

Going High-Tech on Tees and Greens

By blending high-tech capability and detailed low-tech artistry, designers and owners can deliver more interesting courses

By Jerry Pate

Over the past 20 years, technology has revolutionized golf. Equipment companies may be receiving the lion's share of the attention, but new technology has also transformed golf course construction, particularly in the renovation of tees and greens. New technologies can reduce project delivery time, provide long-term economic benefits, and improve a course's environmental stewardship.

New technologies affect all phases of renovation projects, from substrata development to irrigation to turfgrass. In today's competitive golf business, designers, contractors, superintendents and owners must be aware of these constantly improving technologies.

Assessing your needs

There is no one-size-fits-all method to golf course renovation. Every property and project is unique.

Therefore, you must ask the question: What is driving the project? Often, chronic agronomic problems develop over time. Drainage systems become less efficient, causing the saturation of tees and greens. Maturing trees block sunlight from certain parts of the course. Maintenance programs and costs change over the years. Environmental concerns or requirements arise. And, of course, playability and strategic values evolve.

Only after assessing the needs and goals of

the project can you begin to explore how new technologies might provide benefits during the renovation.

New in drainage

Green construction developments include the acceptance of new flat pipe drainage systems. Noted architect and author Michael Hurdzan has long advocated flat pipe drainage, and the USGA recently incorporated the option of flat pipe drainage into its *Green Section Recommendations For A Method of Putting Green Construction*.

For green construction, this system can provide savings up to 50 cents per square foot over traditional drainage implementations. Flat pipe drains have also proven successful in helping to remove water from problem areas, especially fairways dampened by subsurface springs or ground water.

Stronger than dirt?

Water conservation is imperative and must be a goal that design and construction teams pursue. Some companies now offer mixes of sand and ceramics instead of traditional sand/peat greens mix. The goal of sand/ceramic mixes is to retain moisture more effectively than traditional peat mixes. Ceramics may help conserve water in arid climates and enhance turf growth.

Despite all the innovation coming from

top materials laboratories, some advances are as simple as finding a new way of looking at old things. Studies testing crushed rubber in the intermediate layers of greens and tee boxes have shown enhanced nutrient retainage and reduced leachate runoff. As owners, communities and regulatory agencies place a larger emphasis on environmental sensitivity, crushed rubber may serve as a poster child for recycling and creative application of materials.

Finally, advancements in soil-amendment technology have made it possible to tailor the soil conditions of specific microclimates on a golf course to the agronomic requirements of the selected turfgrass. Adding specific nutrients to provide a healthier growing environment for the turf can reduce maintenance costs and improve environmental conditions by decreasing the number of fertilizer and pesticide applications on the course.

