

Water on the golf course

by Ronald Fream

Water is as integral a part of a golf course as it is in any other form of organic life. Water and the golf course are interrelated in three generalized groupings: Aesthetically and strategically, through irrigation and by the effects of water upon maintenance.

The visual impact of water

The most obvious results of water to the typical golfer is as the game is being played. The ball in the lake, gone forever, is a memory, an extra stroke and sometimes an alibi. The use of water on a golf course, as an aesthetic element to enhance the visual beauty of a course, is common. The use of this aesthetic water should be carefully considered, since the impact of water as an element of finality in the hierarchy of penalties and hazards presented to the golfer is generally terminal. The indiscriminate use of water as a hazard is unfair and impractical. No hazard should be added arbitrarily or capriciously, especially one as final as water. The use of water to enhance the beauty of a particular setting while also offering a fair, reasonable and challenging element which heightens the drama and play of the game, is thoroughly justified.

Improper use of water features as



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An in-place, full-coverage system is in operation on the putting green of a par-3 hole.

hazards can contribute to slow play, golfer frustration and, quite possibly, lost revenues for the operator.

Obviously, the abilities of golfers differ, with a 14 handicapper being considered "average." Yet, the introduction of water into the design of the golf course does, on occasion, disregard the average and at times the superior golfer as well. When the "average" golfer is not considered, you may automatically assume those higher than average handicappers are also given scant regard.

Disregarding the golfer when designing a golf hole or a golf course, seems an impossibility, if in fact, one is designing a golf course, yet such is the case more often than one might believe. Consider how often a hazard — and this discussion is regarding water hazards only — is discovered after the golf shot has been hit. The blind shot, or blind hazard, is a design weakness in old and new courses alike. Justifications are few for a blind water hazard. To crest a rise and observe the concentric rings of the impact point of your ball can create frustrations not desirably associated with golf. If, on the other hand, you are able to observe the pond, lake, stream or seacoast before you address the shot, you have the opportunity, if

not the ability, to select a tool from your bag with which to attempt to negotiate or surmount the pending hazard. Whether or not you are able to overcome that hazard, the eyes must be able to observe and the nervous system must be able to react to the flight of the ball and the ultimate results be they favorable or discouraging. Here is the essence of golf! To observe and master an obstacle en route to holing-out provides the joy, the satisfaction and addiction of the game.

As water offers a soothing visual amenity like few others, the inclusion within most modern golf courses is almost obligatory. In actual fact, the real and original courses, those grand and intimidatating links of Scotland, have virtually no lakes and few too are the burns or streams. Modern golf architecture introduced the water as a means of presenting a hazard of finality which, while different, was as total as the deep and treacherous gorse of the links. Golf architecture of recent years has also been oriented more to the aesthetic design of the course as compared to the earlier years laying out of a course on naturally receptive ground. Those "natural" sites are few and far between today and where the given site



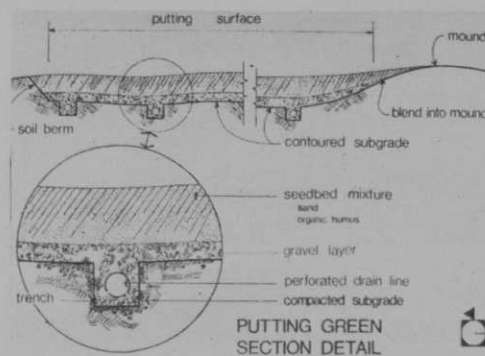
A gravel drainage line is visible in this sand bunker prior to placement of sand.



Close up of a quick coupling sprinkler head.



This portion of an irrigation system plan layout shows head and piping layout.



This cross section detail of a putting green illustrates the correct construction method to provide for subsurface drainage.



Standing water in a cup is an obvious sign of putting.

is blessed with few, if any, natural features, water can be used to create visually appealing elements when none previously existed.

Designing of a water hazard into the golf course is a critical factor. As mentioned earlier, placement without regard to how the water will influence or affect play is careless or amateurish at best. Designing a water hazard which unfairly penalizes the golfer and offers no reward for daring shot-making is useless. To combine a strategic playability with the visual impact of a large lake within the context of a golf hole or as it may affect several holes is a memorable part of a course.

Water as a real hazard can overpower and demoralize. Holes of unforgiving demand, such as the tee shot on 15 at Pine Valley, do not represent modern golf course architecture. (But then was Pine Valley ever intended to represent anything but a one-of-a-kind superlative?)

