The Straight Talk on Staking Electric Lines

Fast, accurate positioning gives an electric line design and staking company a competitive advantage.

Thanks to the precise real-time high accuracy GNSS positioning Trimble RTX provides, crews can design and stake electric lines while in the field.

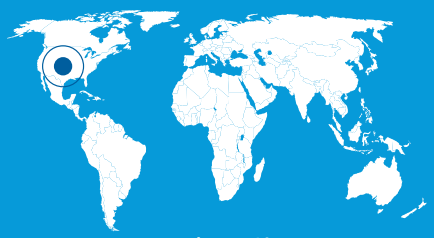
Solution

- Trimble® CenterPoint® RTX
- Trimble Access Field Software
- Trimble R2 GNSS Receiver
- Trimble TSC3 and TSC7 Controllers

overview

The American Great Plains is known for its wide open spaces, views that can stretch for miles and lines of electrical poles that seem to run straight into the horizon.

But before these poles and wires go up, the lines must first be designed and staked – a process that demands fast, accurate and easy-to-use positioning in remote locations.



Location
KANSAS

For RMA Engineering LLC, a Kansas-based company specializing in the design and staking of electrical lines for rural electric cooperatives, the goal of every project is the same: straight lines.

"At the end of the job, we want the poles so straight that when you line up and look down the row, all you see is the first pole," says J.P. Metzler, PE, a civil engineer with RMA Engineering.

But having a straight line of poles is about more than aesthetics, it's also critical to the structural stability of the entire utility system. "The straighter the poles, the stronger the line will be, which makes the whole system more resistant to strong winds or ice and snow deposits," explains Metzler.

To get that critical straight line of poles, RMA Engineering depends on Trimble RTX®.

WELL-SUITED FOR STAKING

Trimble RTX leverages data from a global network of tracking stations and advanced modeling algorithms to generate correction data for real-time precise GNSS positioning. These corrections are broadcast to the roving GNSS receiver via a set of geostationary satellites or over the internet, which the receiver uses to significantly improve the accuracy of its GNSS positions. It is this use of satellites that makes the system particularly well-suited for RMA's work in rural areas that offer unobstructed views of the sky.

Crews use Trimble RTX to obtain both the horizontal position measurements needed to space the poles correctly and to check elevations so they can choose the right-sized pole. According to Metzler, using the wrong-sized pole could cause the conductor to pull the pole out of the ground or put enough pressure on the cross arm to cause it to break. "This vertical measurement doesn't require survey-grade elevation," he says. "We just need a relative elevation based off our last pole so we can adjust the location or size of the pole."

By knowing their current positioning accuracy in both the horizontal and vertical components, crews always know they are setting the stakes in the proper location and with the required level of accuracy. "The system is so intuitive and easy to learn that our crews enjoy using it," says Metzler.

RMA's crews enjoy using Trimble RTX in the field

> "Trimble CenterPoint® RTX has significantly simplified our staking process. On a good day, when everything is clicking, we can easily stake 12 or even 15 miles a day."
>
> —- J.P. Metzler, PE, RMA Engineering

DESIGN ON THE FLY

Preliminary line design is done using the electric cooperative's software. To physically stake a project in the field, the RMA crew uses Trimble Access field software running on a Trimble R2 GNSS receiver and a Trimble TSC3 or TSC7 controller.

Once the poles are staked, Trimble Access generates a shapefile that is imported back to the cooperative's software, where the preliminary design can be adjusted to match the actual field-staked project. "Trimble RTX and Access let us design on the fly," says Metzler. "It works really well in the field, it's very accurate and it saves us a lot of time."

RMA uses Trimble CenterPoint® RTX with an R2 GNSS Receiver and TSC3 and TSC7 Controllers

THE NEED FOR SPEED

Before the advent of GNSS, RMA's staking procedures required up to three crew members: one with a total station, one at the end of the line with a range rod and another walking along the line setting the stakes.

With the GNSS system, RMA can now do the job with just one person. "Trimble RTX has made things so fast and efficient," says Metzler. "On a good day, when everything is clicking, we can easily stake 12 or even 15 miles a day."

Unlike RTK, Trimble RTX doesn't require transporting and setting up a base station – a step that can add significant time and logistical issues to a day's work. Instead, a crew can simply get to the site, turn on their GNSS receiver, initialize – often in just minutes – and go. "When we're working jobs that require the staking of 3,000 miles of line, just imagine the time it would take if we had to lay out RTK base stations," says Metzler. "Instead, with Trimble RTX, when the contractor says they're ready, our crew needs just a few days to put the stakes in the ground."

As a bonus, when flying to a job site, RMA only needs to transport a single GNSS rover and controller – a factor that helps minimize costs and logistics.

"The bottom line is Trimble RTX helps us keep our prices low and do our job faster and with greater quality control," says Metzler. "Most importantly, it ensures that once the poles are planted, we achieve that all-important straight line."

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