

Tri-County Construction Growing With GPS

East Texas earthmoving contractor equips his entire earthmoving fleet with Topcon GPS systems.

BY DANIEL C. BROWN

For Jon Rood, GPS systems are high-value tools. Prior to owning GPS systems to control his earthmoving equipment, his firm had averaged \$1.5 million to \$2 million in annual revenues. Then that changed.

“Last year was our first full year using GPS systems, and we more than doubled our annual revenue,” said Jon Rood, president of Tri-County Construction Co. in Livingston, Texas.

Last year brought Rood some projects that were naturally profitable, but he gives much of the credit for the increase in revenue to his GPS+ machine control systems, which automate the blade controls on two of his dozers and a motor grader. In addition, he uses Topcon GPS systems to indicate digging grades on two excavators.



Jon (left) and Jeff (right) Rood, brothers and co-owners of Tri-County Construction Co., work primarily in east and south Texas.



Tri-County's Caterpillar 140H motor grader is equipped with a Topcon GPS system and can grade base rock to within 0.10 foot.

“GPS equipment is hard for the average excavation contractor to justify because it costs as much as another piece of equipment,” says Rood. “That’s why it took us two years to pull the trigger on the purchase. After some careful research, we chose Topcon equipment, and our initial purchase cost \$180,000. That is a lot of money. But six months later, the GPS equipment had paid for itself and we asked ourselves why we waited two years to buy it.”

With 10 employees, Tri-County works primarily in east and south Texas. Throughout last year, the firm had completed six earthmoving projects – all stakeless – using Topcon GPS systems. Two Caterpillar dozers, a D6N and a D5N, as well as a Cat 140H motor grader, were all equipped with Topcon’s 3D GPS+ systems. A Cat 330 DL excavator got a Topcon 3DXi system for indicating grade. Tri-County also bought a Topcon Hiper Lite+ base and rover with an FC 200 controller and a Topcon stand-alone base station only (no rover). All of Tri-County’s earthmoving machines are now GPS-equipped.

Rood quickly counts the weeks that his GPS systems have saved:

- At the Willacy County Regional Detention Facility in Raymondville, the GPS systems slashed the time of grading completion to 34 calendar days from the 50 days it would have taken using conventional surveying equipment. The project involved 73,000 cubic yards of excavation, three large building pads and 270,000 square feet of parking.

- For the Maverick County Detention Facility in Eagle Pass, Tri-County spent just 28 days to move 100,000 cubic yards of earth. With conventional surveying equipment, the job would

have taken 45 to 50 days, according to Jeff Rood, a co-owner of Tri-County with his brother Jon.

- Heaven's Gate Lake, a private 7-acre lake in Moscow, Texas, required just 11 days to move 42,000 cubic yards of earth. Rood estimated that it would have taken nearly month with conventional equipment.

In fact, Rood credits the GPS equipment with helping him to get the Heaven's Gate project over other contractors who bid lower. The owner was an engineer who designed the lake with multiple grade breaks to create structural habitat for bass fishing.

"The owner asked me if it was possible to grade his lake the way he had it designed, and we assured him that since our 3-D model would be based on his drawings, that our grading would be accurate," says Jon Rood. "The owner had multiple contractors to choose from, and although we were not the low bidder, we got the job because the owner said he was impressed with our professionalism and the amount of GPS equipment that we use. When we finished, he used our Topcon rotary laser to verify that our grades were correct."

Step by Step

Jon Rood said learning to work with a Topcon GPS system is not particularly difficult. The first step is to estimate the job using a digitizer and cut-and-fill software. A digitizer is a large board on which you can trace a stylus over the 2-D drawing and enter the information into the computer. (Tri-County uses Quest cut-and-fill software.) Total square footage of the project, the building pads, the parking lots, the sidewalks, total cuts and fills, and proposed landscape areas are all estimated.

"When we win the job, we immediately request the Computer-Aided Design (CAD) file from the engineer and we forward it to Geoshack Services

and Solutions," says Jon Rood. "That's a business unit of our Topcon dealer, Geoshack. We like having our models built by the same people that sold us the equipment. When you can mesh contractors and high technology, that is a huge asset."

The CAD file, Rood explains, is a two-dimensional engineer's drawing of the project. Then Geoshack Services uses Carlson take-off software to convert the CAD file to a usable three-dimensional model. Field corrections can be handled immediately by e-mail, before the model is sent to the field.

Jon Rood says that because he and his brother Jeff have extensive surveying background, they themselves establish the control points on the project. This is called localization, and can be done by any licensed surveyor.

"The control points are benchmarks for GPS," says Jon Rood. "You have northing and easting and elevations for all of them."

Next he uses the Topcon Hiper Lite+ and the FC200 controller to create a local control file. Then he loads the control file, the 3-D model and the linework file (which also comes from Geoshack) into the GPS system on the earthmoving equipment. All of that information is contained on a flash card or a USB drive.

The base station can be set up on a known control point or anyplace else on the site. Jeff Rood says it takes about half a day to localize the GPS system – to set up the base station, load equipment with the files, and get the equipment on target. Unlike a rotary laser, a GPS base station does not have to have sight lines to its targets – the antennae on your earthmoving equipment.

Topcon equipment uses two constellations of satellites for positioning signals – the U.S. GPS satellites and GLONASS, the Russian constellation of satellites. "We have never had to



On the machines, the GPS system consists of a touch-screen monitor, a satellite receiver box and satellite antenna.

delay a project because we couldn't get a GPS signal," says Jon Rood. "Early in the days of GPS systems, if your satellites went down over the horizon, you might lose two or three hours a day of work."

Good Dealer

"When you're buying GPS equipment, first and foremost you're buying the equipment," says Rood. "The next key ingredient is your dealer. Our dealer is Geoshack/Houston and our salesman is Scott Bird. Our installer is Matt Humbertus. I hope all dealers are as accommodating as Geoshack/Houston."

His next project near Giddings is a \$3.5-million excavation that includes clearing and grubbing stumps, mass excavation of 150,000 cubic yards of earth, and placement of 40,000 tons of crushed limestone base.

"We previously would have been afraid to bid this project because of the stringent grading specification – plus or minus 0.05 foot," says Jon Rood. "But now we're planning to purchase Topcon's millimeter GPS grading system to help us more than achieve the specified grades. In fact, GPS has taken Tri-County Construction from being a good grading contractor to being a great one!" □