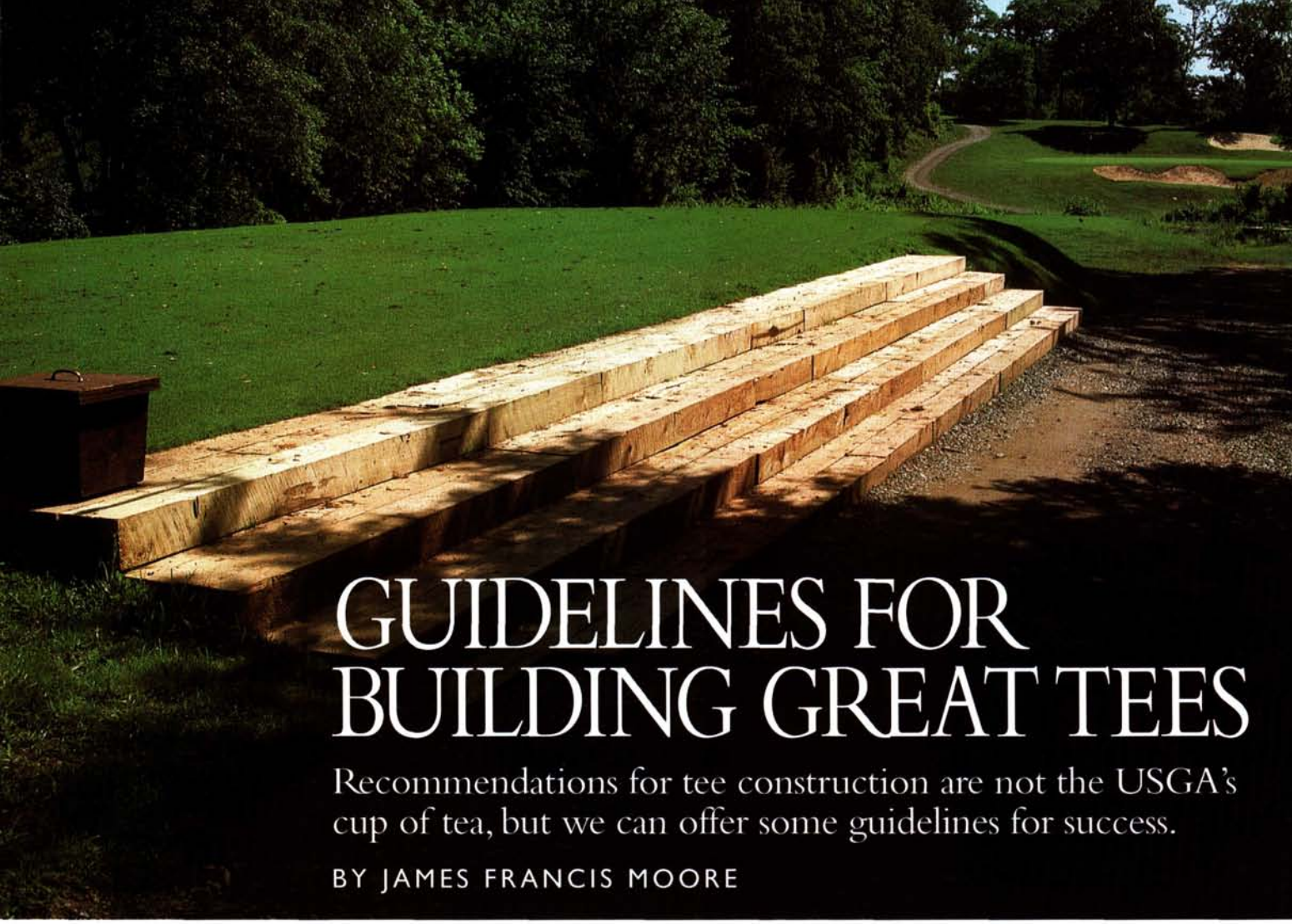


GUIDELINES FOR BUILDING GREAT TEES

Recommendations for tee construction are not the USGA's cup of tea, but we can offer some guidelines for success.

BY JAMES FRANCIS MOORE

Tees should have multiple entrance and exit points so that traffic is not concentrated in a small area. This tee corrected the traffic problem by constructing a large stair area to disperse foot traffic.

Green Section agronomists are often asked why the USGA doesn't provide specifications for the construction of tees. Although many articles have appeared in the *Green Section Record* discussing various aspects of tee maintenance, few have addressed tee construction directly. As most are aware, we have provided very detailed recommendations for putting green construction for more than 40 years, so it would seem reasonable to expect the USGA to follow a similar format for tees as well as bunkers and other facets of golf course construction.

