Building a Purr-Wick Green at Belle Meade

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"What's new in green construction?"

A whole decade has passed since the subject was first opened with *Specifications For A Method of Putting Green Construction* by the Green Section. Like a man going through an insurance physical, the Specifications have been inspected, poked, prodded, and re-examined from every possible angle. Individuals and private laboratories have attempted "improvements" of their own. Research stations have laborously explored the techniques and some have published additional suggestions.

After 10 years the Specifications have indeed undergone some small changes. Nevertheless, they are still sound and successful. They remain the only method of putting green construction recommended by the Green Section of the USGA.

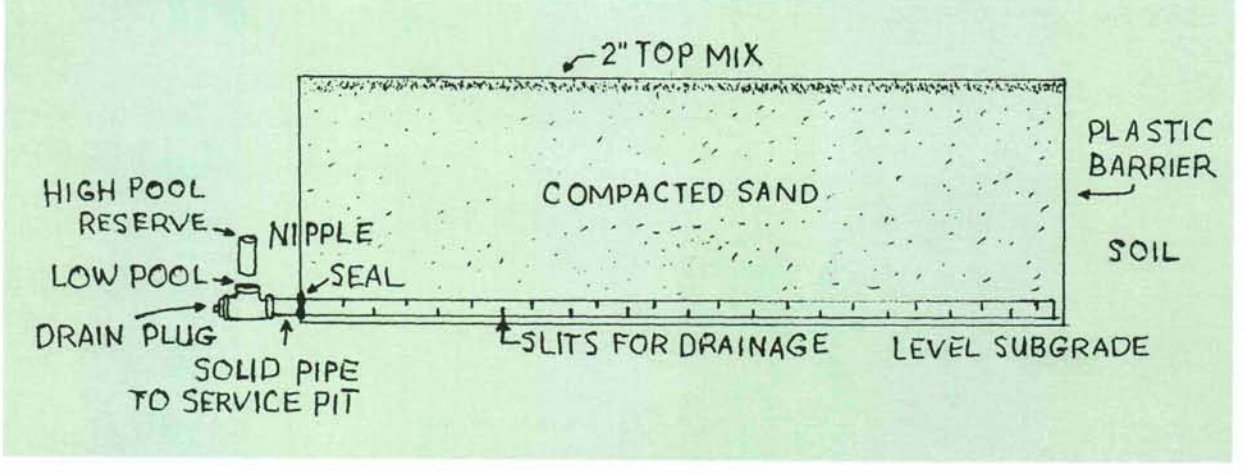
But the question, "What's new in green construction?" is interesting and worthwhile. New ideas are always evolving. One must keep pace. We must be aware and understand them if progress is ever to be made.

The most inventive new technique has been developed by Dr. W. H. Daniels, of Purdue University. Dr. Daniels calls his system the PURR-WICK method with the letters PURR standing for *P*lastic *U*nder *R*eservoir *R*ootzone and WICK denoting the wick or capillary action of the water moving through the sand above the plastic in the rootzone.

Belle Meade Country Club in Nashville, Tennessee decided to try the PURR-WICK method in constructing a new practice green. The following pictures tell the story.

A — This is a cross section diagram of one tier of PURR-WICK from a paper published by the Department of Agronomy at Purdue University. The diagram illustrates the basic PURR-WICK construction idea followed at Belle Meade.

Diagram A



To begin, the old putting green surface was removed, the sod sold and the soil stockpiled. With old sod, soil and gravel removed, the rough grading begins. The allowable tolerance of the subgrade is plus or minus one inch. Water must be installed at the green site before construction begins because it is an essential element for construction as well as for future maintenance.

A bi-level base was produced in the subgrade and all rocks were raked up and removed so they would not puncture the plastic. In this case the subgrade for each section was 16 inches below the proposed finished grade and each level contained approximately 2,750 square feet, or a total green surface of 5,500 square feet.

Four inch pipe was laid along the edge of the terrace and staked down. This formed a barrier between tiers which forms the reservoir on the upper tier. The difference in elevation of the tiers should not be more than half the depth of the sand layer. Example: If the sand is 16 inches deep, there should be no more than an 8 inch change in the elevation of the surface grade of the tiers.

Plastic was laid on the upper tier and seamed together with plastic tape. Belle Meade used 10 mil plastic sheets and allowed the plastic to overlap from three to four feet. Sheets 20 feet by 100 feet were used for an effective width of 17 to 18 feet.

