



LEFT: The Robbins 72-inch (1.8 m) Motorized SBU (SBU-M) broke through almost exactly on line and grade after 395 ft (120 m) of boring. RIGHT: The Robbins SBU-M was the largest machine of its kind ever made, and utilized a mixed ground cutterhead in clays as well as rock.

SYNCHRONIZED SBUs RIGHT ON SCHEDULE

FOUR SIMULTANEOUS OPERATIONS. SIX CROSSINGS BELOW ROADS AND RIVERS.

That was the challenge facing contractor L.J. Keefe Co. on the City of Clinton Contract B Force Main in Clinton, Iowa, USA.

The simultaneous construction required hard rock and mixed ground auger bores as well as TBM tunneling, all within a short construction schedule of just five months. "We had an extremely tight time frame, but we were able to work with the general contractor, engineer, and Robbins to encompass multiple soil conditions and tight tolerances," said Larry Keefe Jr., General Manager of L.J. Keefe Co.

Three crossings ultimately used hard rock Small Boring Units (SBU-As) as well as a 72-inch (1.8 m) Motorized SBU (SBU-M), the largest diameter ever made.

Testing of the 395 ft (120 m) crossing below Highway 67, the busiest roadway in the area, revealed a mixed face of silty, watery sand, clay, and 10,000 psi (70 MPa) UCS hard rock. "We opted to use SBU technology, even though other contractors said it could only be done with microtunneling," continued Keefe.

The machine, complete with mixed

ground cutterhead, began its excavation on January 3, 2012. About 15 ft (5 m) into the bore the machine hit hard clays, requiring water to be added through the cutterhead and to the casing. Despite the clay, crews were able to maintain line and grade using articulation cylinders, while monitoring the progress using laser targeting.

"We were within 0.75 to 1.0 inches (19 to 25 mm) of line and grade the entire time, there was very little drift. I'm used to steering articulated machines, because we use a lot of TBMs. Keeping on line and grade was easy, particularly when we got into the rock," said Steve Lilo, Operator/Foreman of the SBU-M for L.J. Keefe.

Ultimately, all of the contractor's bores were completed on schedule and within the required line and grade limits. "The biggest benefit is in being able to mold our current technologies with SBUs, using them in conjunction with ABMs, or in conjunction with our existing tunneling equipment. We can use our existing equipment with the specialized Robbins equipment to lower costs and shorten project schedules," said Keefe.

2012 EVENTS CALENDAR

Women in Tunneling

June 24
Indianapolis, Indiana, USA
Inaugural event held at the NAT show

Robbins will exhibit at the following trade shows:

NAT

June 24-27
Indianapolis, Indiana, USA
Presentation Topics:
TBMs in Mining
High Cover Tunneling
EPB Cutterhead Wear
EPB Launching Methods
Novel Ground Support

CityBuild

October 16-18
Moscow, Russia

TAC 2012

October 17-20
Montreal, Quebec, Canada



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