was used to incorporate the EK35 into the surface course layer.

Installation Steps:

1. Loosen the existing surface to a depth of 4"
2. Bring material to optimum moisture content
3. Apply 40% of the total recommended EK35 to the runway surface using E-Sprayer
4. Incorporate the EK35 into the upper 4" with CAT RM300
5. Apply an additional 40% of the total recommended EK35 to the runway surface using E-Sprayer
6. Incorporate the EK35 into the upper 4" with CAT RM300
7. Grade and shape the runway surface with proper crown
8. Compact the treated surface with wobbly wheel
9. Apply the remaining 20% of the total volume of EK35 as a seal coat
10. Continue compaction with wobbly wheel

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Results

The installed SECUR System created a tightly bound, hard surface runway that achieved and exceeded the customers requirements. Shortly after construction, flight testing was successfully performed with the Dash Q400 aircraft to confirm the new runway was suitable for operations. CBR test results provided by the runway operator indicates that the stabilized surface far exceeded the minimum strength requirements. Due to the bound surface and moisture repellent properties of the SECUR System, the runway performed great throughout the winter and subsequent thaw even during extremely wet conditions.

The runway has received very positive feedback from pilots regarding performance. In fact, the runway is so hard the operator was able to paint a centerline on the surface. The facility's environmental department also praised the installed runway for the reduction in dust on the tundra as well as the elimination of water to suppress dust on the runway.

Traditional Gravel Runway Upgraded to a SECUR Stabilized Runway



“The runway is in great condition and performing extremely well. Everyone is very pleased with the results.”

– Runway Operator