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THERMAL GROUND TREATMENT FOR POWER CABLES INSTALLATION

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ABSTRACT: The electric power industry is under increasing pressure to install high voltage transmission lines underground in urban and environmentally sensitive areas. Trenchless technology is now being used more frequently to construct these underground installations in areas that are not accessible to trenching. The trenchless methods of choice are small diameter tunnels and/or horizontal directional drilling. These trenchless technologies often result in utility installations that are often significantly deeper than those installed using more conventional open cut trenches. Dissipation of heat generated from the utility lines in these deeper installations is a limiting design factor in the use of trenchless technologies for these types of installations. Open-cut trenches afford space and access to install a thermal dissipation zone around the utility. However, small diameter tunnels and/or HDD installations have limited space and access to the zones between the cable and the duct or the duct and the soil to incorporate heat dissipation materials. The space and access limitations along with duct strength properties require special fluid properties and pumping methods to permit installation while still retaining the long term stability and density to provide the necessary thermal dissipation. This paper discusses the present state of practice for heat dissipation in these restricted access applications, the expected performance of these applications, and thoughts for developing better technology for this problem.