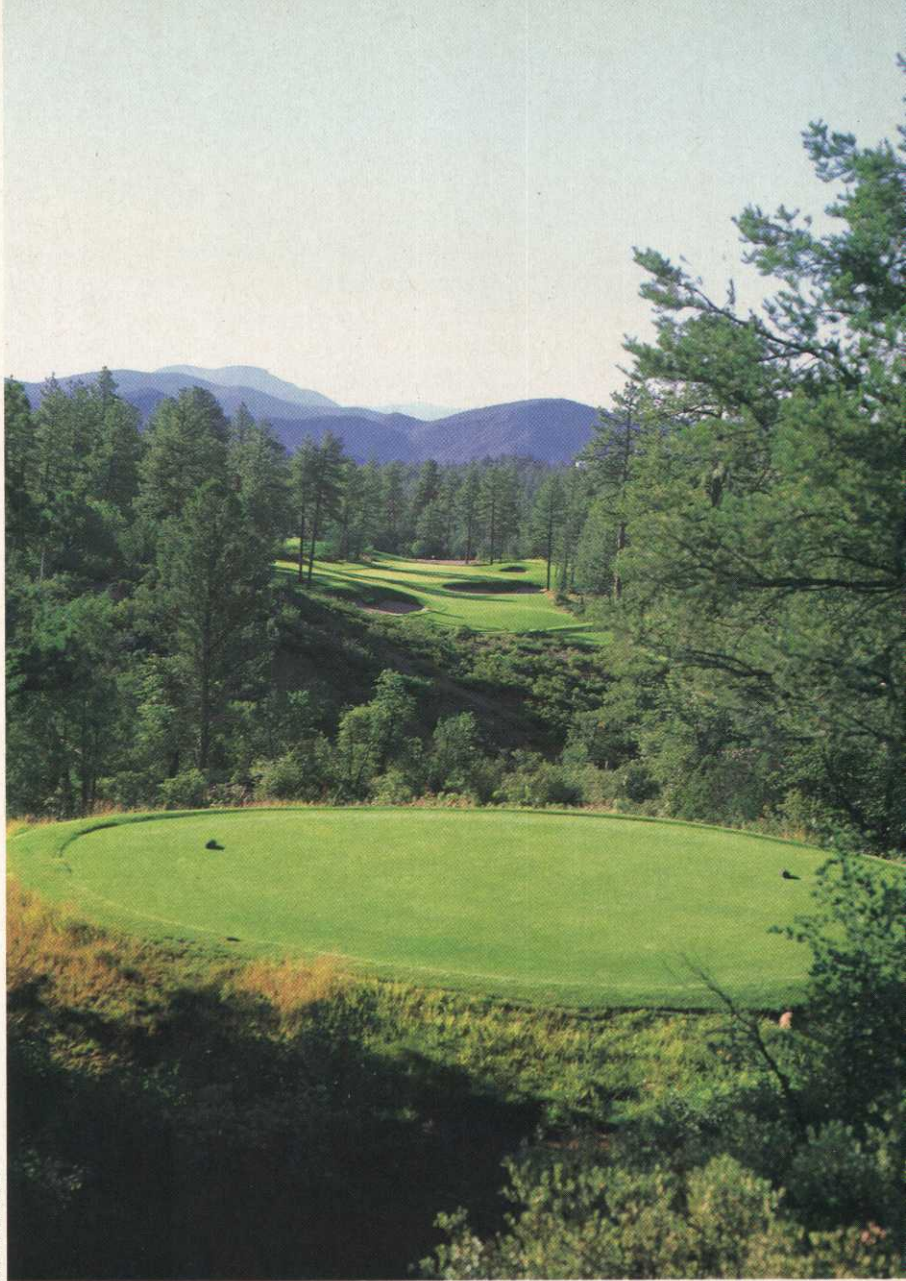
On the level

Remember when lasers were the stuff of science fiction? Today they are part of everyday life in golf course renovation. In restoration projects, where the goal of the project is to modernize green subsurface profiles for easier and more economical maintenance while maintaining the contours of the existing design, lasers allow us to easily record the pre-existing contours and rebuild the greens to their precise elevations. We also use laser levels to insure that pinnable slopes on greens do not exceed 2 percent. At today's green speeds, we believe anything more than that can be too fast and, ultimately, detract from playability.

Right as rain

If there is one aspect of design that has gained the most from technology, it's irrigation. We've come a long way from the center-pipe systems that courses employed for years, and irrigation improvements should be considered for every renovation project.

Modern irrigation systems provide precise coverage, allowing tight control over water dispersal. Technicians can tune each head to deliver only the water needed for its coverage area, resulting in water conservation. Greenside rough can get more water while swales and chipping areas get less. The



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financial and environmental benefits of improved irrigation systems can go a long way toward paying off the cost of the renovation project itself.

Turfgrass trends

University-level turf management programs are pushing the envelope in turfgrass sciences. New varieties of turfgrasses can reduce maintenance costs greatly.

Seeded bermudagrass may provide an efficiently manageable playing surface in the transitional climate zones where traditional bentgrasses and bermudagrasses struggle. Roundup Ready bentgrass, with its immunity to certain herbicides, may allow for the effective control of *Poa annua* invasions. And paspalums can tolerate high levels of salt in irrigation water, allowing for greater use of brackish, effluent

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New technology, such as lasers and modern irrigation, has transformed golf course construction, particularly in the renovation of tees.

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or even seawater. The costs for supplying cleaner irrigation waters, such as usage fees or drilling deep wells, can be reduced greatly.

Construction processes

Nobody likes to see huge dump trucks rumbling up the fairways and around the green sites of their golf courses. Even a targeted renovation project is going to require some serious construction work on the golf course. To undertake a project that addresses all the tee boxes and greens formerly required closing the entire course for a season or more.

Today, thanks to improved construction processes, we can often keep much of the golf course open during renovation. Rather than using heavy, two-axle trucks to haul materials, we can use light trailers and conveyors to load mix into greens and tees, reducing damage to the golf course and the inconvenience of the project to members and golfers on other parts of the course.

