

level to be employed and an accurate estimate of use, a turf bed can be constructed by using modern laboratory analysis as a basis for mixing materials. This bed should never have to be rebuilt because of soil failure, and it will require a minimum of subsequent mechanical aeration. Essentially, these are stabilized soils which can only be compacted so far and no further under normal use and maintenance.

For conservative turf managers who are more interested in facts and sound investments than they are in risking their employer's money and their own reputation just so they can claim to be soil experts in their own right, the days of "by guess and by golly" are almost over. I say

almost over because there is still a tremendous amount of misinformation and a gapping lack of any information at all on **what** is wanted in a soil mix as well as **where** and **how** the necessary analysis should be made.

We now have a considerable amount of information on soil physical analysis and a good technician can measure the physical properties of soil materials and positively determine the proportions needed for an acceptable putting green soil. This is a monumental achievement which was not accomplished overnight and will be of lasting value, but it is only a good point from which to start further investigations into the nature and properties of soils for turf.

Oakland Hills

Prepares for a Major Championship

by **TED WOEHRLE**, Superintendent, Oakland Hills Country Club, Birmingham, Michigan

Oakland Hills Country Club, of Birmingham, Mich., was the site of the 1972 PGA Championship in August. After the membership agreed to host this major event, the services of a well-known golf course architect were sought to make suggested changes. Based on his recommendations, four new bunkers were built in the fall of 1971, and one modification to an existing bunker was made.

When the general condition of the playing turf was under control, we concentrated our efforts on installing the many utility wires required to make the Championship a success. Some of the utilities included underground telephone wires (some 30,000 feet) installed by our own crew to prevent the possibility of damage to the existing water lines, tile lines, and electrical control wires for our automatic irrigation system. Other utility installations included a multitude of electrical wires and television cables. Scoreboards, leaderboards and television towers were installed two weeks before tournament time. Additional towers for still photography, movie cameras and general radio and press coverage were also installed. Over 30 tents and trailers were placed around the course just one week before the Championship. These structures were used by the concession people and other public facilities.

As the Championship drew closer, we had to take into consideration the various heights of cut on the grass. Greens were to be 3/16-inch,

fairways 5/8-inch, tees 1/2-inch, intermediate rough about 10 feet wide cut at 2½-inches, and the deep rough as tall as nature would permit. Fairways were narrowed to 30 yards in the landing areas. A collar of 30 inches was mowed around each green, followed by 5 feet of short rough. The remainder of the turf surrounding the green is considered deep rough. All of these features place a premium on accurate shot placement.

Throughout the entire tournament the gallery was of prime concern to the club, especially the safety of the spectator. The placement of gallery ropes helped to control the crowd, as well as affording them safety. The ropes are placed in such a manner as to give greatest visibility for the gallery. We also cut low-hanging branches on our trees to give an unobstructed view of play and at the same time protect the crowd from accidental eye injuries.

Traffic control on the course during the week of the Championship is perhaps the biggest headache encountered. Strict schedules for delivery trucks which service the concession tents must be enforced. An employee of the grounds crew must accompany each truck. This includes the truck servicing the comfort stations at night. The collection and removal of trash from the premises is a monumental task. The local Boy Scouts gather up loose trash and place it in receptacles. The waste is then bagged for pick-up by the grounds crew and brought to



Seeding near gallery ropes prior to tournament time.

a collection area where it is placed into rubbish trucks and compressed.

Some protection for the anticipated wear on the turf was made just prior to the Championship. We seeded over the existing turf in the obvious wear areas and let the foot traffic of the gallery trample the seed into the ground where it will begin to germinate a few days after the tournament is over.

Maintenance during the week of the Championship was broken into two distinct categories; routine and abnormal. Routine maintenance consists of mowing tees and greens every morning before play, changing cups and repairing ball bruises, raking traps and night watering if necessary. Abnormal maintenance consisted of late afternoon or evening mowing of fairways, divot repairs with seed and soil *both on the tees and the fairways*. Because we mowed the fairways in the evening, we had to

remove the dew from them each morning. This was accomplished by dragging water hose between two vehicles the full length of the fairway with one vehicle on each side of the fairway.

Broken ropes and bent stakes must be repaired and straightened throughout the tournament. This is done during play by roving crews of grounds men and marshalls. There are 1,800 stakes and some 50,000 feet of rope needed to control the gallery, and at the end of one day much of these are in need of attention.

Parking for the tournament was on our North Course, which is adjacent to the Championship Course. Protection against traffic damage to the automatic irrigation system was of great concern to us. We placed empty 55-gallon drums over all the pop-up sprinklers. If we needed to water in the evenings, we simply knocked over the drums and watered. The next morning we placed the barrels over the sprinkler heads again. Over 100 drums were supplied by local golf course superintendents. The greens and tees on the North Course were fenced off with snow fence and roping to protect them from car traffic as well as foot traffic. Of course we had to continue mowing these areas during the tournament.