The plastic was looped over the pipe on the edge of the tier with enough overlap to make the edge vertical without putting stress on the plastic. Lateral drains (slit plastic pipe) were installed and taped in place then covered with sand to further secure them. Then the terrace was flooded to check for leaks.

To run the drain pipes through the polyethylene at the side of the green, a cross (smaller than the pipe) is cut in the plastic at the desired spot and the pipe pushed through. The plastic is then taped to the pipe to make it as water tight as possible and a flange of collar is secured on both sides of the polyethylene and bolted securely around the pipe with additional tape covering this.

Drain pipe for each tier is produced by sawing slits on alternate sides of plastic pipe with a coping saw so that slits are wide enough to permit water but not sand. The pipe is sawed about a third of the way through on 4— to 6—inch centers. These drains may be laid in any desired pattern necessary to fit the green contours.

Dumping the first load of sand at the edge of the green is shown in picture 8. The sand is worked out from the edge and should be kept moist. When moving out on sand, make a bridge across the reservoir dividers and drain pipes first. By going slow and easy the sand will form a base which will support 25 tons of sand plus the weight of the truck rolling over it without damage to the pipes or polyethylene.

To push the sand out and rough grade the surface, a bulldozer may be used, but be careful not to push drain pipes out of line when working between tiers. The upper terrace was filled with sand first, but this was chalked up to experience and it is recommended that the lower level always be filled first to make the sand easier to push over the terraces without displacing the terrace dividers.

Once the sand has been placed over the entire green as uniformly as possible with a bulldozer, a scraper may be used to further level and true the surface. This equipment is easily supported by the sand base without fear of disturbing the drains and tier dividers underneath. Again, you should work slow and easy and keep the sand moist. Putting the sprinkler on for several hours before this operation will help settle the green and make working easier.

With the green surface leveled as much as possible by the scraper, the peat moss is applied by going over the surface once with the topdressing machine wide open.

The next operation is to put down a layer of calcined clay with a drop type spreader. On the 5,500 square foot green, about 40 bags of calcined clay were used, and this may be topped off with another layer of peat if desired. The calcined clay and peat in the surface help hold moisture for seed germination and also give the green surface enough body to hold a good lip on the cup.

The peat and calcined clay are incorporated into the top one to three inches of the green. In this operation, a Mat-a-Way machine worked well, but it needed some assistance when it bogged down now and then in the soft mix.

Following the incorporation of the calcined clay and organic matter into the green surface, the final leveling and smoothing was done with a rake in the same way all topdressing is smoothed when applied to established greens.

The green was then watered again and rolled to firm up the surface in preparation for seeding. When watering after the sand had been applied, leaks were easily detected by holes washing out in the sand. These should be corrected as soon as noticed.

Two or three strips of sod should be placed around the outside of the green to prevent washing and a snow fence is helpful to keep people and animals off the green until the seed is established. This picture shows the green being seeded.

With the seeding accomplished, the surface was mulched with a clean straw which helped hold the seed in place and speeded germination. The germinating seed should be inspected frequently and watered often enough to keep good moisture in the surface of the green. In this case, the green was first mowed three weeks after seeding.

This green cost a little over $3,500 to build, or roughly 64c per square foot with the sand being by far the most expensive item. Less than 400 man hours were used in construction. This would probably have been less if it had not been necessary to remove the old green.

The PURR-WICK method of building greens has both advantages and disadvantages. It does require exact planning, very careful installation and proper machinery for construction. The proper sand must be selected on the basis of particle size to make the final installation perform as it should. Design of the green may be restricted. But this method does give the turf manager absolute water control (playing surfaces are uniformly moist at all times) and conserves water to the maximum.

Proper green construction requires planning and close attention to detail. Improvisions by the builder seldom improve the product. Using only parts of a method of green construction which has been tested for years by competent people, or making your own combination of methods, usually leads to trouble. The compulsion to make "improvements" or to "do it my own way" are strong but seldom rewarding. Don't gamble with the club's money and your reputation. Few golf course superintendents are equipped to take on this kind of research, and most clubs are unsympathetic to poor conditions as a result of unsuccessful experimentation. As Dr. Daniels has so aptly put the phrase, "Do it right or leave it alone."