AKKERMAN NEMS Newsletter About Akkerman Underground Construction Equipment Solutions

Volume I, 2021

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Critical Rock Bore in Virginia

Aaron Enterprises, Inc. recently completed a line and grade critical rock bore in Virginia with an Akkerman TBM just in time for Christmas 2020.

The Harrisonburg – Rockingham Regional Sewer Authority (HRRSA) is the governing body responsible for constructing, operating, and maintaining facilities and infrastructure that collect and treat wastewater in Virginia's service area.

HRRSA sought bids for the Blacks Run Interceptor Division IB



Replacement, a capital improvement project for the construction of a 3,700-lf., 48-in. interceptor, abandoning existing interceptors and reestablishing several sewer service laterals.

Garney Construction of Kansas City, MO, was awarded the contract as the general contractor for most of the interceptor utilizing the open-cut pipe installation method. The exception was a 200-If. bored crossing for installation under Stone Spring Road, which required the expertise of a trenchless contractor. The construction manager was Wiley Wilson of Richmond, VA.

Aaron Enterprises, Inc. of York, PA was identified as the trenchless subcontractor for the 200-ft. bore.

Tom Rice, Aaron Enterprises' program manager, explained that their part in the project was to "Install 200-If. of 72-in. steel casing at a critical line and 1.02% downhill grade for a 48-in. ductile iron sanitary sewer." Rice points out, "The proposed crossing was under Virginia DOT's Stone Spring Road with minimal clearance, and two existing sanitary sewers within 18 and 24-inches."



Continued from Cover...

The mixed-face ground conditions were the biggest known challenge on the project. Two soil borings were conducted along the proposed crossing - one where the launch pit was constructed and one by the exit shaft.

The bore sample from the launch pit side showed limestone at approximately 11-ft. depths. Rice explains, "The invert of the proposed 72-in. casing was at an 18-ft. depth, so we knew we would start the bore in a full face of rock." He furthered, "We anticipated starting in rock, and transitioning in and out of pinnacles of limestone throughout the remaining length, to finish in all dirt."

The sample taken by the exit shaft was mostly dirt, but rock was tagged in the exit pit just below the proposed invert of the casing. Because of lack of surface accessibility to conduct additional bore samples along the alignment, Rice stated, "We had no soil boring information between the launch pit and exit pit."

An Akkerman manned TBM with a project specific mixed-face disc cutter

head capable of 24,000 UCS psi. was selected as the best option to contend with the anticipated ground conditions. Its large opening at the face allows spoils and chunks of rock to pass through the head onto the conveyor. The all-in-one TBM system comprises a pump unit with hydraulic thrust cylinders, a thrust yoke that matches the product pipe, and a skid base for effective pipe jacking in a compact footprint. The addition of a haul unit system and conveyor makes for efficient spoil removal through the tunnel.

The general contractor required three weeks to excavate the 40-ft. long, by 16-ft. wide, by 18.5-ft. deep launch shaft alongside Stone Spring Road.

Aaron crews and the Akkerman equipment mobilized to the project site in late November 2020.

Tunnel boring operations commenced following Thanksgiving 2020, with the intent to complete the crossing before the Christmas holiday. Aaron crews planned to work around the clock, 12-hr. shifts to meet the project manager's aggressive schedule.

Operating a TBM is unlike any experience that one can have. Operating pressures, unidirectional cutter head rotation, and steering to keep the alignment on line and grade are imperative - and operation in rock is even different still.

