A Field Technician's Recommendations on Microtunneling Cable Routing and Care

By Alex Whiteis

Today's microtunneling systems are chock full of electronics and a frequent project concern involves the routing and care of the cabling that support these systems. Sand, dirt, oil and water in cable connections can be detrimental to a microtunneling operation. Debris in the connections can conduct electricity between phases, greatly compromising the equipment.

Your average microtunneling job uses a variety of cables: cutter head power, booster pump, MTBM power, guidance system and communications are just some of the uses for electrical cables. Each section of cable typically ranges in length from 50 to 100 ft.

During setup, a stationary set of cables is routed from the control container on the surface to the jacking frame in the launch shaft. During operation, it is important to keep cables clear of debris, water and fluids. When connecting lines, crewmembers should clean all connections with a non oil-based electric contact cleaner then neatly coil extra lengths of cabling while being wary of pinch points. We recommend that contractors do not use electric contact grease since it tends to collects airborne dust and dirt. When a crane is involved in handling cabling, contractors should be sure to use thick straps rather than chains to prevent damage to the insulation on the cables.

Microtunneling slurry pipes in the tunnel typically lie at the base of the pipe and provide a good foundation to lay the cable lines on, starting from largest on the bottom of the stack to the smallest on the top. The largest and heaviest cables will require more manpower for proper positioning. I suggest hanging the communications cable on the pipe wall when possible to avoid noise interference (RFI) from the variable frequency drives (VFDs) and other high powered electronics. If the tunnel's diameter is large enough, all cabling can be hung from hooks or brackets on the tunnel wall. Bear in mind that when walking the tunnel with a cable, always hold connection ends up so water is not kicked up into the connection ends.

Upon the MTBM launch and as pipe jacking proceeds, additional slack in the cabling can be coiled in the trailing pipe at the thrust plate. As the MTBM advances, pipe sections are added and the cables trail behind. Crewmembers keep tally of when additional cabling will be needed and the new sections are lowered inside the corresponding pipe section.

When breaking cable connections to add a new pipe section to the tunnel, operators should power down all electrical feeds to the tunnel. Electrical cabling should be disconnected first and microtunneling slurry pipes last to prevent slurry water from getting the cables wet. Conversely, when the pipe and connections are reinstated, the crew should start with the slurry pipes, then largest cables and end with the communications cable. During this process, the crew must ensure that their hands or gloves are clear of dirt and oil when making connections to prevent contamination.

As an added convenience and safety feature, the cabling on most modern microtunneling systems have an integrated pilot circuit that won't allow the cable to be energized when debris is present and a connection is not fully made. The MTBM operator in the control console usually has a visual indicator that displays the status of the pilot circuit for each cable.

While care and concern must be given to routing and positioning of cables on the jobsite, just as much focus needs to be given to appropriate storage. Upon storage, cable lengths and connections should be visually inspected, cleaned with electric contact cleaner and blown dry with compressed air. Use industrial strength plastic bags to cover all ends of cable connections then taping the bags to the cable. Cables should be neatly coiled and stored in a container that is protected from the elements.

When contractors follow the above cabling recommendations, they should achieve the maximum value of their cabling investment.

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