

CASE STUDY

PIPE JACKING | TUNNEL BORING



Project Name:
Inuvik Airport Civil Infrastructure & Runway Extension

Prime/Sub Contractors:
The Tunneling Company - Kamloops, BC

Location:
Inuvik, NWT - Canada

Ground Conditions:
Permafrost zone consisting of frozen clays with fine to coarse sand and trace gravel, well bonded with 5-10% visible ice by volume

Akkerman Equipment:
WM480D TBM, Mixed Ground DCh, 5200 Pipejacking System, 524 Haul Unit, and tunnel heating & ventilation system

Pipe:
60-in. OD Steel Casing

Total Length/Longest:
320-lf. crossing

PROJECT OVERVIEW

Most likely the northernmost TBM pipejacking project performed in North America, TTC battled extreme weather and changing ground conditions along this 320-LF alignment. Anticipating permafrost along the entire run, the ground became soft after only 17-LF requiring TTC crews to change the TBM cutterhead to standard carbide tooling onsite to continue.

THE CHALLENGES

- **Unpredictable Permafrost Conditions:** The project was expected to encounter frozen ground throughout the alignment, but crews faced unexpected soft soils after only 17 linear feet, complicating TBM advancement.
- **Extreme Cold Weather:** Operating in one of the northernmost regions of North America, the tunneling crew faced frigid temperatures that threatened equipment performance and worker safety.
- **Remote Location Logistics:** The remoteness of Inuvik posed challenges in transporting equipment, replacing parts, and ensuring consistent site support.
- **Tooling Adaptability:** Initial cutterhead configuration proved unsuitable for the encountered soil conditions, requiring rapid tooling modifications.

THE SOLUTION

- **Onsite Cutterhead Modification:** TTC crews swiftly adapted to the ground shift by replacing the TBM cutterhead with standard carbide tooling directly onsite, minimizing downtime.

- **Specialized Equipment Deployment:** Akkerman’s WM480D TBM and 5200 Pipejacking System, supported by the 524 Haul Unit and a custom heating and ventilation system, ensured equipment remained functional despite the cold.
- **Thermal Control Measures:** Tunnel heating and ventilation systems were employed to maintain optimal conditions for both personnel and machinery.
- **Efficient Project Coordination:** Close coordination between TTC and Akkerman ensured prompt response to shifting ground conditions and remote operational needs.

OUTCOME

Despite facing unpredictable soil transitions and extreme Arctic conditions, the project was completed successfully and on schedule. The flexible engineering and robust tooling provided by Akkerman, combined with TTC’s experienced crew and rapid field adaptability, ensured the 320-lf. crossing was executed safely and efficiently—demonstrating that even the most remote and rugged environments can be conquered with the right expertise and equipment.