To better understand why we have been reluctant to write guidelines for tee construction, a brief semantics lesson is in order. There is a very large difference in the meaning of the words *recommendations* and *specifications*. When it comes to the construction of greens, the USGA has long published the *USGA* ***Recommendations*** *for a Method of Putting Green Construction*. This document details what the USGA Green Section feels is the best way to build greens. When these *recommendations* are referenced in a contract as the construction method to be followed, they become contract *specifications*.

When it comes to greens, the USGA feels very strongly that the *recommendations* should not be modified. On the other hand, it has been our experience that tee construction need not be so precise. The higher height of cut typically maintained on tees promotes much stronger turf that, in turn, is much more tolerant of less-than-ideal growing conditions. It is our belief that there are a lot of ways to build good tees. Publishing a single *recommendation*, which might in turn be utilized as a *specification*, could result in the elimination of many other valid tee construction methods that might be more economical for a particular project.

Our hesitation to publish a single recommended tee construction method does not prevent us from offering a number of guidelines that we feel will help ensure top-quality tees. The following suggestions should be incorporated into every tee construction project.

SIZE

No construction method will produce good turf if the tee is too small for the amount of play it receives. For many years, the Green Section agronomists have utilized a tried-and-true rule of thumb for tee size. For every 1,000 rounds of golf the tee receives each year, 100 square feet of usable teeing area should be provided. Thus, a tee that receives 20,000 rounds per year should be constructed to provide 2,000 square feet of usable area.

Note the phrase "usable area." Many tees meet the square footage requirement in terms of length by width, but some have much less usable area for a variety of reasons. The surface may be so unlevel that only a small portion of the tee is actually used by golfers. A large portion of the tee may go unused as a result of trees that encroach into the target line, forcing players to one side or the other. Shade from surrounding trees often results in turf that is so weak that a golfer cannot take a firm stance and thus will not use that area of the tee. It also should be kept in mind that any tee that receives heavy iron play must be significantly larger than the computed amount. The same typically is true for the number-one tee due to the additional practice swings it must endure.

Once again, this is only a rule of thumb. For a much more detailed discussion on how to determine proper tee size, refer to Paul Vermeulen's article entitled "Tailor-Made" in the March/April 2002 issue of the *Green Section Record*.

ACCESS

Tees should have multiple entrance and exit points so that traffic is not concentrated in small areas. Steps, planter boxes, cart path design, and severe slopes all can result in severe wear on tees in spite of the tee being of sufficient size. No amount of fertilizer, construction method, or turfgrass species can completely overcome heavy traffic concentrated in a small area. The problem is greatly exacerbated if the tee is shaded; limited light and heavy traffic guarantee weak turf.

SLOPES ON SIDES OF TEES

Tee banks or slopes can have a great impact on both maintenance and golfer safety. From a maintenance standpoint, steep slopes are difficult to water, fertilize, cultivate, and, most of all, mow. Mowing steep slopes frequently results in damage to the turf when the equipment struggles to maintain uniform traction. *Crabbing* is a term that describes the tendency of a mower to slip sideways as it travels perpendicularly to the slope. Whenever the drive wheels of a mower lose traction, they chew up the turf.

The same loss of traction results in a dangerous situation for equipment operators. This is particularly true for the drivers of spray equipment, due to the increased weight and load shifting of the tanks. To overcome such problems, many superintendents find the best option for maintaining steep tee banks is to forgo the use of large equipment and rely instead on costly hand labor.

Sands that contain some soil and organic matter are easier to maintain due to better water and nutrient retention. They also are more stable underfoot.

From the golfer's standpoint, the combination of steep tee slopes and spikeless shoes can result in slips and falls. This is particularly true anytime the grass is damp. In an effort to prevent injury and possible litigation, course operators often will build steps and ramps to provide a safer and less-strenuous climb to the teeing ground. Unfortunately, while such devices may help reduce the problems associated with the steep slope, they invariably concentrate traffic to a single entrance and exit point. As already noted, this concentration makes weak turf inevitable.

To avoid these problems, side slopes should be kept at 3:1 (18 degrees) or less.