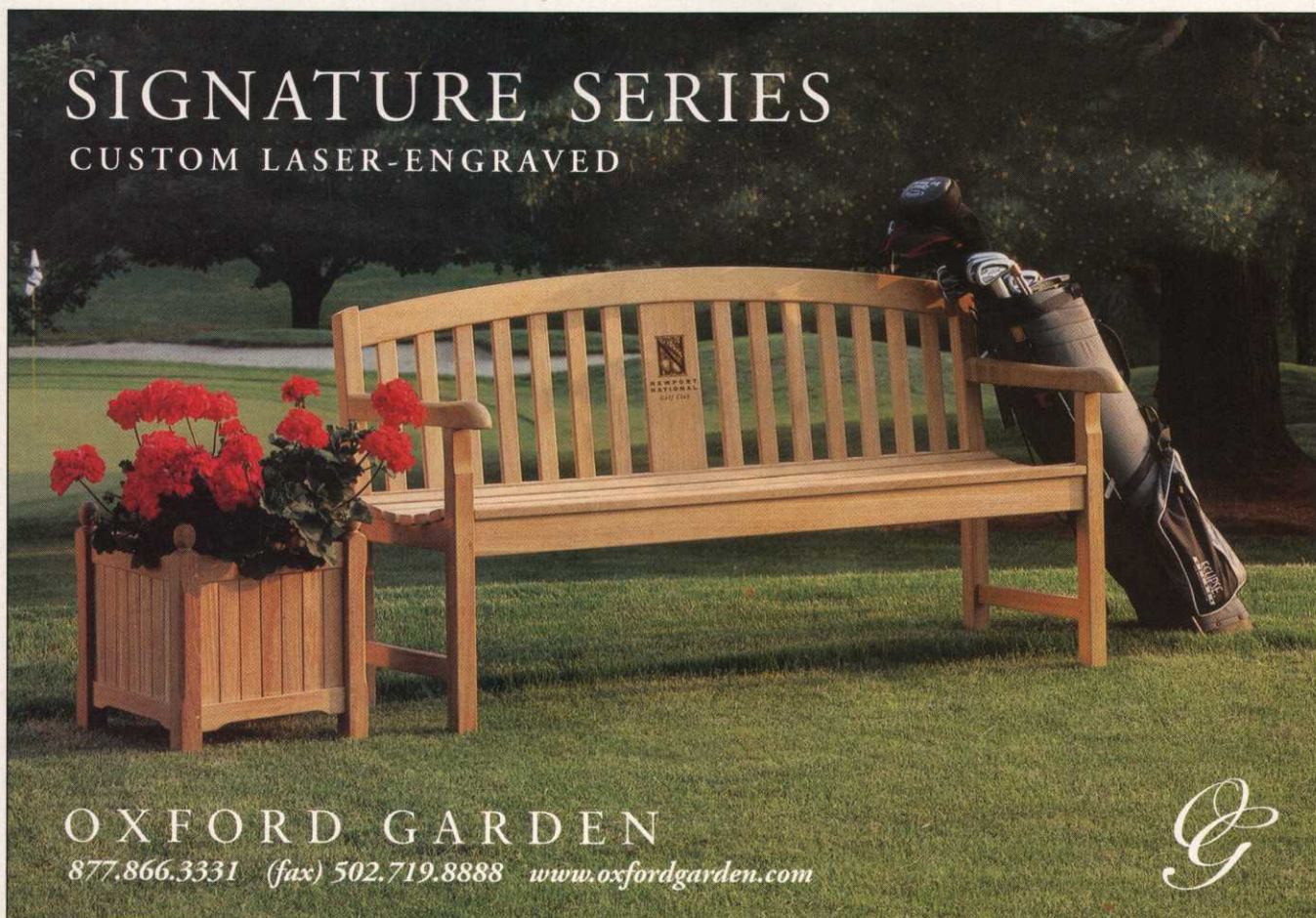
When properly applied, technology saves time, money and helps produce long-term re-

sults that may have previously been unobtainable. But technology alone will not create a successful renovation. A skilled designer must combine new systems, materials and methods with a keen eye for aesthetics and playability.

Perhaps the best benefit that technology offers during golf course renovation projects is the ability to save money and free up resources to do the detail work around tees and green sites. And no matter how advanced we may become, the best detail work is done by hand with rakes and shovels. Those are the touches that make a golf course memorable and special.

By blending high-tech capability and detailed low-tech artistry, designers and owners can deliver fun and interesting courses that will make money and keep golfers coming back for years. ■

Author Jerry Pate, a PGA professional, has several victories, including the 1976 U.S. Open. Pate has also been active in golf course design for more than 20 years and is president of Jerry Pate Design. In addition, he owns a wholesale distributorship that services seven Southeastern states.



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