

# SECUR System Case Study

## Stabilization of Canadian Runway



### Project Background

A large mine located in the Northwest Territories, Canada was seeking an environmentally friendly solution to stabilize their gravel runway infrastructure and facilitate year-round safe operations of Boeing 737 and RJ100 aircrafts. The runway receives over 1000 flights per year including 667 passenger flights and 409 freight flights. Aviation is a critical lifeline to the mine as all passenger and 10% of freight is moved by aircraft. However, aviation is also the mine's single greatest risk.

The major issues with the existing runway were major loss of surface fines and loose gravel on the runway surface that presented hazards for aircrafts. Due to the type of aircrafts operating on the runway the volume of aggregate and fines loss was a major issue and cost to maintain. In fact, each take-off of a Boeing 737-200/RJ100 can result in a loss of 1.3 cubic meters of fines, if untreated – resulting in a runway covered with loose aggregate and FOD.

The runway had been typically treated with EK35 for 2 years prior to the SECUR System installation and had successfully delayed the urgent need for a complete runway rebuild. Once the decision was made to rehabilitate the existing runway, the obvious solution for the mine was to unlock the full potential of EK35 by installing the SECUR System to stabilize the newly placed aggregate.

### Challenges

The following challenges were encountered when designing and implementing 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 warm enough to allow for construction and proper installation of the SECUR System.
- **Large Aircrafts** – The large jet aircrafts generate excessive forces on the surface during takeoffs that result in major loss of fines and surface erosion. A strongly bound surface was needed to withstand these forces and keep the fines and aggregate locked in place.

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### Project Goals

Through discussions with Midwest, the customer identified the following top goals to be accomplished with the installation of the SECUR System:

- Decrease aircraft damage – FOD
- Improve visibility for the pilots
- Extend the runway life
- Save on maintenance costs
- Reduces/eliminate loose gravel, dust and erosion
- Improve air quality for staff on the ground at the airport
- Improve takeoff/braking - decrease rolling resistance for aircrafts
- Reduce dust for helicopter operations
- Greatly reduce the need for runway maintenance
- Safely complete the project – no exceptions!

### Installation

The airport's construction and maintenance crew performed the SECUR System installation with the assistance of Midwest's onsite technical team.

#### 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 2" lift by windrowing with graders
5. Apply an additional 40% of the total recommended EK35 to the runway surface using E-Sprayer
6. Incorporate the EK35 into the next 2" lift by windrowing with graders
7. Windrow the treated aggregate back onto the runway surface
8. Grade and shape the runway surface with proper crown
9. Compact the treated surface with wobbly wheel
10. Apply the remaining 20% of the total volume of EK35 as a seal coat
11. Continue compaction with wobbly wheel



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### Results

The installed SECUR System created a tightly bound, hard surface runway that successfully accomplished the runway operator's project goals. Even with the most demanding aircraft traffic, the aggregate and fines remain locked into the stabilized runway surface – eliminating summer grading operations and greatly reducing the operating and maintenance costs. Most importantly the SECUR System increased safety at the mine by creating an overall better operating surface and healthier working atmosphere for employees.

The customer is very satisfied with their consistent year-round runway surface and improved performance. The runway surface has continued to perform very well with limited maintenance.



**“Midwest demonstrated a true partnership for potential performance improvement and maintenance cost reduction.”**

*Airport Manager*