CASE STUDY
PILOT TUBE & PIPE JACKING | HYBRID METHODS

Project Name:
Empire State Trail Box Tunnel

Prime/Sub Contractors:
Brierly Associates

Location:
Schenectady, NY

Ground Conditions:
Nonconsolidated Ground

Akkerman Equipment:
240A GBM System, Guidance System, Lube System, Pull-back Adapters

Pipe:
12-ft. x 12-ft. Box Tunnel

Total Length/Longest:
170-lf.

PROJECT OVERVIEW

Due to the ground conditions, a unique blend of trenchless techniques were used to construct this box tunnel. To provide guidance and soil stability, an Akkerman 240A GBM system was used to create an exact line, grade floor and ceiling for the box tunnel to be inserted. Pilot tubes were installed with the 240A GBM and the HDPE was pulled out. Once the HDPE was installed and solidified, the material was removed, and the box tunnel was pulled into place.

THE CHALLENGES

- Unstable Ground Conditions: The project was located in nonconsolidated ground, which posed significant risk for settlement and loss of structural support during excavation.
- Precision Alignment for a Box Tunnel: The installation of a 12-ft x 12-ft box tunnel required extremely accurate line and grade to ensure a smooth fit and structural integrity.
- Non-Traditional Tunnel Shape: Unlike circular pipes, box tunnels require flat, consistent surfaces and exact alignment over the full tunnel profile.
- Limited Excavation Options: Open-cut methods were not feasible due to surface disruption concerns and the need for a trenchless solution.

THE SOLUTION

- Pilot Tube Guided Boring: The Akkerman 240A GBM system was deployed to install pilot tubes and establish a precise line and grade for both the tunnel floor and ceiling.
- Use of HDPE Sleeve: HDPE was pulled into place and solidified along the pilot path, creating a stable, guided conduit for the final structure.
- Adapted Pull-Back Method: Once the HDPE was removed, the 12-ft x 12-ft box tunnel was pulled into place using custom pull-back adapters, ensuring smooth and accurate placement.
- Ground Lubrication and Stability Systems: Akkerman's lubrication system was utilized to minimize friction, stabilize the bore path, and support ground conditions during installation.

OUTCOME

- Accurate Installation Achieved: The 170-lf, 12-ft x 12-ft box tunnel was installed precisely to line and grade, ensuring structural integrity and project success.
- Minimized Ground Disturbance: The use of guided boring and HDPE sleeves effectively stabilized the nonconsolidated ground, preventing settlement or surface disruption.
- Innovative Trenchless Execution: The hybrid method combining guided boring, HDPE stabilization, and pull-back installation showcased a creative, efficient solution for complex ground conditions.
- Successful Collaboration: Brierly Associates and Akkerman equipment worked seamlessly to deliver a challenging tunnel crossing with minimal impact and maximum precision.

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