GCSA Guide For Golf Course Construction

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This article has been condensed from a speech made by L. E. Lambert at the GCSA convention.

The GCSA specifications committee was suggested by the advisory committee at the 1960 Houston conference. Gene C. Nutter, our executive dir., past-pres. Elmer G. Border and myself were named to serve on it.

We investigated and read the codes and manuals of many other professions, industries and governmental agencies in setting up this guide for course construction. By the time of the fall executive committee meeting we had arrived at the conclusion that technical terms would have to be used to prevent misunderstandings. Thirteen major subjects and 64 items were covered in our report.

Many courses have been constructed on wasteland but have been improved to the extent that they are showplaces. But if the cost of such a project could have been foreseen, the club probably could have purchased an original tract of the best and most fertile land in the locality. Cost of the land usually is one of the smaller items in the total cost of a course.

First Test: Fertility

In evaluation of a course site, one of the first tests should be for fertility. Past history of its agricultural use is valuable. Most state universities have soil testing facilities and can give the club a complete report at nominal cost. The cost of clearing the site can be an important item. Natural drainage is important as it can be a costly maintenance item. Available water for irrigation should be surveyed and an adequate supply assured. A lab analysis should be made to make sure the water's mineral content is right for irrigating fine turf grasses.

Employment of a qualified course architect is a necessity. He shall be responsible for design of the course and shall furnish adequate drawings of all construction work, including detailed drawing of each green and tee. A complete set of specifications should be a part of the contract with the construction contractor.

Availability of the architect during construction should be determined before he is engaged.

The contract with the builder should cover the usual provisions for insurance, public liability, workmen's compensation and financial responsibility. It should also include rates of payment and credits for all changes and revisions.

Superintendent's Role

A supt. who will have charge of the maintenance of the course, should be employed by the club when construction

starts. He should check and inspect all construction work and keep the club informed of its progress, the contractor's performance in following the specifications, and advise the club on accepting the work done by the contractor. He should look after the club's interests and keep officials informed of problems that may arise during construction.

Where topsoil overlays subsoil, the topsoil should be removed and stockpiled before grading operations are started. Following grading, topsoil shall be uniformly distributed over the graded area. All filled areas should be free of stumps, brush or any other material which will decompose and cause settlement of the fill. Rocks or stones must be at least 24-ins. below the finished surface. All fills shall be compacted as stated in the specifications. All finished surfaces must drain as shown on the drawings and no depressions or pockets which hold water should exist. If subsoil drainage is required it shall be installed during construction before the surface is finished.

All slopes should be graded as indicated on drawings and stated in the specifications, with all surfaces finished smooth. No humps or berms shall remain which can't be mowed with standard course powered mowing equipment without scalping the turf. All contours shall be finished in a like manner.

Tiling Specifications

Where tile drainage lines are specified they should be installed according to the drawings. Tile lines shall be adequate in size, ditches properly graded and tile aligned and covered as stated in the specs. Cleanouts should be provided at not more than 200 ft. intervals to permit rodding in both directions with a 100 ft. tape or rod. Outlet structures should be built at all tile outlets and protected with a suitable screen or gate to keep out rodents and small animals. Where tile lines carry surface water, catch basins shall be constructed at the elevations specified.

All berms at catch basins shall be graded so that they can be mowed with power mowing equipment without scalping the turf. All cleanout and catch basin covers shall have openings in them small enough to prevent a golf ball from entering the system. All surface contours should be designed to conform to the drainage system design. All stream and ditch banks shall be graded to permit use of power mowing equipment.

Where trees and/or shrubs are removed, all roots to a depth of eight inches should be removed. Cultivation is an important item of maintenance and roots can cause expensive repairs to cultivating equipment. All roads and service drives shall be graded and drained; if paved they should be constructed to stand up under anticipated loads. Electric car paths shall be constructed as indicated on the drawings and should be designed for anticipated loads and climatic conditions.

Elevated tees should have slopes that can be maintained with standard power mowers. Adequate surface drainage shall be built into each tee. Topsoil used in construction should be tested for fertility and if deficient, it should be modified while the tee is under construction.

