

# **PROJECT PROFILE**



## Potash mine rail tunnel is first installation using our patented bevel reinforcement

A Canadian Pacific (CP) tunnel for the K+S Potash Canada (KSPC) mine in southern Saskatchewan is the first Canadian installation of a Super-Cor Round structure with AlL's patented MSE-reinforced bevels.







### Project at a glance:

**Project Name:** Canadian Pacific Tunnel for K+S Potash Canada Mine

Location: Belle Plaine, Saskatchewan

**Owner:** Canadian Pacific

Design Engineer: Hatch

**Construction and Geotechnical Engineer:** Clifton Associates Limited

Contractor: Kelly Panteluk Construction Limited

Plate Assembly Contractor: Connal Enterprises

**Product:** Super-Cor Round with MSE-reinforced bevels

Application: Rail tunnel below two-lane rural roadDimensions: Diameter 9.69 m, Invert Length 81.6 mInstallation Time: Two months following subgrade preparation



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#### Innovation saves time and money

This innovation allowed construction of the tunnel's 14.5 m long (2.5H:1V) bevels without the need for internal bracing during the backfill process. This saved time and money compared to the traditional false-work brace method. Our unique design connects heavy-duty welded wire soil reinforcement mats to a series of connection anchor strips that are integrated with the exterior sides.

AIL Mining's scope on this project included the structural design of the Super-Cor tunnel and the cast-in-place concrete collars on the bevelled ends. These collars helped stiffen the ends of the tunnel and facilitate grading of the embankment slopes to the tunnel opening. The tunnel construction took place in a 13 m deep cut excavation area, as the completed tunnel would run under a two-lane rural road.

### Mid-construction change required swift action

Typically, AIL manufactures all Canadian Super-Cor at our Ayr, Ontario, plant. Part way through construction, it was decided to lengthen the tunnel by 28.2 m to accommodate a revised site layout. To lessen the impact on the construction schedule, manufacturing of the extension components was shifted to AIL's sister company Big R Bridge. The new Super-Cor components were rushed from Big R's Texas plant to Saskatchewan without severely impacting the schedule. The AIL Group's consistent manufacturing quality control program ensured easy fit-up between the Canadian and US-produced plates.

## Pre-shaped bedding and flowable fill save time and money

AIL Mining offered technical assistance on constructing a pre-shaped pipe bedding and on injecting a cementitious, flowable fill under the tunnel invert once the plate assembly was complete. Using flowable material allowed for a faster

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and safer fill of any potential voids and saved days of hand tamping gravel below the invert.

### AIL Mining Engineer provided site supervision

An AIL Mining Engineer was retained by the Contactor, Kelly Panteluk Construction Limited (KPCL), to be onsite to offer part-time assistance during the plate assembly and on two other multi-day visits to assist with the backfill process, MSE mat layout and shape monitoring. 24/7 technical assistance was also offered over the phone. Both KPCL and their Plate Assembly Contractor, Connal Enterprises, were excellent to work with.

Full-time construction monitoring was provided by the Construction and Geotechnical Consultants, Clifton Associates, including geotechnical engineering, materials testing, shape monitoring and construction field reviews.

### Early collaboration helps ensure successful outcomes

This project started years earlier with AIL Mining's early design/specification collaborations with Hatch, the project's Design Consultants. We encourage this type of early design collaboration, as it helps ensure the most successful project outcomes.

### Custom-built rail cars make first trip on new line

AIL Mining Representatives were on hand on March 13, 2017 as the first 177 of 531 custom-built rail cars arrived at the mine site — enough to complete one of three trains that CP will use to transport KSPC's product to its world-class potash handling and storage facility in Port Moody, BC. The first train travelled along 30 km of CP's recently constructed Belle Plaine subdivision connecting its main line with KSPC's new industrial spur. The tunnel is located on the CP section.

