

# Laser focus

Nick Scigliano and Frontier Golf take GPS technology to the next level in accurately reconstructing the existing greens at The Olympic Club's Lake Course.

By Jason Stahl

When Nick Scigliano was GPS mapping The Olympic Club's greens using a data collector, an hour didn't go by when a member didn't come up to him and ask, "What is that contraption?"

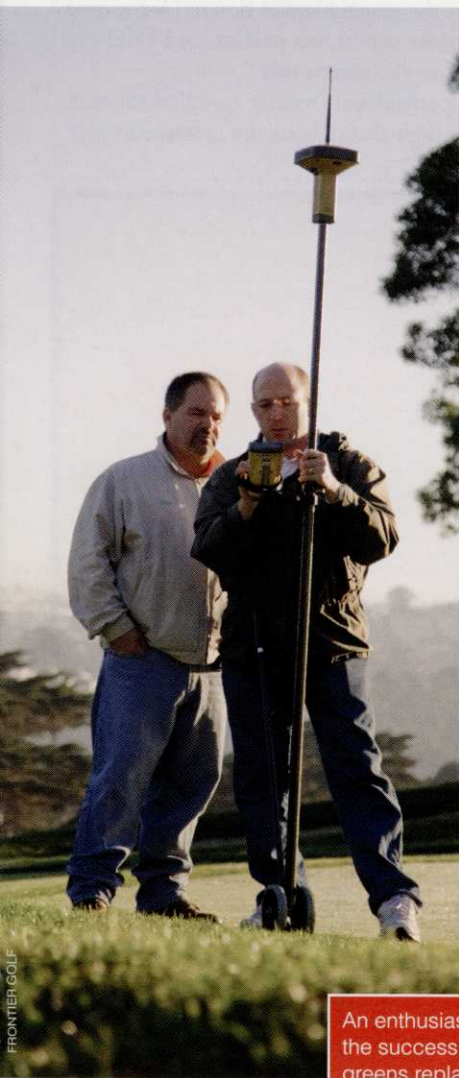
Scigliano, a self-professed "techie," would then turn into an excited little kid explaining to them how it worked. "I got pleasure in demonstrating it to the members," says Scigliano, president and CEO of Frontier Golf. "I would hand them the data collector, which is wireless, and while they were standing on the putting surface and I was mapping, they were able to look at it and see the image of the green and the points I was taking. And then right there in the field I would convert it into a contour map and let them see what I just did. It's fascinating to someone who has never seen it before."

It was that enthusiasm for GPS technology, not to mention meticulous planning and uncompromising attention to detail, that drove the success

of Frontier Golf's Lake Course greens replacement project at the historic club and host of the 2012 U.S. Open located in San Francisco.

The project was necessitated by a nematode issue and the fact that a pesticide the facility had used to deal with the issue had been taken off the market. According to director of golf maintenance operations Patrick Finlen, there was no adequate replacement product, so the decision was made for a total renovation. Seven builders bid on the project, which began on Nov. 24, 2008, and was completed on March 24, 2009, but Frontier Golf stood out.

"Frontier was only one that told me it would have one person on site the entire time who did nothing but run the GPS unit," Finlen says. "The other contractors were going to come in and shoot the greens ahead of time, core them out, do the work and then have someone come back and do the finish work with GPS to make sure the greens went back exactly as they were."



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To Finlen, this wasn't going to cut it, especially when there was no tolerance for error in maintaining the existing contours on 14 of the 18 newly constructed greens. Scigliano's goal was to record the existing surfaces at a 1/8-inch tolerance, and while he was able to do that due to his extensive GPS mapping experience, features of the course itself provided some challenges. "The vertical accuracy of even the latest GPS technology is still dependent on the number of satellites you can see in the sky at any given time," he says. "At The Olympic Club, the cypress trees are so tall and their canopies so dense that they were blotting out portions of the satellite spectrum. So in certain areas, my vertical tolerances were becoming unacceptable at outside a quarter of an inch."