Traps should be constructed so as to drain all surplus water quickly. If necessary, tile drains should be installed at the time of construction. Slopes should not be excessive and should be flat enough to retard washing of the sand during normal rains. External grass slopes of the traps should be graded so that they can be mowed with power equipment. Traps should be spaced to avoid a traffic pattern which leaves only one entrance or exit to and from the green.

Grading of Rough

All areas of the rough should be graded to give good surface drainage. No depressions which will hold water should be permitted to remain. Tree and shrub plantings should be laid out to a landscape plan which shall take into consideration the strategy of the game, and maintenance by power equipment.

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44 Courses in Allegheny County

In reply to Golfdom's request for information pertaining to the number of courses in various counties throughout the country, James H. Potts, assoc. sec. of the Pennsylvania Golf Assn., Pittsburgh, says there are 44 courses located in Allegheny county. According to Elizabeth Lake, asst. sec. of the Cleveland Dist. GA, there are 30 clubs in Cuyahoga county. It is expected, however, that several semi-private courses in the county will soon be out of business because of sales of their land for subdivisions.

and effort. A simple example might be taken from the mowing of the collar adjacent to the putting surface. I noted that my men were making as many as four complete circles around the greens to mow variable width collars. It appeared that by reducing collars to a uniform width we could cut the mowing in half with only two mower widths for the collar. It worked and we have made this standard procedure ever since. Another thought on equipment is the use of multiple units. I find, for instance, that by using two 7-gang fairway mower units, we reduce an over-all job from about 8 hours to a 3½ hours.

Fairway Fertilization

Fairway fertilization is another operation that has always taken its toll of hours. It required about three days with an old conventional 6- or 8-ft. spreader to fertilize our 18 fairways. Weather changes, play, and other factors sometimes entered into the picture, too, and we found it was taking a week or more to get the job done. We needed a more efficient method of fertilizer distribution. We came up with an improved technique of using a cyclone type spreader covering approximately 40 to 50 ft. to a swath and a three-day job was reduced to no more than six hours or less. We also worked out a plan for using the same machine on our tees and now all 18 are handled in about 50 minutes by one man instead of two working all day.

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All banks of water hazards should be graded to facilitate maintenance with power equipment. Provisions for sanitation and vegetation control are important in the construction of water hazards.

Irrigation Requirements

The irrigation system should be designed to produce and distribute all water necessary to maintain good turf under all weather conditions. Extended periods of drought and an inadequate irrigation system have been expensive for many clubs. As this subject is so large and complex, it is impossible to discuss all of the items which must be considered. Climate, water requirements of the grasses, surface drainage, internal drainage, type of soil, rate of application, spacing of outlets, adequate pressure, prevailing winds, control valves, pressure controls, provision for draining, depth of bury, access

to controls, minimum sizes of mains and laterals and many other items must be considered in the design of an adequate irrigation system. A well designed and adequate irrigation system pays for itself many times over.

The construction of greens is the most important part of golf course construction. The architect's drawings should indicate contours, elevations and the number of fair cupping areas for each green. This is very important for clubs anticipating tournaments and heavy play. Contours difficult to maintain and large, unusable areas of greens increase maintenance costs out of proportion to benefits received. Collars, aprons and slopes around the putting area should be finished to facilitate mowing and maintenance with power equipment. The location of trees and plantings should be surveyed during construction. These should be removed when there is a possibility of their roots growing into the green. In wooded locations openings should be provided to allow free air circulation.

As it is almost always necessary to use the soil available at the course site or from a nearby borrow area, modification of this soil is imperative. Proper composition of the soil mixture for a green is a subject on which there is a wide range and difference of opinion. Some research has been carried out but much more is needed. The GCSA believes the soil mixture for a green should have these properties:

1. Fertility—a mixture capable of growing and supporting good putting turf;
2. Structure—the mixture must permit rapid passage of surplus water to the subsoil or underdrainage;
3. Stability—the mixture must stand heavy traffic without compaction. Compaction and poor drainage are the two great enemies of a good green. Compaction results in poor water and air movement in the soil and inadequate root systems for supporting good turf. A compacted green will not hold a well played approach shot.

Surface drainage of a green is part of the architect's responsibilities. Design of the green should be such that surface water will not stand on any area of the green. Under-drainage, if necessary, should be built into the green at the time of construction.