The thoughtless positioning of water hazards immediately in front of the regular and women's tees frequently causes a needless slowdown in

play. Such situations are even seen on the public courses where the race track, race-them-through mentality is prevalent. Placement of water hazards to needlessly trap the mis-hit beginner's shot serves no purpose. Unless the location of the water significantly influences the strategy and playability of the hole, and influences the play of the better golfers, one should seriously ask why the water is where it is.

There are almost as many round, monotonous ponds and lakes as there are round bunkers and round greens on golf courses throughout the world. An artfully conceived outline shape will not alter the fact that your ball is in the lake; however, a flowing harmonious shape will certainly be more appealing to the eye. The design must strive to emulate nature; that is, the location and use of any water hazard must not appear contrived or forced. Harmony with the natural and indigenous environment of the individual site must be a primary objective of any golf course design effort.

As with all other components of the golf course design effort, careful

thought must be given to the safety aspects of using water hazards. Security fencing of individual water hazards is not often encountered or required. However, regard must be made to the attractive nuisance aspects as well as to the influence on misdirected golf balls. In some instances, a grove of trees will be far more desirable than a pond, purely for purposes of golfer safety.

Consider the methods of lake excavation, sealing and water circulation before problems arise. Adequate depth and an impervious lining seal are essential. Modern aquatic herbicides and aeration equipment can keep weed growth minimal. When used as part of the irrigation system reservoir, regular circulation of the water helps maintain water quality. A separate water circulation system within the pond lake may be necessary to insure adequate water movement. In general, the warmer the climate, the more closely attended must the lake be to minimize maintenance problems.

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Water *Continued from page 11*

So long as the use of water considers the golfers first, presenting visible hazards and attainable goals, water will have a very significant and contributory place on the golf course.

Irrigation is essential

A function of water on most golf courses which frequently goes unappreciated by the mass of golfers is the use of irrigation to supplement natural rainfall. In the early years, irrigation may have consisted of a faucet and a few lengths of hose. Even today, in many parts of the world, irrigation is at best a hose connection near the green with no irrigation elsewhere. At St. Andrews, an irrigation system installed a few years ago has, in the opinion of some golfers, damaged the playability of that venerable course. Provided the golfers are willing to accept the variable turfgrass conditions which accompany non- or limited irrigation, installation of an irrigation system may not be advocated in some specific areas of the golfing world.

However, given the ever increasing sophistication of golfers worldwide, the unirrigated "natural"

golf course is becoming less and less an accepted fact of golf. That ever uniform, ever green turfgrass of a properly irrigated course is rapidly becoming the standard whether in the desert, the mountains, the seaside or the jungle.

In arid areas the introduction of a pond or lake as a reservoir for irrigation uses permitted golf where before no grassed course could survive seasons lacking natural rainfall.

Golf is a game of turfgrass. However, there are some instances when due to shortages or an absence of water, golf can only be played on a surface that is other than turf.

Oiled sand greens were occasionally encountered here in the United States in the years before World War II. Advances in technology and increases in available funds have just about eliminated their need. In some of the more arid countries of the Middle East, Northern and Southern Africa, oiled sand greens can still be encountered. A weekly or monthly sprinkling of used crank case oil over the chosen greensite will provide the stabilizer necessary to consolidate the sand base. Normally the caddie carries a

"T" shaped smoothing tool in addition to the normal contents of the golf bag. Once the ball is on the putting surface, a path between the ball and the cup is smoothed. The putt may roll true, however, the speed is not sensational to say the least.

Ever increasing labor rates and the questionable dependability of labor combine to minimize the use of portable sprinklers and handheld hoses. Most irrigation systems installed today are, in one form or another, permanently in place systems with buried main lines and lateral piping. Depending upon the particular location, climate and labor situation, the system may be engineered as a manually operated one, as semi-automatic or as a fully automatic system. Coverage may be greens and tees only; greens, tees and fairways, or total "wall-to-wall" full coverage of all turfgrass areas within the boundaries of the course.

At existing golf courses where the older "quick-coupler" type manually operated systems were originally installed, conversion to some type of automated system is being frequently noted.

Irrigation systems are no panacea!



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Do not make the mistake of assuming once an irrigation system is installed it can be forgotten. Consider the fact that almost any semi-automatic to automatic irrigation system and pumping plant is going to cost from \$100,000 upwards — very upwards for a fully automatic “wall-to-wall” system — on 18 holes of golf. Such systems costing \$500,000 or more are not uncommon. That is no small investment. Installation can be for a new course or at an existing course. However, the most crucial aspect to carefully consider is who will design and engineer the system using what products.