To assist Aaron's new crew with the pipe jacking system's operation, the subcontractor requested that an Akkerman

> with the setup and launch of the TBM. When an electrical component issue arose, it was fortunate that he was there to assist in getting the machine back up and running as quickly as possible. "I feel this downtime was minimized because the technician was on-site, and able to consult with his team back at Akkerman to get it fixed quickly," asserts Rice.

field technician be on-site to advise

Groundwater was an unexpected challenge not identified in the geotechnical data, encountered at the half-way mark during the downhill run. Rice detailed, "Typically, Aaron prefers



As anticipated, the first 30-If. of the 200-If. crossing comprised solid limestone. After 30-ft., the ground conditions transitioned to dirt. The remaining 170-If. was in and out of dirt and limestone.

to bore uphill, but due to site work area constraints as well a the mixed-face conditions, we elected to bore downhill. We believed that it was better to start the TBM in a solid form of rock versus dirt to try and nest the TBM into the rock later. The groundwater began to migrate and collect at the front of the TBM while boring downhill." The crew installed a small submersible pump to remove the groundwater, and mining operations resumed.

As anticipated, the first 30-lf. of the 200-lf. crossing comprised solid limestone. After 30-ft., the ground condition transitioned to dirt. The remaining 170-If. was in and out of dirt and limestone. Aaron operators were able to average 10-ft. of 72-in. casing installation per shift.

They daylighted the TBM in the exit shaft on December 18, just in time to return home to their families for Christmas.

"Mixed-face ground can be some of the most adverse conditions to try and bore through," Rice asserted. "The TBM

TUNNEL BORING SYSTEM KEY ADVANTAGES



- Akkerman Tunnel Boring Machines (TBMs) for manned-entry feature open-faced mechanical excavation and ease of operating controls
- Base TBM diameters from 48-96-in. OD
- Operator controls steering, maintains line and grade and monitors the soil removal process from a control station inside the TBM
- A sealed steering joint allows for full articulation in wet environments



Garney Construction excavated the ground to construct the launch shaft at 18-ft. depths in rock where Aaron Enterprises crew would launch the TBM system.

as	handled the difficult crossing extremely well. Despite the
	challenges experienced, the crossing came out at almost a
F	perfect bulls eye for line and grade! Overall the TBM handled
	extremely well."
f	
	SUBCONTRACTOR: Aaron Enterprises, Inc.
	LOCATION: Harrisonburg, VA
	OWNER: Harrisonburg – Rockingham Regional Sewer Authority
IS	COMPLETION: December 2020
	GROUND CONDITIONS: Limestone and Dirt
	PIPE: 72-in. Steel Casing
	TOTAL LENGTH/LONGEST RUN: 200-If.
	AKKERMAN EQUIPMENT: TBM 600 with Mixed-Face Disc-Cutter Head, 5200 Pump Unit, Skid, Yoke, Haul Unit

- Three-point hydraulic steering control
- High capacity main bearing
- Two-speed drive motors operate in either lowspeed/high-torque or high-speed/low-torque modes
- Torque wings provide anti-roll function
- All-In-One Tunnel Boring System adapts to any jacking pipe and an extensive range of diameters and pipe jacking applications
- The 5200 Series Pump Unit features independent hydraulic jacking and TBM supply functions with pressure compensated capabilities
- Customized excavation modes, cutter head types, and diameters to meet project demands
- Cutter heads are accessible from the interior of the TBM for obstruction removal, tooling changes, and performing maintenance while underground

Employee Lunches Support Local Eateries

kkerman is a leading employer in Mower County, Ain southern Minnesota. In 2020, we continued our commitment to the communities, businesses, and services where our workforce resides with a new approach.

This past year the communities' needs were more significant and varied than ever. Minnesota's two separate executive orders prohibiting indoor dining had many local eateries enduring hardships and scrambling to find a COVID-19 safe way to maintain services.

The closures' coincided with the cancellation of most of Akkerman's typical tradeshow season. We decided to apportion some of the funds customarily used for tradeshow expenditures to provide Akkerman employees with weekly noontime meals.

"In the last eight months, we've supplied 900 lunches for our employees over 13 weeks that coincided with our state's indoor dining shutdown," Justin Akkerman, President of Akkerman comments. "We diversified our orders to include many locally-owned eateries," Akkerman furthered. "The meals gave business to local restaurants and a morale boost to our employees."

