

Laser technology makes tee grading job easier

Computer model man Ed Connor does it again

By Mark Leslie

The man who brought you the computer terrain model to preserve historic golf courses has introduced another technology to the world of golf course construction. Move over, stakes and grade lines. Come on down, laser emitters, gyroscopes and radio-controlled drag scrapers.

"Golf course managers are coming out of the woodwork to look at it," said Edward Connor of the laser equipment he has now used to grade tee areas at Pebble Beach Golf Links in California and Seminole Golf Club in Florida.

Speaking of his current work at two Nashville, Tenn., municipal courses, Connor said: "We've got 120,000 square feet of tee space here. We lasered it and laid a two-inch layer of sand over the top and lasered it again in three days.

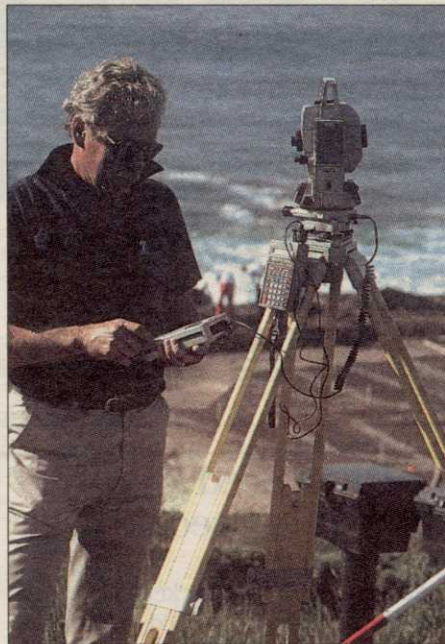
"It used to take me at least a month for that kind of work."

Connor predicted the industry would see the laser gear used as a standard of construction in the future. "It's just too good for one guy to have as a secret for very long... It's one of the best tools I've ever seen for new construction or renovation," he said.

As important as speed is to the equation of rebuilding tees, precision is even more crucial, according to Connor.

"The big advantage is that it allows you to do what the agricultural people have been doing for years when they flood-irrigate large fields. It allows you to put a very flat grade with uniformity on a surface like a tee," he said. "Once you get over a three-percent slope the people standing on the tee can feel it... But to grade less than three percent has always been a problem. You run into the danger of pockets. And when you get down to one to two percent, the threat of pockets becomes significant. Naturally, you don't want anything that holds water or presents an uneven surface."

For years architects have often opted to build a crown onto the tee and "live with some unevenness rather than risk getting a pocket



Ed Connor, above, sets readings to guide his box blade, right.

or an uneven settlement spot," Connor said. "We've now gone a long way in eliminating that problem. We can grade tees very confidently at one percent or even half a percent. And it's so fast that one man can do what used to take a crew of five people..."

"If you don't have a laser you have to have a gun and a rod. That takes two people and it's tedious. It's moving a little bit of dirt and shooting with a gun and moving some dirt and shooting it again. With the laser you do everything from the seat of the tractor — from adjusting the height of your target to adjusting the slope if you find out you entered in the wrong degree of slope into the laser."

Connor added: "All of my construction career I've been taught to avoid straight lines and formal features on a golf course to simulate nature's random look. Tees, however, demand precise construction methods."

HOW IT WORKS

Connor's equipment includes a tractor, scraper blade and laser apparatus. A laser



'It used to take me at least a month for that kind of work (that took three days with laser technology).'

— Ed Connor

emitter — with a gyroscope to automatically level it — is mounted on a tripod and set up on a neighboring hillside or even on the tee. The laser receiver is mounted on a "mast" built onto the blade apparatus.

Connor sets perpendicular and parallel axis grades on the emitter's digital readout. He then sets the speed of his laser emitter at around 20 revolutions per second, "which gives me the quick enough response that my blade won't float out of position."

The emitter rotates on the plane he established to within one-thousandth of a percent, and sends a signal to the receiver, which is attached to the scraper on the tractor. The scraper blade is hooked into a six-way hydraulic valve that is attached to the receiver.

"Its most frequent and common use is in agriculture where they have to pull a grade over a field for a couple of miles. It's no big deal for old farmhands, but we sophisticated golf course builders just caught onto it this year," he joked.

"We try to grade tees in conformance with surrounding terrain so the tee doesn't look like it's artificially constructed. If the ground slopes toward the green that's the way you want your tee to slope, but not severely... because everything over three percent is noticeable," Connor said.

"I try to get a zero grade from side to side so right- and left-handers will have an equal footing on the tee. I'll try to go one to two percent from back to front or front to back, depending on the natural grade."

Continued on page 45

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127	The Andersons	32	167	Master of the Links	45
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162	Bloch & Co.	44	168	Miltona Turf Products	45
112	Certified Consultants	22	111	Nearly Mfg.	19
110	Club Car	18	116	New Golf Concepts	22
165	Continental Bridge	45	109	Par Aide	16
103	Cushman	4-5	125	Parkway Research	30
121	Cushman	20-21	119	Partac Peat	28
135	Davenport Seed Corp.	41	156	Pavelec Bros. Construction	44
101	E-Z-GO	2	132	Peco, Inc.	38
155	E.P. Aeration	44	126	Perfection Sprinkler	30
120	Environmental Compliance Systems	29	118	Precision Small Engine	28
161	Excel Bridge Mfg.	44	169	Precision Tool Prod. Co.	45
108	Fairway Stone	16	138	Pumping Systems, Inc.	47
133	Fore Par	39	122	Sandscape, Inc.	29
124	Formost Construction Co.	30	158	Schipper & Co.	44
159	Golf 2000 Pavers	44	104	Seed Research of Oregon	6-7
123	Grace-Sierra	30	131	Southern Concrete	38
171	Greenscape Pump Services	45	102	Standard Golf	3
115	Greensmix	22	170	Tee-2-Green	9
114	Guettler & Sons	22	170	Terracare Products Co.	45
166	Homotech Indus.	45	107	Toro Comm'l. Prod. Div.	10-11
153	Jacobsen	48	157	Warehouse Radio	44
160	Jesco Products	44	163	Warren's	44
129	John Deere	34-35	134	Watertronics	40
136	Karsten Turf	42	139	Willadsen Scale Models	28
105	Kubota	8	128	Yamaha	33
117	Lebanon Turf Products	26-27	154	Yard Edge	44
137	Lofts, Inc.	46			