LIGHT

Insufficient light, coupled with insufficient size, are the two most common problems with tees. The two factors are physiologically linked. Everyone remembers from grade school biology that green plants produce the energy necessary for growth through photosynthesis. To maintain a dense and attractive surface, the turfgrass on tees must grow faster than it is worn out. Tees that are too small for the traffic they receive cannot recover quickly enough. Turfgrass grown on tees that receive insufficient light grows much more slowly due to reduced photosynthetic activity. Predictably, small, shaded tees generally are found in extremely poor condition. It also should be remembered that the same trees that limit the light to a tee are often close enough to compete aggressively with the turf for nutrients and moisture.

The Green Section recommends that tees receive eight hours of direct sunlight per day. This does not mean that it is impossible to have a good teeing surface with less than eight hours of light. A large tee with multiple entrance and exit points and limited iron play can perform well with less than eight hours. Root pruning of the trees adjacent to the tee can make for an even more favorable growing environment. Turfgrass selection can make a tremendous difference. Bentgrasses and ryegrasses are far more shade tolerant than bermudagrasses. As a result, many southern courses find that the only time they have good turf on their shaded bermudagrass tees is when they are overseeded with ryegrass for winter play.

ROOTZONE SELECTION

Many different construction methods have proven successful for tees. There are examples of excellent tees being maintained with rootzones composed of mixtures of sand, soil, and organic matter. There are also good tees built from the material harvested from old greens when they are rebuilt, and even good tees built from straight sand. Predictably, each method has advantages and disadvantages.

An informal survey of the Green Section staff and many golf course superintendents revealed that most turfgrass managers would rather grow turf on tees that have a rootzone that includes some soil. Soil combined with sand and organic matter provides a stable surface with good nutrient and moisture retention while at the same time draining quickly enough to get the tee back into play in a reasonable amount of time following heavy rain. Rootzone mixes are expressed in ratios of sand to organic matter to soil, with the most popular being 7:2:1 or 8:1:1.

When a course decides to rebuild greens, it is a good idea to give strong consideration to overhauling the tees at the same time. Years of topdressing, aerification, and fertilization will almost certainly result in significant improvement in the upper few inches of rootzone of the old greens. As a result, in most instances, the rootzone material removed from the old greens will prove excellent for use on tees.

Straight sand is the easiest to build with, and it drains very rapidly. However, it provides the least favorable growing conditions in terms of moisture and nutrient retention. It also can be very unstable in terms of playability for months and possibly years. If straight sand is used, it is vital that the sand be submitted to an accredited soil-testing laboratory for analysis. The lab can perform tests to determine how deep the sand should be to ensure good drainage and improved moisture retention. They can also provide some insight into stability issues, although this is not an exact science.

SURFACE DRAINAGE

Regardless of the rootzone selected, every tee should be constructed with a minimum of 0.5% slope on the tee top to ensure surface drainage of excess water away from the teeing ground. Fortunately, such precise grading has been made much easier with the advent of laser grading equipment. As a general rule, the order of preference for the direction of the surface drainage is front to back, right to left, left to right, and back to front. In reality, few, if any, golfers can sense

such a small degree of slope and thus the primary determinant for the direction of surface drainage should be in which direction the water can be discharged most efficiently. To avoid creating slippery and unsafe conditions, consideration should be given to the entrance and exit points used by golfers. On connected, multiple-tiered tees, care must be taken to avoid sending surface water to the area between a forward and back tee. Doing so often results in water accumulating in the transition area between the two levels.

SUBSURFACE DRAINAGE

Every tee should also have subsurface drainage. Ideally, the subgrade of the tee should be shaped to direct excess water to a collection drain. A slope of 1.0% to 2.0% will ensure that water moves across the surface of the subgrade to the drain line. Water should not move more than 15 feet across the subgrade without being collected by a drain. A drain line should also be installed near the edge of the tee to prevent water that has moved across the subgrade from bleeding out of the tee bank and causing maintenance and safety problems.