Josh Diaz, owner of Piggy Blues, one of the restaurants who provided the lunches stated, "I can't thank Akkerman enough for the extra support during the 2020 pandemic. It made a difference in our ability to remain in business through this tough year."

Akkerman has a long history of promoting local patronage and charitable giving. When possible, Akkerman elects to locally source goods and services and encourages its employees to do the same. Akkerman's ownership has been involved in organizations like the Development Corporation of Austin and the Austin Chamber of Commerce. They make annual contributions to support extracurricular activities like robotics, dance, sports teams, education, youth development, historical, arts, veterans' organizations, civic groups, and cancer research, to name a few.

Driven for Customer Success

Akkerman concludes, "We believe that civic involvement is our responsibility as an area employer and that it contributes to our company's success through our employees' quality of life. We want these businesses to be there for us when we come out on the other side of these challenging times."



Rhonda Akkerman and Justin Akkerman prepare the serving stations so that employees can safely get their lunch and condiment options.



Akkerman employees move through the food line during the noon hour during one of the weekly lunches served to employees that coincided with the indoor dining shutdowns.

"We believe that civic involvement is our responsibility as an area employer"

Alex Whiteis Named Plant Manager



▲ lex Whiteis was Apromoted to Plant Manager at Akkerman. Whiteis transitioned into this role when Justin Akkerman moved to his role as President in mid-2020.

Whiteis came to Akkerman as a dual

mechanic and field technician in July 2007, primarily in the microtunneling area, but also provided mechanical and field technician support for the GBM, MTBM, and EPBM equipment lines. He assembled and finished equipment to specification for ten years and spent many months traveling to customer projects throughout North America.

In 2017, Whiteis was promoted to MTBM Product Line Lead. This change aligned his responsibilities with the production side of the business and team lead management for microtunneling field services.

Transitioning to the Plant Manager was a natural progression in his career at Akkerman. As plant manager, Whiteis ensures that the manufacturing processes run reliably and efficiently to meet the customers' schedules. He manages in tandem with the department leads to maintain a safe production environment and efficient workflow, and identifies resource needs and improvements.

Whiteis has a natural inclination towards troubleshooting. reading schematics, electrical systems, and interacting with customers to problem solve. He demonstrated mechanical aptitude at a very young age when working on cars and pickups, dirt bikes, and go-carts. From the age of 13 through 19 years old, he spent summers at his family's resort in Grand Rapids, MN. From this experience, he learned countless skills and the value of a strong work ethic.

Whiteis earned his associate degree in automotive repair and ASE Master Certification from South Central Technical College in Mankato, MN. He began his professional career as the lead technician of an automotive repair business in Austin, MN, before coming to Akkerman.

Whiteis, his wife, and three children reside in Austin, MN. He and his family enjoy camping, fishing, biking, and hunting.

Driven for Customer Success











Whiteis logged many hours and miles throughout North America while providing field technician support for customers at their project sites.





Project Highlights



RS Tunnelling Inc. of Hannon, ON was the microtunneling Contractor on the Streetsville Watermain and Sanitary Sewer Replacement, Contract 2, located in the City of Mississauga, Region of Peel, Ontario, Canada. CRS had their SL60C MTBM outfitted with a new disc cutter head to contend with the shale bedrock and interbedded layers of hard limestone present along the majority of the 853-If. alignment. The image depicts the launch of the MTBM, at 26-ft. deep, in mid-April 2020. The microtunnel was completed on May 21 and went without a hitch.

STREETSVILLE WATERMAIN AND SANITARY SEWER REPLACEMENT

CONTRACTOR: CRS Tunnelling Inc.

LOCATION: Mississauga, Ontario

OWNER: City of Mississauga/ Region of Peel

MICROTUNNEL COMPLETION DATE: May 2020

GROUND CONDITIONS: Shale Bedrock, Limestone

PIPE: 60-in. Steel Casing

TOTAL LENGTH/LONGEST RUN: 853-lf./853-lf.