The safest way to obtain the right system for your specific requirements is to retain the services of an experienced professional irrigation system engineer. Some golf course architects have such professional engineers on staff. In some localities, independent irrigation engineers can be retained. Unfortunately, in some regions, only a product distributor's in-house designer is available. That in-house designer may have had virtually no field experience and little engineering background. Some of the in-house distributors or factory designers are more interested in using their product than in considering what is best or most desirable economically for the specific golf course. During the installation process, that factory or local distributor's designer is unlikely to be on-site inspecting the efforts of the Contractor. In many cases, that factory designer never even sees the site, let alone the local climatic tables or soil permeability analysis.

The engineering of the pumping plant which is vital to the irrigation system is not often provided by a factory designer. Without a properly engineered and functioning pumping plant, no irrigation system, regardless of installation cost or products used, will operate correctly. Proper engineering must match the operating requirements of the specific irrigation system design to that of the pumping plant. Pre-assembled “package” pumping systems offer convenience and in some cases, economy as well. Ideally, the engineer of the irrigation system is also capable of providing the pumping plant engineering.

Water has a direct impact on how the game of golf is played. Without water in the form of irrigation, there would be no golf in many parts of the world. Without water, grass will not grow. That is not exactly a profound statement. It is irrevocable, however.

Water as an adversary

By applying water when and

where needed via the irrigation system, a golf course superintendent can achieve optimum turfgrass growth during even the driest periods. Water and turf growth are complimentary but also antagonistic. It is quite easy to apply too much water; especially with elaborate automatic systems which seem to run themselves. Some superintendents set the controller clocks in the spring and never check them again until the fall. Occasionally, the sophistication of the system so overwhelms the superintendent that rather than try to contend with the system, the manual override is resorted to regularly. Regular adjustment of any irrigation system is essential in order to complement the day-to-day changes in any locality's climate.

Bunkers are often observed as small ponds when drain pipes or vertical gravel sumps have not been installed. Runoff water into a bunker from adjacent areas is another result of careless design and construction. Tee tops become a quagmire if the seedbed preparation does not consider climatic conditions, maintenance requirements and golf playability. The installation of drainage lines, gravel and sand based seedbed layers on a teeing surface can forestall maintenance problems for years. Large teeing surfaces are another very desirable part of proper design and construction.

Fairway construction which strips all the topsoil and leaves only hard pan or clay below will soon promote wet spots and turfgrass deterioration. The contouring of fairways to promote surface drainage and the installation of subsurface drainage lines and catch basins as necessary are an essential part of proper golf course architecture and construction.

The addition of sand, organic humus or both may be required in some high traffic or concentrated traffic areas on fairways and at greens aprons as one means of minimizing water induced compaction.

Don't ever let anyone tell you it is easier to correct or fix drainage problems after they occur rather than anticipate them. The golf course architect can, if he is knowledgeable, design and engineer the majority of drainage facilities — drainlines, catchbasins or whatever, in advance on paper, as easily for fairways as for greens, tees or bunkers. It is never cheaper to install drainage facilities later!

During the construction process, the golf course architect must periodically visit the site to personally

review the on-going works. To provide only pretty pictures or merely schematic sketches without viewing the construction can result in many long term problems. In collaboration with the golf course superintendent during the construction process, potential drainage problems and long term turfgrass difficulties can be prevented. Obviously, not all drainage problems on every golf course can be prevented or eliminated, however, an effort to eliminate such problems is highly desirable.

If the golf architect is only concerned with design and gives scant consideration to the long term maintenance of the golf course, the problems of excessive water and the results are sure to come. If the golf course superintendent habitually over-waters, problems will occur which result in the deterioration of the golf course.

Over-watering is a very common practice. During the drought of 1976-77 in California, great cries of terror could be heard as golf courses became one of the first victims of water rationing. Much to the surprise of many, the first 25 percent cutbacks in water usage resulted in few to no deteriorations in turf playing conditions. In some cases, the quality of the turf actually improved. It was not until cutbacks of 50 percent or more were ordered that severe stress and extensive turf die-out began to occur. In areas where *Poa annua* was the predominant turf, the effects of the drought were more quickly felt. Nonetheless, almost without exception, reductions of 25 percent in average water usage did not materially harm the turf. This is a very important lesson in view of the likelihood of energy restrictions and increasing conservation efforts in the future.

Over-watering then, or excessive rainfall and inadequate drainage facilities, with the resulting soil compaction problems, turfgrass deterioration, and undesirable playing conditions causes far more lasting difficulty and has more impact upon maintenance costs than does controlled under-watering.

There is no easy solution. Too much water as excessive hazards, improper irrigation or over abundant rainfall will each create problems for the successful operation of a golf course. Water is an essential element of golf, for playability and maintenance. Design the golf course intelligently, engineer the irrigation system knowledgeably, build it right the first time and maintain it professionally. □