ALIGNMENT

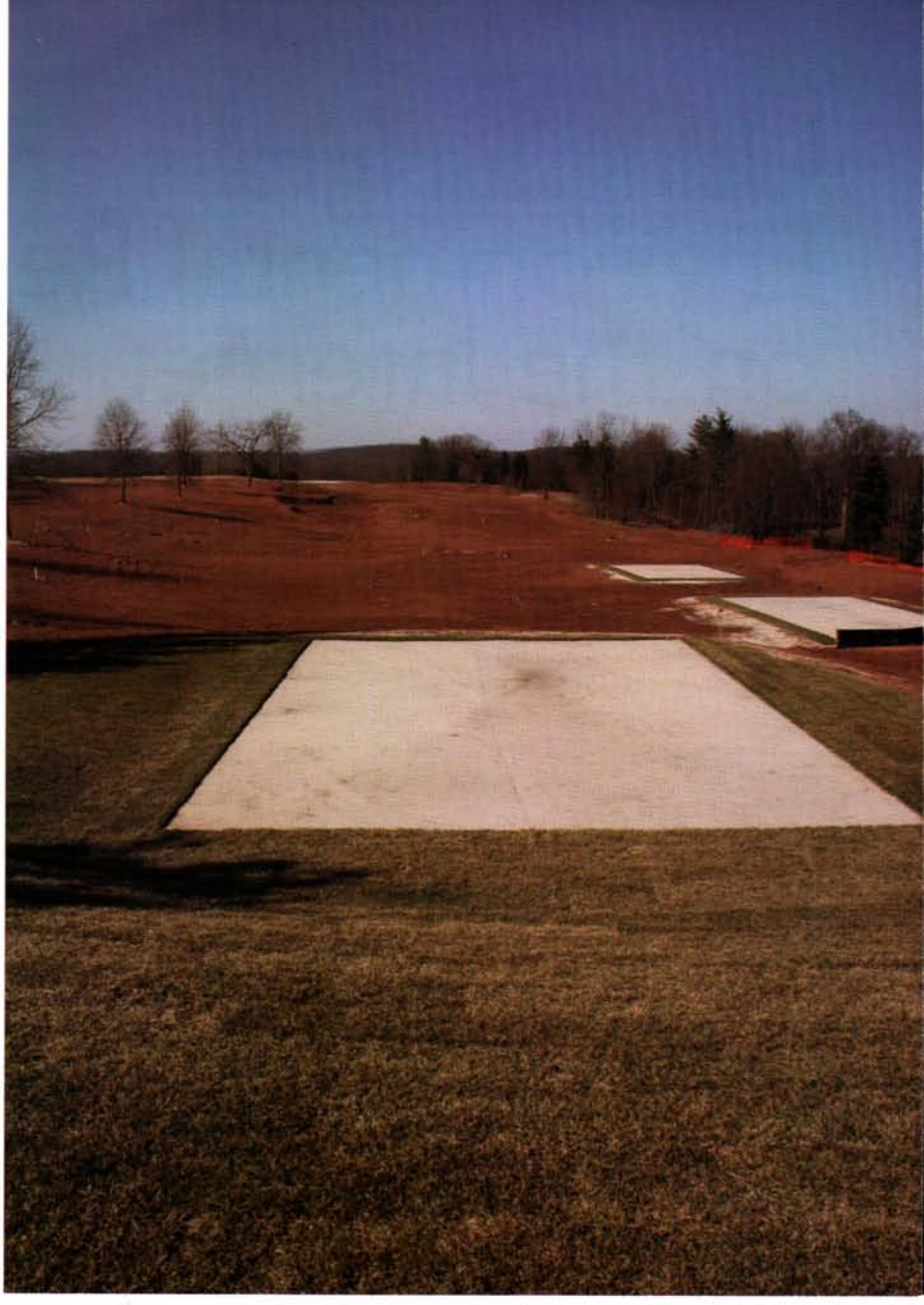
The alignment of rectangular tees with the target area is an issue that causes concern with many golfers. Based on personal observations, golfers have little problem lining up their shots when the tee is pointing well off the target line — greater than 10 degrees. Golfer complaints regarding this issue are most likely to occur when the tee is just slightly off line. This is likely more of an aesthetic issue than one of playability. Regardless, it is an issue with many players and can be addressed easily during construction.

CONCLUSION

In summary, while there are many ways to build good tees, the following points should be kept in mind to ensure a successful tee construction project.

- Adequately size the tee based on how much and what type of play it receives and the growing conditions of the site.
- Provide multiple access points to spread golfer traffic over as large an area as possible.
- Keep the slope of the tee sides at 3:1 (18 degrees) or less to provide safer conditions for players and course workers.
- The surface of the tee should receive a minimum of eight hours of direct sunlight per day.
- A 7:2:1 or 8:1:1 sand/organic matter/soil rootzone generally provides excellent growing properties.
- Provide surface drainage slope of at least 0.5% regardless of the composition of the rootzone.
- Slope the tee subgrade at least 1% to 2% to interception drains spaced no greater than 15 feet apart. Install a drain at the edge of the tee to prevent "bleeding."
- To avoid controversy regarding tee alignment, align rectangular tees directly with the target line or else angle them greater than 10 degrees away from the target line.

JIM MOORE *is the Green Section's construction education program director.*



There is a lot right with this golf course tee, including plenty of light, unlimited access points, ease of maintenance, and alignment.