



# Laying Out the Future

Native American business brings layout function in-house to deal with survey delays; gains a host of additional benefits



Native American architect Eddie Calnimpewa established Terraform Development, LLC both out of frustration dealing with tribal politics and a desire to help development in the area. Today, Terraform operates with a staff of seven whose specialties include civil design, structural/civil engineering, drafting, business management, interior design and, of course, architecture.

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## Company

Terraform Development, LLC  
Flagstaff, Arizona

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## Project

Various projects  
Flagstaff, Page and Tuba City, Ariz.

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## Topcon Products

LN-150 Layout Navigator

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## Topcon Dealer

Branco Machinery, Phoenix, Arizona

For their first seven years in operation, when confronted with a need for layout, the firm would generally hire a surveyor. According to Calnimpewa, however, in the 2019-2020 time frame, wait times for surveying services increased to anywhere from three to five months. "Our schedule can't withstand a delay of that length, so we started looking at the technology available to handle that function ourselves," he said. "We are not licensed surveyors, but we wanted a tool that could verify design layouts and relay information to engineers for their design work."

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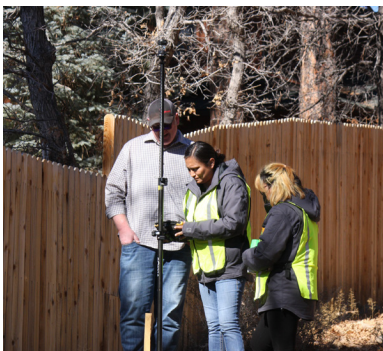


After a lot of research and a failed attempt at renting equipment through a major manufacturer – which pushed an already-delayed schedule back even further – Calnimptewa came upon the Topcon LN-150 Layout Navigator.

“The fact that the LN-150 was auto-leveling sold me right away,” he said. “Bill Stull from Branco came out to our office in Flagstaff, gave us a couple of quick but thorough lessons on setup and operation and we were off and running.”

The LN-150, is designed to easily automate and execute layout and construction verification processes. Doing so not only increases productivity and provides consistent accuracies, but users like Terraform will also benefit from reduced labor hours and costly re-works. Working with a prism/pole and a Topcon FC-5000 field computer, Calnimptewa and his team are getting real-time 3D positioning at up to a 130 meter working radius.

The debut project for the layout navigator, performing infrastructure layout for a civil engineer in Colorado, immediately proved the wisdom of their decision. Roughly two weeks behind schedule at that point, Terraform set up with the civil crew right on their heels.



“We were laying out manholes and line of sight, elevations, etc., and before they could even get 100 feet in, we were almost  $\frac{3}{4}$  of the way done laying out the rest of the line,” said Calnimptewa. “The ability to nail points so quickly was amazing to us. It actually brought us back into schedule – despite being nearly two weeks behind at the time.”

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On a recent job in Page, Arizona, a client asked them to design a stairway – part natural, part man-made – from the surface several hundred feet down into a slip canyon. Calnimptewa’s crew flew a drone and laid out the structure with the LN-150. They then brought the data back to their Flagstaff office, imported it into modeling software and combined it with the Topcon files to create a 3D surface. “The Topcon unit gave us better accuracies than even the drone-mapping could,” he said.

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Closer to home, Calnimptewa's team recently proved that a vacant lot, long viewed as being unsuitable for any type of development, could, in fact, be an excellent home site, according to Shandiin Lake, one of Terraform's interns and job captain for the project. "We did a quick design and, using the LN-150, laid out the house to prove that it could work. While we would have been waiting for months for a surveyor to come out, this layout solution allowed us to get it done when we needed it," she said.

Calnimptewa said the additional services they can provide to their clients and owners have provided a very nice revenue stream that did not exist before.

"There is a big demand from us for these services now," Calnimptewa said. "To be able to do some of the things we can do with the LN-150 and not have to rely on a full survey crew saves our clients both time and money. And that ultimately benefits everyone here. It's been a huge plus for the operation."



A [full-length version](#) of this story is on the Topcon website.



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