

# CPR: BUILT TO LAST



## Eielson Air Force Base, Fairbanks, AK

### >>> DIAMOND GRINDING AND GROOVING

**IT IS NO SECRET** that winters in Alaska can be harsh—not just for its residents, but also for the state’s infrastructure. At Eielson Air Force base (AFB) in Fairbanks, drastic variations in seasonal temperatures of around 100 degrees and extreme winter weather conditions accentuated by the wear caused by constant snow and ice removal had damaged and deteriorated the 14,530-foot concrete keel section of runway 14-32, which is used by fighter aircraft from the 354th Fighter Wing and by large refueling tankers. Repairs and retexturing were required to avoid potentially serious and expensive accidents that could be caused by aircraft losing control on the worn surface.

Concrete was originally chosen for the runway’s 75-foot-wide keel section since it is a material that can withstand the major temperature variations, harsh winter conditions and the process of repeated snow removal by plows. Diamond grinding was used to remove the existing grooved surface before a new grooved surface could be created. In addition, there was a requirement to remove old sealant from the joints of the runway and replace it with new sealant material, followed by striping and marking.

The project was to be completed in four phases. Each phase was to be completed with only a seven-day buffer between the end of one phase and the commencement of the next. In each phase, the old grooves had to be ground out to the satisfaction of the engineer before new grooves could be cut into the runway. Then the old sealant was removed and the joints cleaned, so that new sealant could be installed.

The 14,530 feet of grinding and grooving work was broken down to four phases measuring 2,500, 4,750, 4,750 and 2,500 linear feet. The average depth of the grooves to be ground out was 0.25 inches.



During the work, striping had to be applied on both a temporary and permanent basis prior to the opening of the runway each day. The job required the sealing of 98,000 linear feet of joints.

Approximately 200 locations were repaired on the runway where spalling of the concrete had occurred. Sizes and depths of spalled areas ranged from 5 to 12 inches in width and length and 4 to 14 inches in depth.

Working ten-hour shifts through the night in broad daylight was a shock to the system. Working on a U.S. Air Force base, the contractors also had set procedures for the start and end of each night shift. At the end of each day, the general contractor would contact the tower when the final scheduled landing occurred and would keep constant radio contact with the tower throughout the shift. Cleanup was completed about 30 minutes prior to the first scheduled flight of the day, so that the general contractor and the Air Force could conduct a final walk around inspection of the work area.

“By grinding to remove the existing grooves and re-grooving, a significant amount of time and money were saved,” said Philip Zuzelo, President, Cardinal/International Grooving and Grinding, LLC. “Additionally, there was a huge environmental savings by merely removing a

#### TEAM MEMBERS

- Eielson Air Force Base (Owner)
- Innovative Technical Solutions, Inc. (General contractor)
- Cardinal International Grinding and Grooving, LLC (Sawing and drilling contractor)
- Alaska Concrete Sawing (Joint cutting, sealing and striping)
- Diamond Products (PC5000B grinding machine)

small portion of the existing runway as opposed to complete removal and replacement.”

The grooving and grinding totals for each phase equaled more than 120,000 square yards. In regard to the grinding, over 836 cubic yards of waste material was removed from the runway. The grinding and grooving sections of the work were completed almost one month ahead of the scheduled deadline.

The runway is back in full operation, which was accomplished ahead of schedule, and the 354 FW continues its operations from Eielson Air Force Base on a safer and more efficient surface.