

## USGA

### Rebuilding Greens - The Gravel and Intermediate Sand Layer

By Pat Gross

Probably the most notable changes in the 1993 USGA Green Construction Recommendations were:

1. Including criteria that allowed for the exclusion of the intermediate sand layer, and
2. New recommendations for particle size and installation of the gravel blanket.

First, let's talk about the intermediate sand layer. The installation of the intermediate sand layer, choker layer, blinding layer - whatever you want to call it, was a big sticking point for many people. Eliminating this layer was the most common short cut to building greens because it saved time and money. This led to many people eliminating the choker layer then calling their construction method "modified USGA Greens."

Architects, builders, superintendents and even the USGA Green Section realized for several years that some courses were able to

build successful greens without an intermediate layer. But, there were many more failures than success stories as a result of this short cut. Since people were more likely to continue excluding the intermediate sand layer despite what the specifications said, the USGA asked Dr. Norm Hummel to research the subject and outline the conditions where the intermediate layer is not necessary. These guidelines were developed from existing specifications used by civil engineers for layered drainage systems. Briefly, the intermediate sand layer can be eliminated if the largest 15% of the root zone particles bridge with the smallest 15% of the gravel particles and a specific permeability ratio is maintained (i.e. the D15 of the gravel is greater than or equal to 5 times the D15 of the root zone). I know, it sounds like Greek to me too. The bottom line - **have both materials checked by a physical soils testing laboratory to see if**

**the intermediate sand layer is necessary.**

With the publication of the 1993 USGA Recommendations, many people incorrectly assumed that the intermediate sand layer was no longer necessary. Wrong! The intermediate layer can only be eliminated if strict gravel specifications are met. If this can't be accomplished, you will need an intermediate sand layer to prevent particle migration into the gravel. If needed, the intermediate material must have at least 90% of the particles between 1mm and 4mm, and the material must be placed by hand at a uniform depth of 2" to 4".

This brings us to the next subject - gravel selection. How do you go about finding a gravel that allows you to eliminate the intermediate sand layer, and is it worth the effort? In most cases, finding the right gravel to eliminate the need for the intermediate layer is worth the effort and will save time and money for the overall project. You

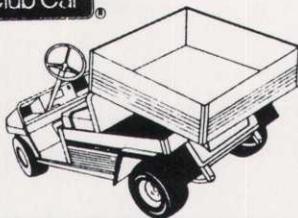
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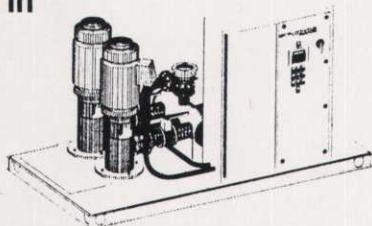
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## Strictly Business

By Bob Costa

In last month's Strictly Business, I described the job search as a three step process, and summarized the persecutors for performing a personal evaluation. The outcome of that exercise was a list which defined the qualities you would seek in a new position. The objective now is to match those qualities with potential positions. A procedure I refer to as the search.

The process of searching for a position that matches your employment needs is not an easy one, be prepared to be frustrated and to have your patience tested. What's important here is to maintain realistic expectations, don't assume you will be successful overnight.

There are many resources that can be used to uncover potential job opportunities, none probably more important than contacts. A word of caution here, depending on your employment status be selective as to whom you "get the word out to". Most people

are not very good at maintaining confidentiality, and we shouldn't have to go to Disneyland to be reminded that "it's a small world". Talk only to those people who are really in a position to help you, and that you can trust. Tell as few close personal, or business associates as possible.

With that said, now is not the time to be shy. Don't be afraid to develop new contacts. You should develop an intimacy with your telephone which you never knew before. If your interest is in new projects, contact those who are in the know, well in advance of the project being started, such as construction firms, architects, developers etc. There are publications which do nothing but list pending projects and trade magazines which highlight development. Use them as a resource. Standard referral services can be helpful too, but don't count on them to be your only source for a new job. The point is to be resourceful and aggressive. The old adage, "No harm, no foul," is

well applied here.

As you begin to cast your bait into the employment waters you're likely to have a few nibbles, have your bait disappear, and get hooked on a few rocks. **Be patient.** If you are fortunate enough to catch a few, don't assume their keepers. It's time now to do a little research.

Research involves under-cover work, asking a lot of questions of a lot of people. The purpose is simply to determine whether or not the job you have an interest in has the potential to meet your employment needs. Again, rely on your contacts for some of this information. Talk to current or previous employees, including the superintendent, or schedule a preliminary meeting with someone involved with the project or operation. Some of this vital information can only be obtained as part of a formal interview. I'll discuss how that can be accomplished next month when we talk about marketing. ♦

## Rebuilding Greens (Cont.)

should check local suppliers and submit various gravel samples to the laboratory for comparison against your root zone. It may take extra time and testing but it could save you the time and expense of installing the intermediate layer. Generally, a good 1/4" gravel with an angular to sub-angular shape will meet the criteria, but again, have the material tested. Keep in mind that the gravel can be too small and end up pulling water out of root zone.

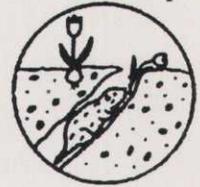
Finally, one of the most

interesting changes in the 1993 USGA Recommendations was that the gravel layer does not have to conform exactly to the subgrade. This means that you can slope the subgrade for optimum removal of water and then shape the gravel blanket to conform with the finish grade of the root zone. Shaping the gravel blanket will be difficult unless you have an angular to sub-angular gravel. The gravel blanket must be a minimum of 4" deep but can be deeper as long as it follows the general slope of the subgrade.

Now that all the materials have been properly selected, it's time to build the green. Next month, Mike Huck will write Part IV of the series - Putting It All Together, Quality Control During Construction. ♦

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