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**Location:** San Francisco **Website:** www.olyclub.com **Type of project:** Renovation **Cost:** \$700,000 **Construction started:** Nov. 24, 2008 **Construction ended:** March 24, 2009 **Architectural firm:** W.R. Love Inc. **Golf course builder:** Frontier Golf **Director of golf maintenance operations:** Patrick Finlen

To troubleshoot this problem, Scigliano employed a millimeter GPS unit, which sits on a known point next to a green and broadcasts a spectrum of laser beams to the handheld GPS unit or "rover" to let it know what elevation it's at. "The rover references the millimeter GPS unit three to four times per second and adds it to the equation it's calculating all the time and takes the vertical tolerance down to one millimeter, or inside of one-eighth of an inch," he says.

Scigliano also took his points on 1-foot centers, as opposed to a more traditional 5- to 10-foot grid. That means a survey point was taken every foot in every direction. If a green had a tier in it, he would take points every 6 inches.

The greens were then cored out and the gravel blankets and greens mixes installed. But the GPS mapping didn't stop. Scigliano mapped the greens as they were being adjusted and built. "I'll bet we mapped the subgrade on the No. 8 green seven or eight times," he says. "I had to use the same level of detail when I got to the greens core to make sure it was perfect. When we put the gravel blanket down, I went over it multiple times to make sure it was perfect, and I did the same when we put down the greens mix."

To further ensure perfection, Frontier installed the mix at a consistent 1 inch high throughout the greens complex



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and then thoroughly saturated it with water to pack it down and maximize compaction. Then, before the sod was laid, they pulled a half inch to one inch of overburden off so that everything they were laying sod on was in a cut. No fill was done.

“Any time you fill, you always have the possibility of settlement because of a lack of compaction,” Scigliano says. “So when we go through a green, we make sure that everything we do in the last pass is a cut so there isn’t one area of the greens surface where any fill materials have been placed. If you put it in at grade and then have a little bit of settlement, when you’re doing your final check, you may find a little water hole and throw some sand in there. But that sand isn’t compacted even after you try to step or tamp it in. It’s still not water packed 100 percent. So if you’re in an area of a green with tight grades, say one-quarter to one-half percent, that little tiny depression could create a problem.”

In addition to GPS, e-mail allowed for constant and instantaneous communication with architect Bill Love of W.R. Love, Inc. Golf Course Architecture, and Finlen. With the No. 8 green, which was brand-new, and three other greens which were modified to Love’s specifications, some changes were made right in the field. In those cases, Frontier would map the subgrade, create a 3D model in AutoCAD, spin out a heat map for floats and, within a few hours, Love could view the changes he made. “Bill could respond even if he was in his office in Maryland,” Scigliano says. “We would e-mail the drawing over, and he could look at and get right back to us with an updated drawing or a drawing right on top of ours.”

Frontier avoided weather delays by finishing the major work by Christmas, before the rainy season. When they came back, all they had to do was touch up the putting surfaces prior to installing the new sod. “We really had to hump,” Scigliano says. “We worked in the rain some, but mostly we had to deal with mist and not what I would call a rainstorm. The GPS works just fine in fog, unlike lasers which don’t.”

Frontier also worked around the members, who were able to still play the course due to the construction of bentgrass temporary greens in September 2008 that ranged in size from 1,000 to 12,000 square feet. “We have a large membership here, so our feeling was that we would have taken a little of the edge off the other 18-hole course by keeping this one open,” Finlen says. “Plus, we knew members would be fascinated by the process, so instead of having them idly checking it out we would let them go play and see the construction. The nice thing was that it wasn’t crowded.”

Aside from the greens, Frontier constructed new holes on the par-4 7th, par-3 8th and par-3 15th and completely reconstructed existing tees on 10 holes. The tee work as well as laser-leveling new driving range tees was added by the club due to the craftsmanship Frontier displayed during the course of the original project. ▲

## What the **JUDGES** said...

“It has always been said that the smaller the work area, the more difficult the project. What Frontier Golf was able to complete by working within the confines of the existing green cavity makes for an impressive project. Minimizing disturbed areas, working on a tight schedule and keeping the golfers happy are goals every contractor strives to accomplish. Frontier Golf passed that challenge with flying colors at Olympic Club.”

“Reconstructing greens and reproducing the original contours with the golf course remaining open is difficult enough. Adding the additional work and the restrictions on time of work and access, makes this is an outstanding example of ‘legacy’ work.”

“Frontier did a fantastic job under the most scrutinizing eyes possible, the USGA, in preparation for the 2012 U.S. Open. Their work will be on display for all the world to see and appreciate.”



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