

CASE STUDY

TUNNEL BORING | WATER & SEWER



Project Name:

US-401 & Ligon Mill Rd Improvements



Prime/Sub Contractors:

Moffat Pipe, Inc. – Wake Forest, NC



Location:

Wake Forest, NC



Owner:

Municipal Infrastructure Authority



Ground Conditions:

Sandy clay with cobbles



Akkerman Equipment:

5200 Pipe Jacking System with WM48S-D TBM. Mixed-Face Disc Cutterhead, VL-80 Laser Guidance System. 524 Haul Unit and accessories



Pipe:

48-in OD steel casing (0.625-in wall thickness)



Total Length/Longest:

Twin drives totaling 880 LF (2 × 440 LF)

PROJECT OVERVIEW

Moffat Pipe, Inc. completed tunnel boring operations for the US-401 and Ligon Mill Road Improvements project in Wake Forest, North Carolina. The project required installation of a 48-in steel casing beneath roadway infrastructure while maintaining precise line and grade control in variable ground conditions.

Originally planned as a jack-and-bore operation, the contractor deployed an Akkerman 5200 Pipe Jacking System with TBM capabilities to improve efficiency and maintain alignment across extended drives. This approach allowed the crew to complete the crossing with minimal surface disruption while adapting to mixed ground conditions.

- Leveraged pipe jacking methods to reduce surface disruption and improve installation efficiency

OUTCOME

- Successfully completed two 440 LF tunnel drives totaling 880 LF
- Maintained accurate line and grade control through mixed ground conditions
- Achieved efficient excavation and consistent production using TBM technology
- Minimized surface impact along the roadway corridor
- Demonstrated the flexibility of pipe jacking and TBM systems for complex utility crossings

THE CHALLENGES

- Variable subsurface conditions including sandy clay and cobbles
- Maintaining alignment accuracy over twin long drives
- Need to optimize installation method for efficiency and access constraints
- Managing excavation performance in mixed-face ground conditions

THE SOLUTION

- Utilized the Akkerman 5200 Pipe Jacking System with WM48S-D TBM to maintain precise line and grade control
- Deployed a mixed-face disc cutterhead to effectively excavate cobbles and cohesive soils
- Incorporated laser guidance systems to ensure alignment accuracy over extended drives

