CASE STUDY
PIPE JACKING & UTILITY TUNNELING | TUNNEL BORING

Project Name:
Michigan Ditch Tunnel

Subcontractor:
BTrenchless, A Division of BT Construction, Inc.

Location:
Never Summer Mountain, Jackson, CO

Owner:
City of Fort Collins

Ground Conditions:
Highly Fractured Pegmatite & Gneiss Rock

Akkerman Equipment: 720 Series II TBM, 98-in. Mixed-Ground Disc Cutter Head, 5200 Pump Unit and Dual Bucket 1548 Haul Unit

Pipe:
98-in. OD Ring Beam & Lagging, 60-in. Hobas®

Total Length/Longest:
766-lf./766-lf.

PROJECT OVERVIEW

The 5.2-mile Michigan Ditch conveys transmountain fresh drinking water for City of Fort Collins residents. A slow-moving landslide imparted damage to various portions of its above-ground piping network, and its continuous restoration had been a burden on the City. The damage reached critical mass when a landslide moved a large section of the delivery system a significant distance.

The City of Fort Collins recognized the water source as one of their communities' most valuable commodities and put together a team of experts using an Alternative Product Delivery System model.

The team decided to re-route and permanently protect the most vulnerable portion of the aqueduct by constructing a 98-in. OD ring-beam and lagging through Never Summer Mountain. The 766-ft. tunnel featured a 630-ft. radius curve, to be completed with 60-in. OD carrier pipe.

THE CHALLENGES

- High-risk tunnel in highly fractured pegmatite and gneiss ground conditions
- Required construction between the snowfall end in the spring and when it began again in late fall
- Remote project site more than 30-miles from the closest city
- Considerable site preparation before tunneling equipment was mobilized
- Careful scheduling and staging to safely transport equipment without exceeding access road weight limits

THE SOLUTION

BTrenchless ordered a customized TBM system package:

- 720 Series II TBM with TBM stabilizers and the maximum number of TBM drive motors
- 98-in. mixed-ground disc cutter head, designed to excavate up to 15,000 psi rock with back-loaded tooling mounts
- Propulsion can for the TBM to advance off of the constructed tunnel
- Dual extended belt conveyors to extend through the TBM and propulsion can for maximum tunneling efficiency to excavate one ring set within two haul unit cycles
- A standard 5200 Pump Unit with a 200 HP Auxiliary Pump

OUTCOME

- A challenging project exceeded all of its goals
- The collaborative approach of the ADPS model resulted in nearly $1 million in project savings
- The project will provide reliable drinking water for City of Fort Collins residents for many years

Corporate Headquarters
58256 266th Street
Brownsdale, MN 55918 | USA
Ph.: +1 (800) 533.0386 | akk@akkerman.com

For more information please visit:
www.akkerman.com