



Kerite Cable Services Coordinates Simultaneous Underground Cable Installations in Highly Congested High Voltage Area

Crews Battle High Winds, Short Timelines and Dangerous Conditions to Link Power to New Substations

Transmission towers carrying 500 kV high voltage power lines extend through certain areas of the city of High Point, North Carolina. These monstrous steel towers and their dozens of associated electric cables exist in very close proximity to utility poles and overhead circuits carrying electricity to homes and businesses throughout the city. Especially in substation areas, these complicated grids can exist so close together that aerial installation and maintenance work becomes challenging if not hazardous.

In November 2014, the city of High Point initiated two similar cabling projects that had to be completed simultaneously. The projects, located on city streets several miles apart, involved installing short-length transmission circuits that connected newly constructed substations to the city's electric grid. The existing high voltage overhead lines were present in both locations, so there was no way to extend a new circuit above ground. The only way to connect the substations to the city's distribution network was to go underground.

The above-ground aspect of the installations involved 80- to 100-foot-tall risers installed at the beginning and the end of each underground transmission circuit. The city installed these risers themselves, but needed to solicit expert project management and execution support in order to complete the installations safely.

City of High Point representatives chose to hire Kerite Cable Services, the engineering, design and project management division of Kerite, because of their impressive experience providing turnkey 46 to 138 kV cable solutions, particularly involving congested substation and underground applications.

Because the entire project required less than 5,000 linear feet of 115kV transmission cable, Kerite offered a cost-saving advantage over other cable suppliers. Typically, short installations come at a high price, with most power cable suppliers requiring minimum order quantities (MOQs) of 10,000 feet or more to place an order. Kerite allowed the city to purchase the exact length of cable required for the job, needed very little lead time to finalize the order, and provided project design through installation services on the project. This saved the city thousands of dollars in cable costs, warehouse expenses and manpower requirements.

Each project involved fabrication and installation of single conductor 115 kV solid dielectric power cable, 115 kV terminations, lightning arresters, ground continuity conductors, cable sheath bonding accessories, cable supports, clamps and other cable accessories, to make a complete working underground 115 kV cable circuit.

The larger of the two installation projects was located on Penny Road. For this project, Kerite crews pulled the 115 kV cable from the ground level to the top of the 80-foot riser where the cable connected aurally to the new substation. The installation crew then pulled the cable thousands of feet through a concrete-encased duct bank that ran along Penny Road — underneath high voltage transmission lines towering overhead and beneath a four-way intersection — before it emerged above ground to be pulled up the 100-foot riser pole and terminated to existing cables at the top of the riser.

The second and smaller project was on Johnson Street. The city of High Point extended existing aerial distribution cable to the top of an 80-foot riser. The Kerite team extended the 115 kV cable from ground level up the 80-foot riser, then pulled it through a 150-foot underground conduit. The final step was to pull the cable up the 100-foot riser at the other end of the circuit, and terminate it to the overhead line.

Work on the risers was done concurrently from a 125-foot aerial man-lift and a crane with a man basket, each one set up and situated between the crisscross of existing overhead circuits. Additional equipment included two 60-foot line trucks and another 100-foot line truck. So when the winds picked up — 20 to 30 mph on some days — the lifts and man baskets were prone to dramatic movement. With elevated wind



conditions, the riser work was either halted or delayed — the concern and safety for the crews a priority on any Kerite project. Racking the cable up the risers to the peak, where terminations and lightning arresters were installed, was a challenging endeavor that the Kerite and High Point crews were able to overcome.

Kerite had approximately one month to complete both projects. Work began Thanksgiving week, and the crews worked in cold temperatures, day and night, with the challenges from the high winds adding further complications. Equipment had to be shared from project to project, so the Kerite crew carefully planned installation logistics for optimal efficiency and cost effectiveness. The project took all equipment and men available to complete as promised before the end of 2014, on time and on budget.

The 115 kV Kerite high voltage transmission cable used for these projects was engineered to deliver discharge resistant insulation, a non-conducting stress control layer for added robustness, superior high frequency attenuation, superior wet performance and unprecedented service life.

