

Design, Maintenance: A Crucial Marriage

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Golf Course News

Part 1 of 2

In no other form of construction are design and maintenance so closely intertwined as with golf courses. Both are driven by the same objective: to provide the golfer with the most pleasant recreational experience possible. To reach this objective, designers and superintendents must be fully sympathetic to each other's purposes and problems. Some of the issues involved and some of the compromises both must face regard drainage, earthmoving, greens and green surrounds, tees and bunker design.

First, maintenance is more important to the golfer than design. Given a choice between a well-designed but poorly maintained golf course, or a poorly designed but well-maintained one, the golfer will nearly always choose the best maintained. Second, maintenance often has a greater influence than design on a course's difficulty and speed of play. When greens are kept fast, fairways lush and narrow, roughs long and sand bunkers soft, you can bet the course will play difficult and slow.

Last, it is the visual impact or interesting patterns of color, texture and height that help make a course memorable and enjoyable. Usually this is achieved through mowing patterns, landscaping and selective maintenance, all under the superintendent's control.

This means the superintendent should be given more credit for making a round of golf an enjoyable experience. (Such influences of superintendents are more than 100 years old, for in researching old magazines I continually find references to the great condition of a

course, with only occasional mention of the design).

Because of the role of maintenance, a superintendent should be hired early in the planning.

Drainage Most Crucial

The single most important element of a golf course is drainage. Everyone has heard the story of the superintendent who was asked what it takes to keep a golf course beautiful. His reply: "About 5 percent drainage, and if you don't have much common sense, then put in more drainage."

Drainage is especially significant to effectively practice Integrated Pest Management.

Two elements of drainage must be studied and coordinated: surface drainage and sub-surface drainage. Unless a site has perfect internal drainage or no rainfall, the entire site must be analyzed for its drainage characteristics and patterns, and these should be planned for until all of the water leaves the site. This usually means a system of drainage swales, catch basins and revetments that exhaust into pipes or tile, a tile system for all greens and bunkers, a series of ponds and drains, and sometimes a retention-detention basin.

The flatter the site and/or the tighter the soils, the more important and complicated drainage becomes. Drainage installation can be expensive, so many times the course architect must cut back on the scope of drainage in order to stay within the budget. Many believe drainage can be installed later, but earthmoving and amended soils for greens must be done now. It is a compromise of the "ideal" and the "adequate." The

designer and superintendent know the value of drainage and must try to convince the owner not to compromise, but often this is futile.

Sadly, this is also true of almost every facet of course construction, but golf course developers must fully understand what complications they are causing.

Earthmoving a Critical Factor

Earthmoving can be another design consideration related to maintenance, especially if it creates better drainage patterns, softens steep grades that might be difficult to water and mow, or reduces traffic funnels or barriers. Specifications that preserve topsoil, insure compaction and provide for clean fill material are other design influences that impact maintenance.

Superintendents should advise designers on any areas that may complicate maintenance or require hard work. Many times such problems can be addressed during earthmoving.

Greens Directly Dictate Maintenance

Greens are the most intensively maintained part of a course, and their design directly dictates future maintenance. Greens design should first produce good surface and subsurface drainage. My personal approach is to design greens that surface-drain in three or four different directions, not just one.

Secondly, we always install tile on 15- to 18-foot centers and backfill them with 1/4-inch pea stone under putting surfaces and bunkers. Finally, we try to stay around 1-1/2 percent slopes within probable hole locations.

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The type of root zone used in greens should be based on water-quality analysis of the proposed irrigation supply, the turfgrass to be used and the microclimate of the green or golf course. Selecting a green construction method by any other way ignores the design/maintenance relationship.

Green surrounds should be designed to provide room to turn greensmowers, spread out foot traffic, permit collar mowing with a triplex machine, reduce the amount of sand blasted out onto the green, and combat localized dry spots on putting surfaces caused by super-heated sand faces. If mostly riding machine maintenance is expected, then 12-foot collars are needed. But if anticipated budgets allow for hand maintenance, 3-, or 4-foot collars will work.

Irrigation systems can be designed to deal with such site influences as wind, soils, slopes, micro-climate and turfgrass types. Individual head control on greens is considered a minimum so that each section of the green can be individually irrigated, and often there are additional heads to water the green surrounds if they have different requirements. Quick couplers for hand-watering are always installed and their locations, as well as the type of control system and location, should be done in consultation with the superintendent.

Greens should be designed to provide adequate cupping area. Our personal goal is 15 to 18 separate and distinct hole locations. This spreads out foot traffic and adds interest to the course. We like to have four or five of these cupping areas to be very demanding in shot value, and the remainder very forgiving of errors on approach shots.

Tees and Bunkers

On tees, the design intent is to provide not only strategy and interest through multiple settings, but to enhance maintenance by providing surface drainage, adequate space to spread out traffic, insuring good air

drainage across the tee and providing an appropriate irrigation system.

The rule of thumb for adequate size is 150 square feet for every 1,000 Grounds played on wood shot holes. That is, for 20,000 rounds a year, an adequate tee size for par 4s and par 5s is 150 x 20, or 3,000 square feet per 1,000 rounds of golf played.

Designer and superintendent will have many discussions on bunker style, shape, size, slope and sand size. Some favor flat sand because it is easy to rake, and in their minds is the most natural form, speeds up play, etc.

Others, like myself, think of bunkers as message boards meant to communicate certain information to the golfer, and as such we prefer splash bunkers and or high sand faces. My bunkers are not easy to care for. In fact, only 75 to 80 percent of each bunker can be raked with a power sandtrap rake. The rest is hand labor.

It is the client's decision between ease of maintenance or flash. However, no matter what bunker type is used, there are some general design techniques and specifications related to maintenance.

First, the bunker should be built to reject surface water from running into it, especially on sand faces, to reduce water erosion. This means that all edges of the bunkers should be at least a couple of inches above grade.

Second, the bunker should be drained either by tile or French drain. Also, the bunker bottom should be perfectly concave or bowl-shaped, smooth and compacted before sand is installed. Sand depth should be at least 6 inches — and 8 inches is preferred. The sand should be of angular shape and in the range of .25 millimeter to 1 millimeter, favoring the larger particles in windy areas. Color doesn't matter.

It is strongly recommended that grass bunker faces be treated with growth regulators, or planted to slow-growing greasses to reduce the need for edging and mowing.

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