



Downrange Primary Power



Direct Buried Cables vs. Conduit System

Purpose

This section provides the standard requirement and comparative analysis between using a direct buried cable versus a conduit system for supplying downrange primary power on ranges.

Conclusion

In all but very rare cases, the benefits of a conduit system do not outweigh the higher initial cost. Direct buried downrange primary power is the standard on ranges.

Assessment

The MCX used the following in the assessment:

- UFC 3-550-01 permits the use of direct buried cable on training ranges.
- The design life expectancy of an Army range is 25 years.
- An undamaged conduit system makes it easier and cheaper to replace a damaged cable reducing any down time.
- Direct buried systems are cheaper to install.
- Issues with, or damage to, down range primary power cabling have not been reported on correctly installed Army ranges less than 30 years old. Reported issues involved cables that were 1) not installed as recommended in the Range Design Guide, (e.g. not buried deep enough, or backfilled with the wrong material), or 2) had exceeded the design life expectancy of the range.
- The cost difference is significant. In addition to the conduit, a conduit system requires access (manholes or handholes) to allow pulling the cables. Initial estimates for the FY19 DAGIR at Ft Knox are \$1.5M for direct buried primary power and \$4.75M for a conduit system.
- The manholes/handholes that are required by the conduit system are susceptible to damage and, if not properly located/protected, introduce potential ricochet issues.

- The conduit system does not significantly increase the protection of the cable from downrange hazards. Rounds from main gun, artillery, or helicopter training that would cause damage to a direct buried cable would generally damage the cable in a conduit just as easily. All underground cable systems require concrete encased duct banks in anticipated vehicle traffic locations; course roads, parking lots, etc.

Results

Based on the significant additional install cost and the rare reports of damage, it is clear that the direct buried primary power cable has a much better cost/benefit ratio. It is, therefore, the standard on Army Ranges. No additional analysis is necessary or warranted.

Exceptions

Installation DPW's that require conduit systems must get an Exception to Standard approved by the RTLP MCX, IMCOM, and DAMO TRS. The exception must include a detailed cost-benefit analysis.