AKKERMAN EOUIPMENT: SL60C Microtunneling System

SUBSTATION **CONDUIT PROJECT**

CONTRACTOR: Sonic Foundation Drilling Pty. Ltd.

LOCATION: Singapore

COMPLETION DATE: September 2020

GROUND CONDITIONS: Crushed Concrete, Sand

PIPE: 159 mm ID PVC

TOTAL LENGTH/ LONGEST RUN: 9,800-lf./40-lf.

AKKERMAN EOUIPMENT:

(2) GBM 240A Systems, Rock Drill Adapter and TriHawk® Heads



onic Foundation Drilling Pty Ltd. of Singapore simultaneously used two GBM systems to construct cable conduits for a new substation. The GBM systems overcame two of the leading project challenges - lack of a reception shaft and accurate bores just 1m

below existing cables. If the existing cables were disrupted, an electrical outage would occur for half of the town. Starting January through September 2020, 254 pilot tube bores averaging 40-lf. each were blind installed and finished by pushing in the project pipe. The bores were initiated with the Rock Drill Adapter and TriHawk® Drill Bit, increased to eight inches with an auger, and lined with HDPE pipes. Approximately 9,800-ft. was successfully completed. This project represents the first instance that such an operation was allowed in Singapore.



NorthConnex Road Tunnel project. UEA crews installed five 36-meter (118-If.) bores to house the utility lines at +68% grade. They used their GBM 240A system for the pilot tube bores, then both pushing and pulling reamers to match the 350-660 mm (14-26-in.) unlined boreholes in sandstone and siltstone ground up to 80 mPa. Their GBM system also assisted on larger diameter HDD bores to provide line and grade accuracy. Now complete, the NorthConnex Road Tunnel follows Pennant Hills Road and alleviates traffic congestion for up to 100,000 vehicles daily, at 60 meters (197-ft.) below the surface.



n May 2020, Total Trenchless of Calgary, AB, was on-site for a guided auger boring drainage culvert project in Calgary, AB, on the West Calgary Ring Road Expansion. The culvert design was very shallow, just feet below active traffic on the TransCanada Highway; therefore, an accurate installation was critical. With quality equipment, an experienced crew, and ideal clay ground conditions, the 360-lf. culvert replacement was completed in six shifts. The pilot tube bore was followed by 40-ft. sections of steel casing, advanced with their Michael Byrne ABM.

Nontractor UEA Ptv Ltd of Sydney, Australia, was a trenchless subcontractor for installing electrical, communications, and water conduits within the cross passages that supported the 9-kilometer (5.5-mile)

SUBCONTRACTOR: UEA Pty Ltd

LOCATION: Sydney, Australia

OWNER: LendLease Bouygues Joint Venture

COMPLETION: September 2020

GROUND CONDITIONS: Sandstone, Siltstone up to 80 mPa

TOTAL LENGTH/LONGEST RUN: 590-lf./118-lf.

AKKERMAN EOUIPMENT: GBM 240A System

PIPE: 30-in. ID Steel Casing

GROUND CONDITIONS:

SUBCONTRACTOR:

LOCATION: Calgary, AB

OWNER: TransCanada

Total Trenchless

Highway

COMPLETION:

May 2020

Clay

TOTAL LENGTH/LONGEST RUN: 360-lf.

AKKERMAN EOUIPMENT: GBM 240A System

Vioit us at these 2021 Tradeshows & Conjerences:

March 28 - April 1, 2021 NASTT No-Dig 2021 Orlando, FL **Orange County Convention** Center Presenter & Gold Sponsor

July 13-15, 2021 UCT 2021 Booth #528 Nashville, TN Music City Center **Exhibitor & Presenter**

November 8-10, 2021 No-Dig North Vancouver, BC Vancouver Convention Centre **Exhibitor & Presenter**



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