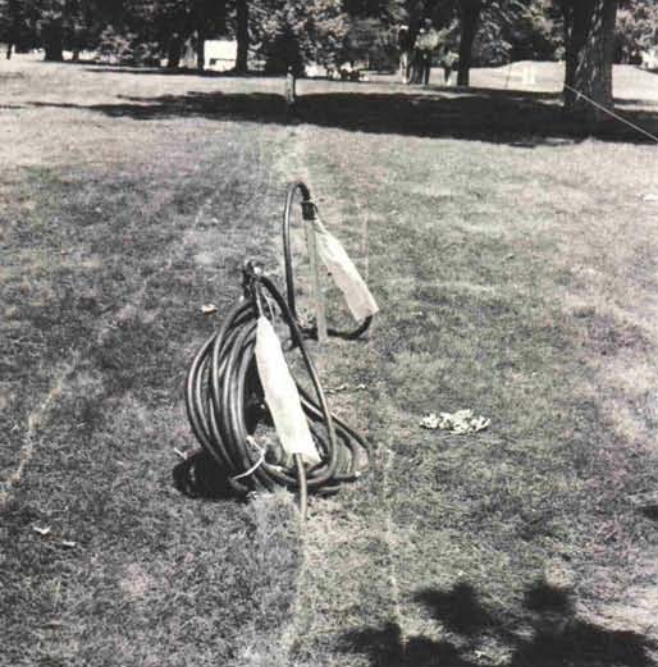
The entrances and exits to the North Course were prepared well in advance. Definite construction specifications were made by the County Road Commission, and these were followed.

The USGA Green Section Agronomist played an important role in guiding the club in its preparation. Suggestions concerning the general condition of the course and many helpful hints in conditioning for a major championship were passed on to the staff, and they were deeply appreciated. Some of the suggestions involved proper timing of top-dressing, fertilizing, watering, mowing, spiking and protection measures against the natural problems of weather. From these we were able to put together a well-

ABOUT THE AUTHOR

Ted Woehrle became one of the first golf course superintendents in the nation to be certified in the GCSAA Certification Program initiated in 1971. He has been Superintendent at Oakland Hills Country Club since 1968 after serving nine years in a similar position at Beverly Country Club, Chicago. Son of the late Herman Woehrle, Superintendent of The Elks Country Club, Kankakee, Ill., Ted is a graduate of Purdue University and currently serves as President, Michigan and Border Cities GCSA, and Director in the Golf Course Superintendents Association of America.





planned program of preparation.

We of the grounds department were caught up in the excitement of the Championship, the preparation and execution of duties throughout the tournament and made it all seem worthwhile. The hard work and long hours are soon forgotten, along with the anxieties and frustrations. These all seemed a natural part of a major tournament.

With a little cooperation from nature, the recovery from the Championship should be complete and the scars healed over before the first welcome snow arrives this winter.

Utility wires buried for protection from the gallery. Easily removed after the tournament.

Bridges Serve the Golf Course

by WILLIAM G. BUCHANAN, Eastern Agronomist, USGA Green Section

Bridges are constructed to various sizes and shapes, but they all serve the same purpose, to move people and vehicles safely over obstacles that would be difficult to traverse otherwise. Bridges constructed on the golf course speed play, speed maintenance, and make it more comfortable for golfers to span hazardous terrain (water, deep valleys, ditches, swampland, etc.). Bridges, therefore, are constructed primarily for utility. However, they should not detract from the overall beauty of the golf course. Finally, and most important, they must be constructed well enough to provide safe passage for all manner of traffic.

All bridge construction must be done well, but especially important is the superstructure which is the basic span with foundation tie-ins. The superstructure can be made of either steel or timber stringers that rest on abutments and any intermediate supports. The load-carrying component of the superstructure is the stringer system, which may be rectangular timber, round timber, or steel beams. Steel stringers are either I-beams, wide-flange beams, channel

beams or built-up beams. Span length depends on the size of the beam and capacity requirements of the bridge.

Abutments and intermediate supports make up the substructure; these may be timber bents, timber piers, pile bents, or a combination of these supports. Rock and concrete piers are very popular around golf courses. Soil and water conditions at the bridge site dictate what type of intermediate support can be used. Deep water, swift current or adverse footing conditions make the use of piles necessary.

Figure 1 is a very good example of creek bank work, abutment installation and using steel I-beams for intermediate supports. The I-beam piles have angle iron lateral bracing. This particular bridge is located close to a dam that stores irrigation water. The abutments of the bridge were built into the wing walls that prevent the creek bank from eroding behind the dam.

Figure 2 shows one abutment. The sill of the abutment is concrete with steel stringers on top. All decking on this bridge is 2x6-inch